HISTORY OF FERMENTED TOFU -
A HEALTHY NONDAIRY / VEGAN CHEESE (1610-2011):

EXTENSIVELY ANNOTATED
BIBLIOGRAPHY AND SOURCEBOOK

Including Various Names and Types: Sufu, Red Fermented Tofu, Bean Cheese, Chinese Cheese, Doufu-ru, Soybean Cheese, Soy Cheese, Bean-Curd Cheese, Fermented Soybean Curd, Bean Cake, Tofyuyo / Tofu-yo, Red Sufu, Fu-Yu, Fu-Ru, Chou Doufu / Ch’ou Toufu, Pickled Bean Curd, etc.

Compiled
by

William Shurtleff & Akiko Aoyagi

SOYINFO CENTER

2011

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History of tofuyo  
History of bean cake  
History of Fu-Yu  
History of nondairy cheeses  
History of healthy nondairy cheeses  
History of vegan cheeses  
Bibliography of sufu  
Bibliography of bean cheese  
Bibliography of Chinese cheese  
Bibliography of soybean cheese  
Bibliography of soy cheese  
Bibliography of bean-curd cheese  
Bibliography of fermented soybean curd  
Bibliography of tofu-yo  
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Bibliography of nondairy cheeses  
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DEDICATION AND ACKNOWLEDGMENTS

This book is dedicated to the kings of the Loochoo / Ryukyu dynasty, Dr. Masaaki Yasuda, Nganshou Wai, and Quong Hop & Co. - pioneers in this field.

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

Of the many libraries and librarians who have been of great help to our research over the years, several stand out:

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- Finally our deepest thanks to Tony Cooper of San Ramon, California, who has kept our computers up and running since Sept. 1983. Without Tony, this series of books on the Web would not have been possible.

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

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

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INTRODUCTION

What is fermented tofu? It is a soft (almost creamy), somewhat salty non-dairy (vegan) cheese that originated either in China or the islands around Okinawa in about the 1500s. It has a rather strong aroma, reminiscent of European mold-ripened cheeses such as Roquefort, Camembert, Blue / Bleu, Brie, Neufchatel, Stilton, Gorgonzola, etc. Many Westerners consider it an acquired taste, but those who try it often grow to love it - or even crave it. It does not melt but it is cut or spreads easily, and is generally used as a condiment, as with rice or rice porridge, or as a spread for crackers. There are many different types made in many different ways – just as there are with dairy cheeses, but all can be divided into two basic types: (1) Tofu molded before pickling. (2) Tofu not molded before pickling. It is typically made using a two-part fermentation. For type No. 1: First, 1-inch cubes of firm tofu are inoculated with spores of a special species of mold. These are kept in a warm place (or incubated) for several days until each cube is overgrown with a fragrant white mycelium. Second, these mold-covered cubes are immersed in a brining liquor (often in individual jars) consisting of a mixture of rice wine, water, and salt. There the tofu ages and ripens. It will keep for years unrefrigerated – or even longer refrigerated.

Brief Chronology of Fermented Tofu.

1596 – Fermented tofu (furō) may be mentioned in the Beccao Gangmu [The Great Pharmacopea] by Li Shizhen. Scholars disagree.

1610 – Earliest known reference to fermented tofu in China appears in Penglong Yehua [Peng Long Ye Hua; Night Discourses by the Penglong Mountain], by Li Rihua. The fermented tofu is named hai fu [hai tofu fu] (Huang 2000, p. 325-26). The next few earliest Chinese documents that mention fermented tofu are from 1680, about 1750, and 1790.

1783 – Fermented tofu is first mentioned in Japan in the Tôfu Hyakuchin Zokuhen [One Hundred Rare and Favorite Tofu Recipes: Sequel], by Ka Hitsujuun of Osaka. Two types of fermented tofu were mentioned, both red. However this fermented tofu subsequently disappeared and can no longer be found in mainland Japan.

1818 – Basil Hall, an Englishman, describing a feast by the king of Loocchoo (in today’s Okinawa province) says: “There was something like cheese given us after the cakes, but we cannot form a probable conjecture of what it was made.” It was probably tofuyo.

1855 Jan. – Fermented tofu is next mentioned in the Western world by Baron de Montgaudry, the French Consul at Shanghai and Ning-po, China. Writing in French in the Bulletin de la Société d’Acclimatation he says (after describing regular tofu): For the rich, a seasoning (assaisonnement) is prepared which requires more care and culinary talent. The soybean paté (La pâte de Pois) [tofu] is fermented after having been seasoned with pepper, salt, powdered bay/laurel leaves, powdered thyme, and other aromatics. During the fermentation, the producer bastes the paté with soybean oil (l’huile de Pois). After several days of fermentation, the preparation is ready. This paté or cheese (fermented tofu) becomes a very powerful digestive (aid to digestion) and an aperitif, which no one can resist because it is extremely tasty.

1858 April – Fermented tofu first arrives in the Western world in Australia (Melbourne). Called “Pickle beans curd” [sic], it is part of a shipment of Chinese foods sent to Chinese in Australia because of the Gold Rush (1851-1861). Unlike regular fresh tofu, fermented tofu is not perishable and can be shipped long distances (Towns 1858).

1878 – Doufu-ru (Fermented tofu) is first made in the Western world in San Francisco by Wo Sing & Co., which also makes regular tofu (Wells Fargo & Co.).

1879 June 4 – Fermented tofu is first mentioned in a U.S. newspaper, in the Hartford Daily Courant (Connecticut) in an article titled “A Hartford lady at a Chinese dinner.” The wife of an American official in China, she calls it “salt bean curd.”

1882 – Doufu-ru (fermented tofu) in now being made by a second tofu company in San Francisco, Sam Sing.

1888 – In France, fermented tofu is first given a real name – “fromage de soja” (Figuier 1882).

1883 – Fermented tofu (“10 boxes of bean cake”) is again imported to Australia from Hongkong, again as part of a shipment of Chinese foods (Brisbane Courier, Queensland, Australia). Another shipment with the same name arrives in June 1885.

1887 – In A Primer in the Mandarin Dialect, published by the China Inland Mission in Shanghai, fermented tofu is described on page 197 as “teo-fu-ru, bean curd;” The three
Chinese characters are given.

1888 – Fermented tofu is first referred to in English as “Beanscurd, preserved” (Alabaster 1888).

1892 – Stinky tofu (a malodorous type of fermented tofu, loved or craved by many) is first mentioned in English in a dictionary by H.A. Giles under the character Ch‘ou (p. 259. No. 2521). The entry reads: “Chou fu - stinking bean curd, noxious.”


1904 – Fermented tofu is first referred to in English as “bean curd cheese” (Geil 1904). This is the first of many names containing the word “cheese.” Indeed fermented tofu is one of the most delicious non-dairy (vegan) cheeses.

1906 (or 1951) – Quong Hop & Co. of San Francisco is said to have started making fermented tofu. As recently as 1984, the company was making two popular types, sold in glass jars – “Bean Cake (Fu-yu)” and Pepper Bean Cake (with flakes of hot chili peppers in the brining liquor). Note: Neither we nor the owners of Quong Hop & Co. have been able to find any proof that the company even existed in 1906. The earliest record we have found that they existed is from a 1930 San Francisco City Directory; they are listed as a grocery store at 135 Waverly Place. The earliest records we have found that they made fermented tofu are from two sources: (1) A listing and ad in a 1951 Yearbook; they were at 133 Waverly Place. (2) A listing in the 1951 San Francisco City Directory; their occupation is described simply as “bean cakes.”

1909 Oct. 4 – Fermented tofu is first referred to in English as “soy bean cheese” (United States Land and Irrigation Exposition).

1919 Dec. – Fermented tofu is first referred to as “fermented cheese” in a British patent by Li Yu-ying of France. From this “fermented cheese” he has invented a way to make Western-style cheeses such as Roquefort, Parmesan, or Gruyere. It is interesting to note that all of these Western-style cheeses are traditional mold-ripened cheeses.

1912 – Tahuli or tahuri, fermented tofu made in the Philippines, is first described by Gibbs and Agcaoili.

1916 – Frank N. Meyer, USDA agricultural explorer in China, first encounters fermented tofu in China. He sends samples back to Washington, DC. His first description reads: “Parcel No. 125c, contains first quality Chinese soybean cheese; please taste a little on the point of a knife; it is extremely appetising.” In this future letters he also refers to it as “Chinese bean cheese,” or “bean cheese.” He notes that there are several kinds of this soft cheese in China.

1917 – Fermented tofu is first referred to in English as “foo-yue” (Chan 1917). This is the first of many names with this sound; others are fuyu, fu-yu, foo-yu, etc.

1918 – C.Y. Shih, writing in English from the Biology Dept., Soochow Univ., China, describes various types of fermented tofu: ju fu, tsao ju fu, chiang ju fu, ham ju fu, and ch‘ing hsien ju fu.

1920 – Red fermented tofu is first mentioned in English by Margaret B. Church of the Bureau of Chemistry, USDA. She refers to it as “Chinese red cheese.” It is made red by the use of red fermented rice or ang-kak. Church is also the first to use the terms “Chinese cheese,” “soy cheese,” or “Chinese soy cheese” to refer to fermented tofu.

1929 Sept. 27 – The first scientific studies on fermented tofu are published in a famous article titled “A new species of mono-mucor, Mucor sufu, on Chinese soybean cheese,” by Nganshou Wai in the prestigious journal Science. Fermented tofu is referred to here (in English) as “sufu” or “tosufu.” The writer is from the National Hygienic Laboratory, Shanghai, China. The name, which soon starts to be widely used in Western scientific publications, causes considerable confusion because (1) it is largely unknown by Chinese outside of the Shanghai area, and (2) it is not used on commercial products. Wai isolated the main microorganism thought to be responsible for the fermentation and identified it as a new species of Mucor; he proposed the name Mucor sufu.

1944 – Fermented tofu is first referred to in English as “preserved tofu cheese” by De Gouy.

1946 – Fermented tofu is first referred to in English as “fermented tofu” by Arnold Marquis in a broadcast on NBC radio.

1948 – Fermented tofu is first referred to in English as “fermented soybean curd” by Manuel E. Arsenio in the Philippines.

1949 March – A.K. Smith, of the USDA Northern Regional Research Lab. (Peoria, Illinois), after a trip to East Asia to study soyfoods, publishes a long and detailed article in Soybean Digest titled “Oriental use of soybeans as food,” part of which concerns fermented tofu. He introduces three new varieties and describes how each is made: chee-fan, tsue-fan (“drunken cheese”), and hon-fan (a red cheese).
1968 – N.S. Wai, now living in Taiwan, publishes a final synopsis of his studies in a major report funded by the United States Agency for International Development.

1970s – Many types of fermented tofu begin to be imported into the United States, especially from countries based on Chinese culture (China, Hong Kong, Singapore, etc.).

1983-1984 – Four articles about delicious tofuyo, made with red koji (beni-koji) are published in Japanese, in leading Japan scientific journals, by Dr. Masaaki Yasuda and colleagues at the Dep. of Agricultural Chemistry, University of the Ryukyus (Ryuku Islands), Okinawa. These included a detailed and carefully documented history (with 37 references) and precise description of the process by which tofuyo is made. With these articles Dr. Yasuda and colleagues introduce tofuyo to the world.

1985 March 9 – NHK TV, Japan’s largest and most respected television station, does a 30-minute documentary titled “Tofuyo” as part of its series “Today’s Food.” It is filmed in Okinawa.

1990-2010 – Dr. Masaaki Yasuda and colleagues in Okinawa publish seven more scientific articles about tofuyo. This time all but the first have a good English-language summary.

2010 Sept. 22 – Quong Hop & Co. files voluntarily for Chapter 7 bankruptcy. The last U.S. maker of wine fermented tofu no longer exists – opening up a business opportunity!

2011 July 21 – CNN names “stinky tofu, a type of fermented tofu, as one of the “World’s 50 most delicious foods” (No. 41 out of 50).

2011 – “Fermented tofu, tofu-yu,” by Dr. Masaaki Yasuda of Okinawa is published in English as a chapter in a free online book by InTech (Croatia). An excellent summary of his work, with 54 references, it contains good histories of both fermented tofu and of tofu-yo.

2011 – Popular vegan cheeses in the United States are made by Daiya, Galalaxy Nutritional Foods, and Chicago Soydairy (Teese); each has a website. Most melt, some stretch. The last two are soy-based. But whereas most Chinese love and use fermented tofu, very few vegans or vegetarians are even aware of it or even think of it.

Alphabetical list of names of fermented tofu (useful for searching digital / electronic text):

Bean cake
Bean cheese or bean-cheese
Bean curd cheese

Beancurd, preserved
Chao
Chee-fan
Chiang ju fu
Chinese bean cheese
Chinese cheese
Chinese red cheese
Chinese soybean cheese
Chinese soy cheese
Ch’ing Hsien ju fu
Chou doufu
Ch’ou doufu
Ch’ou toufu or ch’ou tou-fu or ch’ou tou fu
Doufu-ru or or doufu ru or dou-fu-ru or dou-fu ru
Drunk sufu
Fermented cheese
Fermented curds
Fermented bean curd or fermented bean-curd
Fermented nam yu
Fermented rice sufu (a type of tsao sufu)
Fermented soybean curd
Fermented tofu
Fetid bean curd
Fetid tofu
Fooh yü
Foo yee
Foo-yu
Foo-yue
Funan
Funiu
Funyu
Fusu
Fuyu
Fu Yu or Fu-Yu
Fu-Yue or Fu Yue
Hakko tofu
Ham Ju Fu
Hon-fan
Hon fang
Ju Fu
Kwagtung sufu
Kwantung sufu
Naam yü
Nam yee
Nam yu
Nam yüe
Nan-ru
Nan-su
Nom yu
Nyufu
Pehtze (molded tofu cubes)
Pickled bean curd or pickled beancurd
Pickle beans curd
Preserved beancurd
About This Book

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

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

- 44 different document types, both published and unpublished.
- 709 published documents - extensively annotated bibliography. Every known publication on the subject in every language.
- 27 original Soyinfo Center interviews and overviews never before published.
- 50 unpublished archival documents
- 19 commercial soy products.

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

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

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

A complete subject/geographical index is also included.
ABBREVIATIONS USED IN THIS BOOK

A&M = Agricultural and Mechanical
Agric. = Agricultural or Agriculture
Agric. Exp. Station = Agricultural Experiment Station
ARS = Agricultural Research Service
ASA = American Soybean Association
Assoc. = Association, Associate
Asst. = Assistant
Aug. = August
Ave. = Avenue
Blvd. = Boulevard
bu = bushel(s)
ca. = about (circa)
cc = cubic centimeter(s)
Chap. = Chapter
cm = centimeter(s)
Co. = company
Corp. = Corporation
Dec. = December
Dep. or Dept. = Department
Depts. = Departments
Div. = Division
Dr. = Drive
E. = East
ed. = edition or editor
e.g. = for example
Exp. = Experiment
Feb. = February
fl oz = fluid ounce(s)
ft = foot or feet
gm = gram(s)
ha = hectare(s)
i.e. = in other words
Inc. = Incorporated
incl. = including
Illust. = Illustrated or Illustration(s)
Inst. = Institute
J. = Journal
J. of the American Oil Chemists’ Soc. = Journal of the American Oil Chemists’ Society
Jan. = January
kg = kilogram(s)
km = kilometer(s)
Lab. = Laboratory
Labs. = Laboratories
lb = pound(s)
Ltd. = Limited
mcg = microgram(s)
mg = milligram(s)
ml = milliliter(s)

mm = millimeter(s)
N. = North
No. = number or North
Nov. = November
Oct. = October
oz = ounce(s)
p. = page(s)
photo(s) = photograph(s)
P.O. Box = Post Office Box
Prof. = Professor
psi = pounds per square inch
R&D = Research and Development
Rd. = Road
Rev. = Revised
RPM = revolutions per minute
S. = South
SANA = Soyfoods Association of North America
Sept. = September
St. = Street
to = tonnies = metric tons
tons = metric tons
trans. = translator(s)
Univ. = University
USB = United Soybean Board
USDA = United States Department of Agriculture
Vol. = volume
V.P. = Vice President
vs. = versus
W. = West
°C = degrees Celsius (Centigrade)
°F = degrees Fahrenheit
> = greater than, more than
< = less than

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Click “Open Full Acrobat Search.”  
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When asked: “What word or phrase would you like to search for?” type that word or phrase in the box.  
For example: tofu or Okinawa. No need to use quotation marks. Then click “Search.”  
At “Results” click any line that interests you.

For those using a Mac without Acrobat Reader: Safari is often the default browser. Click “Edit” in the toolbar at top. In the dropdown click “Find.” then click “Find...” again. A search bar will open across top of screen with a search box at right. In this box type a word or phrase you would like to search, such as China or Rockefeller Foundation. Click “Done” then scroll through the various matches in the book.

**Chronological Order:** The publications and products in this book are listed with the earliest first and the most recent last. Within each year, references are sorted alphabetically by author. If you are interested in only current information, start reading at the back, just before the indexes.

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

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

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

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

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

**Most Important Documents:** Look in the Index under “Important Documents -.”

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


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

**Industrial (Non-Food) Uses of Soybeans:** Look under “Industrial Uses ...” for more than 17 subject headings.
Pioneers - Individuals: Laszlo Berczeller, Henry Ford, Friedrich Haberlandt, A.A. Horvath, Englebert Kaempfer, Mildred Lager, William Morse, etc. Soy-Related Movements: Soyfoods Movement, Vegetarianism, Health and Dietary Reform Movements (esp. 1830-1930s), Health Foods Movement (1920s-1960s), Animal Welfare/ Rights. These are indexed under the person’s last name or movement name.

Nutrition: All subjects related to soybean nutrition (protein quality, minerals, antinutritional factors, etc.) are indexed under Nutrition, in one or more of 14 subcategories.

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

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

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

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

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BIBLIO: The software program used to produce this book and the SoyaScan database, and to computerize the Soyinfo Center Library is named BIBLIO. Based on Advanced Revelation, it was developed by Soyinfo Center, Tony Cooper and John Ladd.

History of Soybeans and Soyfoods: Many of our digital books have a corresponding chapter in our forthcoming scholarly work titled History of Soybeans and Soyfoods (4 volumes). Manuscript chapters from that book are now available, free of charge, on our website, www.soyinfocenter.com.

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

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Tofuyo (豆腐よう)
HISTORY OF FERMENTED TOFU


- Summary: Wade-Giles reference: Pên Ts’iao Kang Mu, by Li Shih-Chên (lived 1518-1593). Ming dynasty. This classic work was completed in 1578, but not published until 1596. It describes almost 2,000 animal, vegetable, and mineral drugs and gives over 8,000 prescriptions. A rich source of information, it is still very useful. All foods mentioned are considered as medicines, based on the ancient Chinese saying: “Food and medicine have the same origin.” The title might also be translated as “Collected essentials of herbs and trees. Illustrated compendium of materia medica with commentaries.”

Soybeans and soyfoods are discussed in two chapters of this book. Chapter 24 contains sections on soybeans, soybean sprouts, and yellow soybeans, in that order. Chapter 25 has sections on soy nuggets, yellow molded soybeans (Jap. soybean koji), tofu and yuba (doufu pi), jiang, and soy sauce. Concerning yuba: if a film should form on the surface of soymilk when it is heated in the process of making tofu, it should be lifted off and dried to give yuba (doufu pi), which is itself a delicious food ingredient (Huang 2000, p. 303, 323).

Note. This is the earliest Chinese-language document seen (May 2010) that mentions yuba, which it calls doufu pi.

The first part of each section is titled “Explanation of names”; when these simply repeat material we have translated from earlier Chinese documents, we will not re-translate it. Another part of each section explains each food / medicine in terms of its “nature” or “vital energy” (qi, hot, warm, neutral, cool, and cold) and “flavor “ (wei, bitter, sour, sweet, pungent, salty).

The section titled “Soybeans” (dadou) begins by stating that soybeans are considered a “middle class drug / medicine” according to the Shennong Bencao Jing (Benjing) (Classical pharmacopoeia of Shennong, the Heavenly Husbandman) (+100). This section has four parts: (1) “Explanation of names.” The soybean is shu. The pods are called jia. The leaves are called huo. The stems are called qi. (2) “Explanation of uses.” After quoting information from earlier Chinese sources, he states: The different soybean varieties are black, white, yellow, spotted / speckled (ban), green, and striped. The black ones are also called wudou. They are used for both medicine and food, and for making soy nuggets (shi). The yellow ones are good for making tofu (fu), for pressing to obtain oil, or for making jiang. But the other soybean varieties can also be used to make tofu and can be cooked for food. They are usually planted before summer. The young plants (miao) grow to a height of 3-4 feet. The leaves are pointed. In the fall they have small white flowers which come in clumps about one inch across. The plants wither in the frost. According to the Lüshi Chunqiu (Master Lü’s spring and autumn annals) (239 B.C.), when soybeans are in season, the stems are long and the branches are short. The pods come in groups of 27. The more branches there are, the more nodes. The large soybeans (shu) are round; the small soybeans (shu) are oval. The early varieties tend to grow like vines. The leaves float. The nodes are further apart. The pods are smaller and not solid. The later varieties have fewer nodes, less space between nodes, and they are less solid. According to the Fan Shengzhi Shu (The book of Fan Shengzhi {on agriculture}) (10 B.C.), if you plant soybeans in early summer, you should not plant them deep because the flowers do not like too much sun; they will rot and the roots will be scorched. One should adjust the depth of planting according to the variety. [After harvesting] store soybean seeds in a level, shady place in a bag. Take them out 15 days after winter begins; then you can use them for planting. Soybeans can be stored quite easily for one full year, so they can be kept in preparation for a famine year.

(3) Black soybeans–nature and flavor (heidadou qiwei): They are sweet, neutral, and nontoxic. Prolonged ingestion will make you / your internal organs feel heavy. When raw, they are warm. When cooked, they become cold–according to Zhibo (a person) cited in the Huangdi Neijing Suwen (Yellow Emperor’s classic of internal medicine: Questions and answers) (200 B.C.). Chang Qi (another person) says: When soybeans are raw they are neutral, but when they are roasted they become hot, and when they are boiled they become cool (han). When made into soy nuggets they become cold (leng). When used to make jiang or soy sprouts (“raw yellow curls”) they are neutral. When cattle eat them, they are warm [i.e. they have a warming effect on the cattle]. When horses eat them, they are cold. So even though it is one substance, when it is eaten in different ways, it has different effects.

(4) “Inventions” (faming): Explains the complex pharmacology and medicinal effects of soybeans on the five internal organs–such as the kidney, liver, etc.

The section titled “Soybean sprouts” (dadou huangjuan or “soybean yellow curls”) has two parts: (1) “Explanation of names.” These are sprouted [soy] beans (doumie). Allow the black soybean to sprout until it is 5 inches (cun) long. Then dry it; this is called huangjuan (“yellow curls”). It becomes very small when dried. (2) Nature and flavor (qiwei): Sweet, neutral, nontoxic. Note 1. This is the earliest document seen (April 2003) that uses the term doumie to refer to “sprouted soybeans.”

The section titled “Yellow soybeans” (huang dadou)—
The pods are like those of azuki beans and tofu, disagrees. When asked by Wm. Shurtleff about this little-used term, Dr. H.T. Huang says (2002) he cannot find any mention of it, after another long search. Moreover, he does not mention this book in the section of his Needham series book about fermented tofu (2000, p. 325-28). However Dr. Masaki Yasuda, a professor in Okinawa, who has spent his professional career studying tofu, a type of fermented soybean, disagrees. When asked by Wm. Shurtleff about this specific point he replied (e-mail of 11 Nov. 2011): “You will find mention of fermented tofu in the Special Issue of Honso Komoku (Bencao Gangmu) by Li Shih-Chen in 1596. Maybe you only checked ‘the main issues’ of this book, but actually he also published other special issues that were not included in the main issues. You will find the fermented tofu using the key word furu, not fermented tofu nor rufu. Furu in this book clearly refers to the fermented tofu that you are searching for. Of course I read it myself in this book; I did not hear it from anyone else.”

Red azuki beans (chixiaodou) are also mentioned in this book; a listing of alternative names, with commentaries, is given. (See Li 1958 #393). White beans (baidou) are also mentioned as follows: White beans (baidou) are mentioned in the Song dynasty. They are also called fandou. The seedlings can be used as a vegetable. They are good eaten raw. In eastern Zhejiang the flavor is especially good. They can be used to make jiang and tofu (fu). In the north, the watery white beans (shui baidou) are similar but is not as good. White beans are also called fandou. They can be used to complement congee / gruel (zhou) and cooked rice served as a main dish (fan). According to the author (Li Shih-Chen) fandou is the same as white azuki beans. Some white beans have a yellow color. The beans are about the size of mung beans (lidou). Plant them in the 4th or 5th month. The leaves of the seedlings are like those of red azuki beans (chixiaodou) and can be eaten. The pods are like those of azuki beans (xiaodou). One kind of pod comes with leaves like those of the soybean (dadou). They can be cooked like rice and used to make tofu (fu). They are of the same category. Nature and flavor (qiwei): It is sweet, neutral, and nontoxic. (See Li 1958 #467). (Translated by H.T. Huang, PhD, May 2003). Dr. Huang adds: The white bean (baidou) could well be the white azuki bean.


- **Summary:** Wade-Giles reference: Pêng Lung Yeh Hua, by Li Jih-Hua (who lived 1565-1635). Ming dynasty. Penlong mountain is in Anhui province, in central eastern China. The text states (in very literary Chinese): The people of the Xi district are skilled in making tofu. They use a queer (hand-turned rotary mill stones) made of very fine purple stone. Each pair of stones is worth 2-3 pieces of gold. They are of the quality of inkstone. When the soybeans are ground, the cakes of tofu are completely smooth, without dregs. When you cook them, you do not have to season them with salt or soy nuggets (shi); they have a natural, sweet flavor. On this mountain lived old Mr. Wang. He used a clay pot to cook his tofu; the flavor is superb. Legend has it that a scholar, Mr. Xu, was unsuccessful in his state examinations. So he threw down his pen and said, “How much time does one have in a lifetime? Why not return to my village, heat up my pot, and make tofu?” His product became well known as the Tofu of the Xu Pavilion. (Translated by H.T. Huang, PhD, Nov. 2002).

The second paragraph has been translated by H.T. Hang (2000, p. 325-26) who notes that this is the earliest document seen (Dec. 2002), worldwide, that mentions fermented tofu: “The people from the i District (in southern Anhui) love to ferment hai fu [hai tou fu] in the fall.* They wait until it changes colour and is covered with a hairy coat. The hair is carefully wiped off and the cake gently dried. It is then deep fried in hot oil, just like the making of san pastry. The oil is drained off and the cake cooked together with other food materials. It is said that the product has the flavor of yu fish. (Footnote: *Hai is the ancient word for making a sauce by auto-digestion. The hairy growth refers to the fungal mycelium. The i District lies in southern Anhui).”

Chu Yung-Shung (1981, p. 98A). “Fu ru is the fermented form of bean curd. The earliest record for this is in a book called Night Dialogue under the Shade, written by Li Rihua (1636-1661). He said that fu ru was prepared between summer and autumn in the Qi Men district and briefly described the procedure.” Yet in the next sentence the author, Chu, contradicts what he has just said. “In a famous book on Chinese herbal medicine, Compendium of Materia Medica [Bencao Gangmu], the author, Li Shizhen (1518-1593) describes the preparation in detail.”

Note 1. This is the earliest Chinese-language document seen (Oct. 2011) that mentions fermented tofu, which it calls hai fu.

Note 2. Concerning the date or year this document first appeared: C.N. Li (1958, p. 98 #151) gives the date as 1610. H.T. Huang suggests we use that date; it seems reasonable...
since Li lived 1565-1635.

Note 3. Dr. H.T. Huang (Dec. 2002) is unable to find any mention of fermented tofu in the Bencao Gangmu; he concludes that Chu may have been repeating misinformation started by Morohashi (1955).


**Summary:** Wade-Giles reference: Shih Hsien Hung Mi.

H.T. Huang (2000, p. 623) states that this book is attributed to Wang Shizhen (Wade-Giles: Wang Shih-Chên) but more probably was written by Zhu Yizun (W-G: Chu I-Tsun).

Huang states (March 2004) that the term 

Huang states (p. 324) that frozen tofu (dong doufu: W.-G. tung toufu) is first mentioned in Chinese in this work. The section titled “Frozen tofu” states: In the depths of winter, place a cake of tofu (doufu) outdoors in a basin of water overnight. The water will freeze even though the tofu itself may not. However the beany flavor will be lost in the water, leaving the flavor of the tofu much improved. Another way is to freeze the tofu itself without the water. When thawed, it will look like a little beehive. Wash it well. Heat it in a soup base or fry it in oil. It will be an unusual dish regardless of how it is cooked. Huang adds that this same description of the process is repeated in the Yang Xiaolu (1698). Note: Dr. Huang states (March 2004) that the term dong doufu almost always refers to tofu that has been frozen, then thawed and dried. However he has never seen an early description of how it was thawed and dried. In addition, he has never heard the term bing doufu (“ice tofu”), meaning “frozen tofu.”

Huang (2000) states (p. 325) that pressed tofu (doufugan, “tofu + dry”) is first mentioned indirectly in this work in connection with the preparation of smoked tofu (sun doufu, W.-G. hsün toufu), which is first mentioned in Chinese in this 1680 book. The section titled “Smoked tofu” states: Press tofu until it is as dry as possible. Soak it in brine, wash well, then dry it in the sun [to give doufugan]. Spread sesame oil over the surface, then smoke it. Another method is to soak tofu in brine, wash well, then dry it in the sun. Boil it in soup stock, then smoke it.

When William Shurtleff saw pressed tofu (doufugan) prepared in Taiwan and China during the 1970s, it was always pressed using either a hand-turned screw press or a lever-press with huge stones. He never saw it being dried in the sun. Perhaps the efficiency of the screw press in removing moisture from the tofu made the sun-drying unnecessary. Note that sun-drying takes extra time and exposes the warm tofu to unwanted microorganisms.

Huang (2000, p. 326) translates the earliest known account of making fermented tofu*: To make Fujian (W.-G. Fukien) style fermented tofu (doufuru, W.-G. tou fu fu), press tofu until it contains a little moisture as possible or wrap it in fine cotton paper and desiccate it in fresh ashes. Cut cake into thick square pieces and place them in rows on a bamboo steamer pad. After all steamer tiers are filled, cover steamer. [The best time to make it] is in the 2nd or 3rd month in spring or 9th or 10th month in autumn. Place steamer in an airy place. After 5 or 6 days, surfaces [of tofu] will be covered with a hairy growth, which may gradually turn black or greenish red. Wipe hair off tofu squares with a piece of paper. Save it, making sure not to damage the skin. For [the tofu from] each dou of beans, prepare 3 catties of soy sauce and 1 catty of fried salt. (If soy sauce is not available, use 5 catties of salt.) Grind 8 ounces of fresh red fenert spaced with clean peppercorn, fennel and licorice, then mix powder with salt and wine. Place tofu in a jar, add wine sauce mixture, then seal mouth of urn with clay. Allow urn to stand for 6 months; an excellent flavour will result.”

(Footnote: *The original passage is interspersed with notes that describe a variation of the process as it was practiced in Zhejiang (W.-G. Chekiang). These notes make the text somewhat confusing to read, so they were left out in the translation. However, from these notes we can reconstruct the Zhejiang process as follows: After the steamer is filled with tofu squares, steamed them. Place the steamer, while still hot, on a bed of rice straw and cover completely with rice husks–in a place with little air movement. Remove tofu squares after 5-6 days. Press down and flatten the hairy growth. [This will help to keep the product fresh.] Then layer the squares in a jar. Sprinkle a pinch of salt on each piece of tofu until all surfaces are evenly salted. For each layer of tofu there should be a layer of salt. When salt is dissolved, each piece is heated in the sun by day and marinated in sauce mixture [as indicated in the Fujian process]. Continue sunning and marinating until all sauce is used up. Soak layered tofu in a jar with wine. Then seal mouth of urn with clay. Allow the urn to stand for 6 months and an excellent flavour will result).}

Note: This is the earliest document seen (Feb. 2007) that mentions fermented tofu, which it calls doufuru.

Huang (2000, p. 326) continues by noting: Two other passages in the Shixian Hongmi are also of interest in this connection. One describes a method for making zao rufu (W.-G. tsao ju fu), i.e. fermented tofu (furufu) aged with a fermented mash [rice wine dregs]: Transfer ripened rufu or samples that are too salty in layers to a new vessel. Line fermented mash or residue between layers and allow material to age. A product with a unique flavor is obtained. The other deals with the making of doufu fu (W.-G. tou fu fu), a deep fried ‘stinky’ dewatered tofu: Take good quality [pieces of] tofu and grill in oil. Then cover with a cloth screen to keep out flies and other insects. When a “stinky” odour is developed, fry the pieces again in hot “boiling” oil. The flavor is excellent.

Note: This “stinky” tofu is probably chou doufu. If it is, this is the earliest document seen (Oct. 2011) that mentions a type of chou doufu (“stinky tofu”).

Huang (2000, p. 326-27) comments further: Two
interesting points emerge from these passages. First, by the time that the *Shixian Hongmi* (+1680) was published, *furu* and *rufu* had apparently become synonyms for fermented tofu. The word *fu* could now mean a gel or custard made from any edible suspension or emulsion of food material, and *ru* any type of dairy or soy milk derived product. Second, although the word *zha* (W.-G. cha) was not used, there is no question that the frying in “boiling oil” shown in the second passage indicates that deep frying was a common method of cookery during the Ming dynasty.

Huang (2000, p. 341) states that this book contains an interesting recipe in which soy nuggets (*shi*) are stewed with pieces of pressed tofu (*doufugan*) and bamboo shoots.

A full-page table (Huang, p. 372) shows the “Usage of soy condiments in food recipes from the Han to the Qing dynasties.” Seasonings based on jiang (fermented soybean paste) are used in 49 recipes: jiang itself in only 8, soy sauce made from jiang named *qingjiang* in 1 recipe, soy sauce named *jiangyou* in a whopping 37 recipes, soy sauce named *jiangzhi* in 2 recipes, and soy sauce named *jiangshui* in one recipe. Seasonings based on soy nuggets (*shi*) are used in only 6 recipes: Soy nuggets (*shi*) in 4 recipes, and soy nugget sauce named *shizhi* in 2.

Talk with H.T. Huang. 2001. Feb. 20. This 1680 book contains a recipe titled Soy Sauce Pressed Tofu (*Jiangyou Fugan*) which states: Cut pressed tofu (*doufugan*) into pieces. Mix 1 catty of soy sauce with 2 catties of water. Filter the liquid mixture then boil it. Filter it again to remove any remaining residue. Now add to the liquid: mushrooms and 4 different spices (*dingxiang, baiqi, dahuixiang, guipi*) (cassia bark, *Cinnamomum cassia*), and tofu. Boil for several minutes. Remove from heat and allow to stand for half a day. The color still will not be very dark. Remove tofu from liquid and dry it. After 1 night, repeat the process of boiling and soaking several times. Note: This yields a highly seasoned tofu with a long shelf life at room temperature.

Note: This is the earliest document seen (Feb. 2004) that recommends adding mushrooms or spices / seasonings to soy sauce to enhance its flavor.

4. Li Hua-Nan; Li Diao-Yuan. 1750? *Xingyuan lu* [Memoir from the garden of awareness]. China. Undated. [Chi]
• Summary: Wade-Giles reference: *Hsing Yüan Lu*, by Li Hua-Nan, compiled by his son Li Tiao-Yüan. Qing dynasty.

H.T. Huang (2000, p. 324), in the section on frozen tofu, states that dried frozen tofu is first mentioned in this work, which suggests: Allow a whole batch of thinly sliced frozen tofu squares to thaw slowly, then store them in a cool place so they can be used in the summer.

Huang (2000, p. 327), in the section on “Making of fermented tofu” states: “Technically the most interesting accounts of the making of *furu* are found in the *Xingyuan lu* (1750). Five recipes are presented, representing two types of methodology. One uses ground wheat *ferment* as shown in the translation given below: ‘First prepare yellow wheat *ferment* as previously described and comminute it to a fine powder. Take ten catties of fresh tofu and two catties of salt. Cut the tofu into thin rectangular pieces. Sprinkle a layer of salt over a layer of tofu. Allow the tofu to soak in the brine [that is generated]. After five or six days remove the tofu but keep the juice for later use. Arrange the tofu pieces neatly in a steamer and steam until they are well cooked. Hang the steamer with its contents in an empty room for half a month when the tofu becomes covered with luxuriant fungal growth. After scraping off the hairy surface the pieces are air dried. Now treat the tofu with dry yellow *ferment* as follows. Decant the salty juice from the soaking step and mix in dried *ferment* to form a paste. Spread a layer of tofu over a layer of *ferment* paste and cover with a layer of fragrant (i.e., sesame) oil. Add a few whole pieces of fagara. Place the stacks in a crock and seal the mouth securely with mud. Warm the crock in the sun during the day. After a month the product will be ready for the table.’”

Huang adds (p. 327): “The other methodology uses the mash left from the fermentation of wine from grains.”

Huang (2000, p. 341-42) also notes that the process for making soy nuggets (*shi*) described in the *Bencao Gangmu* (The great pharmacopoeia) (1596) is repeated in four recipes in this book. Although the first stage, the production of soybean koji (molded soybeans) remains unchanged, “a variety of additional materials such as fagara, sugar, wine, melon juice, melon meat, melon seeds, liquorice [licorice], mint, magnolia bark, fritillary corn [fritillaria; bulbous herbs of the lily family] etc. have been included in one or more recipes for the second stage incubation.” These herbs and spices gave each product its own unique fragrance and flavor. One of the four recipes calls for the use of wheat flour. Huang observes that when the amount of wheat flour is large, the process becomes very similar to that for making soybean jiang.

In addition (Huang 2000, p. 363-64) translates the detailed method for making soy sauce, which is presented as a method for making *qingjiang* (“clear jiang”): Clean and wash one *dou* of yellow soybeans. Boil beans until soft and the color has turned red. Blend beans and cooking water uniformly with 24 catties white wheat flour. Form into cakes, arrange on bamboo or willow [leaf] trays, then cover with rice straw. Place trays in a wind-free room, and incubate for 7 days or until a good growth of mycelium appears. Remove the straw. Place trays in the sun during the day; bring them indoors at night. Repeat the procedure for 14 days. If it rains during the day, trays should be placed in the sun for addition days until the total of 14 days is attained. This is how to make the yellow koji for jiang (*jianghuang*).

For each *dou* of yellow koji for jiang, measure 5 *dou* of well water into an earthenware crock. Measure exactly 15 catties of raw salt into a bamboo basket, and hang the basket in the well water [inside the crock] until all the salt
dissolves in the water. Discard any residue in the basket. Mix the yellow koji into the water; let it warm in the sun for 3 days. On the morning of the 4th day, remove earthenware crock from sun and stir contents well with a wooden paddle. Two days later, remove from sun and stir again. Repeat this procedure 3-4 times. After about 20 days, the “clear jiang” (qingjiang, or soy sauce) should be ready for use.

To separate the soy sauce (qingjiang), use a finely woven cylindrical bamboo tube that is open at both ends. People in southern China call this a “circular sieve for jiang” (jiangchou). It is widely available in local markets of the capital [Beijing]. The same markets also sells various sizes of covers for the crock. When the jiang / mash is ready [it has a consistency resembling that of applesauce], push the woven bamboo tube down into its center until the bottom of the tube rests securely on the bottom of the crock. Remove the jiang inside the tube so that the bottom of the crock is clearly visible. Place a brick atop the tube to prevent it from floating upwards. Liquid soy sauce will flow from the jiang mash into the tube. The next morning the tube should be filled with liquid. Use a bowl to transfer this clear soy sauce into a clean crock. Cover the crock with a piece of cloth to prevent flies from falling in. Warm the crock in the sun for half a month. To make more soy sauce, increase the amount of raw materials. After the sauce is ready, you can also use a sieve to collect the soybeans that float to the top of the mash. When half-dried, these beans make delicious soy nuggets or “fermented bean relish” (doushi).

A full-page table (Huang, p. 372) shows the “Usage of soy condiments in food recipes from the Han to the Qing dynasties.” Seasonings based on jiang (fermented soybean paste) are used in 10 recipes: jiang itself in 4, soy sauce made from jiang named qingjiang in 5 recipes, and soy sauce made from jiang named jiangyou in 1 recipes. A seasoning named douyou is used in 8 recipes. Note: This is the earliest document seen (Aug. 2005) in which a soy-based seasoning named douyou (W.-G. tou yu) is mentioned. Huang states (p. 371) that douyou is written with the Chinese characters for bean + oil.

Wilkinson (2000, p. 646) states that this book (late 18th century) is the first Chinese collection of recipes from a regional cuisine—that of Sichuan.

Fukushima (1989, p. 6): “The general manufacturing methods of soy sauce in the Ch’ing (Shin in Japanese) dynasty are recorded in Ch’ing-yuan Lu (sic, Hsing-yuan Lu; Seienroku in Japanese), written by Li Hua-nan (Ri Kanan in Japanese). Cooked soybeans and uncooked wheat were the raw materials used in koji making. The resultant koji was mixed with brine. After aging, the soy sauce was collected by pressing a deep bamboo colander into the aged mash and ladling out the liquid which had accumulated.”

Bo (1982): Describes the method for making chiang-yu (soy sauce).


• Beautiful illustrations (black-and-white wood-block prints on unnumbered pages) show: (1) A lady in a kimono kneeling on her right knee in front of a low table on which are piled cakes of tofu. With a knife in her right hand, she is about to cut the tofu.
cross section as that of a block of tofu, with a handle on one end, a screen over the opposite exit end, and a wooden pusher, which is used to push a block of tofu into the box and through the screen, thereby creating tofu noodles, similar to those called tokoroten made from a block of gelled tengusa / gelidium seaweed.

Masaaki Yasuda states in “Fermented tofu, tofuyo” (2011, p. 302): “The earliest known reference to fermented tofu in Japan comes from Osaka. In 1883, Ka Hitsu Jun published the famous book, Tofu Hyaku Chin Zokuhen (The Sequel to One Hundred Favorite Tofu Recipes). In this book, ‘red tofu’ and the other fermented tofu, ‘tofu-ji’, were introduced. According to the book, how to make the red tofu was a family secret, and few details on its production were provided. The other description was clearly of Chinese style red furu, because the materials not only included red koji from China, shiro zake (white sake, Chinese distilled liquor named ‘Bai-Jiu’), sansho (Japanese spice, this spice seems to be used instead of chili), but also refer to it as tofu-ji and use the same method of preparation.”

6. Yuan Mei. 1790. Suiyuan shidan [Recipes from the Sui garden], China. [Chi]

- **Summary:** Wade-Giles reference: Sui Yüan Shih Tan, by Yüan Mei. Qing dynasty.

H.T. Huang (2000, p. 323-24), in the section titled “Products associated with tou fu,” states that this is the earliest document seen that mentions fresh tofu curds. In a recipe for “Hibiscus Tofu” (fiyong doufu) the famous Qing dynasty gastronome says (p. 100): Place fresh tofu curds (funao = “tofu brain”) in well water and heat to boiling three times to remove the beany flavor. Suspend the curds in chicken soup and heat again to boiling. Before serving, garnish with laver / nori (Porphyra, a sea vegetable) and pieces of shrimp. Later, fresh tofu curds were also called “tofu flowers” (douhua or doufu hua).

Concerning frozen tofu, Huang states (p. 324) that a recipe in this book states: Boil the thawed tofu in water to remove the remaining beany flavor, then simmer it in a soup base.

Huang also states (p. 325, 364) that both pressed tofu (doufugan) and smoked tofu (xun doufu) are mentioned in this book.

Concerning fermented tofu, Huang (2000, p. 327) notes: By the middle of the Qing dynasty local varieties of furu had begun to win national fame, such as the furu of Suzhou [in southern Jiangsu; W.-G. Su-chou or Soochow, formerly Wuhsien] and the white furu of Guangxi [or Guangxi Zhangzu, an autonomous region in southeast China; W.-G. Kuangsi]. The Suiyuan Shidan says:

‘Rufu: The ones from the [shops] near the front of the Temple of General Wén in Suzhou are particularly good. The colour is black, and the flavour is clean. There are two types, a wet and a dry. The product with some shrimp paste in it is also attractive, but may have a slight fishy taste. The white furu from Guangxi (Kuangsi) is also outstanding, especially that made by the family of the official Wang Ku.’

A full-page table (Huang, p. 372) shows the “Usage of soy condiments in food recipes from the Han to the Qing dynasties.” Seasonings based on jiang (fermented soybean paste) are used in 48 recipes: Jiang itself in 15, soy sauce made from jiang named qingjiang in 24 recipes, soy sauce named jiangyou in 2 recipes, soy sauce named jiangshi in 1 recipe, and soy sauce named jiangshui in 6 recipes. Soy nuggets (shi) are used in 2 recipes, and a new type of soy sauce named qiyou (W.-G. ch’iu yu) is used in a whopping 62 recipes. Note: This is the earliest document seen (Aug. 2005) in which a soy-based seasoning named qiyou is mentioned. Huang states (p. 371) that qiyou is written with the Chinese characters for autumn + oil, implying a sauce harvested in autumn.

Wilkinson (2000, p. 647-48). This was the most famous recipe book of its day, yet wok dishes accounted for only 16% of the recipes. Yuan Mei (lived 1716-1798) was one of China’s four most famous “literati gourmands;” they exerted a considerable influence on the development of a higher cuisine, especially when they compiled their own cookbooks...

Letter from Dr. H.T. Huang. 1996. Sept. 29. “Page 103 mentions mock roast goose made with yam wrapped in tou fu p’i (yuba).”

Dr. H.T. Huang, expert on the history of Chinese food and agriculture (personal communication, 5 June 1993), gives the date of this document as +1790, and the English translation of the title as “Recipes from the Sui Garden.” He notes that page 107 contains three recipes for gluten.

Newman (1989) states: “The idea of freezing bean curd is not new. Iced Bean Curd is one of Yuan Mei’s recipes from the Xi Yuan Cookery Book written near the end of the 18th century. This book by a poet, government official and author, is a very comprehensive volume of over 300 recipes, only some are about tofu. One difference is that the Iced Bean Curd recipe is meant to be served hot, the doufu in it is first frozen then prepared for use.”

Bo (1982): In this work Yuan Mei states that it is more graceful for a writer to use the term “ch’ing chiang” instead of “chiang-yu” when referring to soy sauce.

Hummel (1944, p. 955-56): Yuan Mei lived 1716-1798. A poet, literary critic, and essayist, he was a native of Ch’ien-t’ang (Hangchow). Resigning (1748) from his post as magistrate of Chiang-ning, he retired (1749) to his newly acquired “Garden of Contentment,” Sui-yüan, near Nanking. From 1784-1795, spent in alternate travel and quiet seclusion, he came to be known as one of the most skillful poets of his time.

Reichl (1985): Yuan Mei has been called the “the 18th century philosopher of the table.” His sayings are widely quoted. For example: “A great cook cannot with the utmost
application produce more than four great dishes a day.”
Address: China.

7. Hall, Basil. 1818. Account of a voyage of discovery to the west coast of Corea, and the Great Loo-Choo Island;... 
Dairyukyuto Kokai Tanken-ki. Dai-iichi Shobo, publisher. See p. 36, 64. [1 ref. Eng]
• Summary: This book starts when the author’s ship lands in China in Aug. 1816. It contains the earliest indirect 
reference seen to fermented tofu in Okinawa or Ryukyu. In 1816 Captain Hall, an Englishman, visited Naha harbor 
in Okinawa on his way from China. On 23 Sept. 1816 he 
and his party and Captain Maxwell went to visit the king 
of Loochoo (today’s Ryukyu Islands, including Okinawa). 
They enjoyed a meal of local food with a Loochoo chief. A detailed description of the meal is given (p. 95-97). “An 
entertainment was now served, beginning with a light kind 
of wine, called sackee (saké), which was handed round in 
very diminutive cups, filled... from a small high pot in which 
the sackee was kept hot. They insisted on our emptying 
the cup every time, showing us a fair example themselves. 
During the whole feast the sackee never left the table, being 
considered apropos to all the strange dishes which we 
partook of. The first of these consisted of hard boiled eggs, 
cut into slices, the outside of the white being colored red. A 
pair of chopsticks was now given to each person... There was 
something like cheese given us after the cakes, but we cannot 
form a probable conjecture of what it was made. Most of the 
dishes were so good that we soon made a hearty dinner...”

The author states (p. 217) that “milk is never used” on the 

island.

Note 1. The red color was probably imparted to the 
outside of the shelled eggs by red koji (beni koji) and the 
food resembling cheese may well have been tofuyo, a special 
type of fermented tofu, which is also made with red koji and 
for which this area was famous. There is no information on 
fermented tofu in Korea.

Note 2. If the above conjectures are true, this would be 
the earliest document seen (Oct. 2011) that mentions tofuyo 
or Okinawan wine-fermented tofu, and the earliest English-
language document seen (Oct. 2011) that mentions fermented 
tofu. It would also be the earliest document seen (March 
2002) that mentions red koji (beni koji).

Note 3. This is the earliest document seen (May 2011) 
that mentions Okinawa in connection with soy.

Note 4. “Chopsticks” are also mentioned elsewhere in this 
book (p. 116, 160): “for instance, when we first tried to 
eat with their chopsticks: on that occasion there was a sort of 
giggling embarrassment shewn by some of us,...” Address: 

England.

8. Tokashiki, Tsûkan Peichin. 1832. Gyozen honsô [Food 
herbal]. Japan. In Higaonna Kanjun’s 1955 hand-written 
copy of the original book (located at the Okinawa Prefectural 
Library), see pages 23 and 27. [Jap]*
• Summary: E.H. Walker (1976) states: “Originally 
published in about 1860. Treats animal as well as plant 
foods, with Japanese names only... A new edition was 
published in 1961 in Okinawa. The author, T. Tokashiki, 
lived 1793-1845.”

Yasuda (1983, p. 839), in discussing how to eat tofuyo, 
states” In the Gyozen Honsô (Food Herbal) (1832, a book 
about food and medicine) the physician TOKASHIKI Tsûkan 
Peichin wrote: Tofuyo has a delicious flavor and is good 
for the stomach. It makes eating a pleasure and is good for 
various types of sickness” (Ref. #9; Note: This book contains 
the earliest known direct reference to tofuyo. Peichin refers 
to a high-ranking officer).

Passages on soy reprinted in H.T. Huang 2000, p. 319-20, 
324-25. Undated. [Chi]
• Summary: Wade-Giles reference: Hu Ya, by Wang Jih-
Chên. H.T. Huang (2000, p. 319-20), in the section titled 
“Products associated with tou fu,” notes that by the 19th 
century many products derived from soymilk had been 
developed. The most complete discussion of these appears in 
this book, published in about 1850: Tofu (doufu) is prepared 
by grinding soybeans finely [with water], cooking the milk in 
a caldron, then coagulating it with gypsum or nigari. Before 
coagulation, the soymilk is called doufu jiang (“tofu + thick 
liquid”).

Note 1. This is the earliest Chinese-language document 
seen (Aug. 2003) that uses the term doufu jiang to refer to 
soymilk.

The curds are wrapped in a piece of cloth then placed in 
a wooden box, where excess water is drained off.

The soft product is called soft tofu (shuidoufu, “watery 
tofu”). The soft curds (before they are pressed into blocks 
of tofu) are called doufu hua (“tofu flowers”) or doufu nao 
(“tofu brain”).

Curds which have been placed in layers between sheets 
of cloth, then pressed, are known as qian zhang (“thousand 
leaves”) or baiye (“hundred sheets / leaves”).

Note 2. This is the earliest document seen (Feb. 2003) 
that mentions pressed tofu sheets, or the names qian zhang or 
baiye.

When soymilk is heated, a film forms on the surface. 
When it is lifted off, it is called doufu i (“tofu robes”) or 
doufu pi (“tofu skin”) as noted in the Bencao Gangmu (The 
great pharmacopoeia) (+1596).

Note 3. This film is called yuba in English.

When small pieces of tofu are deep fried, giving a 
golden-brown outer surface surrounding a hollow interior, 
they are called deep-fried tofu (you doufu, literally “oil 
tofu”).
When pressed tofu is soaked in brine and fermented, becomes smoked tofu.

When dried tofu is smoked by burning shavings it becomes smoked tofu dry (wuxiang doufugan).

The plain pressed tofu is known as bai doufugan (“white tofu dry”).

When dried tofu is smoked by burning shavings it becomes smoked tofu (xun doufu).

When pressed tofu is soaked in brine and fermented, the product is called chou doufugan (“stinky pressed tofu” / “foul-smelling pressed tofu”).

Note 6. This is the earliest document seen (Oct. 2011) that clearly mentions a type of chou doufu (“stinky tofu”) or that mentions chou doufugan (“stinky pressed tofu”).

Talk with H.T. Huang. 2001. Feb. 20. Tofu was seasoned in this book in about 1850. The use of five-spice was already amendment in the countryside. Note 2.

10. Montgaudy, Baron de. 1855. Compte rendu des expériences faires pour l’acclimatation des semences importées en France par M. de Montigny [Report of experiments made on the acclimatization of seeds imported into France by Mr. de Montigny]. Bulletin de la Societe d’Acclimatation 2(1):16-22. Jan. See p. 17, 20-22. [Fre] • Summary: For years Mr. de Montigny has been sending seeds and plants from China to the Society for Acclimatization. When he last returned from China, in April 1854, Mr. de Montigny brought five varieties of seeds; a portion of this collection was entrusted to the Society for Acclimatization for experimentation.

Mr. Montgaudy was given responsibility by the Society for Acclimatization for distributing these five varieties of seeds to its members. These seeds were three varieties of rice, a variety of green bean (Haricot) unknown in France, alpist or canary-grass (Alpiste), giant maize / corn (Mais géant), and two varieties of soybeans (Pois oléagineux, literally “oil peas”) (p. 17).

“The two varieties of soybeans are completely dissimilar. One has small green seeds; the other has rather large yellow seeds. These seeds are very precious and of the highest usefulness for France. Every year, France is obliged to buy from abroad more than 30 million francs worth of edible oil, but during the years when the types of rapeseed (les Colzas et les Navettes) freeze or cannot produce because of drought, some 60 to 80 million francs must leave the country [to buy oil].

“The two types of rapeseed only grow successfully on choice land, which must be both light and rich in humus. Generally, this quality of land comprises only a small proportion of the total is almost all localities [in France]. The soybean (Le Pois), however, is much less choosy about the soils where it grows well: it prospers on all terrains. In the valleys it grows wonderfully and on the mountains it gives good crops (p. 20).

“The soybeans brought back by M. de Montigny are cultivated on a large scale in the fields of northern China. It is principally in the provinces of Honan, Shantung, and Shansi that one finds vast expanses covered with these soybeans. The climate of these provinces is quite similar to that of our own so-called ‘cold provinces.’ In China there is a large trade based on products obtained from these soybeans. The oil is used in many ways and is preferred to rapeseed oil and colza oil (refined rapeseed oil). Although it has an aftertaste of peas or beans, this is not as disagreeable as the bitterness from rapeseed or colza oils. With the addition of a little lard, it becomes similar in flavor to second-grade olive oil.” Note 1. He was referring to unrefined, probably filtered soy oil. “The residue left after expressing the oil is in the form of cakes, which the Chinese use to fatten their livestock and enrich their soil. These cakes are a powerful soil amendment in the countryside. Note 2. Webster’s Dictionary defines a soil amendment as “a substance that aids plant growth indirectly by improving the condition of the soil.”

“In China, soybeans are transformed into both a food for the poor and a seasoning highly regarded by the rich. For the poor, the flour of these soybeans [i.e. ground soybeans] is used to prepare a paté resembling that of fromage blanc (a fresh dairy cheese resembling cream cheese), known in France as fromage à la pie; it [i.e., tofu] is sold in public places for a few cents (centimes) a portion and cut into cakes by means of a brass wire according to the customer’s wishes. Ordinarily the Chinese fry their paté or cheese (fromage) [tofu] in the oil which also comes from soybeans; this fried food is highly esteemed.

“For the rich, a seasoning (assaisonnement) is prepared which requires more care and culinary talent. The soybean paté (La pâte de Pois) [tofu] is fermented after having been seasoned with pepper, salt, powdered bay/laurel leaves, powdered thyme, and other aromatics. During the fermentation, the producer bastes the paté with soybean oil (l’huile de Pois). After several days of fermentation, the preparation is ready. This paté or cheese (fermented tofu) becomes a very powerful digestive (aid to digestion) and an aperitif, which no one can resist because it is extremely tasty.

“At Kaifeng in Honan, at Tsinan in Shantung, and at T’aiyuan in Shansi, the oil and cheese of soybeans are made in huge amounts, and are consumed locally. But the city of Ning-po, capital of Chekiang, is the center of production and of shipping of various products made from soybeans. The
HISTORY OF FERMENTED TOFU

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Note 9. This is the earliest Western-language document seen (Nov. 2002) that mentions fermented tofu.

Note 10. This is also the earliest document seen in the Western World that mentions an industrial (non-food) use of soybeans (as a fertilizer for the soil).

Note 11. This is the earliest document seen (May 2005) that mentions flavor problems with soy—in this case, soybean oil.

Note 12. This is the earliest document seen (June 2007) that mentions the use of junks (or barges or boats) or water to transport soybeans or soy products within a country (China).

Address: French Consul at Shanghai and Ning-po, China.


• Summary: The president informed the Society that M. de Montigny [the French consul in Shanghai] had made them a gift of “four bottles containing oil obtained from the soybean (des huiles obtenues du Pois oléagineux), cotton, tea, and cabbage (Chou [perhaps rapeseed, which later was usually called colza in French]). Our colleague, Mr. Frémy, is in charge of examining these oils. Mr. Montigny likewise made them a gift of a pot of tofu, Chinese cheese made with the soybean (un pot de Teou-fou, fromage chinois fait avec le Pois oléagineux); it constitutes one of the principal elements of the Chinese diet.”

Note 1. This is the earliest French-language document seen (Oct. 2011) that uses the term fromage chinois (“Chinese cheese”) to refer to fermented tofu.

Note 2. This is the earliest document seen (April 2003) in the Western world that mentions both cotton seed oil and soybean oil. Address: President of the Imperial Zoological Society for Acclimatization (Société Zooloique d’Acclimatation).

12. Towns (B.) and Co. 1858. The undersigned offer for sale, the following Chinese goods... (Ad). Argus (The) (Melbourne, Victoria, Australia). April 24. p. 2.

• Summary: “... now landing, ex Panama, from Hong Kong, -

“Kum chum, vermicelli, soo lew. Beanstick [probably dried yuba], or macaroni [macaroni], red dates, peas.

“Pearl barley, honied dates, green ginger. Chinese oil in jars; salted vegetables.

“Salted turnips (pieces), white beans curd [tofu].

“Pickle beans curd [probably pickled bean curd, which is fermented tofu?], green peas.”

This ad also appears in the April 26 issue (p. 3).

Note 1. This is the earliest document seen (March 2010) stating that beanstick (probably dried tofu), white beans curd (tofu), or pickled beans curd (probably fermented tofu) are now in Australia.

Note 2. This is the earliest English-language document

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port of Ning-po is hard to reach in large vessels, but they can stop at the island of Choushan, where there is a very good port. Thousands of Chinese junks leave Ning-po and travel along the coast of China with no cargo but the products of soybeans, which they carry to all parts of the Celestial Empire, to Japan, and to all countries where they are known.

“Soybeans have produced seeds in France since 1854. Their acclimatization is assured. Unfortunately we still have only a small quantity of seed, but M. de Montigny, who must return to China, will send the Society a large enough amount so that this precious seed will soon be distributed to all parts of France. This will be an eminent service rendered to the nation.”

Note 3. Monsignor Louis C.N.M. de Montigny, bearer of the seeds, was born at Hamburg of French parents in 1895. In 1843 he went to China and in 1847 he was appointed Consular Agent at the port of Shanghai, where he stayed, with promotions, until 1895. There he rendered great services to natural science and horticulture by introducing into France useful Chinese plants and animals, via the Society for Acclimatization (Bretschneider 1898, p. 536).

Note 4. The Baron of Montgaudry, author of this article, was the nephew of Comte Georges-Louis Leclerc de Buffon (1707-1788), a French naturalist who held the prestigious position of superintendent of the Royal Garden (Jardin du Roi/Roy, Jardin des Plantes) in Paris and was on the cabinet of the Natural History Museum. According to Paillieux (1880, p. 561) starting in 1739, French missionaries in China sent Buffon specimens and seeds of the most important plants in that country. Soybeans were probably received and planted by 1739 or 1740, and definitely by 1779. Buffon was a contemporary and ardent opponent of Linnaeus. He must have been disappointed when, in 1744, Louis XV issued the order that the Linnaean system was to be adopted in the future. Buffon was the author of the superbly illustrated Histoire Naturelle (1749-1804) in 44 volumes, some of them published posthumously.

Note 5. This is the earliest document seen (Feb. 2001) concerning soybeans in France, or the cultivation of soybeans in France.

Note 6. This is also the earliest document seen (June 2001) describing the work of the Society for Acclimatization in France with soybeans.

Note 7. This is the earliest French-language document seen (Feb. 2004) that mentions tofu, which it calls La pâte de Pois. It is also the earliest French-language document seen that compares tofu to cheese (fromage) or to the particular French cheese named fromage à la pie.

Note 8. This is the earliest Western-language, or French-language, document seen (Sept. 2006) that mentions soy oil, which it calls l’huile de Pois [oléagineux]. This is also the earliest document seen (April 2002) concerning the etymology of soy oil.

Note 9. This is the earliest Western-language document
Horticole: Journal d’Horticulture Pratique (Paris)

568) we have given information about the soybean
Chine [Advantages of “Chinese oil peas” (soybeans)].
13. Lachaume, J. 1859. Avantages du Pois oléagineux de la
26 William-Street [Melbourne].
that mentions yuba as an item of international trade. Address:

on food and drink from the Random Rest Studio]. China.
Passages on soy reprinted in H.T. Huang 2000, p. 319n, 324,
371-73. And in N. Wai, 1964, p. 92. [Chi]

13. Lachaume, J. 1859. Avantages du Pois oléagineux de la
Chine [Advantages of “Chinese oil peas” (soybeans)]. Revue
Horticole: Journal d’Horticulture Pratique (Paris) 8(8):222-

**Summary:** “In the Revue Horticole (16 Nov. 1857, p.
568) we have given information about the soybean (Pois
oléagineux de la Chine; Soja hispida, Moench) and about the
type of cultivation that suits it.

“New experiments, conducted in 1858, have shown us
that this legume can be very well acclimatized in France.
Thus, on 18 April 1858, some seeds were sown in Vitry-sur-
Seine, a locality whose soil is clay-calcium carbonate and
naturally cold... Until Aug. 1, the time when the plants had
attained 70 cm of height and were showing their first flowers,
the care of the plants was limited to hoeing and weeding.
The rest of the seeds were sown the same day in a nursery
on a flat-band exposed to noonday sun. On April 26, the
cotyledons came up; two weeks later, we replanted them in
lines with the same spacing as before, without watering them
and without the plants becoming fatigued.

“On June 16, at a temperature of 30ºC, we planted a
third lot of these beans in a square. 

“The first beans sown on April 18 and those that were
replanted, bore the drought without any water other than that
which fell from the sky; they came to maturity around Oct.
15.

“This success permits us to place in commerce, for
1859, the quantity of seeds that we have harvested, with the
requirement to keep some for the horticultural societies that
will ask for them.

“The beautiful tests that M. Vilmorin did in Feb. 1858
to determine the quantity of oil contained in his seeds, will
encourage amateurs to introduce this new bean into their
gardens and farms. According M. Vilmorin, a first test
showed that the seeds contained 21.32% oil, and a second
21.16%.

“Besides the advantage of yielding oil, these beans can
furnish an excellent cheese (fromage; [tofu]) that the Chinese
make by boiling and then crushing the seeds in a mortar. A
very white liquid [sic, curds] is produced that thickens if one
applies pressure to it. One next places the paste in molds,
adding salt in the French manner. The cheeses thus obtained
provide an important source of nourishment for the working
class.

“There are numerous varieties of Soja hispida; we have
cultivated some of them experimentally.”

“To summarize, soybeans from China would be a good
acquisition from many points of view: 1. As an oilseed; 2.
As an edible plant, because the fresh seeds [edamame] are
easy to cook and furnish a pleasant (agréable) food, such
as the samples from Sept. 1858 have proven; 3. As a forage
plant which can yield a large harvest, when one possesses a
sufficient quantity of seeds to operate on a large scale; 4. As
a plant whose seeds can be used to make cheese [fermented
tofu], a test that M. Vilmorin did not hesitate to make.”
Address: Arboriculteur at Vitry-sur-Seine.

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should be chewed well.”

Wai (1964, p. 92) translates the section on fermented tofu: “Hardened tofu is difficult to digest, and is not good for children, old people, or patients. Sufu [fermented tofu], which is prepared from tofu and gets better the longer it is aged, is very good for patients.” Wai concludes: “Therefore, we may presume that soybean cheese [fermented tofu] was sold long before the Ch’ing [Qing] dynasty.” He then describes the ancient process. The cubes of tofu are inoculated with the fungus by arranging them on a large bamboo tray and covering them with rice straw (on which the fungus grows wild).

15. **Product Name:** [Fermented Tofu, and Tofu].  
**Foreign Name:** Doufu-ru, Doufu.  
**Manufacturer’s Name:** Wo Sing & Co.  
**Manufacturer’s Address:** 708½ Dupont St., San Francisco, California.  
**Date of Introduction:** 1878.


The 2nd line, written in Chinese characters, states:  


Note: This is the earliest known commercial tofu product made in the western world. And, this is the earliest known soy product made in California. This is the earliest document seen (Oct. 2011) concerning a manufacturer of fermented tofu or tofu in the western world, the USA, or California. It is also the earliest document seen concerning the use of soybeans in California.

Note: Wo Sing & Co. probably imported from China the soybeans it made into tofu.

**Summary:** On page 43 is a listing written in English and Chinese, for “Wo Sing & Co., Bean Cakes, 708½ Dupont st., San Francisco.” The Chinese characters indicate that the company made both fermented tofu and regular (non-fermented) tofu.


Note: This is the earliest directory seen (i.e., publication with the word “Directory” in the title; April 2001) that lists a soy-related company. Address: San Francisco.

**Summary:** A lady, formerly living in Hartford but now the wife of an American official in China, writes to her friends at home and describes a ceremonious dinner she attended recently. The feast was given by the “deputy” (whom she describes as a “lovely old man), and “was attended by only seven persons, two American ladies, and two Chinese men besides the host.”

She describes each briefly each course of the twenty-course meal, which was preceded by eight dishes of appetizers. “Thirteenth–Stewed pigeons and bean curd.” “Twentieth–Rice with chicken soup, salted cabbage, salt bean curd [probably fermented], chestnuts grown in water and I don’t know what.

“After that, tea and it was over. This was followed by a two days’ headache.”

**Summary:** This section contains a summary of the main articles from other periodicals that are connected with the work of the Society for Acclimatization. In the Bulletin de la Societe des Sciences de la Basse-Alsace (1879, Vol. 3) is an article titled Le Soja hispida.

“In the meeting of 3 Sept. 1879, Mr. Fuehrer read the report of a scientific treatise published recently by M. Hecke on the agronomic trials conducted in Austria, Bavaria, and Silesia [Part of Austria-Hungary in 1879; part of Poland after 1945] of a legume which would have been introduced following the Vienna World Exposition of Vienna, the Soja hispida, and from the seeds of which is made, in Japan, a type of sauce that is served as a condiment.

“According to this work, soy sauce (la sauce du Soja) was well known in Europe, and it would have even been stylish, at the beginning of this century, in London and Paris, but no-one possessed the plant. It was only after the Vienna Exposition that the attention of some agriculturists, and especially that of Professor Haberlandt, were called to this legume. Some cultural trials were conducted; it was quickly recognized that the varieties originating in Japan and northern China could be best adapted to the climate of central Europe, and the yellow variety was recognized as

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preference to all others. The good yields produced by the soybean led to its good acceptance by farmers; even more, chemical tests showed that this legume contained one-third more protein than other protein-rich indigenous legumes. And it contained 6 to 10 times more oil. It could even be classified as an oilseed. The author believes that it should be introduced as a food. He took as an example the diet of a family of workers from Silesia, and he concluded that by replacing 3 kg of potatoes (of 9 consumed per day) and 1 kg of rye flour (of 2.21 kg consumed) with only one kg of soybeans, this family would find itself adequately nourished.

"Let's add again, to analyze this treatise, that in 1878 the plant was attacked by the fungus *Septoria sojina*, and by the caterpillars of the Belle-Dame (*Vanessa cardui*) and well as by the nocturnal moth (*Acronycya rumicis; Noctuelle de la Patience*). Rabbits searched avidly for soybeans, chickens like the soaked seeds, and sheep are very fond of the straw, which has 203 times the nutritive value of the straw of peas.

"However, we must note, the introduction of this plant into Europe is not as recent as was thought in Vienna. In April 1854, Mr. de Montigny, the French consul at Shanghai, sent back the first seeds to the Society for Acclimatization in France, and they arrived under the name 'oil peas of China' (*Pois oléagineux de la Chine*). This plant belonged to the legume family and to the genus *Soja* (Moench), a relative of Dolichos; its species was *Soja hispida*. Let us add that in the report that had preceded the creation of the *Jardin du Bois* at Bologne, read at the meeting of 7 May 1858, Mr. F. Jacquemart verified that the naturalization of this legume was complete.

"At this time, in effect, the plant was imported and its cultivation had succeeded. It had been reproduced from seeds produced in France. The role of acclimatization was finished. Now it was up to agriculture and industry to see what role it could play, to study whether it could be used in place of peas, lentils, and haricot beans, or whether it could render services other than those of these similar legumes. Each introduction takes a long time, and many obstacles must be overcome before a newly discovered plant can be claimed a success. We will watch with pleasure as the horticulturists occupy themselves anew with *Soja hispida*. We should add that if Mr. Quihou declares to have tried the cultivation of this legume many times without success (this *Bulletin*, 1873, p. 489), Mr. Blavet verifies that it has been cultivated for three years at Étampes (Seine-et-Oise) (Footnote: Seeds harvested at the Garden of Hyères and sent by the Society for Acclimatization to the Horticultural Society of Étampes on 29 Nov. 1874). It is found there growing very rustically and giving extraordinary yields; the pods are very easily threshed with a flail, and the pea weevil (*la Bruche des Pois*) has not yet attacked it (*Bulletin de la Société d'Horticulture d'Eure-et-Loire*, 25 Feb. 1879). Note: Eure-et-Loire is a department in north-central France.

"We would not need to return to the numerous studies published on the subject of soya in our *Bulletin*, especially from 1855 on; but since much more will be said about this new plant, perhaps we owe it to our colleagues to save them some research.

"The soybean (*Le Soja*) is an essential oilseed, but one which is also used for food.

"This bean is cultivated on a large scale in the fields of north China, where the climate is quite similar to that of our colder provinces, and much commerce is based on the products made from it:

"1. The oil, which is preferable to colza- and to rape-seed oil (*de Colza et de Navette*). However it has a taste of dry legumes and leaves an aftertaste of beans or peas. Yet, with the addition of a small proportion of lard, it becomes quite similar to commercial second-grade olive oils.

"2. The residues from making the oil, which form soybean cakes, used by the Chinese to fatten their livestock and fertilize their fields.

"3. A food for the poor, quite similar to fresh white cheese, called *fromage à la pie* in France, which is generally fried in oil—including soybean oil.

"4. A seasoning (*assaisonnement*) much appreciated by the rich. In this case, the paté of soybeans (*la pâte de Pois*) [tofu] is subjected to fermentation, after the following have been added to it: pepper, salt, powdered bay/laurel leaves, and powdered thyme and other aromatic substances. During the fermentation, the producer sprinkles soybean oil on the paté. After several days of fermentation, the preparation is ready. It (fermented tofu) is a powerful digestive (aid to digestion) and an aperitif, which no one can resist because it is extremely tasty (Report by Baron de Montagaudry, *Bulletin*, 1855, p. 16).” (Continued). Address: France.


• **Summary:** Continued (p. 670.3): “One can read in the *Imperial Encyclopedia of Agriculture* (*Cheou-chi-thong-Khao*) [from China], book/volume XXVII, folio 8, recto: ‘Yellow soybeans can be used to make tofu (*teou-fou*, a sort of fermented soybean paté consumed regularly by the lower classes). Oil is removed from the beans using a press; they are also used to make jiang (*tsiang*, a sort of sauce used as a seasoning). The *Treatise on Agriculture*, by Fan-Ching states: At the summer solstice, one plants soybeans (*dou*); they don’t require heavy labor. The flowers of the soybean don’t like to see the sun, otherwise the plants will become yellow and the roots will blacken’ (Mr. Stanislas Julien, member of the Institute, this *Bulletin*, 1855, p. 225).

“Soybean oil (*L’huile de Pois oléagineux*) is very similar to our edible oils; its odor and taste are agreeable. It is equally suited to combustion [burning in oil lamps].
Exposed to freezing cold, it thickens; atmospheric oxygen makes it rapidly turn to resin. It belongs, therefore, to the class of drying oils and can, according to this report, replace linseed oil in some of its applications. Soybeans contain 18% oil and, because of the quantity and quality of the oil they contain, should provide a new food and a useful product to the industrial arts (Letter from M.E. Frémy, this Bulletin, 1855, p. 382).

“At 3 degrees below zero, the plants are not stressed; at 4 degrees the leaves freeze and the pods are slightly injured. If one considers that Haricot beans freeze at zero degrees, one can consider that soybeans are suited to be cultivated in our climate.” There follows a detailed botanical description of the plant. “Each plant bears 80 to 100 pods. The seed yield is excellent: each plant produces on average 183 seeds which, freshly shelled, make a tenth of liter and weigh 58 gm. A liter of soybeans contains 4,000 seeds and weighs 750 gm.

Independently of these oleaginous qualities, soybeans make a delicious vegetable. Cooking them is very easy: just toss the fresh green seeds into boiling water. The seed make a delicious vegetable. Cooking them is very easy: independently of these oleaginous qualities, soybeans contain, should provide a new food and a useful product to the industrial arts (Letter from M.E. Frémy, this Bulletin, 1855, p. 382).

“Look again at a communication from Mr. Paul Champion on the production of tofu (fromage de pois), in China and Japan (this Bulletin, 1866, p. 562), etc.

“Let us say again that in the meeting of the Central Society of Horticulture, on Nov. 13 of this year, Mr. Duchartre read a note on the relative richness of peas, haricot beans, dry beans (Fèves), lentils and soya (Soja) in nitrogenous materials (protein) and oil. He concluded that soya is the richest of all. Up until recently, dry beans (Fèves) have been considered the richest, containing 30.80% protein and 70% oil; however soya contains 35% protein and 73% oil” [sic, this percentage is much too high]. Address: France.


• Summary: One of the most important and original of the early publications on soya in Europe. Its in-text bibliography on soya was the largest of any published up to that time.


(5) The romanized Chinese names of six types of soybeans and a French translation of each (e.g., Houang-teou = Soya jaune) (p. 447). (6) Two analyses of soybean seeds, reprinted from Chemischer Ackersmann, 1872 (p. 458). (7) The chemical composition of three soybean varieties, including Yellow of Mongolia, Yellow of China, and Reddish-Brown of China; the composition of the original seeds and the first generation seed is given for each type (p. 460-61). (8) The chemical composition of reddish-brown, yellow, and black varieties of soybeans (p. 469-70; data from M. Schroeder, Mach, and Caplan, published by F. Haberlandt). (9) Weight of 1,000 seeds for four generations grown out in Vienna. Original seeds: 81.5 to 105 gm. First generation: 110.5 to 154.5 gm. Second generation: 141.8 to 163.6 gm. Third generation: 116.0 to 151.0 gm.

Contents (continued), Part II. 6. The Soybean, by Count Heinrich Attems (p. 538-60): Soybean culture and harvest, uses, and preparation of whole soybeans. Practical soybean culture trials on a grand scale, in the domain of the archduke Albert, an extract from a booklet by Edmond de

7. The soybean in France (p. 561-76): History (starting with Buffon, who became director of the Jardin des Plantes [Royal Garden, also called Jardin du Roi] in 1739), varieties grown, cultivation, utilization (mainly as forage plant for livestock and as an oilseed for oil and meal), accessory uses (miso, Japanese-style soy sauce {shoyu}, Chinese-style soy sauce {tsiang-yeou}, Japanese-style tofu {tō-fu}, Chinese-style tofu {têou-fou}, soy nuggets {têou-che}, and soy coffee {café de Soja}, white fermented tofu {fromage blanc}, red fermented tofu {fromage rouge}, green vegetable soybeans {des graines fraîches, écossées encore vertes, comme le Haricot flageolet}, whole dry soybeans {les graines sèches comme le Haricot blanc ordinaire}).

8. Conclusion and tables showing French analyses of soybeans (p. 576-78). Appendixes (p. 579-96): Summaries of letters to the Society describing 27 cultural experiments with soybeans conducted during late 1880 at various locations in France, Switzerland and Algeria. (Note: Though the publication date of this appendix is given as Oct. 1880, some of the letters are dated as late as 21 Nov. 1880). Reprint of a 2-page letter from Eugene Simon, former French consul in China, on soybean farming in China (p. 591-93). Reprint of a description by Eugene Simon, based on the description of a Chinese, of how tofu is made in China (p. 593-94). A French translation of a 1781 article by Isaac Titsingh on preparation of soy sauce in Indonesia (p. 594-95). And some information about soybeans from the ancient Chinese herbal Pên Ts'ao Kang Mu (p. 595). Reprints of 2 letters from Eugene Simon in China, on soya and tofu in China. French translation of a 1781 article by Isaac Titsingh on preparation of soy sauce.

Note 1. We find it surprising that this superb work contains no illustrations of a soybean plant, or part of the plant, or of any foods made from soybeans; the only illustration (p. 569) is a cross section of an empty pit into which one could put a mixed silage that contained 20% soybean plants. The distance a-b is 3 meters; f-g is 2 meters; e-f is 0.5 meters; a-e is 1 meter; i-h is 0.4 meters.

Note 2. This is the earliest French-language document seen (Dec. 1999) that uses the term Huile de Soya to refer to soybean oil.

Note 3. This is the earliest document seen (March 2001) that has a bibliography of more than 50 references concerning soybeans.

Note 4. This is the earliest European-language document seen (Sept. 2004) that mentions the Japanese soybean types Nakata-mame or Okute manne.

Note 5. This is the earliest French-language document seen (Feb. 2010) that uses the term tsiang-yeou to refer to Chinese-style soy sauce. Address: France.


• Summary: This is largely a reprint in book form of Paillieux’s excellent article by the same title published in the September and October 1880 issues of the Bulletin de la Societe d’Acclimatation. The arrangement of text on the pages is somewhat different from (and clearer than) the earlier publication, and it contains small amounts of new information–as on p. 87-88.

Note: This is the second book on the soybean published in the western world; the first was by Haberlandt in 1878. This book contains only one unimportant illustration, the same one found in the preceding articles. Address: Membre de la Societe d’Acclimatation, France.


• Summary: “M. Roman, a French engineer, states that the cultivation of the interesting plant, the soja or soya, has been largely developed in Hungary and in various parts of France. He thinks that it may in the future become as important an article of food as the potato. It grows in any soil, even the driest; and the plant is an excellent fodder for cattle. The seeds are very nutritious and have the form of small kidney beans. An agreeable soup [miso soup] may be made of them. The Chinese use them for various kinds of cheese [tofu, fermented tofu], to make a condiment with oil [soy sauce?], &c. In France the seeds are roasted like coffee, and M. Roman says the decoction of the soja bean is very similar to that of average coffee.”

Note 1. This article also appeared (again in the “Gleanings” section) in the May 6 (p. 7) issue of this newspaper.

Note 2. This is the earliest document seen (March 2010) concerning soybeans (the soja or soya) in connection with (but not yet in) New Zealand.

23. Product Name: [Fermented Tofu, and Tofu].
Foreign Name: Doufu-ru, Doufu.
Manufacturer’s Name: Sam Sing.
Manufacturer’s Address: 615 Dupont St. basement, San Francisco, California.
Date of Introduction: 1882.

The 2nd line, written in Chinese characters, states: Sam Sing Fermented Tofu [and] Tofu Shop 615 Dupont st.

Note 1. Wo Sing and Sam Sing, the two companies in San Francisco that made tofu or fermented tofu, were both located on the same street (Dupont St.).

Note 2. This is the 2nd earliest known commercial soyfoods manufacturer in California (after Wo Sing, 1878).


• Summary: For a long time, French agriculturists have worked to introduce this new leguminous plant which has distinct advantages over its close relatives, the haricot bean and the pea.

The soya, or soja, is of Chinese or Japanese origin. For more than a century, the Museum of Natural History in Paris has possessed specimens. The Society for Acclimatization has spread / disseminated the seeds throughout France, but distrust and apathy have always led to the abandonment of the cultivation of this plant, which nevertheless grows very well in our climate.

More intelligently, Austria tried importing this plant in 1873, and it had soon spread throughout Austrian territory. In Italy and Bavaria it was also grown here and there.

A brief botanical description of the plant is given.

In China and Japan the soybean is used in various forms as a food. An oil is extracted from it which, in part, serves domestic needs. But the two principal forms in which it is used are shoyu, a type of sauce or condiment, and to-fu [tofu] or téou-fou of the Chinese, which has the appearance and certain qualities of fromage à la pie (the French term for a fresh dairy cheese resembling cream cheese).

Many people believe that the Chinese eat a diet composed only of rice; however it is clear that they also have their “cheese.” An interesting brochure by Mr. Vall lieux contains all of the information necessary to make tofu (fromage de soja). Doctor Picard has perfected this process and has arrived at a type of tofu (fromage de soja) that resembles Roquefort cheese [probably fermented tofu].

The dry seeds of the soybean (de soja) can be eaten as such, just like haricot beans; they furnish an excellent purée, and offer none of the inconveniences of haricots.

They can also be roasted, in the guise of coffee. The aroma and the properties of the decoction of roasted soybeans would be completely analogous to those of coffee of medium quality, very superior, consequently, to all that are served under the name of coffee in many public establishments.

The pods, stems and leaves are fed to cattle and horses. Eaten like green clover growing in the fields, these parts of the plant produce very rapid fattening; this is easily explained when one examines the chemical composition of the plant.

 Cultivation of soybeans is possible throughout the southern part of France; but in the north and in countries which are somewhat cold, they require a great deal of care and attention.

In summary, because of its completely unique nutritive qualities, the soybean is a plant whose cultivation should be expanded as much as possible.


• Summary: On page 45 is a listing written in English and Chinese, for “Sam Sing, Bean Cake, 615 Dupont st. basement, San Francisco.” On page 69 is a listing for Wo Sing, Bean Cake, 708½ Dupont st., San Francisco. The Chinese characters indicate that both companies made both fermented tofu and regular (non-fermented) tofu.


• Summary: “Venice, s. [steamer], from Hongkong: 46 cases merchandise,... 47 boxes soy [sauce],... 1 bag seaweed,... 18 packages preserved ginger, 5 boxes bean curd, 15 boxes sauce, 8 baskets ginger,... 10 boxes bean cake,... 5 boxes bean stick” [dried yuba].

Note 1. Bean cake, which is apparently a food, is probably fermented tofu, but could possibly be dried frozen tofu. If it is fermented tofu, this is the earliest English-language document seen (Oct. 2011) that mentions fermented tofu, which it calls “bean cake.”

Note 2. These goods are clearly for Chinese customers in Australia.

Note 3. This is the earliest document seen (Jan. 2010) that clearly mentions yuba being imported or exported.

27. Brisbane Courier (Queensland, Australia). 1885. Imports (A special charge is made on consignees’ announcements...
Summary: Page 180: (3 CC = Chinese characters given), ch’ao-teo-fu, fried bean-curd shop.

Page 181: 3 CC, ts’ing-iu-ping, oil cake [press-cake of oilseeds].

Page 197: 3 CC, teo-fu-ru, bean-curd [fermented tofu]; 4 CC, teo-fu-kan-tsi, dried bean-curd cakes [pressed tofu]. Note: This is the earliest English-language document seen (Oct. 2011) that uses the term teo-fu-ru to refer to fermented tofu.

Page 220: 3 CC, teo-fu tien, bean-curd shop.

Page 229: Oil of beans, 2 CC (bean + oil). Address: China.

Mr. Gillet de Grandmont asks: Very precise and extensive information on the cultivation of soybeans can be found in the Annals [Bulletin] of the Society for Acclimatization. This bean, which I have tried to use for food, does not soften easily upon cooking; it always retains a very disagreeable, acrid taste. I could hardly stand it, except that from Batavia [Jakarta] (Ket-Jap [ketjap, kecap]), it is made with from equal parts wheat and soybeans (Soya).

Mr. Lecerf replies: In the fresh state [as green vegetable soybeans], soybeans are not hard and their taste is even...
agreeable. In the dry state, it is easy to render them less tough, by adding a small quantity of sodium bicarbonate [baking soda] to their cooking water, and by taking care to soak them in water 24 hours in advance. Address: M.D., 2 Rue Casimir-Delavigne, Paris.

• Summary: The section titled “Soy ‘cheese’” (Le “Fromage” de Soja) states (p. 220): The starch [sic, protein] of the soybean is sometimes used for the preparation of a cheese.

Those who try to prevent the consumption of this product from expanding say that it has a rather strong taste of raw haricot beans.

The Society for Acclimatization, according to a proposal from Mr. Paillieux, is going to establish a prize of 500 francs to be awarded to the person who finds a practical process for removing this disagreeable taste from soy cheese, fresh or fermented / ripened. Address: France.

• Summary: A table (p. 13) titled “Trade in native produce, imports” has an entries for: “Bean curd, preserved” [probably fermented tofu]. The quantity in 1886 was 1,707.77 piculs, increasing to 3,027.10 piculs in 1888.

“Beans, black” [soy]. The quantity in 1886 was 61,541.72 piculs, increasing to 110,589.00 piculs in 1888.

“Beans, yellow” [soy]. The quantity in 1886 was 500,051.86 piculs, increasing to 670,262.00 piculs in 1888. Note: If this is fermented tofu, this is the earliest English-language document seen (Oct. 2011) that uses the term “Beancurd, preserved” [probably fermented tofu].

• Summary: Contents: 1. Historical and botanical description. Soy a (Le Soya) in Japan: Miso (according to Kaempfer), shoyo (Le Sooju, Shoyn), soybean varieties (23, soy oil, tofu), Japan at the exposition of 1878, practical recipe in France by the correspondent of the Horticultural Society of Paris (Société d’Horticulture de Paris), soy cheese or tofu (fromage de daizu (To-ju), soy in China, soy oil, fermented tofu (Le fromage de Soya, Téou-Fou) (white fermented tofu, red fermented tofu), soy in Cochinchina (black soybean), soya in France (history), preparation of soya for the table. Letter from Maurice Dupuy (chemist at Vienna, June 1888, to M. Lecerf; nutritional value of Soya hispida, nutritional composition of 2 samples). Conclusions. Bibliography. Address: M.D. Faculté de Médecine, Paris; Former student at the Industrial and Agronomic Institute of Nord [Ancien élève de l’institut industriel et agronomique du Nord].

• Summary: This massive volume, weighing almost 12 lb, contains more than 1,450 pages and 13,848 Chinese characters. Contents: Dedication (to the Honourable C.P. Chater). By the same author (17 books). Preface: Number of characters, the characters numbering, duplicate characters, phonetic arrangement, orthography, the tones, the dialects (Beneath the number attached to each character will be found its rhyme (R) as given in the P‘ei-wên-yín-fu. The romanization of each character is given in Cantonese, Hakka, Foochow, Wénchow, Ningpo, Peking, Mid-China, Yangchow, and Ssuch’uan {Szechwan} dialects, as well as in Korean, Japanese, and Annamese, each being distinguished by its initial letter), the definitions, the entries, etymology, grammar, difficulty of Chinese, personal. Philological essay (incl. tones, ranging from 4 to 9, in ten dialects). Table of sounds.

Examples of soy-related characters:

Ch’iang (p. 122, No. 1220). “A soy made by mixing salt with bean-flour. Sauce. Pickled food.” Fourteen compounds using this character are given, including: Bean sauce, soy.


Note 1. This is the earliest English-language document seen (Oct. 2011) that mentions Ch’ou fu which it translates as “stinking bean-curd.” This is also the earliest document seen (Oct. 2011) that uses the term “stinking bean-curd.”

Fu (p. 458, No. 3686). “Rotten; putrid; worthless.” Eleven (p. 458, No. 3686). “Rotten; putrid; worthless.” Eleven compounds and sayings include: Bean curd, see No. 11,417. Bean curd officials--a term of contempt applied to certain of the poorer classes of official servants who are compelled to feed largely on this cheap food. Also explained as flabby or unenergetic officials. A Mongol name for cheese. A kind of milk made from beans (rufu = milk + fu) [Note:
Probably fermented tofu, not soymilk.

_Huang_ (p. 522, No. 5124). Yellow. Compounds: Yellow beans [soja].


Shih (p. 988, No. 9999). See No. 1996.

_Ta_ (p. 1,036-37, No. 10,470). “Great.” But the word “Great bean” = soybean does not appear here.


Note 2. This is the earliest English-language document seen (Aug. 2007) that contains the term “sesamum-seed oil.”

Note 3. Herbert Giles lived 1845-1935.

Note 4. Unfortunately, the pronunciation of the compounds is not given (as in Mandarin).

Note 5. This is the earliest English-language document seen (April 2001) that uses the term “Bean sauce” to refer to soy sauce.

Note 6. This is the earliest English-language document seen (Oct. 2001) that uses the term “bean-flour” to refer to soy bean flour.

Note 7. This is the earliest English-language document seen (Oct. 2011) that uses the term “pickled bean curd” to refer to fermented tofu.

Note 8. This is the earliest English-language document seen (Oct. 2002) that uses the term “Wood oil” to refer to any of several trees of the genus _Aleurites_, and which, according to the investigation of Prof. Osawa of Tokyo Imperial University, contains only 15.32% in the air dry condition. The analysis of _kori-dofu_ gave me the following results: Water 15.32%. Albuminoids 41.42%. Fat and lecithin 23.65%. Non-nitrogenous extract 15.05%. Cellulose 1.48%. Ash 3.08%.

The author’s full name is Nicolas-Auguste Paillieux (lived 1812-1898; he died on 8 Feb. 1898 at age 85). An illustration (non-original line drawing; p. 503) shows a mature soybean plant bearing many pods, plus a close-up of three pods to the lower right of the plant (from an original in J.R.F. 1882). Note: Desire Bois lived 1856-1946.


“The efforts to prepare an easily digestible food from soya beans led to the preparation of _miso_ and _natto_, two kinds of vegetable cheese, which were investigated some time ago in the laboratory of this college. (Footnote: On the preparation of _miso_, by O. Kellner, this Bulletin, Vol. 1, No. 6. On _natto_, by Yabe; Bulletin Vol. 2, No. 2).

“But the most interesting preparation is _tofu_, which consists principally of the protein-matter of the soya bean and which, according to the investigation of Prof. Osawa in Tôkyô, is as easily digestible as beef. This preparation is freshly made every day and sold in the form of tablets [cakes] about 10 c.m. broad, 2 c.m. thick, and 25 c.m. long [4 by 10 by 0.8 inches thick], is of snow-white appearance and of the consistency and taste of freshly precipitated casein of milk, but as there is no trace of bacterial action connected with its preparation, the name vegetable cheese is certainly not justified.” A table (p. 211) shows the composition of tofu determined by _Kellner_.

“Tofu is also sold in another form called _kori-dofu_ [dried-frozen tofu]. It is prepared by exposing the fresh _tofu_ tablets to the action of frost, under which they shrink considerably, lose water, and become more compact. While fresh _tofu_ contains, on an average, 89.02% of water, _kori-dofu_ contains only 15.32% in the air dry condition. The analysis of _kori-dofu_ gave me the following results: Water 15.32%. Albuminoids 41.42%. Fat and lecithin 23.65%. Non-nitrogenous extract 15.05%. Cellulose 1.48%. Ash 3.08%.”

The author then describes the tofu manufacturing process, noting that it “is manufactured only on a small scale, by people who sell it in their own shops.” “The beans are first soaked for about twelve hours in water and then
crushed between two mill-stones until a uniform pulpy mass is obtained. This is then boiled with about three times its quantity of water for about one hour, whereupon it is filtered through cloth. This liquid is white and opaque, exactly like cow’s milk; while the smell and taste remind one of fresh malt.” “I also analyzed the fresh milky liquid with the following results” for “Soya bean milk” and cow’s milk, respectively (p. 212): Water 92.53% / 86.06%. Albuminoids 3.02% / 4.00%. Fat 2.13% / 3.05% Fibre 0.03% /–. Ash 0.41% / 0.70%. Non-nitrogenous extract, including carbohydrates 1.88% /–. Milk sugar–/ 5.00%.

“The fat contained in this liquid as well as in the tofu-tablets was found to consist partly of lecithin. Tofu dried at 100° yielded 26.65% fat and 4.83 gr. of this fat yielded, after igniting with carbonate of soda and nitrate of potash in the usual way, 0.280 grm. of magnesium pyrophosphate, which, when multiplied by the lecithin-factor, 7.2703, corresponds to 2.035 grm. lecithin, amounting to 11.2% of dried tofu, leaving for the genuine fat 15.4% (Footnote: A portion of this lecithin was probably present in the soya bean as lecithalbumin; comp. Leo Liebermann, J.B. f. Thierchemie, 1893, p. 32, and E. Schulze, Chemiker Zeitung, 1894, No. 43); more of the latter, therefore, is left in the refuse than of the former.”

Note 1. This is the earliest English-language document seen (March 2001) that contains the term “soya bean milk.”

Note 2. We learn some curious facts about butter and cheese from that section of Professor Marshall’s learned Presidential Address on Botany, at the meeting of the British Association, which was devoted to the bacteriology of the dairy. To different forms of bacteria, he tells us, are due the distinctive flavours of varieties of butter and cheese…”

“The lecturer suggested that interesting results might be obtained from the investigation of the vegetable cheese [tofu] made in China and Japan from the curd of the soy bean, which is allowed to become mouldy in the process” [fermented tofu].

Footnote 4 (p. 213): “In order to see whether a product similar to Swiss Cheese could be obtained from the crude soya casein or tofu. I infected 50 grm. of fresh tofu with a small dose of pulverised Swiss cheese, and added ten per cent of common salt to the mixture, pressed it in cloth, and allowed it to stand in a moist beker glass for several months. The product resembled, only to a limited extent, the cheese from milk, but further experiments with the addition of small quantities of milk sugar are intended.”

Note 2. This is the earliest English-language document seen (Oct. 2003) that contains the term “soya bean milk.”

Note 3. This is the earliest English-language document seen (Oct. 2003) that contains the term “milky” in connection with soymilk, or that uses the term “milky liquid” to refer to soymilk. It is the second earliest English-language document seen (Oct. 2003) that mentions soymilk, and the earliest that mentions it in connection with Japan. However there is no suggestion that Japanese consume soymilk as a beverage.

Note 4. This is the earliest English-language document seen (March 2009) that uses the term “vegetable cheese” to refer to miso.

Note 5. This is the earliest English-language document seen (Feb. 2004) that uses the word “kori-dofu” to refer to dried-frozen tofu. Address: Nôgaku-shi [Prof. of Agriculture], Japan.
consumed abundantly in this country [Vietnam] and in China. It could be that with carefully-made preparations, Europeans could make use of it [the bean].

The soybean contains an abundance of a milk-like substance with which the followings cheese can be prepared.

1. Tofu (Dau hu)–A type of cheese that is eaten the day it is made. It has a consistency somewhat similar to that of Swiss cheese. It is widely used as an ingredient in other dishes, seasoned with either sugar or salt, or in cooked foods, because heat does not damage it.

2. Pressed tofu (Dau-hu-cu.ng; [cu.ng means “hard”])–Used in the same way as No. 1, it is always cut into pieces and cooked with other ingredients. Having a firmer consistency than No. 1, it can be kept for a day or so.

3. Yuba (Dau-hu-ky; [literally “bean curd skin”])–This cheese comes in dry sheets. It is cooked in other culinary preparations. It serves as a mild seasoning and as a wrapper like some Italian pastas.

Note 1. This is the earliest French-language document seen (Aug. 2010) that uses the word Dau-hu-ky (regardless of hyphenation or capitalization) to refer to yuba.

4. Fermented tofu (Dau-hu-nhan; [nhan means “bitter”])–This fermented and salted cheese will keep for a month or even a year. It is eaten with bread, with cooked rice, or with meats.

5. Chao–Another fermented and salted tofu, but sold in an alcoholic brine, and diluted to make a soft paste. Used in much the same way as butter. It sometimes accompanies starchy foods (grains, bread, etc.) and sometimes it is added to meats or fish.

6. Dau-hu-ooa–A creamy cheese which is eaten with sugar or water sweetened with sugar. Note 2. These are soymilk curds (doufu-hua in pinyin). Also called Tao pho (in Hanoi). Dao-hu hoa (in Hue). Tau-hu (Saigon).

The next section describes how to make each of the six different types of tofu and yuba.

1. Tofu–As with other cheese, each of these must be prepared with care. Start by crushing soybeans into pieces–3 or 4 pieces per bean at most, then soak in water for 18–20 hours. Stir from time to time so that the hulls rise to the surface, then decant then off. Grind the rest finely to obtain a fluid puree. Bring to a boil. After 15 minutes, add sea salt to coagulate the liquid. The sea salt can be replaced by gypsum, but the result will not be the same.

2. Pressed tofu–Prepare like No. 1 but cook longer and press in a form with a very heavy weight for several hours until it is about 1 cm thick and of firm consistency so that it will last for several days.

3. Yuba–Lift off the thin films that form on the surface of hot soymilk with a fork. Let them dry in the sun. The films, which are either white or yellow, will last for a year, if care is taken to dry each film slowly and for a long time; otherwise they will turn red.

4. Salted, fermented tofu (Da-hu nhan)–Cut tofu in pieces a little larger than one’s thumb and spread them on a plate covered by a banana leaf. According to the season, leave them here for 2–3 days or more, until each piece is entirely covered with mold. Wipe off the mold and layer them in a deep crock. Between each later add powdered salt. Hermetically seal the mouth of the crock / vase and expose it either to the rays of the sun or to a source of heat; continue this for 10–15 days, until the cheese is ready. It is an excellent condiment.

5.–Chao. The complex fermentation is described in detail.

6. Soymilk curds before they are pressed. Very light and delicate, with subtle sweetness.


The author’s full name is Nicolas-Auguste Paillieux (lived 1812-1898; he died on 8 Feb. 1898 at age 85). An illustration (non-original line drawing; p. 576) shows a mature soybean plant bearing many pods, plus a close-up of three pods to the lower right of the plant (from an original in J.R.F. 1882). Note: Desire Bois lived 1856-1946.


d’Histoire naturelle de Paris.

40. **Product Name:** [Light House brand Soy Sauce, Chiang, Fermented Tofu].

**Foreign Name:** Jiang-yu, Dou-jiang, Furu.

**Manufacturer’s Name:** Yeo Hiap Seng.

**Manufacturer’s Address:** Chang-chou, Fukien [Fujian] province, China.

**Date of Introduction:** 1900.

**How Stored:** Shelf stable.

**New Product–Documentation:** Letter from Alan Yeo.

1982. April, and YHS news release. 1990. Oct. Yeo Hiap Seng traces its origins to the year 1900 when the patriarch of the Yeo family, Mr. Yang (in the Amoy dialect, his name was pronounced Yeo Keng Lian) purchased a small company named “Hiap Seng” in the city of Chang-chou (pinyin: Zhang Zhou), Fukien (Fujian) province, China. “Hiap Seng” means “unite to succeed.” Yeo Keng Lian changed the company’s name to reflect his family’s ownership. He worked as a manufacturer and retailer of fermented soybean seasonings: soy sauce (jiang-you), Chinese-style miso (dou-jiang), and fermented tofu (furu). All three products were sold from day one under the “Light House” brand. By working together, the family did succeed. Their soy sauce, fermented in the traditional Chinese way in wooden vats and earthenware jars, was of superior quality and the business prospered. The original plant was located near the center of Chang-chou. In about 1920 a second plant was established in the eastern part of the city, and in the late 1920s a third plant was set up in the southern part of the city. Each of the three fermented soy products were produced in all three plants; the second and third plants also produced some pickled vegetables.

In 1935, during the Japanese invasion of China, when life was difficult and unsettled in Fukien province, Yeo Keng Lian sent his eldest son, Yeo Thian In, to Singapore to investigate possibilities there. The son founded the Yeo Hiap Seng Sauce Factory at 410 Outram Road, Singapore 3. He was joined shortly by the rest of the family. His working together, the family did succeed. Their soy sauce, fermented in the traditional Chinese way in wooden vats and earthenware jars, was of superior quality and the business prospered. The original plant was located near the center of Chang-chou. In about 1920 a second plant was established in the eastern part of the city, and in the late 1920s a third plant was set up in the southern part of the city. Each of the three fermented soy products were produced in all three plants; the second and third plants also produced some pickled vegetables.

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Note 1. This is the earliest known commercial soy product (with a brand name) made in China.

Note 2. This is the earliest known commercial soy product made or sold by Yeo Hiap Seng. It is also the earliest record seen (Oct. 2001) concerning Yeo Hiap Seng.


**Summary:** A book review of: *Glimpses of China and Chinese Homes*, by Edward S. Morse. He gives a list of the foods he had for dinner, with his comments. The last is: “Fermented bean-curd soup. Very poor.”

Note: This is the earliest English-language document seen (Oct. 2011) that clearly mentions fermented tofu, which it calls “Fermented bean-curd” (one of two documents).


**Summary:** Only two copies of these rare, magnificent unpublished documents exist. One is Rolls 28-30, Vols. 105-109, Project Studies, Division of Plant Exploration and Introduction, Record Group 54: Records of the Bureau of Plant Industry, The National Archives. The second is at the University of California at Davis. Most are carbon copies of typewritten letters. Includes some illustrations (pencil sketches) by Meyer.

The first letter in this collection, dated 7th Oct. 1902, is from Meyer in Santa Ana, California, to Mr. Adrian J. Pieters (a fellow Dutchman) at USDA in Washington, DC. Meyer arrived in California on 18 Sept. 1902 and started immediately to work for USDA at the plant introduction garden in Santa Ana; he stayed 7 months. In April 1904 Meyer is in Guadalajara, Mexico. In March 1905, Meyer offers an order from David Fairchild and Pieters to work for USDA as an agricultural explorer in northern China. In August 1905, he is in Nagasaki, Japan. In Sept., he is in Shanghai, China. In Oct. 1905, he writes a long letter to Fairchild. Meyer made four very fruitful expeditions to Asia, eastern Europe, and the Middle East. His first expedition was to China, Manchuria, and Siberia, 1905-08. His second was to Europe, Russia, Caucasus, Transcaucasus, Turkestan, and Siberia, 1909-12. His third was Russia, Siberia, Manchuria, China, and Japan, 1912-15. And his fourth and final expedition was to Japan and China, 1916-18.

On 23 Dec. 1917, war engulfed Frank Meyer at Ichang (I-ch’ang or Yichang) on the Yangtze River. He was trapped there until 2 May 1918 when he managed to break through lines of soldiers. The last letter in this collection, dated 18 May 1918, is from Meyer to Fairchild written from Hankow, China. He died about 1-2 June 1918, having drowned in the Yangtze River below Anking, and above Wuhu, China.

Meyer did not report any soybeans in Russia or Turkestan.

Note 1. This is the earliest document seen (July 1998) concerning Frank N. Meyer.

Note 2. Ichang, which opened as a treaty port in 1876, was a city of 40,000 people by 1920. It is situated at the head of steam navigation on the Yangtze, at the throat of the main outlet from Szechuan, and at the point where the mountains of Szechuan and western Hupeh meet the central plain of Hupeh.

Note 3. Soyfoods Center owns all pages that mention soy, plus: (1) The full U.C. Davis cataloging record for the archival collection, which is in Special Collections SB108 A7M49 1902 v1-4. (2) A letter from Melissa Tyler of U.C. Davis, dated 22 Sept. 2003, discussing the collection and its lack of front matter. (3) Appendix A: Bureau of Plant Industry, by Knowles Ryerson about a dispute he had with

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Secretary of Agriculture Henry Wallace involving Nicholas Roerich, Dr. H.G. MacMillan, and James F. Stephens over a plant exploration expedition to Manchuria and the Gobi Desert. In 1934 Ryerson was appointed Chief of the USDA’s Bureau of Plant Industry; this dispute led to his removal that same year; he was replaced by Frederick D. Richey. Address: USDA Bureau of Plant Industry.


• Summary: In Chapter 3, “A Chinese dinner,” the author notes (p. 65): “Women are excluded from the table, as in Japan.” He gives a list of the foods he was served for dinner, with his comments (p. 67). The last is: “Fermented bean-curd soup. Very poor.”

Edward Sylvester Morse (an American, from Hartford, Connecticut) lived 1838-1925. The book is illustrated by sketches from his journal. Prof. Morse, who lived and taught for several years in Japan in the late 1870s and 1880s, and quickly grew to admire and love the Japanese, finds little to like or admire among the Chinese: “In my short experience with the Chinese I do not recall the faintest indications of kindliness, politeness, or urbanity; whether high or low in station, their attitude was always the same.” “The reception a foreigner encounters in China is due to an intense dislike of us, coupled with an absolute contempt for all we do and for all we have accomplished” (p. 206-07).

Note: This is the 2nd earliest English-language document seen (Oct. 2011) that clearly mentions fermented tofu, which it calls “Fermented bean-curd” (one of two documents). Address: Former Prof. of Zoology, Imperial Univ., Tokyo.


• Summary: Sir Alexander Hosie (lived 1853-1925) traveled to Ssuch’uan in June and July, 1884.

In Part A, titled “Agricultural and horticultural products,” section II on “Pulse” (p. 10-11) states: “1. Soy Bean (Glycine hispida, Max.).–The soy bean does not play the same part in Ssuch’uan [Szechwan] as it does in Northern China, and especially Manchuria, where it is cultivated almost entirely for its oil and for the refuse cakes, which find a ready market not only in China and adjacent countries, but are winning their way as fertilisers into remoter regions. The great oil-yielding plant of Ssuch’uan is rape, and although oil is extracted from the soy bean, it is as an article of food, whether cooked whole or in the form of resultant products, that the latter is appreciated in Western China. Three well-marked varieties, each with two or more sub-species, are cultivated.” A bushel of each weighs 40 pounds.

(I.) Yellow Soy Bean (all are ovoid in shape; oil is extracted from the first two): (a) “Pai Huang Tou” or White Yellow Bean. This is the lightest in color of the three sub-species of the yellow bean. A bushel of 40 lbs. costs T. [Taels] 0.8.8, or about 2s. 1d. There are about 150 beans per ounce. “As a rule they are cooked whole and served as a vegetable condiment.” (b) “Ta Huang Tou” or Large Yellow Bean. Has a light tinge of green. Eaten in the same way as the white-yellow bean. (c) “Hsiao Huang Tou” or Small Yellow Bean. This bean is much smaller and less expensive than the other two sub-species. “For this reason it is in demand for the manufacture of bean curd in its various forms. It is also used as a vegetable. “Oil is extracted from (a) and (b), and to a much less extent from (c); but this subject will be dealt with under the head of oil-yielding plants.

(II.) “Ch’ing Tou”–Green Soy Bean. “There are two sub-species of this bean, (a) where epidermis and inside are both green, and (b) where epidermis is green and inside yellow. The former is more commonly cultivated in Ssuch’uan, and both are eaten and cooked as a vegetable. They are also salted and put away in jars for winter use. The bean is of the same size, shape, and weight as the white-yellow bean. The above yellow and green varieties of the soy bean occupy the ground from April to August, whereas the next variety (black) takes a month longer to mature.

Note 1. This is the earliest English-language document seen (May 2009) that contains the word “Green Soy Bean.” It refers to mature dry soybeans with a green seed coat—not to green vegetable soybeans.

(III.) “Hei Tou”–Black Soy Bean. “There are two sub-species of this bean: (a.) The first is much larger, rounder, and heavier than the yellow and green variety. Only 88 are required to make up an ounce and the cost is T. 0.6.5 per bushel of 40 lbs. Like the green bean, it is used cooked in its fresh state as well as pickled. (b) The second is a small flattish bean, about 450 going to the ounce. It is used in medicine and for food, principally the former. The cost is T. [Taels] 0.8.0 for 40 lbs. Both these sub-species are black outside and yellow inside, the epidermis of the former being readily detachable when crushed.”

In section VI, “Products of cereals, pulse, and starch-yielding plants,” the first entry (p. 19) is for “1. Bean curd and Jellies.–In my book on Manchuria I have fully described the manufacture of bean curd from the yellow soy bean, and it is therefore unnecessary to go into details in this place; but in Ch’êngtu it is preserved and exported in jars like wine. The bean curd is cut into small pieces, drained of its water, and packed in jars with layers of salt. There they remain for forty days, when they are taken out, drained of the brine, packed in other jars with ground up bread, red rice (dyed), star-anisced, and red wine. The jars are then closely stoppered and the preserved bean curd is ready for export. It is also preserved.
without the wine, which is replaced by the cold water which had previously drained from it, but with a seasoning of ground-up chillies, star-aniseed, &c.” Related products are “pea jelly,” “sweet potato jelly,” “rice jelly,” and “buckwheat jelly.” Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “preserved beancurd” to refer to fermented tofu.

Note 3. This is the earliest English-language document seen (Oct. 2011) that uses the word “wine” (including rice wine or “sake” / “saké”) in connection with fermented tofu, and explains how that wine is used in the two-step fermentation process.

We also read (p. 19): “3. Soy or bean sauce. Two kinds of soy are manufactured in Ssuch’uan–white or red–or, as the latter is frequently called, black:–(a) Red soy.–In describing the manufacture of soy, I propose to give the exact quantities by them may be obtained.

“Twenty-eight catties of yellow soy beans are steeped overnight in cold water. In the morning they are removed in their swollen state and steamed for five hours. They are then taken from the steamer, spread out on mats, and allowed to cool, after which they are thoroughly mixed with 20 catties of wheat flour and placed in a basket made of split bamboo.

[Note: The ratio by volume of soy beans to wheat flour is 1.4 to 1]. In six or seven days, as soon as yellow mould begins to appear, they are placed in an earthenware jar with 30 catties of cold water (well-water preferred) and 30 catties of granular salt and the whole is thoroughly mixed and the jar covered. In three or four days the jar, which has been placed in the sun, is uncovered and the contents stirred by hand, and the same takes place daily for three months. At the end of this time the liquid has all evaporated. During the following months the cover is removed during the day and replaced at night. The contents are now a black pickle, and may be eaten as such; but to obtain the soy they are divided up into equal parts and placed in two earthenware jars, to each of which is added 40 catties of boiling well-water. The contents of each jar are now thoroughly mixed and stirred up and a fine bamboo sieve in the shape of a basket is placed in the jar. The liquid escapes into the basket while the dregs are kept back by the sieve. In two or three days the liquid has all drained into the basket, when it is baled out and boiled with two catties of white sugar or glucose manufactured from glutinous rice, already described, with the addition of two or three ounces of mixed whole chillies and star-aniseed. Each jar will yield 35 catties of red soy, valued at 96 cash a catty, so that the 28 catties of yellow beans, with the other ingredients, yield 70 catties of soy. A whole year is required from the steeping of the beans to the production of this soy.

“(b) White soy.–In the case of white soy the beans are first roasted in sand which has been previously heated in an iron pan with a mixture of rape oil. This roasting is complete when the beans open or split, and the sand is removed by sieve. They are then placed in an earthenware jar and steeped in cold water for twelve hours. They are afterwards steamed as in the manufacture of red soy, and mixed with flour and salt; but, instead of 30, some 60 catties of water are added to prevent the blackening of the beans and the discoloration of the soy. The daily uncovering, stirring, and recovering take place as in red soy, but at the end of 120 days the solid matter is removed and the liquid alone is exposed in the jar to the sun. This soy is ready for use at the end of the 120 days, but improves by keeping and exposure to the sun. No sugar or glucose is used, and the seasoning is placed in the jar with the 60 catties of water. Nor is there any boiling before use. The cost of white soy, which is more yellow than white, is from 80 to 96 cash a catty, according to quality.”

In the section on oil-yielding plants, p. 34 states: “(e.) ‘Glycine hispida, Max.’–In Ssuch’uan the soy bean of Northern China and Manchuria is replaced by rape seed, and it is cultivated more as a vegetable than for its oil. The production of the latter is insignificant from a commercial point of view.”

In 1922 a derivative work titled “Szechwan, its Products, Industries, and Resources,” was published in Shanghai by Kelly & Walsh, Ltd. (185 p.).

45. **Product Name:** Doufu, and Fuyu (Fermented Tofu).  
**Manufacturer’s Name:** Sing-how Lee & Co.?  
**Manufacturer’s Address:** Jackson St., San Francisco, California.  
**Date of Introduction:** 1904.  

**New Product–Documentation:** Shurtleff & Aoyagi. 1980. History of Tofu. p. 63. based on interview with Stanley Lee: In about 1904 Mr. Sing-how Lee started a tofu shop in San Francisco with several partners. No one remembers the name any longer. Because of conflicts with the partners, he left and started Quong Hop in 1906 in Chinatown. The company may also have made fermented tofu. And some fermented tofu was probably being imported to America from Hong Kong and China.


• **Summary:** The section titled “Early rice” states (p. 15): “These dishes bore frightful dragon and other terrifying decorations, and contained first, superannuated and odoriferous shrimps; second, sickly bean curd floating gently on a summer sea of native vinegar and mustard seed oil; the third dish boasted pickled turnip tops and other refuse; and the fourth, bean curd cheese which reminded me of wild-cat’s liver soaked in sulphurated hydrogen.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “bean curd cheese”
In China, not much animal milk is consumed. It is many countries.

"Everyone knows that animal milk is an excellent

...of inferior quality, and often fraudulent. However, vegetable

...as casein; chemical composition. It is well known that animal

...of inferior quality, and often fraudulent. However, vegetable

...yields of up to 25,000 to 30,000 kg of green forage

...oil peas of China.' This is an annual legume which has been

...some resemblance to gruyere cheese. It can be stored for a rather

...it flavor is very strong, like that of Roquefort.

...nearly to compare the products of the

...not only in terms of their similarity in appearance, but also in terms of their chemical composition. It is well known that animal milk contains a large proportion of casein; the same is true of vegetable milk, which contains legumine that has the same chemical formula as casein.

...firstly, to compare the products of the animal dairy with those of the vegetable dairy, not only in terms of their similarity in appearance, but also in terms of their chemical composition. It is well known that animal milk contains a large proportion of casein; the same is true of vegetable milk, which contains legumine that has the same chemical formula as casein.

...thought of the same family. Analyses show that they contain 30% protein, oil, and little starch.

...which is a major source nourishment for the peoples of China and Japan. It is consumed, in effect, every day and at every meal, as a main dish.

...It is of interest, finally, to compare the products of the animal dairy with those of the vegetable dairy, not only in terms of their similarity in appearance, but also in terms of their chemical composition. It is well known that animal milk contains a large proportion of casein; the same is true of vegetable milk, which contains legumine that has the same chemical formula as casein.

...Furthermore, during processing, the peas (le pois, i.e. soybeans) undergo a complete chemical and mechanical transformation which concentrates the nutritive parts and eliminates the others; it is this which explains the richness of the vegetable milk and cheese in nutritive principles.

...of the same family. Analyses show that they contain 30% protein, oil, and little starch.

...which is a major source nourishment for the peoples of China and Japan. It is consumed, in effect, every day and at every meal, as a main dish.
milk does not support fraud and cannot transmit contagious diseases. It is the same for everyone; the poor consume the same product as the rich.

“Let the culture of soybeans expand therefore in Europe. One might try to make vegetable milk which will be destined, not for those who have the means to buy good milk, but rather for those who can only afford low-price milk; thus, fraud becomes useless, and this will a benefit for public hygiene and for the purse of poor people.”

Note 1. This is the earliest document seen (May 2011) concerning Li Yu-ying. It is also the earliest publication seen by him on the subject of soya.

Note 2. These proceedings contain a list of attendees and of excursions. Address: Attaché at the Chinese Legation, and official delegate.

• **Summary:** Describes experiments to make a cheese similar to Swiss cheese. The soybean contains (according to Osborne and Campbell 1898) as its “chief proteid constituent glycinin, a globulin similar in properties to legumin, but of somewhat different composition, containing nearly twice as much sulphur...” and having the following composition: Carbon, 52.12; hydrogen, 6.93; nitrogen, 17.53; sulphur, 0.79; and oxygen, 22.63 per cent.

This protein can be extracted from [soaked, ground] soybeans by boiling. “The liquid thus obtained resembles cow’s milk in appearance,” and when treated with calcium and magnesium salts, yields a precipitate which is sold in Japan under the name of Tôfu. The author has attempted the preparation of a cheese from tofu. 450 gm of pressed tofu gave similar results. Address: Acting Commercial Attaché to His Majesty’s Legation at Peking.


• **Summary:** This is a very detailed report by a seasoned expert on China. “Net foreign trade [in 1904] amounted in silver to 583,547,291 Haikuan taels” (£83,580,992l. = pounds sterling).

Table H, titled “Principal articles of export in order of value” (p. 32): Shows the three most valuable exports to be silk (£11,208,457 = 78,255,412 Haikuan taels), tea (£4,325,802), and cotton (£3,553,744). No. 6 was “Beans” [soy] (£705,662 = 4,926,805 Haikuan taels), and No. 17 was “Bean cake” [soy] (£337,436). Other exports include: Oils (vegetable), fire-crackers, tobacco, hemp, Chinaware, earthenware and pottery, opium (native; exported to Tonkin, etc.), sesame seed, joss sticks, groundnuts, aniseed, and rhubarb.

Table L, titled “China’s principal exports to Asiatic countries” (India excepted), expressed in units of quantity, 1903, 1904, and 1899-1903 average. The top two articles in terms of the 5-year average are [soy] bean cake (3,464,375 cwt) and [soy] beans (2,650,900 cwt). Note: 1 cwt = hundredweight = 112 pounds.

The section titled “Beans and bean cake” (p. 45) states: “I have already explained that the shortage in the export of beans and bean cake to Japan was due to the war being waged in Manchuria. In the total export from China, beans decreased by 823,412 cwt. as compared with 1903, and bean cake dropped from 4,052,026 to 1,370,178 cwt. In these products the Yangtsze [Yangtze] Valley is beginning to compete with Manchuria: in 1904 Hankow sent away 3,173,224 cwt. of beans of all kinds, and Chinkiang had an export of 580,989 cwt. of bean cake and 355,670 cwt. of beans and peas.”

Under the year 1905, soy beans and bean cake are discussed on p. 94 and oils (vegetable) on p. 95. “The oils produced in China are numerous and varied. Rape, sesameum, groundnut, tea, wood (Aleurites cordata, M. Arg.), cotton seed, bean, poppy seed, tallow seed (Sapium sobiferum, Roxb.), castor, cocoanut, hemp seed, linseed, perilla seed (P. ocymoides, L.), as well as lighting oils from Amoora Rohituka, W. and A., and Jatropha curcas, L., are all well known. In addition to these we have the essential oils–camphor, cassia, aniseed, peppermint, ginger, clove, orange peel and sandalwood (from imported wood). The most important of these oils from a commercial point of view is wood oil.” Address: Acting Commercial Attaché to His Majesty’s Legation at Peking.

50. **Product Name:** Doufu (Tofu), and Soy Sprouts.

**Manufacturer’s Name:** Quong Hop & Co.

**Manufacturer’s Address:** Wentworth Place (between Jackson and Washington Streets), San Francisco, California.

**Date of Introduction:** 1906.

**How Stored:** Refrigerated.

**New Product–Documentation:** San Francisco City Directories. 1906-1966. In the years prior to about 1927 these directories did not list the names of Chinese residents or companies. In 1927 they listed three companies whose
names started with “Quong” but not Quong Hop & Co. which was first listed in 1930 as a grocery company at 135 Waverly Place. This listing continued until 1938, when the term “groceries” was replaced by “food manufacturers” at 133 Waverly Place. In 1948-49 the company was listed as an “importer” at the same address.

In 1951 for the first time the company listing was associated with tofu; the occupation was described as simply “bean cakes,” still at 133 Waverly Place. The term “bean cakes” may well have referred to fermented tofu, or to both fresh and fermented tofu. This was changed in 1955 to “bean cake manufacturers.” In 1960 Hom O Hing and Yee Let Wong were apparently the owners. In 1966 the address changed to 1779 Folsom St. The occupation was still “bean cake manufacturers.”


Shurtleff & Aoyagi. 1980. History of Tofu. p. 63. Based on interview with Stanley Lee: “In about 1904 Mr. Sing Hau Lee started a tofu shop in San Francisco with several partners. Because of conflicts with the partners, he left and started Quong Hop & Co. [the name means ‘Great Unity’] in 1906 in Chinatown, on an alley called Wentworth Place, between Jackson and Washington Streets. In the basement of the store the company made tofu (firm and wine-fermented) and sprouts (soy and mung). The shop was very similar to a typical small tofu shop in China; the foods were sold at the store-front upstairs. After the 1906 earthquake, the company moved across the bay to Oakland for 6 months, then moved back to San Francisco to a new location at 135 Waverly Place. Quong Hop did a good business until the beginning of World War II when their supply of soybeans, all of which were imported from China, was cut off. So they restricted their tofu production to only fermented tofu. In the mid-1960s the company moved to 1779 Folsom St. at 14th. As the natural foods movement began, they decided in 1971 to start again to make regular tofu (plus several new varieties) and soymilk. In 1972 they moved to a large new factory at 161 Beacon St. in South San Francisco and developed many innovative products using tofu and soymilk.”

Note: This is the earliest record seen (April 2001) concerning Quong Hop & Co. and tofu. But note that the early documentation is missing! The first solid listing is in 1951!

51. Product Name: Fuyu Bean Cake (Fermented Tofu).
Manufacturer’s Name: Quong Hop & Co.
Manufacturer’s Address: Wentworth Place (between Jackson and Washington Streets), San Francisco, California.
Date of Introduction: 1906.

Francis Kalnay. 1959. House Beautiful. May, p. 174-75. “Soybean has all the answers.” A photo shows the jar and label. The English portion of the front panel reads (from top to bottom): “Since 1906. Quong Hop & Co. Bean cake.”

Hokubei Mainichi Nenkan (Year Book). 1970. Page 15. Half-page ad. Across top of ad in English: Quong Hop & Co., 1779 Folsom St., San Francisco, Calif. Phone: 552-2476. A large photo at the center of the ad shows a jar of their “Bean cake” [fermented tofu]. In Japanese: Since 1906 the old maker (shop). Many years of experience and using very selective raw materials. It is the best side dish with your evening drinks. After 3 months you can enjoy it [Does this mean you must wait for 3 months before eating it?] Please buy it at your local grocery store. (Directory entry, p. 37 under “Food Products”).

Shurtleff & Aoyagi. 1980. History of Tofu. p. 63. Based on interview with Stanley Lee: “Quong Hop & Co. started in 1906 in San Francisco to make tofu (firm and wine-fermented) for the local Chinese population. The label bore the Cantonese characters pronounced ‘fuyu,’ as well as the English term ‘Bean Cake,’ a termed coined by the company to help health inspectors understand what type of product they were inspecting. During the Prohibition era (1919-1933) and thereafter, the term aided government inspectors from the Treasury Department’s Bureau of Alcohol, Tobacco, and Firearms to understand what they were taxing. Hop did a good business until the beginning of World War II when their supply of soybeans, all of which were imported from China, was cut off. So they restricted their tofu production to only fermented tofu. In the mid-1960s the company moved to 1779 Folsom St. at 14th. As the natural foods movement began, they decided in 1971 to start again to make regular tofu.”

Letter from Gordon Chang, Prof. of Chinese Studies, Stanford Univ. 1999. July 19. He likes fermented tofu and would like to learn to make it himself. He called Quong Hop and they no longer make it. They stopped three years ago, much to the dismay of his friends and relatives.

52. Marre, Francis. 1907. Le lait végétal en Chine [Vegetable

**Summary:** The use of milk as food in China is very limited. The immense empire, which is governed by the Son of Heaven, is not suited for raising livestock, except in its northern and western regions, which occupy only a small part of its total area. Moreover, the climate and nature of the soil do not permit the culture of forage crops. These purely geographical reasons are enough to explain why vegetable milk is consumed abundantly in the majority of Chinese provinces.

This milk, whose name seems strange and a bit paradoxical, is made from the seeds of *Soja hispida*, also called the oil pea of China (*haricot oléagineux de Chine*), an annual plant of the legume family. To obtain it, the seeds are first [ground with water], boiled and then pressed, making a sort of puree which, when dissolved in water, makes a very nourishing vegetable milk. When treated with a mineral salt, which acts much like rennet in milk, it coagulates and may be made into a kind of cheese ([to-fou] [tofu]) which plays an important part in nourishing the Chinese and Japanese people. It is one of their basic daily foods and can be made into a great variety of culinary preparations. It is generally consumed fresh, the day it is made. But it may be cooked, and preserved by salting or smoking. In commerce, three principal varieties of vegetable cheese ([fromage végétal] [tofu] are found. One, which is fermented [fermented tofu], is white, yellow or gray, and has a piquant flavor like that of Roquefort. The second is white and salty, resembling goat cheese / goat’s milk cheese. The third is smoked and quite like Gruyere (gruyère).

In the process of making vegetable milk and tofu, they recover with care the various by-products [okara, whey] and use them with ingenuity to nourish their animals and as fertilizer for their fields; in this way nothing is lost. Even the stems of the plant and the pods that envelop the seeds are used as forage. Thanks to the fact that every part of the plant can be used, and thanks also to the low cost of manpower in China, soy cheese ([fromage de soja]) can be sold for such a low price that enough to serve a man for a day (110 square cm of surface by 2.5 cm thick) costs less than a centime [one-fifth of a U.S. cent], or 50 to 60 times less than an equal quantity of animal cheese.

As for the food value of soymilk, it is approximately equal to that of cow’s milk; it contains significant quantities of legumein, whose chemical composition is very close to that of casein.

Mr. Li Yu-Ying, an attaché at the Chinese legation in Paris, made soymilk ([lait de soja]) the subject of an important presentation at the last dairy congress, and forecast the introduction of soya ([soja]) into French culture.

Note: This is the earliest French-language document seen (Oct. 2003) that uses the term *lait de soja* to refer to soymilk. As of Oct. 2003 *lait de soja* is the modern French word for soymilk.


**Summary:** A list (p. 52) shows that China’s leading articles of export, in descending order of value (million Haikuan [Haikwan] tael), are silk (89.1), tea (31.7), cotton, raw (16.9), skins and hides, undressed (12.4), bean cake (9.1)... vegetable oils (4.2), fire-crackers (4.2)... sesame seed (3.6)... groundnuts (0.4). A table (p. 62) shows exports of these items from China to Europe and America in 1902-06 (average), 1906, and 1907. Exports of oil (bean, tea, groundnut, wood, etc.) dropped 2.5% in 1907 compared with 1906. A table (p. 64) shows exports from China to Asiatic countries (India excepted) in 1902-06 (average), 1906, and 1907. Exports of “beans” dropped from 1,778,037 cwts. in 1906 to 1,591,508 cwts. in 1907.

A section titled “Beans, bean cake and bean curd” (p. 68) discusses soybeans, soybean cake, and tofu. “Within the knowledge of the Chinese Imperial Maritime Customs the export of beans from China to foreign countries amounted in 1907 to 1,591,508 cwts. [1 cwt = hundredweight = 112 pounds] of the value of 526,735 L.; but the total export was much greater, for Japan alone claims to have taken 2,003,840 cwts., of which Manchuria contributed 1,266,775 cwts.”

There are also discrepancies in the figures for bean cake, accounted for in part by the fact that there was no Chinese custom-house at Dairen until July 1, 1907, and that during the whole of the year beans and bean cake, especially the latter, found their way from Northern Manchuria by the Chinese Eastern Railway to Vladivostock [Vladivostok], and thence by steamer to Japan without coming under the cognisance of the Chinese customs.”

“The export of the bean product known as bean curd [fermented tofu], which is packed in earthenware jars and shipped for consumption by Chinese emigrants in the East, was larger in quantity but fell in value.”

A section titled “Oils, vegetable and essential” (p. 69-70) begins: “The quantity of oil (bean, groundnut, tea, wood, &c.) shipped to foreign countries in 1907 was 541,999 cwts., or 120,193 cwts. short of the export of 1906. The value of the shipment was 687,714 L. [pounds sterling]. It is unfortunate that the Chinese customs authorities continue to group these oils under one heading. A detailed classification would be of considerable value in view of the important position which wood-oil has recently established in foreign markets... The same recommendation is applicable to essential oils which are grouped together as anised, cassia-leaf, &c.” [incl. camphor oil].
A section titled “seeds and seed cake” (p. 70-71) notes: “The most important of all the seeds exported from China is sesame, which has sprung into prominence within the last few years.” Also discusses exports of rape seed, cotton seed; soy is not mentioned in this section.

Note: This is the earliest document seen (May 2005) that mentions the Russian port of Vladivostok in connection with soybeans. Address: Sir, Acting Commercial Attaché to His Majesty’s Legation at Peking.


- Summary: Wade-Giles reference: Wei T‘ui Chi Shui Pi, by Huang Shih-Jung. Qing dynasty. A revised edition of this book, edited by Huang’s son, appeared in 1916 during the Republican period. This is a summary by Mr. Huang (in China) of a publication by Li Yu-ying— who was in France at the time.

The section titled “Soybeans efficacy and use” (gongyong) states: Mr. Li Yu-Ying recommends that China establish an association / society for soybeans and soybean technology for Chinese manufacturing. Li wrote two articles: One, to promote the establishment of a society for soybeans, and the second to promote manufacture of soybean products in China using modern technology. It is most important to invent new methods of production and manufacture, which would have a great effect on the industry. These two, which contained 5,000 words, were published in a Chinese newspaper [probably in China] the 2nd month on the 6th, 7th, 8th, 9th, 10th, 11th, and 12th days. Note: The name of the newspaper is not given. Mr. Huang summarizes the content as follows:

The nutrients of the soybean benefit health, economics, and commercial production; it is worthy of future development. Its wider propagation will improve the fertility of the soil because the roots contain nodules which fix nitrogen to enrich the soil. Soybeans are a rich source of dairy products (milk content) and oil, so they are very nutritious. They can be used to make good substitutes for meat. They are rich in phosphorus and potassium, so they are healthful and strengthen the brain. Since they are lacking in starch, they are good for diabetic diets. Because they are a rich source of dairy products (milk content) and oil, they would be a good material for industrial exploitation. And its very inexpensive; it sells for only about one-fifth as much as legumes from other countries. When you compare the milk / protein content with that of meat, milk, or eggs, or with other legumes and cereal grains, it is at least 2-10 times higher.


- Summary: This organization believes that, using highly-productive mechanized agriculture, the answer to the above question is “yes.” “Food value of rice: The nutritive value of rice is greater than that of any other cereal, and it is easily digested, With a little seasoning—dried fish, soy sauce or soy bean cheese [tofu, or fermented tofu] it furnishes for the Oriental a large part of the protein necessary for daily diet.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “bean cheese” or the term “soy bean cheese” (regardless of hyphenation) to refer to fermented tofu. Address: 4th Floor (#407) Commercial National Bank Building, 115 Adams Street [Chicago].


- Summary: “As a contribution to the study of the question of soybeans, so clearly revealed by the Inspector-Consul Mr. Brenier in a recent edition of this Bulletin, he judged it useful to ask me for the notes hereafter collected as much over the course of my lectures as upon the occasion of my voyage to Japan in 1903.

“I borrow much from Rein (The industries of Japan) and from Messrs. Paillieux and Bois (Le Potager d’un Curieux or The Kitchen-garden of a Curious One) who summarized all that we know about soybeans (soja) in Europe up until recently” (p. 493).

Describes and gives the names of more than twenty cultivated varieties, using the classification system of Rein and the Japanese based on seed coat color.

“I have already said that it [the soybean] needs heat and frequent watering. These considerations explain, in part, the failures encountered up to now in the attempts to introduce this crop into Europe. I fear the same obstacles for Mr. Li-yu-Ying, of Chinese nationality, formerly a student at the school of practical agriculture at Chesnoy, near Montargis (Loiret).

Note: Loiret is a department of France just south of Paris. Montargis is a commune in the Loiret department; the ancient town is located about 110 km (68 mi) south of Paris.
According to a lecture he gave last year to his former classmates, Li set himself the task of taking up these trials on the outskirts of Paris: or was it on the manure fields / sewage farms (champs d’épandage) of Gennevilliers or Achères.

“But even if the cultivation of soybeans in France is not profitable, nevertheless the popularization of the diverse products that come from them is no less useful; Indochina, if the need be, could provide for new industrial ventures. With Mr. Albert Demolon, a scientifically educated agriculturist (ingénieur-agronome), then professor at Chesnoy, and today director of the Agricultural Station of Aisne [northeast of Paris] and of the Laboratory of Bacteriology at Laon, Mr. Li-yu-Ying again took up his previous studies related to these various products. In particular, he compared soymilk, which he calls Caséosojaïne, with animal milk, and he believed [it] possible, employing the highly developed procedures of handling and fermentation used [in France] with cow’s milk, to obtain forms of tofu (Téou-fou) acceptable for our Western palates. That is to say: first, before any fermentation, a liquid [form of tofu] lends itself to the same uses as milk, especially useful for artificial feeding of livestock; then, after coagulation: 1. a hard cheese, corresponding to cheese of the firm sort (fromage à pâte ferme), cooked egg, or cooked meat in richness of protein; 2. a soft cheese, corresponding to fresh cheese (fromage frais) and able to be consumed as a legume; 3. a fermented cheese, after sterilization then inoculation with microorganisms of certain special cheeses, corresponding to these diverse fermented animal cheeses” (p. 497-98).

Also discusses: Azuki (p. 497). Address: Directeur des Services agricoles et commerciaux du Tonkin.


• Summary: Li gives his occupation as “Engineer.” “This invention consists in the manufacture of a vegetable milk and its derivatives by means of soja grains (Chinese peas), the milk thus produced having the appearance, the colour and the taste of ordinary milk, its chemical composition greatly resembling the same. It has moreover the same nutritive and alimentary properties.” The grains are cleaned, decorticated, soaked and ground with water in a mill of the kind specified in British Patent Application 11,903 of 1911. The mechanized mill is composed of a fixed lower millstone above which the upper millstone is mounted on a vertical shaft.

“The clear milky liquid produced by grinding the grain previously mixed with water in combination with the supply of water in the millstone enters a channel then passes into a shoot (t) which conveys it to a tank (u) from which it is drawn off by a pump (v) which forces it under pressure into the filtering press (x). On leaving the filter, it falls, after passing through a sieve (y) into a vat (z). From this vat it is conveyed through a pipe (a) to the boiler or digester (b).” It is cooked with steam in a water-jacketed vessel, then pasteurized or sterilized. “It is then bottled and is ready for consumption. The soja milk may be utilised in the two following cases. 1st. As a substitute for ordinary milk. It may be consumed as sterilised at temperatures of 110º to 120ºC. 2nd. As a raw material for use in different manufactures (cheeses, casein, and the like). It must then be heated from 60º to about 120ºC. “It may also be concentrated, dried, or fermented. “The milk obtained may be humanised or animalised,” i.e., its composition may be brought to resemble that of human or animal milk. It is coagulated for making cheese by magnesium salts, organic salts, rennet, lactic ferments, or “sojaobacille,” a ferment obtained by cultivation in a mixture of the above-described liquid and sodium chloride. 
the fermented paste obtained by putting into salt water soy beans that have been cooked with water and allowed, alone or mixed with cereal flour, to stand in the air.

“For obtaining fermented cheese such as roquefort [Roquefort], parmezan [Parmesan], ramatour [Rahmatour; Bavarian cream cheese], camambert [Camembert], and gruyere, suitable ferments are employed.”

“For the fermented milk, the special ferment termed ‘sojaobacille’ is employed or other ferments used for obtaining fermented milks—kephir [kefir], yoghourt [yogurt], koumiss, and the like, and which are the saccharomyces cerevisae, dispora caucasica, maya bulgare, and the like, and the said milk is modified by the addition of sugar levulose, and the like and particularly of lactose.”

In making casein, the oil may be expressed from the beans before the preparation of the milk. The casein, obtained by coagulating the milk, may be used as food, paste, etc., or may be mixed with borax, oxide of zinc, magnesia, gelatin, etc., to obtain a hard industrial (non-food) substance termed “sojalithe” [resembling ivory, horn, or shell]. The filter press residues may be dried and ground to form a food for human beings, or may be used as food for cattle, or as manure. The liquid expressed in making cheese [soy whey] may also be used for feeding animals.

An illustration shows a longitudinal view of all the equipment used in the invention; each important part is marked with a letter.

Note 1. This is the earliest document seen (June 2011) that mentions soy yogurt or fermented soy yogurt.

Note 2. This is the earliest document seen (June 2011) that mentions the word “sojalithe” (a hard plastic) or that discusses a specific non-food industrial use for soy protein; “sojalithe” is probably derived from “Galalith” (a registered trademark; see F.G.J. Beltzer, June 1911). Galalith, or Ernoid in the United Kingdom, a synthetic plastic material manufactured by the interaction of casein and formaldehyde, was introduced in 1900 at the Paris Universal Exhibition in France. In France, Galalith was distributed by the Compagnie Française de Galalithe located near Paris in Levallois-Perret. It was first used to make buttons, resulting in a revolution in the button industry. In 1913 some 30 million liters (8 million U.S. gallons) were used to make Galalith in Germany alone. Ever the entrepreneur, Li apparently saw “sojalithe” as a potential substitute for expensive ivory.

Note 3. This is the earliest English-language document seen (Oct. 2011) that uses the term “fermented cheese” to refer to a type of fermented tofu, or to a Western-style soy cheese (Roquefort, Parmesan, Camembert, or Gruyere types). It is interesting to note that all of these Western-style cheeses are traditional mold-ripened cheeses.

Note 4. Levulose, now more commonly called fructose, is a sugar.

Note 5. This is the earliest English-language document seen (Oct. 2003) that contains the term “soja milk.”

Note 6. This is the earliest document seen (Feb. 2011) that mentions the bottling of soymilk or the sale of soymilk in bottles. Address: Engineer, 46 rue Denis Papin, aux Vallées [Vallées] (Seine), France.


Summary: This first volume discusses bacterial (“schizomycetic”) fermentations. Richly illustrated, it also includes accurate historical background on many subjects. An extensive bibliography for both this volume and volume II appears at the back of volume II (p. 417-518).

The Preface, by Emil Chr. Hansen of Copenhagen, states (p. vi): “Within the last two decades the study of Microbiology has made gigantic strides, both in the pathological and technical branches of the subject; and just as investigations into the Physiology of the higher plants gave the first impetus to the establishment of Agricultural Experiment Stations in all countries, so, in like manner, have the Physiology of Fermentation and Technical Bacteriology called into existence, within the last few years, a number of Stations and Laboratories for the development of those branches of industry where micro-organisms play an important part.” The first three chapters, comprising the introduction, give an interesting early history of the discovery of fermentation. Their contents: 1. The theory of spontaneous generation:
In Chapter 33, titled “The fermentation of cheese and allied decompositions” (p. 243-52) are sections on “Pure culture ferments” (p. 246-47) and “Natto and miso” (p. 247-48; each a kind of “vegetable cheese”). The latter section also discusses the Soja bean, Fr. Haberlandt, koji, shoyu culture ferments “(p. 246-47) and “Natto and miso” (p. 247-48; each a kind of “vegetable cheese”). The latter section also discusses the Soja bean, Fr. Haberlandt, koji, shoyu (called shojou, soy or shoyin). Reports by H.C. Prinsen-Geerligs “on the preparation (by the aid of fungoid ferment) of other dishes from soja beans in Chinese cookery, such as Taohu or bean-cheese [tofu], the sauce Taofungoid ferments) of other dishes from soja beans in Chinese cookery, such as Taohu or bean-cheese [tofu], the sauce Taofungoid ferments. The latter section also discusses the Soja bean, Fr. Haberlandt, koji, shoyu (called shojou, soy or shoyin). Reports by H.C. Prinsen-Geerligs “on the preparation (by the aid of fungoid ferment) of other dishes from soja beans in Chinese cookery, such as Taohu or bean-cheese [tofu], the sauce Taofungoid ferments (p. 246-47) and “Natto and miso” (p. 247-48; each a kind of “vegetable cheese”).

In Chapter 31, titled “The discovery of fermentative organisms, Needham’s demonstration in favour of ‘Generatio Æquivoca’, Spallanzani’s experiments, Franz Schultze’s experiment, foundation of the science of antiseptics by Schwann, labours of Schröder and Dusch, Pasteur’s examination of the theory, Béchamp’s microzyme theory, spontaneous generation only unproven, not impossible. 2. Theories of fermentation: The alchemists–Stahl’s theory of fermentation, Gay-Lussac’s opinion, Cagniard-Latour’s vitalistic theory, Th. Schwann’s researches, Fr. Kützing’s general theory, Liebig’s decomposition theory, Pasteur’s theory. Nägeli’s physico-molecular theory, the enzymes and M. Traube’s fermentation theory, general definition of fermentation, so-called spontaneous fermentation of sweet fruits, decompositions effected by light and air.

In Chapter 33, titled “The fixation of free nitrogen by bacteria” (p. 259-71) are sections on “The discovery of leguminous nodules” (p. 261-62; Malpighi, Boussingault, Hellriegel), “Formation and functions of the nodules” (p. 262-64; Lachmann, Frank, Woronin, Hellriegel, Wilfarth), “The nodule bacteria” (p. 264-66; organized albuminoids, Bacillus radicicola), and “The bacteroids” (p. 266-69). Concerning bacteroids: “The first successful, artificial production of nodules by the aid of pure cultures was made by A. Prazmowski. This worker, in view of the absence of the sporogenic faculty in these organisms, changed the name of Bacillus radicicola, bestowed on them by Beyerinck, into Bacterium radicicola.”

Note 3. This is the earliest English-language document seen (March 2003) that uses the word “bacteroids” (or “bacteroid”) in connection with root nodules on plants.

Note 4. This is the earliest English-language document seen (Feb. 2004) that uses the word “Taohu” to refer to Chinese-style tofu. Address: Prof. of Fermentation-Physiology and Bacteriology, Imperial Technical High School, Vienna.


• Summary: This remarkable work, written entirely in Chinese, was the first of Li’s major works on soybeans and soyfoods. Published in Paris, it was written in Chinese and meant to be read by young people in China interested in coming to Paris to study or in helping Li with research on Chinese soybean varieties. An expanded and revised version was published into French the next year (1911).

Contents: Soybeans: 1. Introduction. 2. Names and varieties (colors, sizes, and shapes) of soybeans. 3. Where soybeans are produced and their history. 4. The place of soybeans in the hierarchy of plants (taxonomy). 5. Nutritional composition of soybeans. 6. Characteristics of soybeans (physiological, morphological, etc.). 7. Food uses of soybeans (incl. tables comparing the price of tofu) and the dry process (from soy flour). 8. Equipment used in making soyfood products (a photo shows the equipment in Li’s modern soymilk and tofu plant near Paris; p. 37), and compares soymilk with cow’s milk. A large soybean utilization diagram in Chinese (p. 44) shows all the products that can be made from soybeans using the wet process (from soymilk) or the dry process (from flour). Note: This is the earliest document seen (July 2002) that contains a diagram of this type.


Illustrations (line drawings) show: (1) Comparison of shapes and colors of 7 different colors of soybeans (p. 5). (2) Five views of soybean pods with beans, incl. outside of pod, inside of both halves when open, with beans in one half, the two cotyledons of a single soybean (p. 11). (3) Soybean plant with pods (p. 12). Photos show: (1) The cellular components and layers of soybeans and hyacinth beans (p. 22, 23). (2) The interior and equipment in Li’s soymilk and tofu plant on the outskirts of Paris (p. 37). (3) Microscopic views of soymilk (doujiang) and a liquid resembling soymilk made from soy flour (p. 38).

Tables show: (1) Size range (length, width, and thickness; maximum, average, and minimum) of 7 colors of soybeans: yellow bean, green skin bean, green bean, dark bean (“black” or “crow” bean), black bean, red bean, spotted bean (p. 4). (2) Composition of four parts of a soybean plant: Comparison, water, protein, oil, carbohydrates, ash (p. 18). (3) Comparison of oil and protein content of 5 colors of soybeans (red, black, green, white, yellow) from various countries and regions: China, Japan, Southeast Asia, Russia, Hungary, and France (p. 19). (4) Composition of soybeans, hyacinth beans, and wheat (p. 21). (6) Comparison of the price of tofu with that of various meats (p. 29). (7) Ash content of soybeans, hyacinth beans, duck, uncooked rice, cabbage, egg, beef, chicken, lamb, pork, carp, wheat flour.
LE SOJA

par

LI YU YING

1ère Edition

Société biologique de l'Extrême Orient, Paris

1910


Special announcement concerning soybean research (p. A9): “Gentlemen–Many of us in this society are researching the benefits of the soybean. It may be considered as China’s greatest resource. We have already published a number of specialized reports. These have been made available to you.

In view of the fact that there are so many varieties of soybean in China and that the regions of cultivation are so extensive, we must rely upon you, our colleagues, in all parts of the country to go into the field and collect data for us. Only then will we be able to complete our research into every variety of Chinese soybean. If we should receive your kind consent, we beg you to be so good as to send the soybean varieties to the Peking postal address of this Society (address is given).

We are interested only in soybeans (see pages 1-6 of this book) and need one or two catties (0.5-1.0 kg) of each. Once our research into the benefits and properties of these beans is complete, we will submit a further report to this Society, in order to repay your goodwill. If you would please advise us of the cost of the beans and the postal charges, we will make the appropriate refunds. We will also send you a copy of this book as a modest token of our gratitude. Enclosed please find an explanatory document. Please take the trouble to complete this and send it together with the beans.

“The Paris/Far-East Biological Research Society”

On page A-10 is a form to be used when submitting the Chinese soybean varieties.


*Summary:* The author did his research in Cochin China [today’s Vietnam], then a French colony. This is a very original and important article.

Contents: Introduction. Vegetable milk [soymilk]. Vegetable cheese [tofu and fermented tofu]. Industrial vegetable casein (*La caséine végétale industrielle*; i.e. soy protein). Production of vegetable casein: Cleaning and washing the soybean seeds, extraction of the oil (which can be used in soap), extraction of the casein. Industrial [non-food] applications of vegetable casein: Paint, paper coating, Galalith, etc. Conclusion.

The preparation of vegetable milk and vegetable cheese are widely practiced today in Cochin China and in Annam [today’s North Vietnam], as recently discussed by Mr. Henri Labbé in *Revue Scientifique* (11 Feb. 1911).

Soymilk (*lait végétal*). After describing the process for preparing soymilk, the author notes: This soymilk serves for the feeding of infants and for general nutrition (*Le lait sert à l’allaisement des enfants et à l’alimentation générale*): it can also be used for the production of a vegetable cheese (*fromage végétal*).

Tofu (*fromage végétale*): When vegetable milk is treated with a mineral salt or an acid, playing a role analogous to that of rennet, it produces curds through coagulation, resembling those of ordinary casein. By draining and washing, one obtains a sort of white cheese (*fromage blanc*) which plays a major role in the nutrition of the peoples of the Far East. In Indochina the milk is coagulated by the addition of a very small quantity of a powder called Tchach-Kao or plaster [calcium sulfate], which comes from a selenite pulverised by the action of fire.

Tofu is generally eaten fresh, the same day it is made, but it can also be preserved by salting or smoking. In Annam, three main varieties of tofu are found: 1. Fermented tofu, gray or yellow in color, with a flavor resembling Roquefort cheese; 2. White or salted tofu resembling goat’s cheese; 3. Baked or smoked tofu, resembling Gruyere cheese. At the market in Saigon, Chinese sell regular tofu to the natives for one-tenth the price of Gruyere cheese.

Industrial vegetable casein: Defatted soybean meal from oil presses is ground between millstones with cold water to give a slurry that is filtered to obtain soymilk. The soymilk is heated to boiling, then calcium sulfate is added to precipitate the protein, which is collected (just like tofu curds) on filter cloths. The presscake is mixed with forage and molasses, then fed to livestock. The curds are then dissolved in diluted soda lye (sodium hydroxide), filtered, precipitated with acetic acid. The finely divided precipitate is filtered out, washed on the filter, left to evaporate in the open air, then dried to a yellowish powder at a low temperature. The casein thus obtained is white, and, from an industrial viewpoint, very pure. It is insoluble in water, but soluble in dilute caustic alkalis and in ammonia. It exhibits almost precisely the same properties as the casein obtained from ordinary milk. It is found on experiment to be susceptible of the same industrial applications as animal casein, and may come to largely supersede this because of lower cost. 100 gm of soybeans yields about 25 gm of this “vegetable protein,”

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which has both food and industrial uses.

Note 1. This is the earliest document seen (June 2011) concerning isolated soy protein. The author says that his “vegetable protein” has both food and industrial uses.

Note 2. This is the earliest French-language document seen (Aug. 2003) that uses the term caséine végétale du “soja” or caséine végétale industrielle to refer to isolated soy protein.

Industrial applications of vegetable casein: “Like animal casein, industrial vegetable casein, free of fat or buttermilk, can be used in a host of applications. It can be used in making paints, and for the preparation of moisture-resistant products. Note 3. This is the earliest document seen (Oct. 2001) that mentions the use of soy protein in paints.

“It may be used also for the sizing (coating used to fill the pores) of paper, which consumes such large quantities of ordinary casein. Being soluble in ammonia and caustic solutions it is capable of forming a smooth and solid size.

Note 4. This is the earliest document seen (Oct. 2001) concerning the use of soy protein as a sizing for paper.

“Other uses are in certain manufacturing processes in the preparation of silks and artificial textiles, as well as rubber, leathers, plastic materials, films, photographic emulsions, etc.

Note 5. This is the earliest document seen (Sept. 2001) concerning the use of soy protein to make silks, artificial textiles, or other industrial (non-food) fibers.

Note 6. This is the 2nd earliest document seen (Dec. 2001) concerning the use of soy protein as a raw material for making plastics.

Large amounts of animal casein are at present employed in the manufacture of ‘Galalith,’ from which are made numerous objects which imitate articles made from ivory, tortoise-shell, bone, horn, etc. The Soya casein, when free from fats, is equally well adapted for these purposes.

“Formol acts upon this casein in the same way as on ordinary casein, rendering it insoluble. Hence it may be used for the water-proofing of fabrics, straw hats, etc., as well as for the preparation of sizes and dressings... A solution of vegetable casein and borax can be successfully utilized in the process of calico printing.”

“It will be seen from the foregoing résumé, that the fabrication of vegetable casein for industrial purposes has immense possibilities, only exceeded in importance by the alimentary value of its food products for man and for beast.

Note 7. Webster’s Third New International Dictionary (1963) defines Galalith (a registered trademark)–as “used for a hornlike plastic [also resembling ivory or bone] made from casein [milk protein] and formaldehyde and used especially in making small molded objects (as buttons, beads, or combs).” This is the earliest document seen (Nov. 2003) that mentions Galalith in connection with soy protein. Galalith, “a new horn-like product from cow’s milk,” was sold commercially by Nov. 1905 and the process was protected by patents “in all civilized countries” (Monthly Consular and Trade Reports, USA. 1905. No. 302. Nov. p. 243.)

Conclusion: “A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (produits alimentaires à base de Soja). This factory now produces tofu (Caséo-Sojaine) and the following food products: Soy flour, soy bread, soy sauce, sweet soya preserves (confiture de Soja), soymilk (lait de soja), fermented soymilk (lait de Soja fermenté), tofu (fromage de Soja), etc.

Note 8. We wonder: Was Beltzer influence more by Li Yu-ying, or was Li influenced more by Beltzer? Both did independent and original research, however by Dec. 1910, some 6-7 months before this article was published, Li had applied for two French patents and three British patents which describe how to make various soy products in detail–including many of those products described by Beltzer. Therefore, we believe that Li influenced Beltzer more than Beltzer influenced Li.

“The Indochinese prepare, in addition, a fermented liquor, a concentrated milk, an alimentary flour, and a casein which forms the essential food of the people... Many Europeans are preoccupied with extracting part of the nutritive principles that exist so abundantly in the seeds, for the feeding of armies at war and of colonial troops... Hopefully the question of food uses of soy will be taken up at the same time as the manufacture of industrial casein, and that this will permit the utilization of the immense resources that our Indochinese colonies offer as raw materials.”

Note 9. Later in 1911 this article was summarized in Scientific American Supplement and printed as a special booklet.

Note 10. This is the earliest document seen (May 2000) that uses the term la Caséo-Sojaine to refer to a food–clearly to tofu. Li Yu-ying coined this term, apparently after considerable thought and research. However the author also uses the term fromage végétale to refer to tofu–perhaps more generically. Martine Liguori, a native French speaker who is interested in tofu, noted in an interview (May 2000): “This term for tofu doesn’t sound foreign. Rather it sounds somewhat scientific, learned, and upper-class, as from the techno-elite. If you don’t know what it means, that’s because you are not well enough educated. In France, people will adopt something that is upper class, but they resist foreign things–even foreign words. This whole idea originated in France when Napoleon created the Grandes Ecoles (French graduate schools) to develop an intellectual elite to replace the royal elite.”

Note 11. This is the earliest document seen (April 2001) that mentions dried tofu. Address: Ingénieur-chimiste.

**Summary:** The Roquefort cheese industry in the region of Roquefort is experiencing hard times and the author fears that soy cheese (*le fromage de Soja*) may offer additional competition. “Many provinces of China, especially Manchuria, and all the countries of East Asia, cultivate on a vast scale the bean called *Soja or Soya* from which one can extract at will an excellent bread, oil, milk, butter, or cheese. Already, quite near Asnières (Seine), there exists a factory named Caséo-Sojaine, supplied by soybeans imported from these distant countries. In this factory attempts have been made to make a special bread for diabetics using the flour of this bean. (Soybean seeds are very low in starch, which is the enemy of diabetics, and very rich in oils and protein.) The factory also produces confections, raw milk, cooked and sweetened milk, oil, various cheeses, not to mention the various cakes used to feed livestock.

“In the region of Roquefort, certain people are starting to ask themselves if they won’t soon have to fight against another products besides the cheese made in Corsica, or in the Pyrenees region, or in the plains of the Crau (near Avignon in Bouches-du-Rhône province). This product which they see as a competitor in the near future is soy cheese.”

“With special reference to soy cheeses, it is stated in the Revue Scientifique of last June 11, that the Orientals obtain three varieties of it: (1) A fermented variety, gray or yellow in color, reminiscent of Roquefort; (2) A white, salted variety resembling goat’s cheese; (3) A broiled or smoked variety (*cuire ou fumée*) resembling Gruyère.”

Since the Orientals themselves make a cheese from soya milk that reminds us of Roquefort, doesn’t this tell us that tomorrow the factory at Asnières, with the same milk, won’t also imitate Roquefort cheese very well? And how do we know that one day an industrialist won’t come right here to Roquefort to establish a factory, similar to that at Asnières, to convert to cheese the milk drawn from soybeans (*féves de Soja*)? “Thus speak those who are always trembling for our old and glorious Roquefort cheese. They would like to limit clearly the territory and the rights of soja, and have Parliament decide that one can never make from it a cheese resembling ours, and above all that such a soy cheese can never be imported into the commune of Roquefort. But is that possible? No. What is possible is to let it be known, by the local tribunals (courts of law), what has already been pronounced 100 times, that Roquefort cheese is made from the milk of sheep, and that a cheese made from vegetable milk cannot be sold under the name of ‘Roquefort cheese.’”

“After all this time, we don’t really see that soy cheese could jeopardize our Roquefort. And if ever there are measures to take against soya, ordinary local tribunals will doubtless suffice, without national legislators getting involved.” Address: France.


**Summary:** Contents: Introduction: Chemical composition of the soybean and of soy oil. Fermented soyfoods and koji: Li Yu-ying and his soyfoods plant established near Paris (at Vallées, near Colombes), the products it makes (tofu or soy casein (*Caséo-Sojaine*), soy flour, bread, sauce, confections, milk, fermented milk, tofu, etc.), soyfoods made in French Indochina. Soymilk (*lait végétal*). Tofu (*fromage végétal ou to-fou*): fresh tofu, fermented tofu (*La variété fermentée, which is gray or yellow and has a piquant taste resembling that of Roquefort cheese), white and salted tofu (which resembles a goat’s cheese), smoked tofu (which resembles a gruyère cheese)...

Industrial production of vegetable casein from soybeans (cleaning the seeds, extraction of the oil), cost of a plant to make vegetable casein, industrial applications of vegetable casein: in paints, glues, paper coatings, plastics resembling Galalith, conclusion.

An illustration (schematic drawing; p. 248) shows two views (a cross-sectional side view and an overhead floor plan) of a factory for producing vegetable casein, with a capacity to process 10 tons of soybeans per day.

Note: This is the earliest document seen (Sept. 2001) concerning the use of soy protein in glues or adhesives.

Address: Ingénieur-chimiste, Expert, Professeur de Chimie Industrielle, France.


**Summary:** “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market Soya flour, Soya bread, Soya sauce, Soya Milk, Soya cheese, preserves, fermented milk, etc.”

The well-known chemical engineer, F.J.G. Beltzer, “who has made a careful study of the whole subject, publishes in the Revue Scientifique a report of whose most important features we present an abstract.”

“For purely industrial applications it is necessary, as we have said, that the vegetable casein be entirely free from fatty matters.

“In the industrial treatment of Soya, therefore, the process is somewhat different. The 3 objects sought are: the...
pure oil, the casein entirely free from oil, and the residuary cake.

“The oil is extracted by pressing, and 2 grades are obtained. The first or purest is sold for edible purposes, while the second is useful for soap-making and other manufactures where oils and fats are employed...

“The pure casein is prepared from the pulp which remains after the extraction of the oil. The milky liquid obtained by triturating the pulp with cold water, is filtered and treated with powdered gypsum. About 1 kilo of gypsum per 1,000 liters of the liquid is used. The mixture is brought to a boil and the resulting coagulate is drained and washed in cloth filters. The casein thus obtained is dissolved in a quantity of very dilute soda solution, so weak that the reaction is either neutral or very slightly alkaline. The solution is filtered and then precipitated by acetic acid. The finely divided precipitate obtained is filtered out, washed on the filter and finally dried at a low temperature.

“The casein thus obtained is white, and, from an industrial point of view, very pure. It is insoluble in water, but soluble in dilute caustic alkalies and in ammonia. It exhibits almost precisely the same properties as the casein obtained from ordinary milk. It is found on experiment to be susceptible of the same industrial applications as animal casein, and may come to largely supersede this because of lower cost.

“Among the various uses to which it may be applied we may mention its employment in painting, and for the preparation of products having a resistance to moisture.

“It may be used also for the sizing of paper, which consumes such large quantities of ordinary casein. Being soluble in ammonia and caustic solutions it is capable of forming a smooth and solid size.

“Other uses are in certain manufacturing processes in the preparation of silks and artificial textiles, as well as of rubber, leathers, plastic materials, films, photographic emulsions, etc. Large amounts of animal casein are at present employed in the manufacture of ‘Galalith,’ from which are made numerous objects which imitate articles made from ivory, tortoise-shell, bone, horn, etc. The Soya casein, when free from fats, is equally well adapted for these purposes...

“It will be seen from the foregoing résumé, that the fabrication of vegetable casein for industrial purposes has immense possibilities, only exceeded in importance by the alimentary value of its food products for man and for beast.

“The residuary cake left after the extraction of both oil and casein still retains sufficient nutritive qualities to be useful as an addition to the feed of animals.”

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “soya cheese” to refer to fermented tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “soya cheese” to refer to either (or both) regular tofu or fermented tofu. By 1905 Li presented a paper (in French) describing how he had tofu to make “Fermented cheese (Le fromage fermenté). Its color is white, yellow, or gray, and it flavor is very strong, like that of Roquefort.” In Dec. 1910 he applied for British Patent 30,275, titled “Vegetable milk and its derivatives.” It was accepted / issued on 29 Feb. 1912. It stated: “For obtaining fermented cheese such as roquefort [Roquefort], parmezan [Parmesan], romatour [Rahmatour], camambert [Camembert], and gruyere, suitable ferments are employed.”

Note 3. This is the earliest document seen (Oct. 2008) that uses the term “Soya casein” to refer to an isolated soy protein product; it is used for industrial purposes.

Note 4. This is the earliest English-language document seen (Dec. 2004) that uses the term “silks” (or “silk”) to refer to spun soy protein fiber used like a textile fiber.


• Summary: Contents (continued): Soymilk (continued): Chemical properties, composition (comparison with 8 animal milks–in bar chart form showing protein, lipids, carbohydrates, and ash), action of ferments [enzymes] and diastases [diastic enzymes] on soymilk (Action des ferments et des diastases sur le lait de soja) (1. The lactic ferments {kéfir, yogourt, etc.} act in the same way on vegetable milk and on animal milks. 2. The ferments of certain European cheeses make analogous vegetable cheeses {fromage végétal d’une façon analogue}. 3. Rennet coagulates soymilk, but the optimum temperature is a little higher than for cow’s milk. 4. The ferments that we have extracted from shoyu [Japanese soy sauce] coagulate animal milks in the same way as vegetable milk).

Uses of soymilk (p. 30): They are the same as those of the animal milks. We will note, mostly, its use in China as a substitute for mother’s milk. (Footnote 1. One of our parents was nourished, from the first phase of life, with soymilk. He/ she is now 37 years old and has always been in excellent health).

Residues of the [soy] dairy (residus de laiterie; okara). Condensed soymilk (lait de soja concentré). Powdered soymilk (lait de soja en poudre). Fermented soymilk (Kéfir, yogourt, etc. are increasingly used therapeutically. One can compensate for the lack of carbohydrates in vegetable milk by the addition of lactose {or levulose for diabetics}). Tofu— which Li calls Caséo-Sojaïne (fromage de soja)—meaning “tofu or soy cheese”: Method of production, coagulants used, perfected modern production methods at Li’s factory (In this factory, tofu can be made into either non-fermented or fermented cheeses. The non-fermented cheeses {Fromages non fermentés} are of two types: Fresh and hard/firm. The fresh are white in color and the consistency of hard-boiled eggs. The hard/firm are of two types: In diced sheets {salted or unsalted}, and in salted, semi-dry pieces/morsels. The
fermented cheeses \textit{[Fromages fermentés]} may be of the Gruyere, Roquefort, or Camembert types), tofu yields, preservation and storage, composition of tofu (compared with 4 meats on a moisture-free basic, in bar chart form showing protein, lipids, carbohydrates, and ash), digestibility of tofu, culinary preparations based on tofu (tofu omelette with egg, smoked tofu with shoyu, tofu pâte, soy sausage—made like regular sausage except that meat and fat are replaced by fresh, hard tofu plus butter or cocoa butter). Soy casein (\textit{Caséine de soja}; for food or industrial uses). Contains various tables and charts from other sources.

Residues of the [soy] \textit{dairy (residus de laiterie; okara, p. 30-31)}: After filtering the [soy] milk, a slightly firm, aqueous oilcake remains in the filter cloth that is still very rich in nutrients (\textit{substances alimentaires}). According to Dr. Bloch, it does not contain any trace of starch (our tests agree with this conclusion). Consisting of torn cells emptied of the largest part of their content, it would have the following percentage composition (see Bloch 1907):

\begin{itemize}
  \item Protein 0.248, water 88.75, ash 0.36, fat .04, other 10.85.
  \item The oilcake (\textit{torteau}) obtained at the factory of ‘Soy-Casein’ (\textit{Caséo-Sojaine}) and analyzed at the municipal laboratory of Paris yielded:
    \begin{itemize}
      \item Water 80.04, protein 33, fat 8.44, carbohydrates 22.63, mineral salts 4.24.
      \item “This oilcake was very easily dried to 10% water. The milk can only be filtered after boiling, thus according to Prinsen [Geerligs]:
        \begin{itemize}
          \item Protein 29.38, oil 12.81, ash 4.66, carbohydrates that are convertible to sugar 26.80, fiber 11.10, cellulose 10.2.
        \end{itemize}
    \end{itemize}
\end{itemize}

Soy casein (p. 38): The casein or legumine of soymilk can be prepared by precipitation, purifying it by several dissolutions and precipitations, and finally drying it. One obtains a yellowish powder resembling animal casein obtained by the same processes.

It is generally admitted that vegetable albumins have a coefficient of assimilation greatly inferior to those of animal albumins. But confirmation of this is far from being definitive. The experiments of Messrs. H. [Henri] Labbé and Marchoisne have showed, in effect, that vegetable albumin is as well assimilated as animal albumin.

Legumine is different from animal casein, but the differences are of the same order as those which exist between the various animal caseins. The differences existing between the caseins of the various animal milks have been noted by many chemists.

The casein extracted from soymilk can be used in the same applications as casein from cow’s milk. These are of two types: food and industrial. For food uses, one can point out the manufacture of powders, of lacteal flours (\textit{farines lactées}, perhaps wheat flour enriched with soy casein), of whole-grain bread, etc.

Note 1. This is the earliest document seen (April 2001), worldwide, that mentions a Western-style soy cheese (Gruyere, Roquefort, or Camembert types), or a tofu sausage. This is also the earliest French-language document seen that mentions soy cheese, which it calls \textit{fromage de soja}.

Note 2.

Note: This is the earliest document seen (Jan. 2003) concerning the use of tofu in a second generation product.

Note 3. This is the earliest document seen, worldwide, that mentions powdered soymilk or dried soymilk.

Note 4. This is the earliest document seen, worldwide, that mentions soy kefir. Address: 1. Conseiller de 1ere classe au Ministère de l’Agriculture de la Chine; 2. Ingénieur agricole (G.).


\textbf{Summary:} Discusses chemical analyses of soybeans, method of manufacture of the curd around Manila, and adulteration of the product in the locality. “One of the most important foods manufactured from the soy-bean is the curd which is sold in the form of small cakes. The Chinese have introduced and extended the use of this product throughout the East, and Bloch [1906] states that there is no Chinese settlement without one or two bean-cheese factories. “This curd is known by a number of different designations. In English it is often spoken of as ‘bean cake’ or ‘bean cheese,’ although it is not entitled to the designation ‘cheese,’ since no ripening process takes place in its manufacture... Among the natives of the Philippine Islands surrounding Manila, it is called \textit{toqua} [tokua], a name of Chinese origin. In China the substance is known as \textit{teou-fou} and \textit{tao-hu} and in Japan as \textit{tofu}.

In this district, as far as observation has extended, the manufacture is carried on entirely by Chinese practically in the manner described by Bloch and Geerligs, except that methods have been introduced which border on adulteration [sic, with powdered gypsum, which coagulates the soymilk].

“The soja-bean, \textit{Glycine hispida} Maxim, is imported into the Philippines from southern China in large quantities, principally from Amoy and Hongkong. In the markets of the latter place they are known as ‘soy-beans’ or \textit{pak-tau}” [“white beans”].

The author conducted two analyses of baked cakes of \textit{toqua} and found they contained: Moisture: 73.0% and 72.1%. Protein: 13.88% and 17.56%. Fat: 10.78% and 10.99%. Ash: 1.2% and 1.27%.

“The same food product, known locally under the name \textit{tahuli or tahuli} [tofu pickled in brine] is imported from southern China in large stone jars. It is preserved by covering the cakes with a strong salt solution. During shipment, the cakes are somewhat broken, giving to the liquid portion the
appearance and consistency of an emulsion. The two portions of the mixture were analysed separately.” Table III shows that the solid and liquid portions of tahuri / tahuli contain:

Water: 55.76% and 57.86%. Protein: 14.56% and 9.56%. Fat: 7.12% and 2.09%. Sodium chloride: 12.7% and 16.38%.

Note: In this book the word tahuri appears 21 times compared with only 6 times for tahuli.

A photo shows the inside of a Chinese bean-curd factory in Manila, with four people, seated on stools, working at a table.

Note 1. This is the earliest document seen (Feb. 2004) that uses the term “soja-bean curd” or the word toqua, or the word teou fou (or teou-fou) to refer to tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) that contains the word tahuri or the word tahuli. There is no suggestion that the product is fermented. However it is salted, and later documents explain that it is pickled / fermented in this salt solution.

Note 3. This is the earliest English-language document seen (Sept. 2006) with the word “Soja-bean” or “Soja-beans” in the title. Address: 1. Assoc. Prof. of Chemistry, Univ. of the Philippines. From the Lab. of Organic Chemistry, Bureau of Science, Manila, P.I.

66. **Product Name:** [Fermented Tofu Cheese (Gruyère, Parmesan, Roquefort, or Camembert types)].

**Foreign Name:** Fromages fermentés (Gruyère, Parmesan, Roquefort, or Camembert).

**Manufacturer’s Name:** Usine de la Caseo-Sojaine.

**Manufacturer’s Address:** Valles, Colombes (near Asnieres, Seine), northwest of Paris, France.

**Date of Introduction:** 1912. February.

**New Product—Documentation:** Li, Yu-ying. 1910. “Vegetable milk and its derivatives.” *British Patent* 30,275. 5 p. Date of application, 30 Dec. 1910. Accepted 29 Feb. 1912. See p. 2. “For obtaining fermented cheese such as roquefort [Roquefort], parmezan [Parmesan], romatour, camambert [Camembert] and gruyere, suitable ferments are employed.”


Li Yu-ying. 1913. U.S. Patent 1,064,841. June 17. Application filed Oct. 10, 1911. “Method of manufacturing products from soja.” “The object of this invention is to provide a simple, efficient and economical method of producing a product from soja beans, and from which product it is possible to obtain by adding certain substances a product resembling human or animal milk, and also to obtain fresh or fermented cheese...” “The coagulated milk is molded and pressed, and cheese of different forms and consistency obtained according to the degree of coagulation or pressure. The cheeses may be eaten fresh or they may be dried. They are salted or not according to the nature of the manufacture... In producing fermented cheese: Roquefort, Parmesan, Romatour, Camembert, Gruyère, etc., ferments suitable for the manufacture of those products are employed...”


**Summary:** One of the earliest, most important, influential, creative, interesting, and carefully researched books ever written about soybeans and soyfoods. Its bibliography on soy was larger than any published prior to that time. It was first published as a series of eight articles in *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) from September 1911 to April 1912. Before being published as a book, it was revised slightly by adding a table of contents at the back, dividing the material into 5 parts with 19 chapters, and adding several photos (p. 16-17), a world map showing
the distribution of soybean cultivation (p. 21), and an interesting 2-page table (p. 66-67).

Contents: The soybean: Origin and history. Part I: Soybean culture. 1. Species and varieties of soybeans: Botanical characteristics, species, varieties (Chinese, Japanese, Indian, Indo-Chinese, Hawaiian, USA, European). 2. Needs of the soybean: Climatic, geographical area of the soybean by region worldwide, agrological/soil needs, fertilizers, soil preparation, the place of the soybean in crop rotations. 3. Soybean seeds: Study of seeds (by weight, by germination rate, selection of seeds), time of planting, plant spacing, depth of seeding, rate of seeding per hectare, method of seeding (broadcasting, in rows, in mounds). 4. The soybean during its vegetative stage: Germination, transplanting, types of care (e.g., second dressings), irrigation, flowering and fruiting, enemies of the soybean (e.g., insects). 5. Harvest of soybeans: Time for harvest (forage or grain), methods of harvesting (forage or grain; mechanical mower), threshing (use of machine), yields of soybeans (forage and grain in various countries, ratio of seeds harvested to straw is about 1 to 2, yield of nutrients). 6. Fixation of atmospheric nitrogen by soybeans, and improvement of the soil. 7. The soybean in mixed cultures and alternate rows: With corn, cowpeas, rice, sweet sorghum, or millet.

Part II: Chemical composition of the soybean. 1. Composition of the plant: Minerals in the leaves and total plant. 2. Study of the seed: Composition, chemical composition, microscopic comparisons, table of analyses by 28 previous researchers, albumins, sugars, starch, dextrin or dextrine, diastase, lipids, ash/minerals.

Part III: The soybean as human food and animal feed. 1. The soybean as feed for animals: Green forage and hay. 2. The soybean in human feeding: From the viewpoints of physiology, economy, and gastronomy. The role of soya in special diets: Vegetarianism, remineralization, diabetic, and lactose intolerant.

Part IV: Food products based on soya. 1. Soy milk and its derivatives: Soy milk (Methods of manufacture, Chinese and modern at l’Usine de la Caséo-Sojaïne, nature and properties [physical and chemical] and composition of the milk, action of ferments and diastases (enzymes) on the milk, uses of the milk, the residue from the soy dairy [okara], condensed soymilk, powdered soymilk, fermented soymilk (kefir, yoghurt, etc.), tofu (called Caséo-Sojaïne, or fromage de soya; methods of production, coagulants, yield of tofu, storing tofu, composition and comparison with various meats, digestibility, culinary preparations made from tofu (smoked tofu, tofu pâté, tofu sausages)), Soy casein (food and industrial uses). 2. Soy flour and its derivatives: Soy flour, soy bread, wholemeal bread, other products based on soy flour (as biscuits and cakes for diabetic diets). 3. Soy oil and its by-products: Soy oil, physical and chemical properties, usage, residue of the oil mill: the cake, price, uses. 4. Use of the soybean as a legume: Whole soybeans (composition and digestibility), soy sprouts (germes de soja), green vegetable soybeans (le soja frais). 5. Fermented soy condiments: Solid condiments from Japan: Tokyo natto (Le Tokio-Natto) and Ping-Ming natto or tao-tche (Le Ping-ming-Natto); soy nuggets with salt, ginger, orange rind, etc. A similar product is made in China and called tao-tche). Paste condiments: Miso (four types and composition), tao-tjung (Chinese miso). Sauces: Shoyu (its production, varieties, properties, composition), chiang-yu (tsiang-yeu), ketjap [kechap, from Java], tuong (from Annam, with rice or corn), tao-yu (widely used in China and Japan, described by Prinsen Geerligs). 6. Confectionery products: Comparison with chestnuts, roasted soy flour to replace chocolate. 7. Soy coffee (with analysis by Kornauth). 8. Special fermented products: Kiu-tsee (a special commercial ferment from Canton described by Thiersant), fermented soymilks.

Part V: Industrial uses of soybeans. Oil based: soap, wax candles (bougies), and paint oils. Protein based: sojaliithe or soy stone which corresponds to lactite, insulators for electrical apparatus, glue, etc. Conclusion. Addendum (Complément) to Part III, Chapter 1: Soybean straw and stems. Composition of various seeds, including soybeans. Soy flour. The cakes from oil mills. Soymilk and the cake from soy dairies (tourteau de laiterie, okara).

A very interesting table (p. 66-67), which does not appear in the original 8 articles) shows earlier nutritional analyses of the composition of soybeans by Steuf (from Hungary, Mongolia and China), Schroeder, Caplan, Pellet (from China, Hungary, Etampes), Muntz, Nikitin (black soybeans from Russia, 2 samples), Lipski [Lipskii] (yellow, from Russia), Giljaranski (yellow from Russia, China and Japan; black from China and Japan; green), König (Hispida platycarpa black, Tumida yellow, brown and black), Prinsen (white from Java and China), Goessmann, Kellner, USDA, Chemiker Zeitung (white from Java and China, 29 Jan. 1896), Scuff (miso soybeans), Zulkovski (yellow from China, reddish brown from Mongolia), Institut Agr. de Vienne (Austria; yellow from Vienna, reddish brown from Tirol), Ecole Imp. et Roy d’Ag. Hong (yellow from Mongolia and China, reddish brown from China), Chez M. Olivier Lecq (from Moravia), Lechartier (Etampes and black), Joulie (yellow), Stingl and Morawski, Bloch (yellow, green, and black), Ballard, Cavendish Evelyn Liardet (yellow, brown, green, black, and white), Jardin Colonial (Laos, Tonkin, China), Aufray (Tonkin, Yun-nan), Homes Laboratory (black from China, or white). Photos and illustrations are the same as those referenced in individual sections of the book, except for the following: A field of soybeans (p. 16). A soybean plant growing in Europe (p. 17). Color illustrations appear facing pages 12, 22, and 64. Address: Li is from Societe Biologique d’Extreme-Orient (Chine). Grandvoinnet is from Ingenieur Agricole (G.).
*Summary: Contents: Preface. Part I: The lactose industry (p. 9-95; 4 chapters). Part II: Vegetable milk, vegetable casein, and products from soybean seeds. Introduction. 1. Vegetable milk (Le lait végétal; soymilk), microscopic examination of vegetable milk. 2. Vegetable cheese (Le fromage végétal; tofu). 3. Industrial uses of vegetable casein, proximate analysis of soybean seeds, quantity and dosage determination, the price of soybeans, price of recovery of vegetable casein, industrial production of vegetable casein, cleaning the soybeans, extraction of soy oil, extraction of soy casein. 4. Plan and installation of a factory for processing (10 tons/day of) whole soybeans [to make industrial vegetable casein], estimate and specifications for special materials, general materials, the buildings, price of recovery of vegetable casein, industrial uses of vegetable casein. Illustrations (line drawings) show: (1) Microscopic view of soymilk globules. (2) Microscopic view of soya bean tegument (exterior). (3) Schematic drawings (cross section and overview) of a factory for making vegetable casein.

The Preface notes that in Indo-China, vegetable milk and vegetable cheese made from the soybean form the base of the people’s nutrition. Cow’s milk is largely unknown, and the people raise and nourish their children largely with soymilk. Tofu serves equally for the current nourishment of the poor (p. 6).

The Introduction (p. 101-07) notes that soy protein is a globulin, called glycinine or vegetable casein (caséine végétale). Osborne & Clapp submitted this substance to acid hydrolysis and found its composition, which is very rich in glutamic acid (p. 102). Soy flour (farine de Soja) contains little starch but a large amount of nitrogenous materials, similar to gluten; it is widely used in making bread for diabetics. It can also be used as the basis of foods that are rich in protein and very nutritious, as for colonial or European troops (p. 103).

Soy sauce (Soja fermenté) is made in Japan from a mixture of soy and wheat (koji). The number of brewers (brasseurs) of soy sauce exceeds 12,000 in the entire Japanese Empire, furnishing more than 2,500,000 hectoliters of this condiment (p. 103).

A Chinese factory has been founded on the outskirts of Paris (at Vallées, near Colombes) for the production soy-based food products (produits alimentaires à base de soja). This factory currently makes Caséo-sojaïne [tofu] and the following food products: Soy flour (Farine de soja), soy bread (Pain de soja), soy sauce (Sauce de soja), soymilk (Lait de soja), fermented soymilk (Lait de soja fermenté), soy cheese [tofu] (Fromage de soja), soy confections (Confitures de soja), etc. The Journal, in its issue of 9 Jan. 1911, under the title “Une usine chinoise fonctionnee dans la banlieue parisienne [A Chinese factory is operating on the outskirts of Paris]” gives some details (p. 106).

In our colonies in Indo-China, the indigenous people have long prepared soymilk, tofu, and several other foods. Soymilk is used like regular milk for feeding babies. Soy cheese, when cooked, is analogous to gruyere cheese; fresh soy cheese resembles our goat cheese. Many Europeans are now preoccupied with making the best of the abundant nutritive principles found in the soybean. One can eat green vegetable soybeans (Les fruits verts) like green peas (pois verts). In Annam and Japan a sauce is also made from soybeans; its use has spread from East Asia just like that of tofu (fromage végétal) (p. 107).

The introduction into Europe and France of soyfoods (aliments retirés du Soja), especially soymilk and tofu, will enable us to combat periods of scarcity of animal milk and periods when the prices of certain foods are high. Will the substitution of vegetable casein for milk casein enable us to likewise conserve milk for food use instead of delivering it to industry? (p. 107).

Chapter one, “Soymilk” (p. 108-13), discusses the work of the Japanese chemist T. Katayama (1906) with soymilk and notes that it can be homogenized and condensed. Illustrations show a microscopic view of the globules of soymilk and of okara. The absence of starch in soybeans is a very positive characteristic.

Chapter two, “Tofu” (p. 114-18), notes that in Cochinchina, calcium sulfate is called Tchack-kao, and there are three main varieties of tofu: (1) The fermented variety, which is gray or yellow in color, has a piquant taste and resembles Roquefort cheese. (2) The white salted variety resembles goat’s cheese. (3) The baked (suite) or smoked variety resembles gruyere cheese and keeps as well as the salted variety.

Chapter three, “Industrial uses of vegetable casein” (p. 119-32), observes that the oil in soybeans must first be removed by pressing or extraction. A table (p. 120) gives the chemical composition of soybeans from Laos and Cochinchina, Tonkin, and China and Manchuria. They contain 17.64 to 18.28% oil. In Indochina a food which Beltzer calls La caséine végétale en lames (“vegetable casein in sheets” = yuba) has a rather high oil content—about 25-28%. There follows a section (p. 126-32) which contains details on industrial production of soy casein. Chapter four, “Design and installation of a factory for processing soybeans into industrial vegetable casein,” describes each piece of equipment and its cost, itemizes the costs of general and special materials plus, buildings and working capital. Also includes a detailed schematic diagram (p. 136-37) with three production lines, and both top and side views. Finally, it lists expenses, income, and profit (p. 139). The last section, applications of industrial vegetable casein, includes paints, paper coatings, silk and artificial textiles, Galalith, and
waterproofing of textiles and straw hats. The book contains no bibliography, few footnotes, and no mention of the work of Li Yu-ying—from whom the author appears to have borrowed much.

Note: Although this book is undated, all major sources (except a Seattle Public Library bibliography) give its date as 1912. Address: Ingenieur-Chemiste-Expert, Professeur de Chimie Industrielle.


• Summary: These two massive volumes, each weighing about 9½ lb, contain more than 1,800 pages and 13,848 Chinese characters. Contents of Vol. I: Part I. By the same author (25 books). Dedication. Preface. Extracts from preface to first edition. Dialects (The romanized pronunciation of each character is given in Cantonesean, Hakka, Foochow, Wênchow, Ningpo, Peking, Mid-China, Yangchow, and Ssuch’uan {Szechwan} dialects, as well as in Korean, Japanese, and Annamese, each being distinguished by its initial letter). Tables: Insignia of of officials–a term of contempt applied to certain of the poorer classes of official servants who are compelled to feed largely on this cheap food. Also explained are pasteurized or sterilized, and from which it is removed, ready to be delivered for consumption as milk, or for use in the manufacture of the products mentioned above.

The apparatus necessary for this manufacture is illustrated in the accompanying drawings by a longitudinal sectional elevation.” Li’s signature, written “Yu Ying Li,” is just below the mechanical drawing. A detailed description of the ingenious equipment and process follows. The ground paste is mixed with water; a pump “forces it under pressure into the filtering press...” The slurry is cooked in a “boiler or digester” which is actually a steam-jacketed kettle; there “it is heated to a variable temperature for the purpose of pasteurization or sterilization.”

Concerning the okara: “When the operation is finished, the grain [okara] is removed from the filter-press and now forms cakes which can be utilized for feeding human beings...
(they are in that case dried and reduced to powder). They may also be used for feeding cattle, and, even if these cakes are greatly exhausted, they form a very good nitrated manure, after undergoing certain treatment; drying and dressing.”

“The soja milk contains more casein and less lactose and butter than human or animal milk, but by reducing its quantity of casein by adding certain matters a product is obtained resembling human and animal milk. With this milk fresh or fermented cheese can be made as desired.

“In making fresh cheese [tofu], the milk is curdled or coagulated by means of magnesia salts, organic acids and ferment, rennet or lactic ferments.

“The coagulated milk is molded and pressed, and cheese of different forms and consistency obtained according to the degree of coagulation or pressure. The cheeses may be eaten fresh or they may be dried. They are salted or not according to the nature of the manufacture...

“In producing fermented cheese: Roquefort, Permesan, Romatour, Camembert, Gruyère, etc., ferment suitable for the manufacture of those products are employed...

“The fermented milk is obtained by using ferments such as the ferments employed in producing fermented milks—kephir [kefir], yoghourn [yogurt], koumis [koumiss], etc. These are the Saccharomyces cerevisiae, Dispora caucasica, Maya bulgare, etc., and the manufacture is effected by modifying the said milk through the addition of sugar (glucose, levulose, etc.), and more particularly lactose.

“The casein derived from Soja is manufactured either from the milk itself obtained as indicated or with the cakes remaining after the extraction of the oil or fatty matter of the soja beans...

“In order to prepare it the soja milk is coagulated. The coagulation having been effected, the product is dried, asepticized or not, ground or not, and may be employed as an alimentary or as an industrial product. This latter product may be employed for all purposes; paste, bedding paper, manufacture of the objects, etc. the same as animal casein. To the casein thus obtained chemical products such as borax, oxal of zinc [zinc oxide], magnesia, gelatin, etc., may be added in different proportions in order to obtain solid casein. It is also possible to produce sauce with soja milk the fermentation of which is effected by means of special ferments such as sojaobacille and the acetomyces. This sauce is more or less salted with chlorid of sodium [sodium chloride] and an addition may be made of spices; pepper, clove, nutmeg, piment*, etc. The sauce having been made may be concentrated or dried by heating. Soja preserves may be also be obtained with soja milk slightly thickened with sugar. In this case, the soja grains are cooked before being ground and may be mixed with or added to dry fruits, chestnuts, almonds, hazelnuts, cocoa, etc.”

Note 1. This is the world’s 2nd earliest patent seen (June 2011) concerning a fermented cheese made from soja, and also the earliest U.S. soymilk patent.

Note 2. Webster's Third New International Dictionary (1963) defines piment as “wine flavored with spice and honey.” It defines pimento as a synonym for allspice.

Address: Vallées, France.


• Summary: “A large concern known as the ‘Synthetic Milk Syndicate, Ltd.’ is about to establish a factory in Liverpool, at which soya milk will be made according to the process of Dr. Fritz Goessels, of Essen, Germany.” A detailed description of the process follows. “It is expected that this milk will be retailed in England at 4 cents a quart. It is claimed to have the same nutritive value as natural milk, and will be free of the characteristic oily flavor which makes other soya bean products unpalatable to most people who have not acquired the tastes of the Orient... Treated with a mineral salt or an acid, which acts the part of rennet, vegetable milk can be converted into cheese of several varieties. In Indo-China, where the soya milk industry has assumed large proportions, three principal kinds of cheese are made: a fermented variety with a taste suggesting Roquefort; a white salted variety, resembling goat’s milk cheese; and a cooked or smoked variety, like Gruyère.”

Note: This is also the earliest English-language document seen (Feb. 2004) that uses the word “smoked” (not including “smoked”) in connection with tofu. Address: England.


• Summary: Meyer wrote all these letters from China to Fairchild or Dorsett at USDA in Washington, DC. Page 2246-47 (21 Nov. 1916 from Peking). “Parcel No. 125c, contains first quality Chinese soybean cheese; please taste a little on the point of a knife; it is extremely appetising. Mr. [William] Morse of Forage Crops [USDA] wants it and asked me for some samples of Chinese bean cheese in May 1916. I wonder whether the fermenting organism is a new one possibly, that can be made to work in other substances than beancurd.” Note 1. This is the earliest document seen (April 2001) concerning USDA's work with fermented soyfoods.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “bean cheese” or “soybean cheese” or “Chinese soybean cheese” or “bean cheese” to refer to Chinese-style fermented tofu.

Page 2282, 2284 (12 Feb. 1917 from Peking). “I am sending tomorrow, via Diplomatic Pouch, one small tin case, well soldered up and containing 33 small squares of old bean cheese... Mr. Morse again may be the right man to give it to. The quality is not as fine as that of sample 125b,
but still, it is passable. There must be several kinds of this soft cheese here in this land and I’ll be on the lookout for them when traveling about. My interpreter informs me that in summertime one has to keep this cheese perpetually under a layer of sesame-oil, otherwise maggots get in and eat it all up.”

Page 2289, 2291-92 (23 March 1917 from Ichang).
“Well, I am also busy in getting details about Chinese bean-cheese making; it is getting to be a very interesting process in which fungi and personal experience play their parts.”

Page 2316, 2321 (6 June 1917 from Hankow, Hupeh).
“No, the bean-cheese you tasted was not any more spoiled than Limburger or Camembert.”

Page 2328 (14 June 1917 from Hankow to David Fairchild). “It certainly surprised me agreeably that you and your guests dared to eat that bean cheese after its long journey—and that it was found to be a good appetizer. I hope my fotos [photos] and letters relating to the making of same have reached you since and that Mr. Morse can do something with this new food product.”

Page 2338 (20 June 1917 from Hankow to Fairchild). “In my descriptions about the making of bean cheese I have used the word ‘foo’ instead of ‘fu’ since the last can be pronounced fyu, as in future, etc. I also mentioned that ground-up capsules of *Illicium anisatum* are used; now I am not sure whether *I. anisatum* and *I. verum* are synonyms; I saw, however, that the last name has been given to the true star-aniseed, which is the one the Chinese are using and which is said to come both from Kwantung [probably Kwangtung province in southeast China] and from Szechuan.”

Page 2343 (23 June 1917 from Hankow to Mr. Stuntz). “I’m glad the bean-cheese was so well received.”

Page 2355, 2358 (27 July 1917 from Hankow). Meyer lists samples he is sending to Mr. Morse and the Bureau of Chemistry: “Fermented rice, used in coloring bean cheese red. Bean cheese, one white and one red, each in a little jar.”

Page 2361, 2363-64 (1 Aug. 1917 from Hankow). “I am certainly very much interested to hear that Mrs. [Yamei] Kin has obtained a commission from the Bureau of Chemistry to investigate the bean cheese industry... a subject like this is too fascinating to leave it alone. I do not think Mrs. Kin will find that bacteria play much of a role in this bean cheese affair; it seems a mould does the work... It pleases me that you and almost everybody to whom you served the bean cheese, liked it... Did Mrs. Kin put you in touch with a New York firm of Chinese products where this bean cheese can be obtained?”

Page 2369-70 (8 Sept. 1917 from Kingmen, Hupeh). “I am quite pleased to hear in your letter of July 5, 1917 that my soy bean-cheese samples have really created so much interest. Mr. Menderson wrote me a long letter on this problem; I cannot give him, however, much more information in my report to Mr. Morse and on the photos. [Note 3. This report has apparently been lost.] Beancurd and beanmilk always taste beany. The cheese, however, has lost this unpleasant characteristic. If soft beancurd is beaten up with sugar, it also improves much in flavor. I have not heard from Mrs. Kin yet; she surely will get along without my assistance, for she ‘knows the ropes’ here in her own land.”

Page 2407, 2409 (25 Oct. 1917 from Kingmen, Hupeh). “Yes, I’ll get various varieties of bean cheese as soon as I can lay my hands on novelties.”

Location: University of California at Davis, Special Collections SB108 A7M49. Address: USDA Plant Explorer.


“Analyses of important varieties of soy beans (p. 16-17);... In determining the range in the oil and protein contents of over 500 varieties grown in the variety tests at Arlington Farm, Virginia, the percentage of oil was found to range from 11.8 to 22.5 [Tokyo had 20.7% and Biloxi had 20.3% oil] and of protein from 31 to 46.9 [Chiquita had 46.9% protein]... At the present time the Mammoth Yellow variety is the most generally grown throughout the South and is the one used in the production of oil. The yellow-seeded varieties, which are most suitable for the production of oil and meal, contain the highest percentage of oil.

“Environment has been found to be a potent factor in the percentage of oil in the same variety. Considerable differences occur in oil content when soybeans are grown in different localities. The Haberlandt variety grown in Mississippi, North Carolina, Missouri, Virginia, and Ohio gave the following percentages of oil, respectively: 25.4, 22.8, 19.8, 18.3, 17.5; while the Mammoth Yellow variety grown in Alabama, South Carolina, Tennessee, North Carolina, and Virginia gave, respectively, 21.2, 19.6, 19.5, 18.4, and 18.8. Variety tests conducted in various parts of the country indicate a higher percentage of oil with the same variety for southern-grown seed. Similar results have been obtained in Manchuria, the North Manchurian beans showing an oil content of 15 to 17 percent and the South Manchurian beans from 18 to 20 percent.”

Photos (both by Frank N. Meyer) show: (1) A fleet of junks carrying soy beans to Newchwang, Manchuria.
(2) Coolies at Newchwang, carrying loads of soy beans from junks to big stacks.

An outline map of the USA (p. 8) shows the area to which the soy bean is especially adapted for growing for
oil production. The area of double hatching shows that it is especially well suited to the Deep South. The northern boundary of the area was it is “less certain of profitable production” includes the southern one-third of Ohio, Indiana, and Illinois, and most of Missouri. On the west, the “less certain” area includes the eastern one-third of Nebraska, Oklahoma, and Texas.

Tables show: 1. “Exports of soy beans, bean cake, and bean oil from the principal ports of South Manchuria (Antung, Dairen, Newchwang), 1909 to 1913, inclusive.” 2. “Quantity and value of exports of soy beans and soy-bean oil from Japan to foreign countries, 1913 and 1914.” The countries are: China, United Kingdom, France, Germany, Belgium, United States, Hawaii, British America, Australia, other countries. 3. “Quantity of imports of soy beans, soy-bean cake, and soy-bean oil from Dairen, Manchuria, into Japan, 1911 to 1914, inclusive.” The greatest imports were of soy-bean cake, followed by soy beans, with only small amounts of oil.

(4) “Quantity and value of imports of soy beans, bean cake, and bean oil by European countries, 1912 to 1914, inclusive.” The countries are: Austria, Belgium, France, Germany, Italy, Netherlands, Russia, Sweden, United Kingdom. In 1912, the UK imported the most soy beans, while Netherlands imported the most cake and oil. (5) “Quantity and value of imports of soy beans, soy-bean cake (Footnote: Includes bean cake [perhaps fermented tofu or canned regular tofu], or bean stick [perhaps yuba], miso, or similar products, with duty, 40 per cent) and soy-bean oil into the United States, 1910 to 1915, inclusive.” The quantity of soy-bean imports was greatest in 1915 with 3,837 million lb. The quantity of soy-bean cake imports was greatest in 1913 with 7,005 million lb. The quantity of soy-bean oil imports was greatest in 1911 with 41,106 million lb. “Prior to 1914 soy beans were not classified separately in the customs returns” (p. 9). (6) “Composition of soy-bean flour in comparison with wheat flour, corn meal, rye flour, Graham flour, and whole-wheat flour.”

(7) “Value of a short ton of soy-bean cake and other oil cakes in the principal European countries” (Incl. cottonseed, linseed, peanut [Rufisque]). Countries: Germany, United Kingdom, Netherlands, Denmark, Sweden. (8) “Analyses [nutritional composition] of soy-bean meal and other important oil meals.” (Incl. Cottonseed, linseed (old and new processes), peanut (decorticated), sunflower seed). (9) “Fertilizing constituents [nitrogen, ammonia, phosphoric acid, potash] of soy beans, soy-bean meal, and cottonseed meal.”

(10) Analyses for protein and oil of important varieties of soy beans grown at Arlington Farm (Virginia), Newark (Delaware), and Agricultural College (Mississippi). The varieties are: Mammoth, Hollybrook, Manchu, Haberlandt, Medium Yellow, Ito San, Chiquita, Tokyo, Lexington, Guelph, Black Eyebrow, Shanghai, Peking, Wilson, Biloxi, Barchet, Virginia. Note 1. “At the present time, the Mammoth Yellow variety is most generally grown throughout the South and is the one used in the production of oil” (p. 16). (11) “Acreage, production, and value per ton of cottonseed in the boll-ewevel states.” “Since the boll weevil first entered Texas in 1892,” it has steadily decreased production of cottonseed. The soy beans offers a good replacement. (12) “Comparative prices per ton of cottonseed and soy beans on the European market, 1911 to 1914, inclusive.” Soy beans are usually slightly more expensive.

Note 2. This is the earliest published document seen that contains soy-related photos by Frank. N. Meyer.

Note 3. This is the earliest document seen in which William Morse describes soy milk, or mentions natto, or correctly mentions tofu.

Note 4. This is the earliest document seen (Sept. 2004) that mentions the soybean varieties Biloxi or Lexington.

Address: 1. Agrostologist in Charge; 2. Scientiﬁc Asst.
Forage-Crop Investigations, USDA, Washington, DC.


• Summary: The New York Times Magazine is part of the Sunday New York Times and may be simply cited as such. Dr. Yamei Kin is “the only Chinese woman with a physician’s diploma from an American college,” the Woman’s Medical College of New York. “She left New York a few days ago for the orient to gather data on that humble but nutritious food [the soy bean] for the Department of Agriculture at Washington.” During World War I, new demands are being placed on America to feed its citizens and allies. “The appointment of Dr. Kin marks the first time the United States Government has given so much authority to a Chinese. That it is a woman in whom such extraordinary confidence is now reposed detracts nothing from the interest of the story.”

China was the first country to invent paper, printing, gunpowder, porcelain, chess, playing cards, and silk. “And now Dr. Kin is going to see if her native land can teach the United States how to develop a taste for the soy bean in its numerous disguises...

“‘The world is in need of tissue-building foods,’ said Dr. Kin, ‘and cannot very well afford to wait to grow animals in order to obtain the necessary percentage of protein. Waiting for an animal to become big enough to eat is a long proposition. First you feed grain to a cow, and finally, you get a return in protein from milk and meat. A terribly high percentage of the energy is lost in transit from grain to cow to a human being.’

“The statement is frequently made that the Orientals live almost exclusively upon rice, eating little meat. It is not generally known, perhaps, that deficiency in protein is made up by the consumption of large quantities of products of the
soy bean, which take the place in our dietary of meat and other costly nitrogenous foods. They are eaten in some form by rich and poor at almost every meal. Instead of taking the long and expensive method of feeding grain to an animal until the animal is ready to be killed and eaten, in China we take a short cut by eating the soy bean, which is protein, meat, and milk in itself. We do not eat the plain bean in China at all. It is never eaten there as a vegetable, but in the complex food products—natto, tofu, miso, yuba, shoyu, and similar dishes.

"The chief reason why people can live so cheaply in China and yet produce for that nation a man power so tremendous that this country must pass an Exclusion act against them is that they eat beans instead of meat."

She then describes how to make tofu. "Soup noodles are made out of bean curd. Entrées made of bean curd are served with cream mushroom sauce or a hot Spanish tomato sauce. A salad of bean sprouts, accompanied by cheese—the cheese [fermented tofu] a cross between Camembert and Roquefort, and made from the soy bean—is very nutritious and palatable. Americans do not know how to use the soy bean. It must be made attractive or they will not take to it. It must taste good. That can be done. We make from it a delightful chocolate pudding. A black soy bean sauce we use as a foundation for sweetmeats in China." Note: None of the various Chinese food experts whom we have asked can understand what Dr. Kin means by the previous sentence. None has ever heard of a "black soy bean sauce" that is used as a foundation for confections or sweets in China. The two black soy bean sauces made in China, from either soy nuggets or jiang, are both salty. (WRS Jan. 2009). Nevertheless: This is the earliest English-language document seen (Oct. 2008) that uses the term "black soy bean sauce" to refer to a kind of sauce made from soybeans.

"The soy bean contains practically no starch, which means that it is a most desirable food for diabetics, and also, of course, for vegetarians. Buddhists kill no animals—they thrive by making a specialty of the soy bean, which, by the way, is already being used in the French Army. They find there that soy bean mixed with flour makes a good cracker, more nourishing than any other cracker."

"The Chinese do not know what worn-out soil is. Some places are so fertile and are cultivated with so much care and skill that three or four crops a year are regularly gathered... it is very common to see two crops in the same field at the same time... The Chinese have a passion for fertilizing the soil..."

"Dr. Kin is a graduate of the Woman’s Medical College of New York, and her great interests have always been domestic sanitation, civic hygiene, the conservation of life, and questions of nutrition. She is the head of the Imperial Peiyang Woman’s Medical School and Hospital, near Peking... the Imperial Infant Asylum in Tien-tsin, the Widows’ Home, and the Girls’ Refuge all come under her supervision as head of the woman’s hospital work of Northern China. She will return to this country in October, bringing to our Government the detailed results of her study of the uses of the soy bean as a foodstuff needed by this country and by the world in the campaign of food raising and conservation.” An illustration (line drawing) shows a portrait of Dr. Yamei Kin.

Note 2. This is the earliest published document seen (July 2000) that mentions Dr. Yamei Kin. Frank N. Meyer wrote letters about her in 1911 and 1916.

Note 3. This is the earliest document seen (Oct. 2001) that mentions a soy pudding (a “delightful chocolate pudding” made from bean curd).


- **Summary:** Subtitle: “Containing more than one hundred recipes for everyday food prepared in the wholesome Chinese way, and many recipes of unique dishes peculiar to the Chinese—including Chinese Pastry, “Stove Pastries,” and Chinese Candies.” Contains 151 recipes.

Page 15: “Chinese white cheese (CC = Chinese characters given). Foo yue [fermented tofu]. (a) Cut bean cake [tofu], made of Chinese white beans, into half-inch squares ¼ inch thick. (b) Put into a jar provided with an airtight cover, the size of the jar depending upon the amount to be made. (c) Fill the jar ¼ full of Fun Wine. (d) Salt to taste. (e) Cover air tight and put away for not less than two weeks.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Foo yue” to refer to fermented tofu.

Page 16: “Chinese red cheese (CC). Noun yue [red fermented tofu]. For this the bean cake is made of Chinese red beans [azuki?]: (a) Wrap up the cakes in a piece of cloth in any desired size. Put pressure on top for 5 days. (b) Take off the weight. Then the cloth. Scrape off the mold on top. (c) Place in a jar. Fill the jar ¼ full with Fun Wine, and add plenty of salt. (d) Cover air tight, and set away for not less than 2 weeks; the longer, the better, provided the jar is kept air-tight.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Noun yue” to refer to fermented tofu.

Page 147: “Bean cake. Do fu. This is a most delicious dish for its price. Many people in Paris can tell you how delicious it is, for there is a factory in Paris that makes millions of dollars each year by manufacturing this cake. The process of making bean cake is really so complicated that it would require a separate volume to describe it. Put white beans in water for a few hours. Then grind in a water stone grinder. Cook for 5 hours with calcium powder. Let it filter through a cloth and run into a cup or bowl. When cool it becomes solid. Tie this in a piece of cloth and boil. This is
called bean cake” [Note: the above process, which does not even call for soybeans, will not make tofu!].


• Summary: Discusses the physiological, economical, and ethical advantages of a vegetarian diet, with recipes and principles of preparation. The author, who wrote mostly about geology, lived 1835-1920.

A large table titled “Composition of foods” (p. 44-47) gives the percentage of protein, fat, carbohydrates, and ash (on a dry basis) for many foods, including natto, fresh tofu, soy bean—dried, Swiss miso, soy [shoyu] No. 1 and 2, and white miso (all figures from Abel 1900), plus peanuts—dried.

In the chapter titled “Foods of vegetable origin” (p. 141-267), the section on “Pulse” (p. 152-78) contains a subsection titled “Soy bean” (p. 155-58), which begins: “The soy bean of China and Japan is perhaps the most important food plant there, next to rice. The bean is eaten

“...”

141-267), the section on “Pulse” (p. 152-78) contains a subsection titled “Soy bean” (p. 155-58), which begins: “The soy bean of China and Japan is perhaps the most important food plant there, next to rice. The bean is eaten

“The Chinese in Paris [probably Li Yu-ying] have been urging the culture of the soy bean. The seeds, when boiled, mashed, and pressed, yield both milk and cheese; if thinned with water, a very good substitute for animal milk; and if coagulated with mineral salt, a cheese that is usually eaten fresh, though it may be preserved by salting or smoking, after being cooked. Three varieties of the cheese are common in the oriental markets; a fermented kind [fermented tofu], white, yellow, or gray in color, with a piquant taste, like roquefort; a salty and white kind, like goats’ milk cheese; and a third kind, smoky and resembling Gruyère. The soy cheese costs about a fiftyth as much as animal cheese; and in nutritive value, like the vegetable milk, compares very favorably with the ordinary products of the cow. (‘Phila. Ledger,’ Sept. 27, 1906).”

Note 1. No such article in the Philadelphia Ledger or the Public Ledger (Philadelphia, Pennsylvania), of this date, can be found.

Note 2. This is the earliest U.S. document seen (Dec. 2008) that mentions smoked tofu.

The section on peanuts (p. 158-62) includes roasted peanuts, peanut butter, peanut taffy, and “Terralac or peanut-milk (here first published).” Details on how to make peanut-milk at home are given, followed by many recipes for its use—each preceded by the word “Terralac.” Thus: Terralac custards, Terralac punch. Terralac cream, salad dressing, sauce, cream sauce, cream, blanc-mange [blancmange], cream pie, Bavarian cheese, Terralac in soup, “Ice-Terralac, or peanut ice-cream,” peanut soup, salted peanuts.

There are also sections on the cowpea (p. 163+), almonds (p. 263-65; incl. salted almonds, marchpane, macaroons, nougat or almond cake, almond milk, orgeat syrup, burnt almonds, replacing almonds), vegetable-gelatine (p. 384-87, incl. carrageen or carrageen [carrageenan], Irish moss, and kanten), sesame oil or gingelly oil (p. 388), peanut oil or groundnut oil (p. 388), almond oil (p. 389), and sago and sago recipes (p. 390-91, incl. three sago puddings).

Note: Merriam-Webster’s Collegiate Dictionary (1998) defines orgeat (a word first used in 1754) as “a sweet almond-flavored nonalcoholic syrup used as a cocktail ingredient or food flavoring.”


• Summary: “On the top floor of 641 Washington street, New York city, is one of the most interesting kitchens in the world, presided over by a Chinese woman doctor.” Dr. Yamei Kin, who recently traveled to China for six months to study the soy bean, says that its protein is equal to that of meat. A “sort of vegetable cheese [tofu],” it is a replacer of meat and forms no acid; it is an alkaline form of protein. The salty black sauce [soy sauce] served on top of “chop suey,” “chow mein” and other dishes in Chinese restaurants, is made from soy beans. Dr. Kin can make from soybeans a roquefort cheese [fermented tofu] that looks and smells like the real thing. “In all the world there is not a more misunderstood vegetable than the soy bean, says Doctor Kin.” An illustration shows Dr. Yamei Kin standing, holding a plate in her left hand.


• Summary: “From a correspondent: In these days of agalactia [failure of the secretion of milk in mammals] any reasonable substitute for milk is certain of a welcome, so that particular interest attaches to the soy bean, an alimentary plant grown on a very large scale in China, and imported into this country [Britain] by hundreds of thousands of tons annually for the sake of the oil it contains, which is utilized in the manufacture of soap, margarine, etc.

“More interesting from the alimentary point of view is the fact that it can be made to yield a substitute for milk, which in respect of appearance and composition so nearly approximates the familiar article as to be wellnigh indistinguishable therefrom.

“The process is simple. Five ounces of the bean are soaked overnight in a quart of cold water; it is then coarsely ground, mixed with the water in which it has been soaking, and filtered through muslin [coarse cotton fabric]. The result
is a milky fluid with a rather strong smell of haricot bean, which disappears after it has been raised to boiling point. Infants take it readily, and, mixed with tea or coffee, the taste is imperceptible. Fresh soy bean milk has a fairly acid reaction; it is quite homogeneous under the microscope, and its physical properties are those of cow’s milk; rennet causes it to curdle, lactic acid germs cause it to undergo lactic acid fermentation. When boiled it ‘rises’ like ordinary milk and forms a pellicle [yuba] on the surface.

“Its composition is: Casein 3.13 per cent., fats 9.89, but it lacks carbohydrates, a shortcoming which can easily be remedied. As the fatty constituent is an oil, butter cannot be made from soy bean milk, but it can be made to provide cheese (120 grams of the bean yields 184 grams of cheese), and the cheese [fermented tofu] can be made to resemble any of the popular cheeses in the market; it is merely a question of employing the proper flavouring ferment. Soy-bean milk can be retailed at 3 centimes a litre. The residue, after making milk, is still very rich in alimentary principles, and can be worked up into very palatable ‘almond’ cakes and biscuits. Being practically free from starch, these cakes are especially suited for consumption by diabetics.

“Roasted, the bean provides a colourable imitation of coffee, just as do barley and oats, to what a satisfactory degree only those who make use of these substitutes will understand.”

“A practical idea of its alimentary value may be formed by contrasting the cost of this as compared with other albumins: 100 grams of albumin, at before-the-war prices, would cost—from egg 1s. 8d. [1 shilling 8 pence], from meat 1s. 4d., from pork 8d, dried peas 3d., and from soy bean 2d. The bean contains four times as much mineral constituents as meat, and is twice as rich in phosphoric acid.” A table compares the nutritional composition of soy beans (water plus 5 nutrients) with lentils, haricot beans, peas, and broad beans.

• Summary: “Of the leguminous crops in the Philippines the soy bean is the only one of which the finished products are used. These finished products, the most important of which are the [salt pickled] soy bean curd (tahuri) and soy bean sauce (toyo) have been long known all over the islands. In spite of this evidence of its economic importance, the crop has been given but very little attention by Filipino farmers.”

The field tests were carried out in the Philippines. The author mentions that soy beans are used in China, Japan, and other countries as a substitute for meat.

The author has carried on the breeding work with soybeans begun by Maceda in the Philippines to determine their commercial value and to find the varieties best suited for the rainy and the dry seasons, respectively. It was found that the selections from the variety Kedilcie Wit grown during the rainy season and strains from Ami’s bean grown during the dry season produced the highest yields. Address: Philippines.

• Summary: “Dr. Yamei Kin, a Chinese woman doctor of New York City, recently spent six months in China, studying and analyzing the soy bean. Dr. Kin says that the protein contained in the soy bean is equal to that of meat, and is of great value to persons who cannot safely eat meat. It is a replacer of meat, a sort of vegetable cheese. It forms no acid. It is an alkaline form of protein.

“There are several varieties of soy beans, says Dr. Kin. They look like dried peas, and taste like pebbles. Combined with hash or any form of meat leavings, it forms a wonderful food for diabetics, as the curd contains no starch. When you eat ‘chop suey,’ ‘chow mein’ and other dishes in Chinese restaurants, the salty black sauce [soy sauce] served with the food is made of soy beans.

“Excellent cheese [tofu] can be made from soy beans, according to Dr. Kin. She says she can make roquefort cheese [fermented tofu] that smells and looks like the real thing. She also says that when the public becomes educated to the soy bean it will take its place at the head of the procession of American products. In all the world there is not a more misunderstood vegetable than the soy bean, says Dr. Kin.”

• Summary: From St. Louis Post-Dispatch Sunday Magazine: “Soy beans! Once I tried to cook them. After that I never wanted to hear any more about them. But that was before I was invited to a soy bean luncheon in a Greenwich Village apartment. Whenever anyone said ‘soy beans,’ I would recall that bowl of pebbles and then an unspeakably unpalatable mass of stuff that had to be thrown away. But now! As long as I live soy beans will seem like a symbol of pleasant sensations inside and out. I must tell you about that luncheon.

“I went the other day to see Dr. Yamei Kin, a charming Chinese woman, who is giving her time and talents to the Government to help solve the food problem. Her specialty is Oriental food, especially soy beans, and she has been spending the summer showing how that food can be adapted to Occidental appetites. I found her in a blue silk kimono and a big white apron, hustling about the kitchen of the United States Department of Agriculture Laboratory in New York.

“The place looked as if somebody had just milked the cows and brought in the milk pails. On the floor near the stove were two 12-quart pails filled with warm milk. Dr.
Kin was starting to make curds and whey. I watched her put a couple of spoonsful of fluid into each pail and saw the milk curdle in the good old way. Then the Chinese boy helper strained the stuff through an aluminum strainer and cheesecloth. They were going to make cheese.

“The Chinese lad had just finished milking the soy beans before I came in. That may sound queer to a mind that doesn’t orientate toward those beans. But its all very simple. If we knew as much as we ought to know about soy beans there wouldn’t be any need to be on the old or grazing lands or winter fodder. Because soy beans are ready to supply meat and milk and butter and cheese and all the rest of it. Dr. Kin says so. And there are rows of jars and bottles on shelves and tables in that kitchen to prove it. Besides, there was a soy bean luncheon.

“The beans from which the milk had been extracted were soaked the night before. In the morning the Chinese lad put them through the mill, which is part of the kitchen equipment. It looks primitive, being made of two huge pieces of granite, imported from China. In its homeland this mill is worked by coolies, in New York by electricity. When the grist comes out of the mill it is strained. That was the stuff that filled those two pails. Dr. Kin told me that in China people eat the curds and cheese in their natural state. Here, however, she is making that cheese a base for a series of camouflage experiments.

"'We made ours into fish for dinner last night,’ said a man from a nearby laboratory, who comes in every day to find out whatever happens to be new about soy beans."

"'How was it?’ asked Dr. Kin.

"'Great,’ said the man. ‘My wife fried a couple of fish and then fried some soy bean cheese in the gravy, and, honest to goodness, I couldn’t tell which was which. It has a way of absorbing the flavor of whatever it’s cooked with,’ he explained to me.

"'We had ours with chops,’ remarked another laboratory expert who joined us. His name was Mr. Gleason. He declared that if he didn’t know the difference he might have thought he was eating an extra chop. Everybody in the place was ready to root for soy beans.

“Dr. Kin explained that the reason the soy bean has been misunderstood in America was because people didn’t take the trouble to investigate and analyze it, and to find out what are its food properties with reference to the nutrition we get from meat and vegetable.

"'Don’t try to think about soy beans in a scientific way,’ she advised me. ‘This thing I am working with is in reality a vegetable cheese. It takes the place of meat. We’ve been using soy beans in China for over 2,000 years, and they are really very delicious and nutritious,’ this in an offhand way, as if an experiment of 20 centuries or so ought to pave the way for the American appetite. She didn’t want me to get my mind cluttered with such terms as carbohydrates and proteins.

“‘I wouldn’t waste a minute experimenting with food that was merely nutritious,’ she told me. ‘This whole movement about finding out the possibilities of food is part of the cultural development of the American people. The older a civilization becomes, the more people like to be surrounded by beautiful things. Chinese art, you know, is the most highly developed art in the world. All this bother about beans is not a question of science or of what is good for us, but it is a question of what is dainty, what is nice, what appeals to the taste. Making a study of eating is a part of the fine art of living.

“‘American women, you must admit, are lacking in artistic sense. That is because the country is so young. When the process of refinement is farther advanced they will not regard household work, and especially cooking, as drudgery. It is really art. The older nations, being more cultured, make a deeper study of things. Chinese, for instance. But the Americans are very susceptible, very open-minded and frank and eager to acquire new ideas.

“‘The trouble with vegetarians was that they expected us to eat such awful things. I’m not a vegetarian, but I must admit that I find great satisfaction in being able to sit down to most of my meals without facing the fact that I am eating slices of what was once a palpitating little animal, filled with the joy of life. I shouldn’t be surprised if the soy bean will save the lives of many American animals.’

“On a long table was a row of glass jars filled with what looked like slices of white cheese [fermented tofu]. It was soy bean cheese. A jar was filled with a brownish paste [probably a type of Chinese jiang]. It was soy beans. There were bottles filled with the condiment we get with chop suey. That, too, was made from soy beans. Talk about dual personalities! The soy bean has so many aliases that if you couldn’t like it in one form you would be pretty sure to like it in another.

“Dr. Kin has been trying any number of experiments with a view to boosting the bean to a bigger place commercially. In due time the results of all these experiments will be catalogued at Washington [DC]. Perhaps some day there will be a Bureau of Beans, from which may be obtained for the asking recipes on a thousand ways to prepare soy beans.

“Because she is working for the Government Dr. Kin doesn’t disclose many details about the things she is doing. All that is worth while will be public information in due time, she says. Canning curds and cheese so they can be kept an indefinite length of time and then utilized in various forms is something she is trying to perfect.

“‘I might talk to you until doomsday about the manifold uses of soy beans, but you wouldn’t understand,’ she told me candidly. Then she invited me to have luncheon in her apartment, promising me a practical and palatable demonstration that would make an impression in the way food ought to interest us. Of course, I was charmed with the
idea. The only hitch was that I had to have luncheon without my hostess. Dr. Kin was going out of town early in the afternoon.

“While the Chinese lad was getting his instructions about piloting me to the apartment and serving luncheon, Dr. Kin turned to me and asked what kind of cheese I liked best.

“‘Roquefort,’ said I.

“‘That’s good,’ said she, and then she told the boy something else in Chinese, told me she hoped I’d enjoy the luncheon and invited me to spend all afternoon at the flat if I cared to read any of her books or look at her pictures.

“Before we turned in at 56 West Eleventh street, I discovered that Wei, my amiable escort, was somewhat limited as to English vocabulary. He had been here only six months. When he entered the apartment he ushered me into a cool-looking parlor, indicated a comfortable big chair beside an open window, and disappeared with a smile that seemed to say: ‘I’ll rustle along the luncheon if you just sit there and fan yourself.’

“In a corner over near a window there was a big mahogany desk that looked like business. On it was the photograph of a Chinese-American youth, a strapping tall fellow who looked every bit a soldier. He is Dr. Kin’s soldier son, Alexander, 21 years old, who left college to enlist as a private, and is now with Pershing’s Eighty-second Division.

“A book and a magazine lay side by side on that desk. The book was Rabindranath Tagore’s ‘Nationalism.’ The magazine was ‘The Bean Bag.’ I took up the magazine. Here are a few things I learned:

“Three million acres have been cultivated to soy beans in the South, principally in North Carolina; man could come nearer living well on soy beans alone than on any other food: it is the nearest substitute to meat there is; containing starch, sugar, fat, cellulose, albuminoids, mineral salts; a new harvester has been invented that threshes the beans on the vines, over 100 American manufacturers are using soy bean oil for soap, paint, varnish, enamel, salad oil; soy beans are listed in the food market of the District of Columbia; the soy. or soja, is the first and oldest of the 150 branches of the bean family; Manchuria claims the honor of its nativity; the Manchurian railroad recently opened a branch and an improvement station for distribution of the Ssupingkai special.” Continued.


• Summary: Continued from p. 106. “Soy beans for human food: In Asiatic countries, especially China and Japan, the soy bean and the various food products made from it are so largely consumed that it is second only to rice in importance as a food crop. The soy bean is eaten only to a very small extent like other beans, but in China and Japan it is elaborated into a great variety of products, all having a high percentage of protein and making a well-balanced diet when eaten in connection with the staple food, rice. Some of these products are said to be eaten at every meal and by rich and poor alike. Of these numerous preparations, only one, ‘shoyu,’ or ‘soy sauce,’ has been introduced to any extent in other countries. It is quite possible that some of these products would appeal to the American taste and with proper exploitation become established on the American market.

“Although the soy beans as an article of food has attracted attention from time to time in the United States, thus far it has been used but little except as a special food for invalids. The beans contain only a trace of starch and are highly recommended as a food for persons requiring a diet of low starch content. During the past year, however, much interest has been manifested in the possibilities of the soy bean as a staple food.

“Many schools of cookery and domestic science throughout the country have conducted experiments rather successfully, utilizing the dried beans in the manner of the navy bean. As a result, the dried beans can now be purchased in the markets in nearly all of the large cities. The variety and palatability of the forms in which the bean can be served make it a very desirable article of food, and it may be expected to grow in favor as it becomes better known (p. 107).”

“Dried beans:... During the season of 1916 about 100,000 bushels of American-grown [dried] soy beans were packed as baked beans by several canning companies in the Central and Eastern States.” Properly roasted, the dried beans “make a good coffee substitute. Those fond of cereal beverages pronounce it equal to many of the preparations on the market. In China, the beans are soaked in water and roasted, the product being eaten after the manner of roasted peanuts. This method of preparing the beans is improved by soaking the beans for about twelve hours in a 10 per cent salt solution, boiling slowly for about 30 minutes, and then roasting to a light-brown color. The yellow-seeded and green-seeded varieties are preferable, as they make a product of better appearance.

“Green beans: When soy beans are three-fourths or more grown, the seed makes a most palatable and nutritious green vegetable. As such it may be used much as is the green pea or the Lima bean. The pods are somewhat tough and not desirable to eat. The green beans are rather difficult to shell, but after cooking in the pods for about five minutes, they shell out very easily.”

“Soy-bean milk:” If dried soy beans are soaked, crushed, and boiled “a milky emulsion is obtained which is very similar in appearance and properties to cow’s milk. This liquid, separated out by means of a very fine sieve or through a cloth filter, is the soy-bean or ‘vegetable’ milk used so extensively in China.” “Soy-bean milk has a rather strong characteristic taste and odor which may be masked
by the addition of a small quantity of coumarin or vanillin. This 'vegetable milk' can be used in numerous preparations, such as breads and cakes, in creaming vegetables, in milk chocolate, and in custards. If allowed to remain in a warm place the milk becomes sour, like animal milk, and in that form may be employed just like sour milk or buttermilk...

“After separating the milk from the solid material, the residue [okara] is still very rich in nutritive substances. It can be dried and used for cattle feed or possibly made into a meal or flour for human consumption.”

“Soy-bean cheese: “The addition of magnesium or calcium salts (about a 1 per cent solution) to soy-bean milk when hot precipitates some of the proteid substances, forming a grayish white curd which settles out, leaving a yellowish watery liquid. This curd, after being drained and pressed, represents the tofu, or bean curd, which is so extensively eaten and forms the basis of numerous fermented, smoked, and dried cheeses in China and Japan (Plates III and IV). Tofu is made fresh daily and is a staple article of diet of oriental peoples. In many cities of the United States having a large Asiatic population, fresh bean curd generally may be found in the Chinese markets. Although the fresh curd, or tofu, is tasteless, it is a highly nutritious food and no doubt could be elaborated by the American housewife into a variety of palatable dishes.

“Soy sauce: Soy or shoyu sauce is a dark brown liquid prepared from a mixture of cooked and ground soy beans, roasted and pulverized wheat (barley is sometimes used), salt and water. This mass is inoculated with a culture known as rice ferment (Aspergillus oryzae) and left in casks to ferment from six months to a year and sometimes longer (Plate V)... This product may well serve as the basis of sauces of the Worcestershire type... The manufacture of soy sauce is conducted on a large scale in China and Japan, and to some extent in India. The yearly production of Japan is said to amount to nearly 2,000,000 barrels. The brewing of this sauce has also become a well established industry in Hawaii. Although there are no factories in the United States, considerable quantities of the sauce are imported annually, and it can be obtained at Chinese stores in most of our cities.”

“Soy-Bean sprouts: Several species of beans are sprouted and used as a green vegetable by the Chinese (Plate VI). Soy beans are used to a very considerable extent for this purpose, as these sprouts are larger and firmer than those of most other legumes. Bean sprouts can be used as a home winter vegetable, for the dried beans are sprouted easily in a short time under proper conditions of heat and moisture. It is quite possible that sprouted soy beans utilized in various vegetable dishes would appeal to the American taste.”

A table (p. 111) shows the “Quantity and value of soy beans, soy-bean cake, and soy-bean oil imported into the United States, 1910-1917, inclusive.

Photos on unnumbered pages show: (1) A typical soy bean plant. (2) A field of the Biloxi soy bean grown at Biloxi, Mississippi. (3) Pods and seeds of 7 common varieties of soy beans.

(4) “Large blocks of freshly made bean curd, ‘tofu’ [on a round wooden table], ready to be cut up into squares and sold to the housewife.”

(5) “Large bamboo tray of various kinds of soy-bean cheese of the drier type” [pressed tofu sheets].”

(6) “A dark room of even temperature where wooden trays, full of bean curd [tofu] are piled. This is another method of preparing soy-bean cheese” [fermented tofu].

(7) “Large earthen jars full of squares of bean curd, which are covered with spiced brine and soy sauce. After several months’ curing a bean cheese [fermented tofu] is formed, which can be kept for many years.”

(8) A “courtyard full of covered pots of fermented soy beans and brine from which soy sauce is made.”

(9) The basket on the left contains “sprouted soy beans, which are sold and used as a green vegetable” [in China]* * = Photographed by Frank N. Meyer, Agricultural Explorer, USDA.

Note 1. This is the earliest published document seen (Jan. 2001) that contains photos of soyfoods by Frank. N. Meyer. Most of the photos appear to have been taken in
China.

Note 2. This is the earliest document seen (Jan. 2001) in which William Morse describes “soy-bean sprouts” or “soy-bean cheese” (tofu).

Note 3. This is the earliest English-language document seen (Oct. 2011) that uses the term “soy-bean cheese” to refer to fermented tofu.

Note 4. This is the earliest English-language document seen (Oct. 2003) that uses the term “milky emulsion” to refer to soymilk.

Note 5. This is the earliest English-language document seen (May 2005) that uses the term “masked” (or any other form of that verb) in connection with the undesirable taste or odor of soyfoods (soy-bean milk) or soy beans. Address: Scientific Asst. in Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

83. Shih, Chi Yien. 1918. Beans and bean products. Shanghai, China: Soochow University Biology Dept. 13 p. [Eng] • Summary: The author’s name in pinyin is probably Shi Jiyan. At the head of each section, the name of each product or type of bean is written in Chinese characters. Contents: Introduction by N. Gist Gee of the Dept. of Biology, Soochow Univ., China.

Note 1. Soochow, also called Su-chou (formerly Wuhsien) is a city in southern Kiangsu (pinyin: Jiangsu) province, in eastern China, on the Grand Canal. Introduction by N. Gist Gee of the Dept. of Biology, Soochow Univ., China.

Note 2. This is the earliest document seen (Jan. 2001) in which William Morse describes “soy-bean sprouts” or “soy-bean cheese” (tofu).

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great pharmacopoeia), perhaps China’s most famous materia medica, was written by Li Shizhen (+1596). The above information, which is all wrong, has been cited again and again, down to the present day (2002), in connection with the supposed origin of the soybean.

“Even during the ancient times they were considered by the people to be the most important of the cultivated leguminous plants.” Note 6. This is the earliest document seen (Aug. 2002) which states, incorrectly, that the date of Emperor Shen-nung’s book is 2838 B.C.

The methods of cultivation are as follows: In general all of the soja beans are planted in rows along the banks of canals and the boundaries of the fields, which separate the fields of one family from those of another, except those which are called oil beans or Eighth month white bean and Water white bean. These last are planted in large fields. The oil beans are planted early in June.” The method of cultivation, harvest, and threshing is then described in detail. A table gives the time of planting and harvest for 18 varieties of Chinese soybeans, grouped into 6 types by planting and harvest dates: (1) Plant in latter part of April, harvest in latter part of Sept.: Heidou (black [soy] bean), huangdou (yellow bean), maliaodou (horse material / feed bean), guguo qingdou (bone wrap green bean), jiajia sandou (pod pod three bean), xiangzhidou (fragrant branch bean). (2) Plant in early part of June, harvest in middle part of Sept.: bayue baiddou (8th month white bean), shuibaiddou (water white bean), maquedou (sparrow bean). (3) Plant in early part of July, harvest in early part of Oct.: equedou (chirp magpie bean), niuta bianidou (cow tread flat bean), shijia xiandou (ten family fragrant bean), xifeng qingdou (west wind green bean), shizi hedou (persimmon pit bean), denglongdou (lantern bean). (4) Plant in early part of April, harvest in early part of July: guashidou (melon ripe bean). (5) Plant in early part of April, harvest in latter part of July: shidou (fennel bean). (6) Plant in early part of April, harvest in latter part of June: yadou (sprout bean).

The rest of the work concerns the food products of the beans, including a detailed description of how each is made.

Note 7. This document contains the earliest date seen for soybeans in Australia or Oceania (1875). It is not clear whether or not these soybeans were cultivated in Australia; they may well have been. The source of these soybeans is unknown, as is the author’s source of information concerning that early introduction, 43 years before Shih wrote this booklet. He is the first to give such an early date for the introduction of soybeans to Australia. Yet the date does not seem unreasonably early since there were 17,000 Chinese in Australia by 1855 (see Australian Department of Immigration and Ethnic Affairs. 1985. “A Land of Immigrants”). Address: Biology Dep., Soochow Univ., China.

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four or five months. It is eaten in the same way as the other Chiang Ju Fu, and the price is approximately the same.

“Ham Ju Fu (Cc = nantui furu) is the Chiang Ju Fu which has ham mixed with it.

“Tsao Ju Fu (Cc = zaofuru): Tsao Ju Fu us made from Tou Fu Koen which is first allowed to mold, just as in the process of preparing Chiang Ju Fu in the second way. After molding, the cakes are thoroughly salted, using about three ounces of salt to one catty of Tou Fu Koen. Then they are put into an earthenware jar for about four days and Chiu Niang (Cc = jiuniang) is added to cover all of the Tou Fu Koen.

“Chiu Niang is made from rice which is first steamed and then poured into a big earthenware jar where it is allowed to cool. After this, a kind of yeast powder is added to the rice. Sixty seven pounds of rice requires six ounces of yeast powder. The two are mixed together and cold water is added to moisten the rice. Then a hole is made in the rice at the center of the jar and the rice is pressed back against the side of the jar. A straw cover is used to cover the mouth of the jar and a straw matting is wrapped around it. This is to keep its temperature high enough to hasten fermentation of the mixture. During cold weather the jar must be kept in a warm place. After about three days the wine collects in the central cavity. The fermented rice is called Chiu Niang.

“After Chiu Niang is poured into the Tou Fu Koen, the jar is sealed in the same way as in the making of the Chiang Ju Fu. The cakes of Tsao Ju Fu can be eaten after about two weeks.

“The price is about ten cash for one piece which is about the same size as that of Chiang Ju Fu.

“Ch’ing Hsien Ju Fu (Cc = qingxian furu): This is made from Tou Fu which is first divided into small square cakes. These are exposed upon matting or boards to allow them to mold. After about eight or nine days a whitish mold, about half an inch long thoroughly covers the Tou Fu cakes. The cakes are first salted, using about three ounces of salt to one catty of Tou Fu. Then they are put into a big earthenware jar and covered with cold water to the depth of an inch. It is not necessary to seal the mouth of the jar, so it is only kept free from the dust by being covered with a piece of cloth. After ten or twelve the Ch’ing Hsien Ju Fu is used in the same way as the Chiang Ju Fu.

“Its price is about sixty cash for one catty.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the terms “Ju Fu” or “Tsao Ju Fu” or “Chiang Ju Fu” or “Ham Ju Fu” or “Ch’ing Hsien Ju Fu” to refer to fermented tofu. Address: Biology Dep., Soochow Univ., China.


• Summary: The author, who begins by acknowledging his indebtedness to Dr. Yamei Kin, Dr. John Harvey Kellogg, and Mr. W.J. Morse for much of the material in this article, gives an overview of the soya bean worldwide. The article contains excellent photos (many by Adachi): (1) Stacks of soya bean cake in open storage on Dairen wharves, South Manchuria. (2) Horses plowing soybean fields in North Manchuria. (3) Modern machinery [a huge steam-powered tractor] used in bean cultivation in remote parts of Manchuria where foreign interests are involved. A Western man and woman ride horses nearby. Caption: “To the Manchurian farmer, with his laborious methods of hand cutting and hand winnowing, the introduction of modern Western farming methods would spell many-fold prosperity.” Note: This is the earliest document seen (Feb. 2003) that shows a photo of a tractor in connection with soybeans. (4) Stacks of soybeans piled high in sacks in Manchuria as far as the eye can see. (5) Soybeans stored in huge cylindrical, 20-foot-high osier bins, each covered with a conical top.

Soy oil is purified and flavored with an admixture of olive oil for use as a salad oil. It also forms the basis of some of our butter and lard substitutes. “What Mr. Li Yu-ying accomplished in Paris in the establishment of a Laboratory of Research and of a factory for the production of all the products derived from the soya has been the forerunner of activity on the part of certain independent Chinese companies in America and of government and private investigations.”

“In general the use of whole soya beans has not been attended with much success because of the ever present flavor of the oil content and because, with the ordinary method of cooking, they remain hard and unpalatable; but it has been found that cooking at a temperature somewhat above the boiling point, say from 220 to 230 degrees, breaks up the cellulose structure and develops a richness of flavor that is not obtainable with the lower temperature.”

“By far the most extensive use of the soya is in the products manufactured from it. And it is here that Dr. Yamei Kin, the talented Chinese physician, is making her chief studies under the direction of the Pure Foods Division of the Department of Agriculture, with the purpose of spreading a knowledge of the soya among Americans. For convenience of consideration the products studied may be divided into sauces, curds, cheeses and milk.

“Of the sauces the liquid form is already familiar, although unrecognized, perhaps, by a large percentage of Occidentals through the work of early English traders in bringing back the base of the now famous Lea and Perrins Worcestershire Sauce. This original Chinese shi-yu was highly spiced and became a well recognized adjunct to many an English meal. Following the example of Lea and Perrins, others have put out sauces with the same base without, however, attaining the same success, because the makers did not understand that there are many kinds of soya sauce. While they are all made by the same ferment and in the same general way, they differ very greatly in quality according to the locality and to the manufacturer, just as
wine, though made from the identical kind of grape and by the same process of fermentation, may be a very different article from different hands. It takes several months to make this liquid form of sauce, while the best kind requires a year or more to attain the finest flavor and mellowness. The hot condiment added by Lea and Perrins is not favored by the Chinese, since according to their taste it detracts from a wide use of the soya sauce.”

Tofu (spelled to-fu) is discussed in detail. “There are records to show that it has been used since at least nine hundred years B.C. To-fu making is a staple industry in every little community. Usually it is done at night so that the fresh curd will be ready for the morning demand in the market, or for peddling around the streets. It provides, for the fraction of a cent, the indispensable equivalent of meat and affords very often the explanation of how the Chinese laborer does so much work on what is purely vegetable diet, popularly supposed not to contain much protein. To-fu is made in many different forms and the bean stalls occupy quite as large and prominent places in the city market as the fish and meat stalls...

“Cheeses are also made from the growth of cheese-making moulds on to-fu. The Chinese resident in America regularly import a certain highly flavored red bean cheese for their own use...

Perhaps the greatest contribution of the soya to the life of the Occident will be in its form of milk. Back in the golden era of peace there had been established in London a soya bean milk factory which was prepared to place its product regularly on the market, and there were said to be plans consummated for the erection of two others at Manchester and Liverpool; but of what the development has been we have no definite information. In Shanghai, Peking and Dalny Chinese companies are supplying hospitals and individuals with an 8 or 10 ounce bottle of concentrated milk per day at a cost of $1.00 Mex per month.

“In its competition with the cow the legume has in its favor the following facts: Soya milk can be produced with less contamination; it is tuberculosis-free; its caseins break down much more readily than the caseins of cow’s milk and do not form curds in the stomach in the same degree...

“By those who advocate and urge a vegetarian diet, a very strong bill can be drawn in favor of this oriental substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological substitute.

resultant from the catabolism of the cells of the animal, and from possible putrefaction. In China the Buddhist priests and people who enter the various temperance societies all depend on varieties of to-fu.”

   • Summary: “S.S. Seald, from Rangoon [Burma].
   Agents: M.M. and Co.–94,573 bags of rice,... 50 casks lub. [lubricating] oil, 2 jars and 1 case bean curd, 5 cases and 9 tins sauce,... 250 cases groundnut oil.”

   Note: This bean curd, because it is sold in jars and must have a long shelf life in the tropics, is probably fermented tofu.

   • Summary: On pages 286-87 is a section on “Sunflowerseeds, soybean cake and soybean meal (Sojakuchen und–mehl) as fodder for milk cows,” by Nils Hansson. A table shows the weight of the feed and the resulting milk, and the fat content of that milk. Soybeans are also mentioned in two places on p. 346 as a raw material for soymilk—which is described in German as a “fluid resembling cow’s milk” or a “soybean emulsion” (Footnote: Die Sojabohnenmilch).

A table titled “Plant cheeses (Pflanzenkaese)” gives the composition of tofu, kori-tofu (frozen tofu), Hamananatto, three types of soybean cheese (Sojabohnenkaese; from the year 1912, one type prepared in a laboratory), Chinese tofu, and Daua-Daua (Dawa-Dawa) cheese made from the seeds of Parkia africana. The source of all data is given, and the lengthy footnotes accompanying each entry in this table take up more space than the table itself.

Note: This is the earliest German-language document seen (March 2001) that mentions soy nuggets, which it calls Hamananatto. Address: Germany.

   • Summary: Contains a brief overview of the soybean, soybean production, and soybeans as a food product, with several long excerpts from Dr. J.H. Kellogg, and the USDA Year Book of Agriculture (about food uses, including shoyu or soy sauce).

A photo shows “Soy bean curds and cheeses in a Japanese factory,” in large earthenware containers (p. 362).
Note: This photo of “curds and cheeses,” taken by Frank N. Meyer, shows the production of fermented tofu, probably in a Chinese factory (See: {1} Morse 1918. “The Soy-bean Industry in the United States.” Plate IV, fig. 2; {2} Piper & Morse. 1923. The Soybean. p. 242).

Concerning use of food resources, in the USA and Canada, the chief goal of agriculture is not to feed humans but to feed animals. This was true even in the food crisis of 1918 [at the end of World War I]. About 5,191 million bushels of grain are now grown in the USA; in descending order of importance (in million bushels) they are corn (2,863), oats (1,422), wheat (643), barley (195), rye (54), and buckwheat (14). Of this total of 5,191 million, the American people eat less than 550 million (14.1%). Adding the 340 million bu exported, the total amount used for human food was 900 million bu (17.3%). “The rest, 4,300 million, went to our four-footed brethren, who outnumber us and whose food requirements, because of their greater size, are several times our own.

“In addition to the grain, they get all of the 85,360,000 tons of hay grown on 54,618,500 acres. (More than ten per cent of the half billion acres under cultivation in the United States). They also roam over millions of acres eating all the grass. It is therefore plain that more than four-fifths [80%] of the produce of American agriculture, even in 1918 [a war year], went to feed beasts.” Address: Prof. of Geography, Columbia Univ., New York.


• Summary: A call for the cultivation of the soy beans in France on the ground that they can be the source of valuable food products. Soybeans are said to be especially valuable as a food for diabetics, since they are re composed almost entirely of nitrogenous and fatty materials and contain practically no carbohydrates.

Food uses of soya: In the past, it has been objected to as a food because the dried beans are difficult to cook. The fresh beans, however, are said to be as easily cooked as peas and to have a flavor somewhat resembling that of chestnuts. The soybean can be used to make: (1) Flour, from which biscuits, pastries, and bread can be made. (2) Edible oil. (3) Vegetable milk (lait végétal), from which one can make a cheese [tofu] that can be eaten either fresh or dry, smoked or fermented. (4) A coffee substitute, after roasting.

A table compares the nutritional composition of soybeans grown in China, Hungary or France; there is no significant difference in their chemical compositions. Address: M.D., licencié în sciences.


• Summary: This important article begins: “Chinese red rice, or ang-khak (ang-quac) (Footnote: See Lafar 1906) is produced by means of a noteworthy fungus, Monascus purpureus Went. Red rice evidently originated in one of the provinces of China and even to-day may be procured only in certain localities of that country. It is well adapted to its special use, the coloring of food products, such as Chinese cheese, because of its property of breaking into fine particles when rubbed or brought into contact with water solutions. The Chinese have been very secretive concerning the preparation of red rice, and the literature contains only the following facts on the subject.” These are vague.

“Not withstanding the competing organisms, Monascus purpureus has always been successfully isolated from Chinese red cheese which are colored with red rice.”

Dr. Church obtained two strains of Monascus purpureus from silage, sent to her by A.R. Lamb of Iowa State College. Four more strains of Monascus purpureus “were secured from Chinese products, three from the superficial red coloring on soy bean cheeses and one from red rice.” In Dec. 1917, laboratory experiments with the pure culture manufacture of red rice were begun. Strain E of the mold, which came from “Chinese soy cheese,” resulted in more promising material.

The laboratory products developed by Church “were compared with a sample of red rice collected in China by Dr. Yamei Kin,” a Chinese woman doctor, working for the USDA Bureau of Chemistry.

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the terms “Chinese cheese” or “Chinese red cheeses” (or “Chinese red cheese”) or “soy cheese” or “Chinese soy cheese” to refer to fermented tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) which mentions the mold Monascus purpureus in connection with fermented tofu or which states that this species of mold is the cause of the red color in red fermented tofu.

Note 3. The author worked with Dr. Charles Thom. This was a study of the Monascus fermentation of rice to produce ang khak or red rice, which was used to color various foods such as fermented tofu, red rice wine, or roast meat. The purpose of the investigation was to determine the cause of the red pigment in commercial ang khak.

Note 4. This is the earliest study seen (Feb. 2007) of a fermented food published by a USDA researcher.

Note 5. This is the earliest document seen (Feb. 2007) published in the Western World that mentions “ang-khak” or “Chinese red rice” or “red rice.”

Dr. Church discovered the production of the red color in rice to be caused by a mold, Monascus purpureus Went. Not all strains of this mold are adapted to the production of red rice. She demonstrated that the rice moisture level had to
be at 25% or lower to get good pigment formation. Address: Bureau of Chemistry, U.S. Department of Agriculture, Washington, DC.

91. Church, Margaret B. 1920. Re: Request for information on and samples of fermented foods in China. Summary of research on these foods in the USA. Letter to Dr. Y.S. Djang, Chichi Industrial Inst., Tientsin, China, April 6. 2 p. Typed, without signature (carbon copy).

**Summary:** Church was given Dr. Djang’s name by Carl Fellers, who is presently a member of her Bureau and stationed in San Francisco, California. “We are studying in this office food products produced from soy beans by controlled fermentation processes, and also red rice (ang-kak). As it happens we have studied the Japanese process of making soy sauce most specifically.” Church requests samples of Chinese soy sauce not found on the U.S. market, “or sauce flavored with decoctions of such things as Perella or Cerela... We are interested in knowing to what extent sweetening such as molasses, caramel or sugar is used in Chinese soy sauce. Is the practice of sweetening soy sauce local, or confined to broad areas as southern China and not Central China?

“At times we have attempted to make fermented bean cheese. It would be of value to us if you could send us one or more of those little to-fu cheeses as they might be secured in the middle of the process, when they are covered with an inch or so of white mold...” Address: Microanalyst [Biological Laboratory, Bureau of Chemistry, USDA, Washington, DC].


**Summary:** “I have obtained some information regarding the manufacture of soy cheese and canned soy curd and have made one factory inspection. I hope to make a couple more soon and will be glad to send you a copy of my report when it is finished. As you probably know, Aspergillus is used in the manufacture of these products.”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “soy curd.” “Soy cheese” almost certainly refers to fermented tofu, and “canned soy curd” to canned tofu. Address: Bacteriologist, San Francisco, California.

93. Chung, H.H. 1920. Re: Offer to gather information about fermented soy products in China for Margaret Church. Letter to Miss Margaret B. Church, Biological Laboratory, Bureau of Chemistry, USDA, Washington, DC, April 27. 1 p. Handwritten. [Eng]

**Summary:** Chung plans to return home this coming July; his address will be Nan Kai College, Tientsin, Chihli province, China. “I shall be very glad to do my best for you in gathering information about the fermented food products of my country and securing samples of the same, whenever possible, after I have arrived at home. At present I have nothing to add to what I already told you about the making of soy sauce. The people in my province (Kiangsi) also make cheese out of tofu as you described, and we usually dye it with the powder of a kind of seeds which I think are those of Bixa Orellana L. [annatto]. I have never examined the mold with a microscope, so I cannot say what mold is used here. Yours truly...”

Note: At the top of the letter Miss Church has written “Chinese cheese.” Address: 120A Conant Hall, Cambridge 38, Massachusetts.


**Summary:** In No. 1 (Aug. 1920), soybeans and soyfoods are discussed in the following sections (p. 218-19): (7) Yellow soybeans. (8) Soy nuggets or shi (explanation, about the name). (9) Jiang or shô (explanation, about the name). (14) Fermented tofu. Since the text is written in Chinese characters, it is hard to tell the meaning of sections 10-13.

No. 2 was published in Nov. 1921. No. 3 in May 1922. No. 7 in March 1924. No. 8 in Sept. 1924. No. 9 in Oct. 1925. Address: Kyôju Nôgakushi, Tôadôbunsho-in Shina Kenkyû-bu.


**Summary:** “Here is some soy sauce in a bottle—this was made between January and October 1920 in Washington, DC, by the Department of Agriculture.” Describes how soy sauce is made and its microbiology. Also discusses miso (red and white), grey-white or red Chinese cheeses based on soybean curd (made by ripening with a mold and then brining; in Foo-chow is made a red vegetable dye—made from ang-quac or red rice made with the red mold Monascus purpureus), katsuobushi. Address: USDA Bureau of Chemistry, Washington, DC.


**Summary:** “To ascertain whether or not there is any kick in Chinese (?) soy bean cheese made with alcohol,...." Director E.E. Mitchell yesterday lunched on this delectable dish—that is, he attempted to make a lunch out of the delicacy.

"‘Its sure got a kick all right,’ he said, after partaking of a sample. ‘But not the kind I’m paid to look for. The kick in this cheese is of the limburger variety. No one can get
fact that these ‘Manna’ or Soya bean products were
László Berczeller of Vienna, there is no reference to the
“In the letter giving the details of the researches of Dr.
uses to which it can be put–of all legumes.
are losing by our neglect of this, the most valuable–for the
manna bread, and milk substances made from the Soya bean,
and many semi-public bodies. The early experiments failed
our Board of Agriculture, the Royal Agricultural Society,
[54x425]“My interest in the Soya bean began in 1913 with a
Virginia.
By 1918 Europeans were aware of 500 different soybean
varieties that were growing experimentally at Arlington,
Virginia.

“Soya bean cheese is made by preparing a paste [sic,
firm tofu] from soya beans and cutting it up into pieces
which are pickled in 20 per cent alcohol and brine. At the
end of sixty days it is ripe. The liquid is poured off and the
cheese, which retains 3 (?) per cent alcohol, is used as a
condiment.”

Note 1. We call this product “fermented tofu.” The text
of this article is very hard to read, as indicated by “(??)” after
uncertain words or numbers.

Note 2. This is the earliest English-language document
seen (Oct. 2011) that uses the term “soya bean cheese” to
refer to fermented tofu.

97. North, J.L. 1921. To solve the cost-of-living problem? A

• Summary: “The leading article and letter in the Times
of Sept. 28 from its Vienna correspondent about Manna flour,
manna bread, and milk substances made from the Soya bean,
are likely to do good if they help us to realise how much we
are losing by our neglect of this, the most valuable–for the
uses to which it can be put–of all legumes.

“In the letter giving the details of the researches of Dr.
László Berczeller of Vienna, there is no reference to the
fact that these ‘Manna’ or Soya bean products were first
made in England before the war. Samples of the flour and
biscuits are to be seen in the cases of the London Institute
of Hygiene, and Manna milk has been for years–and, no
doubt, still is–sold here under the name of ‘Solac’ at a price
considerably lower than that charged for milk by dairymen.
The appearance and rapid rise into importance of the Soya
bean is one of the most remarkable commercial events of
modern times.”

“In 1790 the [soy] bean was brought to Europe when
its cultivation was first attempted by Young [Arthur
Young, lived 1741-1820 in England], the father of British
Agriculture, though without success. In 1878 an Austrian
professor, Haberlandt, tried it, but failed [Note 1. Haberlandt
did not fail; he successfully cultivated soybeans in Austria
as early as 1875, and many times thereafter.] When the bean
came here in 1908 there was an immediate rush to grow it
both in Europe and America. Experiments were started by
our Board of Agriculture, the Royal Agricultural Society,
and many semi-public bodies. The early experiments failed
completely, for the reason that they were made with seed
whose climatic origin was unknown, as well as the orthodox
Chinese methods of growing it. Later, this was remedied...

By 1918 Europeans were aware of 500 different soybean
varieties that were growing experimentally at Arlington,
Virginia.

“My interest in the Soya bean began in 1913 with a
visit from an agent of a German cultivator at the office of
the Royal Botanical Society at Regent’s Park. He was, he
said, trying to form a syndicate to grow what he called an
acclimatised Soya bean, brought from China in 1910, and
already in cultivation in Germany. He refused seeds for
testing, but sent from Hamburg a plant which had been
carefully cleared of the seed, though the empty pods, nearly
sixty in number, were left. The syndicate never materialised,
and I thought no more of the matter, until later on, whilst
examining the dried plant, I noticed a tiny pod, scarcely
half an inch long, which contained a seed no bigger than a
pin’s head. Going over the plant I found other pods which
evidently had been thought too insignificant to be of use,
and from these I obtained thirteen seeds. These were sown
in 1914 and resulted in thirteen plants, which produced four
hundred and forty seeds. From thirty-three plants in 1915
one thousand seeds resulted, and in 1916 no less than twelve
thousand. Many experiments as to the value of different
methods of growing them were made in several countries,
and with no less than twenty-one different foreign varieties.
One thing came clear throughout the tests, and that was that
the original variety started with was by far the best. It says a
good deal for German astuteness that they should have gone
to Manchuria and, from hundreds of varieties, chosen the one
best for them and for us.”

The future of the Soya bean in England is uncertain.
“Natural selection helps the plants that mature earliest
produce most seed; those that mature late die out. It is
noticeable that the plants experimented with in England fruit
earlier now than they did at first, and this is a very hopeful
sign. Another satisfactory fact is that there is no lessening
in the number of pods produced, but rather a gain. This year
there are plants with three times the number of pods shown
in a photograph of the best German-grown specimen of
1912.”

In China and Japan the Soya bean “enters into the
composition of most dishes, and in one form or another,
as Soy sauce, bean paste, bean cheese, bean curd, bean
milk, bean wafers, bean cakes and confectionery, is used
everywhere. For a hundred years Soy sauce has been
imported–the principal ingredient in the well-known
Worcester [Worcestershire] sauce.”

Apart from its value as a food, it is used in the
manufacture of glycerine, explosives, enamels, varnish,
varnish, waterproofs, linoleum, paints, soaps, celluloid,
printing inks, and as a lubricant.”

Photos (all but #1 by Frank N. Meyer of the USDA)
show: (1) A typical pod from a soya bean plant grown by
Mr. J.L. North at Chiswick, England, in 1921. (2) Two large,
thin “blocks of tofu (bean curd)” on a round, wooden table.
“Soya bean cheese for human food... Ready to be cut up into
squares for sale to the public. Tofu, or Soya bean curd, is
made by adding magnesium or calcium salts (about a 1 per
cent. solution) to hot Soya bean milk; the product is drained
and pressed. (3) “Varieties of soya bean cheese on a bamboo
tray. Tofu, or Soya bean curd, forms the basis of many

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Note 2. This is the earliest document seen (March 2002) written by Mr. J.L. North, the pioneer in cultivating soybeans in England.

Note 3. This is the earliest English-language document seen (March 2010) that uses the term “soya bean cheese” (or “soybean骄傲”) or the term “soya bean curd” to refer to tofu.

Note 4. This is the earliest English-language document seen (July 2007) that uses the term “magic bean” or that uses the word “magic” as an adjective to refer to the soybean.

Note 5. Concerning Arthur Young. He was the author of many books on agriculture, which were very influential in their day. He was an important advocate for the progressive agricultural practices of his time, advocating such innovations as the seed drill, improved crop rotations, the use of marl as fertilizer, and the enclosure of open fields. In 1767 he undertook the management of a farm in Essex. He conducted various experiments and published the results in A Course of Experimental Agriculture (1770). In 1784 he began the publication of the Annals of Agriculture, a periodical which was continued for 45 volumes and had many contributors. Young traveled to France during 1787-89 and in 1792 published an important book about his travels and observations there. The soybean was first grown in Paris, France, perhaps as early as 1740, definitely by 1779. So he may have learned about soybean from fellow agriculturalists in Paris while on this trip. Address: Curator of the Royal Botanic Society of London.


• Summary: This is the first comprehensive book about the soybean written in English, and the most important book on soybeans and soyfoods written in its time. Contains an excellent review of the world literature on soybeans and soyfoods with a bibliography on soy that is larger than any published prior to that time (563 references), a good description of the present status of the soybean worldwide based on the authors’ extensive contacts, and a great deal of original information. It quickly became a key source for people and organizations working with soybeans and soyfoods in all countries, and a major factor in the expansion of the soybean in the western world. Because of its scope and influence, Soyfoods Center considers the year of its publication to mark the end of the “Early Years” of the soybean worldwide. It remained in print until about 1986.

Contents: Preface. 1. Introduction: Name of the plant, origin, literature, use by the Chinese and Japanese, present importance, future prospects in the U.S., recognition of the possibilities. 2. The commercial status of the soybean: Manchuria and China, Japan, Europe, U.S., other countries, summary of imports and exports of soybeans and soybean oil. 3. Botanical history of the soybean: History prior to Linnaeus’ “Species Plantarum” 1753, Linnaeus’ misunderstandings of the soybean, Prain’s elucidation, other and the correct botanical name.

4. Agricultural history of the soybean: Vernacular names of the soybean, China, Korea, and Japan, India and neighboring regions, Cochin China, Malayan region, early introduction into the United States, later U.S. introductions, the early introduced varieties (grown in the USA by 1898–Ito San, Mammoth, Buckshot, Guelph or Medium Green, Butterball, Kingston, Samarow, Eda, Ogemaw or Ogemaw), soybean in Europe, varieties grown in Europe and identification, Hawaiian Islands, Australia, Africa, Argentina (p. 50), Canada (“Soybeans are grown in very small quantities in Canada and then usually as a forage crop”), Philippines, Egypt, Cuba (p. 52), British Guiana, Mauritius (p. 53), present culture distribution. 5. Culture of the soybean: Climatic adaptations, soil preferences, water requirement, preparation of seed bed, time of planting, methods and rate of seeding, seeding for pasturage, depth of seeding, inoculation, fertilizer reactions, cultivation, soybeans in mixtures (with cowpeas, sorghums, Sudan grass, Johnson grass, millet, corn, or sunflowers and corn).

6. Harvesting and storage of soybeans: harvesting soybeans for hay, silage, for the seed, seed yields, proportion of straw to seed, storing seed, separation of cracked from whole soybean seed, viability of soybean seed, pedigreed, inspected, registered, and certified seed. 7. Composition of the soybean: Proportions of stems, leaves and pods, composition of plant and seed, nutritive and mineral constituents, forms of nitrogen in soybean nodules, factors affecting oil content of seed. 8. Utilization of the soybean: Diversity of uses (a chart, p. 129, shows 59 products that can be made from soybean seeds, and 6 more that can be made from soybean plants), soybeans for green manure, pasturage, silage, ensilage, hay, straw.

9. Varieties: Japanese, Manchurian, botanical classifications, vital characteristics, descriptions of important varieties, key for identification, breeding and improvement, genetic behavior, oil content.

10. Structure of soybean seeds. 11. Soybean oil: Methods of extraction [Manchurian, and solvent], American oil mills, methods of shipping and marketing, prices, utilization in soap manufacture, food, paint manufacture, miscellaneous. 12. Soybean cake or meal: Feeding value, composition, use for feeding for dairy cows, cattle, swine, sheep, poultry, digestibility, injurious effects, fertilizer.

13. Soybean products for human food: Food value of the
soybean, digestibility of the soybean and its products, mature or dry soybeans, immature or green soybeans (a “nutritious green vegetable”), soybean flour, digestibility of soybean flour, soybean bran (p. 225-26), soybean sprouts, soybean coffee, soybean or vegetable milk [soymilk] (preparation, composition, residue from the manufacture of vegetable milk [okara], utilization of soybean milk, condensed vegetable milk, vegetable milk powder, fermented vegetable milk), vegetable casein, tofu or soybean curd (names and brief history, method of manufacture, coagulating agents, manufacturing yields, digestibility, utilization of bean curd and manufactured products, bean curd brains or tofu nao, dry bean curd or tofu khan, thousand folds (chien chang tofu), fried bean curd (tza tofu). Fragrant dry bean curd (hsiang khan), frozen tofu (kori tofu). Chinese preparation. Various dishes.

Tofu, “a sort of white cheese or curd... is called “Teou fu’ by the Chinese, ‘Tofu’ by the Japanese, and ‘Dan Phu’ by the Annamites [in today’s Vietnam]. It is said to have been originated by the Chinese philosopher, Whai Nan Tze, before the Christian Era, and was undoubtedly introduced into Japan from China by the Buddhists.”

“The coagulating agents most generally employed throughout the Orient are the concentrated mother liquid obtained from the manufacture of salt from sea water, burned powdered gypsum, and magnesium chloride... The junior author (Morse) has obtained successful results with rennet and 1 per cent. solutions of acetic, tartaric, and lactic acids. Sour milk has also given satisfactory results as well as the water [whey] drawn from the bean curd after coagulation. By the use of pure salts or rennet the bitter taste which is generally found in the curd made by Oriental methods is avoided.”

Yields: In commercial tofu production, 1 pound of beans is said to yield about 3.57 lb of tofu (i.e., the yield is 3.57). Champion (1885) got a yield of 1.53 and Paillieux (1880) got a yield of 1.50. Morse conducted many tests to determine the yield of curd from 19 different soybean varieties. His yields ranged from 0.686 to 0.282—extremely low. Different types of Chinese tofu: (1) Dry bean curd or tofu khan: bean curd squares are dipped in burnt millet-sugar sauce until rich brown in color. “Fine salt also has been rubbed on them. This form of cheese can be kept for several days and is generally eaten in soups.”

Note 1. This is the earliest English-language document seen (Aug. 2011) that contains the term “bean curd squares” or that uses that term to refer to Chinese-style pressed tofu. (2) “Thousand folds (chien chang tofu): This product is prepared by placing very thin layers of the bean curds on cloths, on top of one another, and subjecting them to considerable pressure and allowing them to dry for a short time. The layers of bean curd are then removed and rolled together like a jamroll. It is said to be eaten cut into strips, like noodles, in soups. When allowed to mold for several days it is fried in sesame oil and has a meat like flavor.”

(3) “Fried bean curd (tza tofu): The fresh bean curd is cut into small squares and fried in deep fat. After a few minutes the bean curd pieces float on the surface and they are taken out. This product is often fastened on bamboo fibers (Fig. 65) and may be kept for several days. They may also be eaten with syrup as fritters.” (4) “Fragrant dry bean curd (hsiang khan) [wu-hsiang toufu kan]. This form is made like the ordinary bean curd but great pressure is applied to drive out as much water as possible. The squares (Fig. 66) are first soaked in a weak brine or bean sauce to which powdered spices and burnt millet-sugar have been added and then are
thoroughly dried out. The curd becomes very hard and can be kept indefinitely. It is said to be eaten sliced in soups and in various vegetable dishes.”

(5) “Frozen tofu (kori tofu): Frozen bean curd is an excellent example of the application of the freezing process for the drying or concentration of a food. Fresh bean curd contains rather a high per cent. of water and is therefore a very unstable product. The fresh bean curd is cut into small pieces and exposed to severe cold weather. By freezing, the vegetable proteid shrinks and forms a porous cake permeated with ice crystals. This frozen cake can be readily thawed out and dried. It forms a product much resembling gluten bread in appearance. If the tofu is not frozen, it is difficult to dry and the resulting material is dense and horn-like...” (6) “Chinese preparation:... Tofu is quite generally preserved in loaves (100 to 150 grams) which are cooked in a decoction of turmeric roots. It is also preserved with salt. Often the curd is cut into small pieces and preserved in rice brandy [to make fermented tofu]. When smoked, the curd also keeps very well and can be wrapped in tinfoil for the market. Smoked curd is prepared by cooking the curd in a sauce diluted with water (80 per cent. and 20 per cent. soy sauce) and after cooking the curd is smoked in the same manner as meat.”

Various American- and European-style recipes: “When cut into small pieces and cooked with an egg, it furnishes an excellent omelet. It also may be used as the principal ingredient in baked stuffed peppers. The fresh tofu makes an excellent salad or sandwich filling if the curd is chopped finely and chopped olives, pepper, salt, and mayonnaise dressing are added. When cut into small pieces and cooked in tomato sauce or similar sauces, a very good meat substitute is obtained. Cooked with meat broth, the curd takes the flavor of the meat. It is readily seen that the fresh bean curd can be utilized in many ways and when the people of the western world become better acquainted with this simple method of manufacture, it will no doubt, become more generally utilized.”

Nineteen tofu recipes are given on pages 273-78.

Photos show: (1) “Large blocks of freshly made bean curd ‘Tofu’ ready to be cut up into squares and sold for breakfast.” (2) “A large bamboo tray full of various kinds of bean curd. In the little wooden tubs on the ground the watery sorts of curd are kept immersed in saline water.” (3) “Squares of fresh bean curd fried in oil and put on a string of bamboo fiber. Called tza tofu (fried bean curd) and said to supply a ‘snack’ in between meals for hard working Chinese laborers.” (4) “A semi-dry bean curd of the consistency of smoked sausage, called ‘Hsiang khan’ (fragrant dry) which is eaten sliced in soups, and with vegetable dishes.” Two squares, each bearing a stamped mark, are shown next to an open pocket knife for size comparison. (5) “A semi-dry fresh bean curd, called ‘Lao to fu’ (old bean curd) said to be used by the poorer classes of Chinese for breakfast.” One square (with a cloth-like texture on the surface) on a small plate, and a broken half square are shown. (6) A room in which fermented tofu is being made. “A dark room of even temperature where wooden frames, full of squares of bean curd are piled, one on the other, the lowest resting on a layer of somewhat damp rice straw.” One tray is open, showing the rows of tofu cubes, each covered with a white mycelium. (7) “Large earthen jars, full of squares of bean-curdi, which are covered over with spiced brine and soy-sauce. After several months’ curing a new product has been formed, called ‘Foo-yu’–Bean cheese [fermented tofu], which can be kept for many years and becomes better with age.”

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “Foo-yu” to refer to fermented tofu.

Note 3. Each of these 7 photos was taken (probably in China) by Frank N. Meyer, Agricultural Explorer, USDA.

Tables show: (1) Yields of bean curd obtained by William Morse from different varieties of soybeans. Variety #37062 gave the highest yield of tofu. 50 grams of soybeans yielded 34.3 gm of tofu and 30.5 gm of “Cake” [okara]. Note 4. This yield of 0.69 is very low; it should be at least 2.5. Variety #38462 gave the lowest yield, 0.28. (2) Composition of tofu and tofu products, compiled from various sources: Five samples of fresh tofu (6.0% protein on average), one frozen tofu (48.65% protein and 28.65% fat), and one fried tofu (21.96% protein and 18.72% fat).

Note 5. This is the earliest English-language document seen (Feb. 2004) that uses the term “soybean curd” to refer to tofu, or that uses the word “Teou fu” (or “Teou-fu”), or the word “Dan Phu” (or “Dan-Phu”) to refer to Chinese-style tofu.

100. Church, Margaret B. 1923. Soy and related fermentations. USDA Department Bulletin No. 1152. 26 p. May 12. [27 ref]

• Summary: This long and very informative paper, with its excellent bibliography and review of the literature, is the third earliest study seen of a fermented food published by a USDA researcher. The focus is on Japanese fermentations because of the laboratory’s contact with Japanese researchers, such as Dr. T. Takahashi and Dr. G. Kita. “The experimental work reported here was conducted under the direction of Charles Thom, mycologist in charge, Microbiological Laboratory, Bureau of Chemistry.”

some additional starchy component. It is widely used as a seasoning throughout Japan, China, and Java [Indonesia], and has been introduced into the Philippines and Hawaii* (*= See letter from C.W. Carpenter, Sept. 23, 1918). Where the occidental would use a vegetable or meat extract and salt, the oriental daily uses soy sauce. Americans are familiar with soy sauce as it is used in the Chinese-American restaurants and as an ingredient which produces the characteristic flavor of the Worcestershire type of sauce." In Japan, the process of preparing "shoyu-koji," a mold-fermented product made from "tane-koji," takes 3 to 4 days. "The mold-fermented material is emptied into a strong brine, thus producing a mash. Constant daily attention is given to aeration, even distribution, and stirring of the solid ingredients. Progressive changes take place over a period of from six months to several years, until at last the mature ‘moromi,’ as the mash is designated by the Japanese, is produced. These changes are due partially to the activity of bacteria and yeasts, but chiefly to the enzymes of the mold introduced into the mash with the koji."

"Experimental work: The Department of Agriculture had certain strains of the Aspergillus flavus-oryzae group of molds known to be used in making soy sauce. Through the courtesy of W.T. Swingle, of the Bureau of Plant Industry, a can of commercial Japanese rice tane-koji designed for shoyu manufacture was also received. Dr. Gen-itsu Kita brought additional samples of shoyu tane-koji under sterile conditions directly from Japan. Provided thus with soy beans, wheat, and the mold ferment, experiments with soy sauce were undertaken by the Bureau of Chemistry in 1918.

(1) "Apparatus: The apparatus was made according to specifications drawn by Doctor [T.] Takahashi, of the Imperial University of Tokyo, who worked in the bureau for a month." "The usual Japanese koji room (fig. 2) is 32½ feet long, 11 feet wide, and 7 feet high. The walls are thick, and in the more modern factories are built of brick, which does away with fluctuations in the temperature from without. At one end of the room is an entrance and at the opposite end a window. In the ceiling several openings provide means of escape for the carbon dioxide [dioxide] and the damp air. Steam pipes along the floor make it possible to warm the room in cold weather. The ceiling is built with many layers of straw in order that the condensing moisture may be absorbed. One disadvantage of such a ceiling is that infection always occurs in the wet straw. A large area of infection directly over the piles of koji trays is detrimental to the production of sweet koji. In modern buildings, therefore, the surface of the ceiling is coated with cement. When a cement ceiling is used the condensed water drops on the trays of koji, which also is harmful... The burning of sulphur is useful in combatting any infection of a koji room."

Material: “The mold ferment employed in shoyu-koji manufacture is Aspergillus flavus Link, occasionally A. oryzae (Ahlb.) Cohn, or strains intermediate between the two species.” “Certain Japanese manufacturers add cultures of pure yeast belonging to the genus Zygosaccharomyces at the time of placing the first mold-fermented material in the brine.”

Preparation of ingredients: While soaking the soy beans, the water should be changed at intervals of several hours to prevent the formation of spore-forming rods, which cause heating and souring. The spores of these bacilli are on the beans as they come from the field. “After being soaked for 20 to 24 hours the swollen beans are cooked in an open kettle or under pressure until they are soft enough to be easily pressed flat between the thumb and finger. This desired softness can be obtained by autoclaving at 15 pounds pressure for 50 minutes and also by much longer cooking in an open kettle. Autoclaving under pressure has the advantage of sterilizing the material.” After roasting, the wheat is crushed or cracked. It is important to “reduce some portions of the kernel to a fine powder or dust.” The cooked beans and cracked wheat are “mixed in large trays or on mixing tables.” Hot beans “may be cooled with a draft of air directed over a thinly spread layer.” These “two ingredients need to be thoroughly mixed, so that the wheat dust may form a coat over each bean. The lower water content thus induced on the exterior of the beans makes them better adapted to mold growth than to bacterial growth.”

“Shoyu-koji–Ripening: After the beans and wheat are thoroughly mixed, a very small quantity of previously molded material, such as mature rice koji (tane-koji), some shoyu-koji, or a pure mold culture, is thoroughly mixed into the ingredients. The whole mass is then distributed into the small flat koji trays (Plate II, inserted between pages 4 and 5) which are immediately placed into the koji fermentation room before they cool further. Each tray holds about 1.8 liters, or about 2 quarts of raw material. The koji trays are placed in tiers along the wall of the room (Fig. 3).” They are usually stacked in a zigzag fashion to ensure adequate aeration. This is extremely important “because moisture and the lack of oxygen induce the development of mucors and bacteria, and are said to cause the diastatic enzyme to develop at the expense of the proteolytic enzyme. In some localities in Japan no such trays are used, but a broad straw mat with which very good koji can be secured.” “The koji room or compartment is kept at a temperature of 24° to 25° C., with a definite humidity.” Continued. Address: Microanalyst, Microbiological Lab., Bureau of Chemistry [USDA].

101. Church, Margaret B. 1923. Soy and related fermentations (Continued–Document part III). USDA Department Bulletin No. 1152. 26 p. May 12. [27 ref] • Summary: Continued (p. 20): Relation of enzymic activity to soy processes: During the ripening of the moromi, the essential factors are diastatic and proteolytic enzymes produced by the mold. But what part do the enzymes of the
bacteria play? “Increasingly great numbers of bacteria in the koji cause an undesirable flavor in the final soy sauce.”

Manufacture [of soy sauce] in the United States: Making soy sauce is a complex, subtle, and difficult process. “If this were not true the process would not be regarded as secret, as it so generally is in the Orient.” Church was interested in helping a soy sauce industry to develop in the USA.

“The majority of soy sauce makers and manufacturers in the Orient employ purely rule-of-thumb methods which have been handed down and individually perfected by more or less successful experience. Accurate knowledge of the reasons for the steps involved in the process as practiced is not common.”

“Of the almost innumerable ways in which soybeans are used in the Orient as more or less elaborately prepared foods, soy sauce seems to offer prospects of more immediate adoption in the United States than any other product...”

“Soy sauce has already gained a strong foothold with frequenters of Chinese-American restaurants.

“Table sauces containing soy sauce as an ingredient are to be had in a great variety of grades and flavors. They also present an unlimited field for further variation. Concentrated forms of seasoning, such as yeast and vegetable extracts suitable as meat substitutes in flavoring soups and other prepared dishes, are receiving consideration by manufacturers.”

“The manufacturers of table sauces and condiments interested in soy sauce are among the largest and best known firms of the United States... One company at least in the United States manufacturers a wholly domestic product.”


• Summary: “In China the curd, or to-fu, made from soybean milk, is ripened with a mold preparatory to a ripening in brine. Such products are commonly termed cheese by travelers. The to-fu is cut into square, rather thick pieces which are arranged on the narrow face in rows upon traylike racks. The racks are stacked zig-zag fashion, or so that aeration is possible under damp conditions. The squares of bean curd become overgrown with a mold. The final cheese as received in the United States shows the mold on the squares of curd as white mycelium with no fruit. After the development of the mold on the curd the squares of to-fu are placed in brine for further ripening. At the completion of this ripening the product is utilized as a food product. It comes into the country commonly as canned white or red squares of fairly salty bean curd, covered with a salty liquid which is thick because of the crumbling from the curd itself. The red color in such mold-ripened and brined to-fu is due to red rice, made by changes produced upon rice kernels by the mold Monascus purpureus Went.” Address: Microanalyst, Microbiological Lab., Bureau of Chemistry [USDA].

103. Douglas, Carstairs; Barclay, Thomas. 1923. Supplement to dictionary of the vernacular or spoken language of Amoy. Shanghai, China: Commercial Press Ltd. 276 p. See p. 221. 28 cm.
• Summary: This edition was found bound at the back (p. 613) of the 1873 edition. See tâu (R. tô) = “pease or beans,” chìu tâu-hû “soured bean curd.” Address: 1. Rev., M.A., LL.D. Glasgow; 2. M.A., DD., Glasgow, Missionary of the Presbyterian Church of England, Tainan, Formos.

• Summary: Name of company with diacritics is: Minami Manshû Tetsudô K.K. Kôgyô-bu. Nôm-u-ka. This important, major work was written by Yoshitane Satô. Contents: Photos (on unnumbered pages at the front of the book) show 16 scenes of soybean transportation, storage, and processing in Manchuria, as follows: (1) Mule drivers whipping mules trying to pull carts loaded with large sacks of soybeans over muddy roads. (2) Cylindrical osier storage bins for soybeans. (3) Row upon row of sacks of soybeans piled high in storage near docks. (4) Soy sauce being made in a courtyard; each earthenware jar is covered with a woven conical lid. (5) The inside of a huge and modern soy sauce plant. (6) Wooden kegs and glass bottles of Yamasa shoyu. (7) Soy sprouts growing in round woven baskets. (8-11) Soy oil being pressed using vertical screw presses [as an alternative to hydraulic presses]–four views. (12) Boilers used in a soybean mill. (13) A wooden barrel of soybean oil being sealed. (14) Soy oil packaged in many small containers, each surrounded by a wicker basket. (15) Round soybean cakes stacked high on railway flatcars. (16) The inside of a modern soy oil factory.

Contents: 1. Current status of soybean production and consumption: A. Production: Overview (p. 2), Japan (p. 4), Korea (p. 12), Manchuria (p. 16), China (except 3 eastern provinces, but including Eastern Inner Mongolia, p. 31), USA (p. 34), British colonies (p. 37), European countries (p. 40). B. Consumption: Japan (p. 41), Korea (p. 52), Manchuria (p. 57), China (p. 59), Dutch East Indies (Indonesia, p. 60), USA (p. 61), European countries (p. 63).

2. Characteristics of soybeans: A. From a physical sciences viewpoint (p. 67): Structure (overview, cotyledons, hypocotyl, seed coat), contents of each system (p. 70), appearance (p. 73); color, gloss, shape, size, hilum (fissuma) color, young plumule leaf color, ratio of seed to seed coat).
B. From chemical viewpoint (p. 82): General composition, structure of each component (p. 109; protein, oil, carbohydrate, ash/minerals, vitamins). C. Appearance and relationship between oil and protein content (p. 126): Oil and protein color related to color, glossiness, shape, size, hilum color, young plumule leaf color. D. Evaluating soybean quality (p. 140): Overview, key points (sizes, shapes, colors, glossiness, hilum color, young plumule leaf color, ratio of seed coat to seed, dryness of seed, volume, weight, smell, mixing of different varieties, ratio of imperfect seeds, amount of other types of seeds), collection of materials for testing, testing and evaluating commercial soybeans.

3. Soybean usage and processing (p. 175). A. One view of main usage of soybeans. B. Nutritional value of soybeans as food (p. 183): Nutritional value of soy protein. C. Processed soyfoods (p. 208): Soy sprouts (p. 208), natto (itoiki nattō, p. 212, Hamanatto, p. 224), types of tofu (regular tofu [namama-dōfu, p. 226], kori-dōfu or koya-dōfu, p. 240, aburaage, p. 245, tofu curds [tofu nō, p. 247], hard tofu [tofu-kan, p. 247], fragrant hard tofu [kō-kan, p. 248], senchō tofu, p. 249, fermented tofu [nyūfu or funyū, p. 249]), tofu-p’i or yuba (p. 256), soymilk and artificial cow’s milk, p. 259, soybean flour raw, or roasted (kinako, p. 263), shoyu (p. 266; overview of miso and shoyu, Japanese traditional regular shoyu, p. 267, Japanese traditional special shoyu and tamari, p. 269, Chinese soy sauce, p. 272, recent shoyu research and development, p. 274), miso (p. 280; Japanese traditional regular miso, Japanese traditional special and processed miso, p. 282, Chinese miso, recent miso research and development, p. 285). D. Soybeans as feed or fodder (p. 287; green soybeans as feed, p. 290): Fresh forage, dried forage or hay. E. Soybeans as manure or fertilizer (hiryō, p. 297; in the Kaijō area of Manchuria, have been roasted and steamed, or mixed with compost, and used for green manure (ryokuhai) or soybean cake (daizu kasu). This method has also been used in the northeastern provinces (Tohoku chigo) of Japan in rice fields). F. Soybeans as oilseeds (p. 302). G. Use of soybean protein in industrial products (p. 304).

4. The soy oil extraction industry (p. 305): A. Methods of removing the oil (origins, traditional methods, hydraulic pressing, extraction method, p. 340). B. Advantages and disadvantages of each method (p. 348). C. The soy oil industry in Manchuria (p. 357): History of development, important places for soy oil on the Manchurian Railway, economic condition of the Manchurian oil industry (p. 420), oil extraction in Japan (history, p. 437, commercial factories, p. 442, development of these factories, p. 451).

5. Soybean meal or cake and its composition (p. 464). A. The varieties of soybean meal or cake and the composition of each. B. Evaluation of quality (p. 473). C. Soybean meal or cake as a fodder (p. 478): Feeding value and digestibility, incorrectness of the theory that there are bad effects from feeding soybean meal or cake (p. 479). D. Soybean meal or cake as a fertilizer (p. 490). E. Soybean meal or cake as food (p. 504): Use as a raw material for shoyu production (p. 506), use to make soy flour (p. 509). F. Soybean meal or cake as a source of protein in industrial products.

6. Soy oil and its processing (p. 526). A. Characteristics of soy oil: Composition, physical characteristics (p. 535), chemical characteristics, testing and evaluating soy oil (p. 564), the quality of commercial soy oil products (p. 577). B. Refining soy oil (p. 587). C. The use and processing of soy oil (p. 631): Overview, refined soy oil as a food, substitute for salad oil, or for deep-frying oil, as an illuminant, as a cutting oil, lard substitute, margarine, in paints, soap, hardened oil, for waterproofing, substitute for petroleum oil, glycerin, fatty acids, stearine.


Note 1. This is the earliest Japanese-language document seen (Oct. 2011) that mentions fermented tofu, which it calls nyūfu or funyū.

Note 2. This is the earliest Japanese-language document seen (Feb. 4) that uses the term itoiki nattō to refer to natto. Address: Dairen, Manchuria.
are cheaper than the green variety by several hundred cash per hundred catties.

“The method of manufacture is briefly as follows. The beans are first cooked, then mixed with wheat flour and table salt, and put in a slightly closed wooden jar. The contents of the jar are afterward sprinkled with salt solution, and then transferred into a porcelain kong [earthenware vessel], in which they are hard pressed. Finally they are heated in the sun: the longer they are exposed to sunlight, the better the taste of the soy produced.

The soy [sauce] produced in Foochow is inferior in quality to the Kwantow product. The general processes of manufacture are practically the same, the only difference being in details, which remain a commercial secret among the manufacturers.”

Other reasons for the superiority of Kwantow soy sauce “may be enumerated as follows: (1) Absence of adulterants. Soy [sauce] is generally divided by its color into two kinds, the light color soy and the dark color soy. The former is pure and has a pleasant taste; it is sold at 1,280 cash per catty. The latter is adulterated with molasses, so as to reduce the cost of manufacture; it is therefore much cheaper in price, not exceeding 32 cash per oz.

(2) Longer exposure to the sun. The Foochow manufacturers are less spacious and less sunny than the Kwantow manufactories. The soy in the former is exposed to the sun for eight or nine hours a day, while the soy in the latter is exposed from sunrise to sunset.” This partly accounts for the superior quality of the Kwantow soy.

(3) Long period of preservation. Having been prepared, the soy should remain in the sun for a year before being sold. Old soy is better than fresh soy, as old wine is better than new. However, small manufacturers cannot afford to keep their output for such a lengthy period and sell it after a few months.

“While Tang Sen-hsing and Kwo Pen-yi confine their business to soy, the Tung An also deals in the following: Table salt; chiang [jiang] (CC) a semi-solid soy, distinguished from chia-n-glou, which is a liquid soy; distiller’s grain; vinegar; dried bean curd [probably Chinese-style pressed tofu, doufu-gan], pickled bean curd [probably fermented tofu]; salt eggs; salt vegetables and melons; prawn oil; samshu; sesame seed oil; salt turnip; &c. Tang Sen-hsing and Kwo Pen-yi are the best soy makers in Foochow, while Tung An produces excellent pickles.

“Soy and pickles in store are kept in porcelain kongs or sometimes wooden barrels. Soy to be transported to other cities is packed in glass bottles or bamboo bottles, the former having a capacity between half a catty and two catties, the latter between three catties and ten catties.

“Owing to the increase in the price of salt from $6 to $8 per 10 catties, soy manufacturers in Foochow have raised the price of soy by 16 cash pr catty in May. Prices of other products have also been advanced by the following rates.

Dried bean curd, from 8 cash to 10 cash a catty. Pickled bean curd, from 20 cash to 24 cash a catty...”


• Summary: Page 539: “The liquid substance is like milk in appearance and on coagulation becomes the bean curd, or [when fermented], as it is sometimes called, Chinese cheese. There is an enormous consumption of bean cheese in China and in Japan. Still it is not made in factories. Every small town has a bean-curd shop. It must be made fresh each day and resembles cottage cheese.”


Address: Manchuria.


• Summary: The nutritive value of many Chinese foods (water, protein, fat, ash, crude fiber, carbohydrate, calories) is given (with the English name, scientific name, and name in Chinese characters), including the following: wheat gluten, sesame seed (p. 155), yellow soy bean, black soy bean (large or small), green soy bean, soy bean sprout (yellow or green), soy bean flour, soy bean curd, soy bean dregs (okara), bean curd (doufu-gan, boiled in salt and spices and partially dried), oil skin ([yuba], from boiled soy bean milk), bean curd skin ([yuba], dried, or rolled like bamboo), soft bean curd, soy bean milk (p. 156), smoked bean curd, sheet bean curd, fermented bean curd, pickled bean curd, soy bean (fresh) (Characters: hair + bean = mao tou), wild soy bean, red gram bean (red small bean, Phaseolus mungo [azuki bean], p. 157), cucumber pickled in soy bean paste (p. 175).

Condiments: Thick soy bean paste, thin soy bean paste, fermented soy bean, fermented bean (dried), thin soy bean sauce (white), thick soy bean sauce (white), thin soy bean sauce (black), thick soy bean sauce (black), soy bean sauce (“chemical”), sweet flour paste (p. 176).

Table 4 (p. 180) gives the calcium, phosphorus, and iron content of some Chinese foods in percentages of edible portion, including the following: Wheat gluten, job’s tear, yellow soy bean, black soy bean, red gram bean [azuki], green soy bean (fresh), soy bean flour, soy bean milk, bean curd (Southern style and Northern style).

Table 5 (p. 182) lists foods as sources of vitamins A, B, C, or D, including the soy bean (an excellent source of vitamin B).

Note 2. This is the earliest English-language document seen (Feb. 2004) that uses the word “doufu-gan” (or “doufu
gan”) to refer to Chinese-style firm tofu. Address: Dep. of Biochemistry, Peking Union Medical College, Peking, China.


• **Summary:** Discusses *Aspergillus* molds, soya sauce or shoyu, shoyu-koji, tane-koji, the shoyu-yeast (a strain of *Zygosaccharomyces*), the sodium salt of glutamic acid (which imparts a meat-like flavor to these purely vegetable preparations), *aji-no-moto*, red miso and white miso (*shiromiso*), natto, the protein-splitting powers of the enzymes secreted by the molds mentioned above.

Red soya cheese is a type of tofu. The ripened curd is immersed in a brine and the maturing is finished by a purple mold—*Monascus purpureus* (Went.)—which imparts a red color to the finished tofu.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Red soya cheese” to refer to fermented tofu. Address: Ph.D., A.I.C.


• **Summary:** Also called the “Log of the Dorsett Morse Expedition to East Asia” and (by the National Archives) “Dorsett-Morse Expedition to the Far East, 1929-31,” this is one of the most important documents ever produced on soybeans and soyfoods. Covering the period from late 1928 until 1932, it consists of 17 volumes of typewritten unpublished manuscript plus handwritten notebooks.

The two explorers, who were gone on the expedition for a little more than two years, initially planned to be gone for about three years. They took 3,369 photos of which 95% appear in the report; the original prints are pasted on the pages, each with a number and a caption. The first negative number is #43196 (p. 238) and the last is #46514. The last numbered page of the report is #8818, but most of the index pages are not numbered and some special reports at the end of the main report each start with page 1.

The first quarter of the pages (to about page 2,500) are indexed, using 4 separate indexes. The only original and 2 microfilm copies were at the American Soybean Assoc. (St. Louis, Missouri), however as of Aug. 2011 they are on permanent loan to Rare and Special Collections at the National Agricultural Library (Beltsville, Maryland)—which also has 7 photograph albums that accompany the 7 log books. A list of the missing pages has been compiled. One photocopy of a microfilm copy is at the Soyinfo Center (Lafayette, California). One microfilm copy is at the National Archives in Washington, DC, in Records of the Bureau of Plant Industry, Soils, and Agricultural Engineering, Record Group 54. See: “National Archives Microfilm Publication No. M840. Expedition Reports of the Office of Foreign Seed and Plant Introduction of the Department of Agriculture, 1900–1938.” Rolls 16-20, volumes 56-73. These microfilm rolls may also be available for viewing or duplication at one of the various regional branches of the National Archives (e.g. San Bruno, California).

A brief itinerary of the trip is as follows: 1929 Feb. 18–The party of 5 people leaves Washington, DC, for Los Angeles by train. It consists of Morse, his wife Edna, their daughter Margaret (age 7), Dorsett, and his daughter-in-law Ruth (Bobbie; the widow of Dorsett’s son, she served as Dorsett’s secretary and general helper).

March 1–They sail from San Francisco to Yokohama on the S.S. President Grant of the Dollar Steamship Lines. March 29–Arrive in Yokohama, proceed directly to Tokyo, establish headquarters with rooms at the Imperial Hotel, and hire an interpreter, Mr. Suyetake, who works with them for the next 2 years. May 21–The Morses go to Hokkaido, the Dorsetts to Kyoto, by sleeper train. Morse returns to Tokyo.

Aug. 17–The entire party arrives in Hokkaido and establishes headquarters in Sapporo to study soybeans. Oct. 8–Leave Hokkaido for the Northeast Provinces, then arrive in Tokyo on Oct. 15. Oct. 22–Arrive in Keijo (Seoul), Korea, then take many side trips. Note: 1929 Oct. 29–Great Depression begins in USA with stock market crash. Dec. 8–Return to Japan via Kyushu, then to Tokyo to study soyfoods. They buy and photograph many!

1930 April 1–Travel by steamer to Dairen, Manchuria, where they set up headquarters. Dorsett very sick from April 11 to June 11; taken to a Japanese hospital in Dairen, he almost dies of double pneumonia. Morse does the work of both men and does not inform USDA of Dorsett’s critical condition. June 24–Morse takes a quick trip to northern Korea, via Mukden and Antung (Tan-Tung), to look for Zoysia grass.

July 1–Returns to Manchuria via Mukden. July 21. Dorsetts leave for Peking by train; Morses and Mr. Suyetake stay in Dairen. Aug. 21–Morse party travels to northern Korea, staying in Heijo (Pyongyang / P’yongyang); takes a 4-day side trip to Seoul. Sept. 28–Morse returns to Dairen, Manchuria.

Oct. 19–Morse party leaves Dairen, arriving in Peking the next day. Nov. 9–Morse party returns to Dairen. Nov. 30–Morse arrives in Harbin, north Manchuria, then passing through Mukden, returns to Dairen. Dec. 18–Morses leave Dairen for Japan, passing through Kobe on Dec. 21 and arrive in Tokyo on Dec. 23.

for the USA, arriving in San Francisco on March 4. March 15—Dorsett party leaves Peking for Tientsin, Shanghai, and Hankow. March 27. Dorsetts sail from Shanghai to San Francisco.

Note 1. The title of this report is puzzling since the expedition never went to Taiwan, Singapore, Java, Sumatra, or Ceylon. It was proposed several times that they visit these places, but the plans did not work out.

Note 2. This is the earliest log (unpublished) seen (Oct. 2001) that mentions soy. Address: Agricultural Explorers, USDA, Washington, DC.


• Summary: Appendix V is an 8-page table titled “Total quantity and fuel value of food consumed by twelve elementary school teacher families in one month.” The section on “Vegetables” (p. xvii) mentions numerous soybean products, with both the English-language name and Chinese characters, including:
  - Bean-curd (dou fu) [firm tofu]
  - Bean-curd, green, fresh (ma dou fu).
  - Bean-curd, preserved (chou dou fu) [stinky tofu].
  - Bean-curd, smoked (dou fu gan) [smoked tofu].
  - Bean-curd, smoked, thin (dou fu si) [smoked tofu noodles].
  - Bean-curd, lamina (qian zhang) [pressed tofu sheets].
  - Bean, lamina (fen pi) (made from mung beans).
  - Bean-curd, cheese (jiang dou fu) [a type of fermented; tofu preserved in Chinese jiang].
  - Bean-curd, green, dried (ge xi dou fu).

Note: We have never heard of two of these types of tofu before: (1) Bean-curd, green, fresh (ma dou fu). (2) Bean-curd, green, dried (ge xi dou fu). From the name and context they appear to be made from soybeans. Address: Formerly Prof. of Sociology, National University, Peking, China.


• Summary: Describes fermented tofu and its preparation. “It is probable that the Chinese are the best empirical dieticians in the world... At any Chinese restaurant one may obtain, by asking for it with sufficient diligence, a cheese made not from the animal protein of milk but from the vegetable protein of the soybean. Persistence in the asking is usually required, because the Chinese manager of the restaurant keeps this food on hand for his own use. It is only in rare instances that his American customers know or ask for it.

“Soybean cheese is highly salted and its use by the Chinese corresponds very closely to our use of Roquefort cheese. The Chinese do not serve salt on their own tables, but they salt and at the same time season their food by the addition of one of two substances, soybean cheese and soybean sauce... Soybean cheese is excellent when served with salad, meats, vegetables or bread.”

“Protein is extracted from the soybean in the form of a milky liquid by a process of grinding, boiling and straining.” The protein in this “soybean milk” is coagulated or precipitated to form white curds by adding brine made from impure salt [nigari] containing as impurities magnesium chloride and calcium chloride, in much the same way that cheese curds are precipitated from dairy milk by adding rennet.

From the firmly pressed soybean curds, soybean cheese is made through the process of fermentation described in a forthcoming paper titled “A New Species of Monomucor, Mucor sufu, on Chinese Soybean Cheese.” The author of this paper, Mr. Nganshou Wai, chief chemist of the National Hygienic Laboratory, Shanghai, is a native of Chekiang Province, China, and was graduated in 1924 from the Japanese Imperial University, Kyoto, where he became especially interested in biochemistry. He then worked for two years in Kyoto in the laboratory of Professor Genitsu Kita, whose studies of fermentation are well known.

“Mr. Wai has isolated from soybean cheese [fermented tofu] a mold which uniformly accompanies the proper fermentation of this cheese.” He “has grown the mold in pure culture, and by inoculating fresh soybean curd with it, he has produced soybean cheese of characteristic flavor and texture.

“The original account of the experiments was published in Chinese, with illustrations, in December, 1928, in the Agricultural Journal of the Agricultural College, National Central University, Nanking. Mr. Wai’s paper, an abstract of the original, is the first presented in English.”

Note 1. See the next issue of the this journal, Sept. 27, p. 307-08.

Note 2. This is the earliest published English-language document seen (Oct. 2011) that uses the term “soybean cheese” to refer to fermented tofu.


• Summary: “The utilization of fermentation microorganisms was known so early in China that we can trace it back to the Hsia Dynasty, 2000 B.C... From the scientific point of view, the old manufacturing methods seem to be fundamentally sound. For example, the regulation of temperature, the purity of the culture and the means of pasteurization and preservation are conducted so skillfully that we can not but be impressed with the painstaking and accurate observations on natural phenomena in the past. The application of mono-mucor in the manufacture of ‘sufu’ is such an example.
“Sufu” or “tosufu” is a well-known dish in the Chinese
dietary. It is made from soybeans and sold everywhere
in groceries.” Soy milk is coagulated with brine to make
tofu. “The tofu is pressed in wooden molds into blocks of
desirable sizes, which are then arranged on bamboo trays
and left in the fermentation chamber for about a month.
The manufacture of sufu begins in December and ends
in February. The average temperature of the fermentation
chamber is found to be 14°C. After this treatment these
blocks are transferred to large earthenware barrels, each
having a volume of seven hectoliters. Then salt and
Shoushing wine are added one after the other to the blocks,
mainly for the purpose of preservation. The barrels are
finally closed, covered with wooden plates and left unopened
for about three months. After this procedure the blocks,
having acquired a peculiar flavor, are ready for sale. The
products seen on the market are usually red or white blocks
2 to 4 cm square and 1 to 2 cm in thickness. The white ones
are untreated, while the red ones are colored with ‘hung chu’
ch ‘u, which is derived from the culture of another mold,
Monascus purpureus, on rice.

“Sufu” is manufactured in large quantities in the region
of Shoushing [Shaoxing] in Chekiang Province [Zhejiang,
a coastal province in central eastern China] and Soochow
[Suzhou], Wushih [Wuxi], and Changchow [Changzhou]
in Kiangsu Province [Jiangsu, a coastal province in central
eastern China]. The native manufacturers know how but not
why such flavored sufu is produced. They believe that the
fermentation is controlled by one of the gods, to whom they
make prayers for its success.

“Early in my research on sufu I found in the
fermentation chamber of a factory in Shoushing gray
mycelium about 2 cm in height covering the whole surface
of the blocks. As I deemed this mycelium to be valuable
for scientific research, I made a culture of it on the spot
and brought the culture back to Nanking. The mold which
produces this mycelium was isolated. It appears to be an
undescribed species of Mucor for which the name Mucor
sufu is proposed...

“From the observations recorded above I conclude that
the transformation of tofu into sufu is due to the growth of
this Mucor. It is also interesting to note that the mono-mucor
on sufu manufactured in Shoushing in Chekiang Province
and that in Soochow, Wushih, and Changchow in Kiangsu
Province is all of the same species. In ancient times traveling
was handicapped by lack of railway connections between
Chekiang and Kiangsu nearly three hundred miles apart. It is
remarkable that the mold on sufu manufactured in these two
provinces should be of the same species, a coincidence of
historical as well as biological importance.”

Note 1. This is the earliest English-language document
seen (Oct. 2011) that uses the word “sufu” or the word
“tosufu” to refer to Chinese-style fermented tofu.

Note 2. Usage of these terms seems to be largely
confined to the area in and around Shanghai. In Mandarin,
this product is widely called doufu-ru or furu (pinyin), fu-ju
(Wade-Giles), rufu, or dou-ru. In Cantonese (and in most
Western tofu shops run by Chinese—who come from Canton)
it is called fyu, fu yu or funan. The first Westerner to use
the term sufu was Walter T. Swingle (1945), a brilliant plant
pathologist and plant physiologist with the USDA—as well
as an agricultural explorer and sinologist. The first Western
microbiologist or food scientist to use the term was Dr.
C.W. Hesseltine in his classic 1965 paper “A millennium of
food, fungi, and fermentation.” From that paper and from
the ongoing research on this food by Hesseltine and his co-
workers, the term spread rapidly among Western scientists
and writers. We feel this is unfortunate, since few Chinese
know the meaning of the term sufu.

Note 3. Frederick V. Coville, in his article titled
“Soybean Cheese” (Science, 20 Sept. 1929, p. 283), states,
in reference to this journal article, that “Mr. Nganshou Wai,
chief chemist of the National Hygienic Laboratory, Shanghai
[the same city where the term sufu is most widely used!],
is a native of Chekiang Province, China, and was graduated
in 1924 from the Japanese Imperial University, Kyoto,
where he became specially interested in biochemistry. He
then worked for two years in the laboratory of Professor
Genitzu [Gen-itsu or Genitsu] Kita, at Kyoto, whose studies
of fermentation are well known... The original account of
the experiments was published in Chinese, with illustrations,
in December, 1928, in the Agricultural Journal of the
Agricultural College, National Central University, Nanking.
Mr. Wai’s present paper, an abstract of the original, is the
first presentation in English.”

Note 3. The mold Mucor sufu was renamed (actually,
first reported as being identical to) Actinomucor elegans in
1965 (See Hesseltine, C.W. 1964. “A millennium of fungi,
food, and fermentation”). Address: National Hygienic Lab.
[Shanghai], China.
pork, clover leaf and bamboo, fish with rich gravy, shark’s fin, and fermented bean-curd soup. In a Chinese meal, the fruits and sweetmeats come first, and if there is soup, it comes last.”

Page 258: “Peanut oil, sesamum seed oil, and soy sauce are used instead of butter.” Address: Assoc. Secretary of Missionary Education, General Sunday School Board, Methodist Episcopal Church, South.


* Summary: Describes the various food uses of the soybean, including soymilk, concentrated, powdered, or fermented soymilk, soy flour, soy oil, soybeans consumed as a vegetable (fresh soybeans are prepared like peas), soy sprouts, soy sauces, soy confections, soy chocolate, and soy coffee.

The soybeans also have uses other than for food, in making candles, colors, and in the form of Sojalithe as an electrical insulator.


Soybean, called yellow bean in China, is “cultivated in all parts of the country, but most abundantly in Manchuria. While in 1913 the export of soybean amounted only to about 10 percent of the total export and ranked next to silk and tea in importance, it has in sixteen years increased ten percent of the total export and ranked next to silk and tea in every household. Recent scientific investigations have shown that the soybean satisfies a particular requirement in the Chinese dietary.”

The human body is like a machine. It needs carbohydrates and fats for fuel and motive power, and protein for repairing worn-out parts. A table compares the nutritional composition of soybean, rice and wheat. “It is evident that soybean is entirely different from either wheat or rice. Whereas wheat and rice supply carbohydrates in the form of starch, soybean is mainly the source of protein. It is interesting to note that the poorer class of people in China consumes very little meat but seems to have sufficient amount of protein. Remembering that every Chinese takes a large amount of soybeans in various forms of preparation, we can readily understand how the protein requirement is satisfied. As soybeans contain more than twice as much protein as does any meat and is much cheaper, we can satisfy our protein requirement at one-tenth of the cost of meat.”

Exact data regarding soybean production in China are lacking. “The Manchurian crop is more accurately estimated at 5,200,000 tons [probably metric tons] in 1928. The production of soybean in all other provinces has been estimated at 2,000,000 tons by Horvath and 10,000,000 tons by Marakujev [in Russian]. The total exports of soybeans, soybean oil and soybean cake is about 3,500,000 tons, leaving 3,750,000 to 11,750,000 tons for domestic consumption. The consumption per capita is thus 20 to 65 lbs. per year. These two figures at least represent the two extremes. Marakujev’s figure is probably nearer to the actual. These 65 lbs. of soybean are used:

1. As soybean oil. 2. As soybean milk, “a very popular drink in China,” “which is to the Chinese as cow’s milk is to the Westerners.” The process for making this milk is described briefly and a table compares its nutritional composition with human milk and cow’s milk. The composition of the three are “very similar. One of the products of soybean milk is the pellicula (CC = Chinese characters given) (dou-fu-pi [yuba]) which is a thin sheet coagulated on the surface of the milk when it is heated. It is especially rich in protein and fat and used as a table delicacy.”

“4. As soybean curd (CC: doufu), one of “the most universal preparations” of the soybean. “It is relished by the poor as well as the rich. When a coagulating agent like gypsum is added to the bean milk, a thick mass separates out.” “It is very similar to meat in chemical composition.” A table compares the composition (only protein, fat, and carbohydrate on an “as is” basis) of soybean curd, beefsteak, pork chops, and eggs. “Although the protein content of ‘tofu’ is only half that of meats, we see the economy of it even if we have to use a double quantity of it. The solid bean curd (CC: doufu gan) is more like meat as it contains less water than ‘tofu’ and is also extensively used in China.

“4. As soy sauce, another popular soybean preparation...” “Other fermentation products like the fermented soybeans (CC: douchi) and the fermented ‘tofu’ (CC: furu) serve similar purposes.” Note: This is the earliest English-language document seen (Oct. 2008) that uses the term “fermented soybeans” to refer to these Chinese-style “soy nuggets.”

“5. As a vegetable. Cooked [green vegetable] beans are also used by the Chinese but not very extensively. Experience has taught us that the cooked whole beans are not so digestible as ‘tofu’ or other preparations. However, soybean sprouts, obtained by germination in water, are
highly digestible and contains the antiscorbutic vitamin C, which is lacking in the original seed.”

“The chief demand for soybean in foreign countries is for the oil and the bean cake.”’ The oil is used for either edible or technical [industrial] purposes and the cake is used as a fertilizer or as cattle feed. “The soybean owes its popularity to its resemblance to cottonseed oil which is widely used in making soap, lard [substitutes] and oleomargarine. The first shipment to Europe was attempted by Japanese in 1908. It was warmly received...”

“Due to its peculiar smell, the raw soybean oil is rarely used in western countries for cooking. But now it is possible to refine this oil and render it entirely palatable to the western taste. It has been put on the market as salad and cooking oils. By the process of hydrogenation, the liquid oil can be transformed into a solid fat, which is an excellent substitute for animal lard” [or butter].

“Thus we see that in a period of twenty years, soybean has extended its usefulness from the Chinese dietary into industries of world-wide importance and is now one of the most valuable agricultural products not only of China but of the whole world.”

“In Germany and Denmark artificial milk is regularly manufactured from soybean and sold on a commercial scale. Soybean milk powder is also being manufactured.

“The soybean curd has also a good future, as it can be used to make meat substitutes. Artificial meat has been prepared by a German soybean factory.

“The biggest possibility in the popularization of soybean as a food is the soybean flour. From the bio-chemical point of view, white bread made from the wheat flour is deficient in protein and vitamins. Therefore a substance like soybean should be a valuable addition to the wheat flour. In fact, half a dozen kinds of soybean flour are already on the market in Europe and America.”

“The phenomenal rise of the soybean as a universal article is not a matter of accident: It is the result of years of intensive scientific research. We should be thankful that we Chinese are not only the biggest consumer but also the biggest producer of this valuable article. But in the face of keen competition at the present time, we should look out lest this leguminous seed should fall into the same pit as did our silkworm and the tea plant. Up to the present we have been benefited by the researches of foreign countries and also the laboratories of the South Manchuria Railway and the Chinese Eastern Railway, whose immediate interests are not purely Chinese. Are we going to lead the world in soybean production? The future is by no means bright. Already the Chinese soybean oil mills are suffering due to their out-of-date equipment and inefficient process. America is rapidly increasing the acreage for soybean planting. When the American soybean crop is big enough to supply herself and other countries, China will have a difficult battle to fight. China should take an active part in studying and widening the usefulness of soybean as a food and as an industrial raw material.”


• Summary: Discusses the history of the soybean in various countries. Its uses in the United States are outlined. A plastic named Satolite is used to make combs and buttons. In “Paris there is a cheese factory that makes Roquefort [Roquefort] from soy bean curd.” Soy bean “milk has more proteins than cow milk and little danger of contamination. Its flour contains four and one-half times more fat, four times more proteins, half as much water, and nearly half as many carbohydrates as the flour of wheat. These chemical ingredients make it a food, more interesting, perhaps, than palatable. Though the milk is supposed to be good for one (it arrests cases of retrogression, causes normal growth), it has generally to be drunk sweetened with sugar. Soy bean sauces are better spiced. (For the Chinese taste Lean & Perrins Worcestershire is too hot. The Chinese themselves make their sauces by exposing the crushed bean to sunlight and actually melting it. Certain Korean sauces are thus matured thirty years before they are considered palatable.) But if the bean’s chemical make-up only indirectly contributes to its success as human food, it is nevertheless the basis of the bean’s industrial importance. Because of its nitrogen, the bean is valuable as fertilizer and also as poultry and stock feed. And the bean’s hereinafter mentioned oil has proved of value to many a manufacturer of paints, enamels, lacquers, and even explosives.”

The Anglo-Chinese Company at Harbin and the Suzuki Mill at Dairen, both of which use chemical solvent extraction, have succeeded in extracting virtually all of the oil from the soybean; Manchuria’s traditional crude stone presses were able to extract only about half the soybean’s oil content.

“Perhaps the greatest economic and industrial triumph of the soy bean occurred, oddly enough, in Denmark. Until some thirty years ago this pleasant country was more than self-supporting in the production of cereals, especially wheat. But U.S. mass production and low prices made for perilous and in some cases disastrous competition, even in Denmark’s home markets. The Danes bethought themselves of raising live stock, imported the soy bean (using the oil for its usual purposes), and used it as feed for their live stock and poultry. Today 70 per cent of Denmark’s export trade consists of live stock and animal products: milk, butter, cheese, bacon, ham, eggs, and the like. And for their country’s regained economic health Danes give thanks to the soy bean...

“In the United States the paramount importance of soy bean is still its agricultural use. But it is significant that 75 per cent of the soy bean oil consumed in United States is being used by paint and varnish industries and in
manufacture of linoleum, oil cloth, artificial leather. Lesser quantities are utilized in printer’s ink, liquid soaps. Few soy beans are imported into this country.”

Note: This is the earliest English-language document seen that contains the term “mass production.”


• Summary: Page 6264 (24 Oct. 1930). While in Peiping, China, P.H. Dorsett writes: “... went to Hsi Tan Pailou Street in the northwestern part of the city before tif... where we found a number of kinds of bean curd and other soybean products... We got a number of still and motion pictures, also quite a collection of soybean products which we hope to get photographed during the afternoon.”

Page 6270. A photo shows several small crocks (about 15 cm {5.7 inches} in diameter) in a small carrying case. Dorsett names them “Pickle: soybean curd, white and pink... Peiping, China... Red chiang toufu and white chiang toufu... Chinese name ‘Tu ju’ ['Fu ju' = Furu], meaning ‘curd milk’” (neg. #46120).

Page 6271. A photo shows two crocks of about the same size, one with a tied paper lid, the other open at the top. “White pickled beancurd. Peiping, China... Chinese name, chiang toufu (white). Small blocks of bean curd placed in jar of rice wine and salt. Jar sealed and placed in sun, where curd cures for a year”(neg. #46121).

Page 6272. A photo shows two crocks of about the same size, one with a tied paper lid, the other open at the top. “Pink bean curd pickled... Peiping, China... Chinese name, chiang toufu (red). Small blocks of bean curd placed in jar of rice wine and salt with red rice [fermented red rice; angkak] (produced by fungus growth). Jar sealed and placed in sun, where curd cures for a year” (neg. #46122).

Note: This is the earliest English-language document seen (Oct. 2011) that uses the terms “pickled beancurd” or “White pickled beancurd” or “Pink bean curd pickled” or “chiang toufu” or “Red chiang toufu” or “White chiang toufu” or “Tu ju” to refer to fermented tofu. Address: Agricultural Explorers, USDA, Washington, DC.

120. Wei, Y.S. 1930. [On the microorganisms of fu-yu]. Hsueh-I Magazine 9(10):113. [Chi]*

• Summary: From the well-know foodstuff fu-yu or preserved, fermented soybean curd, the author isolated the same species of Mono-Mucor from different samples obtained from Shaoxing (in Chekiang province) and Suchow (in Kiangsu province).


• Summary: Mentions the mold genera Rhizopus, Mucor, Aspergillus, and Monilia. Address: Nôgaku Hakase, Japan.

122. Mao, P‘i-chiang. 1931. The reminiscences of Tung Hsiao-wan. Translated into English by Pan Tze-yen (Z.Q. Parker). Shanghai, China: Printed by the Commercial Press, Ltd. xv + 159 p. See p. 64. 19 cm. [21* ref]

• Summary: Page 64: “The red bean-curd, after being baked and stewed five or six times and turning crisp, should be stripped of its outer coat and mixed up with some kind of flavour. It will be edible in a few days, and its taste far excels that stored at Kienning * for three years. (Footnote: *"Allusion too vague to be interpreted").

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “red bean-curd” (or “red bean curd”). It probably refers to a type of fermented tofu.

Note 2. The author, Mao P‘i-chiang (lived 1611-1693) was an eminent Chinese scholar who lived towards the end of the Ming dynasty. This “is a memoir of his deceased concubine, the famous Tung Hsiao-wan, whose beauty and accomplishment were such that she did not die in the prime of her life, but was forcibly carried away from her husband by the Manchu emperor Shun Chih” (p. ix). His concubine even met his wife (p. 47). Address: Ming dynasty, China.


• Summary: This translation (by Mr. C.A. Baker, the reputed ex-Botanist for the flora of Java) of Ochse’s classic “may
be taken as an entirely revised and much enlarged second edition of 'Tropische Groenten' ('Tropical Vegetables'), which booklet was published in July 1925.” The author, a Dutchman who confined his research to Java and Madoera, described the tempeh-making process in detail, saying that the mold used was *Aspergillus oryzae* and that it was obtained from a former batch of tempeh.

Page 366 discusses ontjom (témpe boongkil in Javanese), tetémpe, and dagê, all made from peanuts. Page 372 notes that the pigeon pea (*Cajanus cajan*) can be used to make témpe bosok.

Pages 389-93 discuss the soya bean, which has various names in local languages. Malay: Katjang diepoon or Kedele. Javanese: Dekeman or Dekenan, Dele, Demekan, Gadele, Kedele, Kedoongsool, or Dangsool. Sundanese: Kadele, Katjangbooloo, Katjangdjepoon, Katjangkadele. Madura: Kadhele, Kadhellée, or Kedeleh. A description of the plant is given.

Illustrations show: (1) A young soybean plant with leaves and pods (half size). (2) A bamboo scaffolding or curing frame, in tripod form with 3 horizontal supports, used for drying bunches of soybeans.

Soybeans come in two main forms: Light yellowish-brown seeds, and black seeds. The latter are used to make témpe bosok.

The seeds can also be roasted and afterwards pounded. The boobook [babuk, roasted soy flour], boobook or boobookan (Jav.) is eaten in the shape of powder, usually with the addition of lombok and other ingredients.

The seeds are mixed with a porridge of rice-meal and with the addition of lombok and other ingredients. The mixture is poured on winnows (tampah [winnowing trays]) covered with waroo-leaves, sprinkled with ragi or beeang, probably of *Aspergillus Wentii*, Wehmer, and covered with leaves. The filled tampahs are piled on each other and left alone till the cakes are very mouldy. Then they are dried in the sun, soaked in brine and mixed with sirup of arèn [sugar palm] and with tapè [tapai: a sweet fermented cake] of rice and glutinous rice. Next the porridge is placed out of doors. After the seeds have become soft by this treatment, which takes three or four weeks, the taotjo is ready for use.

“Taaloo does not keep well for a long time. For this reason it is soon made into takooi. For this purpose the tahoo is cut into pieces, folded in pieces of cloth, pressed in order to remove part of the water and next boiled in a decoction of koonir [turmeric]. The product obtained in this way has an intense yellow color and is a much relished delicacy, especially with lombok rawit [fiery dwarf chilies].”

*Taotjo* [Indonesian-style miso] is a porridge made of soybeans and rice meal. The soybeans are soaked, dehulled (the testa removed), cooked, and left to cool. Then they are mixed with the meal of rice (regular or glutinous), which has been previously roasted. “The porridge obtained in this way is poured on winnows [tampah [winnowing trays]] covered with waroo-leaves, sprinkled with ragi or beeang, probably of *Aspergillus Wentii*, Wehmer, and covered with leaves. The filled tampahs are piled on each other and left alone till the cakes are very mouldy. Then they are dried in the sun, soaked in brine and mixed with sirup of arèn [sugar palm] and with tapè [tapai: a sweet fermented cake] of rice and glutinous rice. Next the porridge is placed out of doors. After the seeds have become soft by this treatment, which takes three or four weeks, the taotjo is ready for use.

“Taotjo must be boiled, otherwise the smell is to strong. It is eaten with cooked or raw vegetables. It is used for dressing some dishes of meat or fish, whilst it is also a material of which diverse side dishes are made.”

Note 1. This is the earliest English-language document seen (March 2009) that uses the word “taotjo” to refer to Indonesian-style miso.

“According to De Bie (1901), *tao djees* [tao diji; doushi, douchi] is taotjo alternating with layers of cooked whole kadelê-seeds. This stuff is put into a pot or basin with some salt and boiled arèn-sugar. The mass is left to itself during a few days till the taotjo has become pervaded by the salt and the sugar and has assumed a uniformly brown colour. Note 2. *Tao djees* [doushi] is soy nuggets, which are not the same as *Taaloo* [Indonesian-style miso]. De Bie (1901) seems to have made a mistake.

“Of the black kadelê-seeds soya [soy sauce] is made, exclusively by the Chinese and the natives. First the seeds are cooked in a strong solution of salt. After diverse
manipulations the cooked seeds are mixed with arèn-sugar and so-called soya-condiments and the mixture is concentrated till the salt begins to crystallize. By diluting this product with more or less water one obtains the diverse qualities of kétjap or soya found in commerce."

The “Pemimpin Pengoesaha tanah” of 15 Jan. 1915 lists various ingredients that can be used with black soybeans in making kétiquep. “Young seedlings, obtained, like taogé [taogé, soy / bean sprouts], by fermenting, are called ketjambah kedele; they are cooked and eaten as petjel (Jav.) with the rice (ganteng, Jav.)”

“Finally young leaves of Kadele can be eaten, raw or steamed, as lalab.

Page 398 describes dagé and tempé bengook made from these seeds of the velvet bean (Mucuna pruriens). Roasted tempeh are also discussed.

Pages 407-08 states that the seeds of the Katjang oji (rice bean) can be used for the preparation of tempeh.

Pages 414-15 state that, when they have no soybeans, the Chinese use mung beans (Katjang eedjo) to make tofu and takoah, but they are most widely used to make mung bean sprouts (taogé). Page 634 mentions tempé bosok (overripe tempeh) made with the foul-smelling bruised leaves of the plant Paederia foetida. Page 732 also mentions overripe tempeh.

Note 2. This is the earliest English-language document seen (Dec. 1998) which contains detailed information about tempeh, or which refers to tempeh as “tempé.”

Note 3. This is the earliest English-language document seen (Feb. 2004) that uses the word “tahoo” or the word “takoah” to refer to tofu. Address: Buitenzorg (Bogor), Java, Indonesia.


**Summary:** Note 1. On the title page, the authors’ names are given as Simon Yang and L.K. Tao.


In Part I, section IX is titled “The standard of living food” (p. 47-55). The 2nd most important type of food, after “(a) Cereals and products” is “(b) Legumes and products,” which states (p. 48): “Of beans, the young soy bean (Chinese characters: mao dou) formed the principal kind, but among the bean products, bean sprouts, bean curds of various makes and mung bean starch were consumed in considerable quantities.”

Page 49: “(g) Fat and oil: Bean oil [soy] formed the most important article in this class, of which the average consumption was 4.78 catties (2.8 kg) per family per month. Lard, the second in order, lagged far behind…”

“(h) Condiments: Salt and soy sauce were the principal articles of this class.”

Page 50: Whereas rice accounts of 44.6% of total expenses, legumes and products account for only 7.6%. More rice and legume statistics appear on page 53.

In Part II, “Statistical tables,” six long tables mention soy as follows: I. “Average quantity of and expenditure for the principal articles purchased per family per month, by income groups” (p. ii-iii): Yellow soy bean sprouts, 0.15 expenditures. Soy bean curd, 0.26. Sheet bean curd, 0.18 [pressed tofu sheets, pai-yeh or ch‘ien-chang]. Bean curd, fried, 0.10. Bean curd, dried [doufu gan] 0.16. Soy bean oil, 1.19. Soy bean paste 0.38.

II. “Average quantity of and expenditure for the principal articles purchased per family in each of the twelve months under investigation (p. viii-xxx): There are entries for: Yellow soy bean sprouts, 1.87 annual expenses. Soy bean curd, 3.14. Sheet bean curd, 2.15. Bean curd, fried, 1.19. Bean curd, dried [doufu gan] 1.95. Yellow soy bean, 0.38. Young soy beans with pods [mao dou, edamame], 0.81.

III. “Average quantity of and expenditure for the “other” articles of food purchased per family in a year” (p. xxxii, xxxvii). Bean curd, fermented, odoruous, 0.05 annual expense [ch‘ou toufu]. Soy bean milk, 0.17. Fried beans, with salt, 0.21. Fermented bean curd, fried, 0.05. Bean curd skin, 0.02. Bean curd, fermented, with fragrant malt, 0.05. Bean curd, frozen, <0.005 [tung-toufu, ping-toufu]. Bean curd skin, cooked in skin forms, <0.005. Dried bean curd, fried, 0.005. Bean curd, fermented, 0.6. Soft bean curd, 0.05. Soy bean dregs, 0.02 [okara?]. Sheet bean curd, in skin [netlike] forms, >0.005. Soy bean paste, 0.01.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the word “odoruous” or the term “Bean curd, fermented, odoruous” to refer to ch‘ou toufu.

VI. “Average quantity and fuel value of food consumed per family in a year” (p. 1-li). This table has 6 columns. (1) Classes and articles of food. (2) Quantity, total (grams). (3) Quantity of protein, grams. (4) Quantity of fat, grams. (5) Quantity of carbohydrates, grams. (6) Fuel value, calories.

Note 2. For soy products we will give only the quantity / amount purchased each year per person in grams. Yellow soy bean sprouts, 34,229. Soy bean curd, 55,080. Sheet bean curd 8,34. Bean curd, fried, 6,163. Bean curd, dried, 13,218. Yellow soy bean, 2,407. Mung bean sprouts, 15,257. Note 3. The weight of mung bean sprouts purchased was less than half (44.5%) the weight of yellow soy bean sprouts purchased. Young soy beans with pods, 7,180. Bean curd, fermented, odoruous, 364. Soy bean milk, 6,963.

At the end of the book is a very interesting bibliography of the best books on China’s economic and social development, divided into these periods: China during the interregnum [Republic of China] (1912-1949). Modern Chinese economy: The late imperial period (late 19th and
early 20th centuries), the agrarian economy, foreign trade and investment, 20th century economic development, labor and the economy. The wartime economy and postwar problems.

Note 4. This book would have been much more useful if the Chinese names of these foods (in both Chinese characters, and transliterated) had been given. We are unsure of the exact identity of: (1) Fried beans with salt. Are these characters, and transliterated) had been given. We are unsure if the Chinese names of these foods (in both Chinese


• Summary: A very early Japanese study on fermented tofu which is called nyûfu (milk + spoiled; the fu of tofu) in Japanese, but written “Su Fu, bean curd preserved” in roman letters. From both red and white nyûfu (preserved, fermented tofu) obtained from Hankow, the author found some species of Aspergillus, Penicillium, Alternaria, Cladosporium, Saccharomyces, Bacillus, and Streptococcus. He showed that the ripening of fermented tofu is caused by enzymes produced by the mold during the fermentation process. Address: Hokkaido Imperial Univ., Japan.


• Summary: Note: This is the earliest Japanese-language document seen (Oct. 2011) that uses the term “Kabi-dôfu” to refer to fermented tofu. Address: Hokkaido Teikoku Daigaku Nogakubu, Nosen Seizogaku Kenkyushitsu, Japan.


• Summary: A detailed study of the enzymes of fu-yu, or preserved, fermented tofu. Address: Dep. of Agricultural Chemistry, Hokkaido Imperial University.


• Summary: This remarkable, sympathetic and very comprehensive book has been revised to May 1932. The author has lived for many years in China, starting before the downfall of the Manchu Dynasty, and for 35 years has had close association with Chinese affairs. The 1st edition was published in 1923. While focusing on the Era of Reform (1902-1911) and the period of the Chinese Republic, established on 1 Jan. 1912 by Sun Yat-sen, the book contains many interesting features and appendixes, including a chronology of “Important dates in Chinese history” (p. 673-680a), and a lengthy bibliography.

In Chapter 8, “The Craftsman,” the section titled “Bean curd” states (p. 174-75): “I stopped at a neighboring door to watch a great, lazy-looking water buffalo turning a heavy mill-stone grinding beans. In a shop down the street the bean flour was being cooked, mixed with a little gypsum and turmeric to curdle it. The cooked paste, wrapped in cloths, was placed in a cheese press from which, after it should be properly solidified, it would be taken, cut into small cakes, and exposed for sale. It is the cheese of the Chinese and a very popular article of diet, rightly so, indeed, in a land where meat is too dear a luxury to be the daily food of the poor. There are several varieties of this bean-curd; one known as the ‘stinking bean-curd’ rivals the choicest cheeses of Europe in odor.

“At an oil-mill another variety of [soy] beans was being ground and pressed for its oil. The refuse finds a ready sale for fertilizing purpose. Vegetable oils are in great demand in China for culinary and other domestic purposes, animal fats not being abundant enough to supply the need. Besides [soy] beans, cotton-seed, rape-seed, peanuts, a variety of tea, or camellia seed, hemp-seed, sesamum, seed of the castor oil plant and nuts of the wood-oil tree are all used for this purpose. The oils of the cotton, rape, beans, hemp and peanut are all used in cooking, and the bean and rape-seed oils are also used for lamps [illumination]. The lamp of the poor man is merely a shallow cup with a spout at one side, like the classic lamp of ancient Rome. A piece of rush pith is placed in it for a wick. The soja bean is used for making soy, the common sauce of the rich and poor alike. It is said to have been suggested to the English [for] the manufacture of their Worcestershire and other sauces.” Note: This is also the earliest English-language document seen (Oct. 2011) that contains the term “stinking bean-curd.” Address: Agassiz Prof. of Oriental Languages and Literature, Univ. of California, Berkeley, California; Formerly American Chargé d’Affaires, Peking, China; Recently Chief of the Division of Far Eastern Affairs, Department of State (U.S.).

129. Orosa, Maria Y. 1932. Soybeans as a component of a balanced diet and how to prepare them. Manila (Philippines) Bureau of Science, Popular Bulletin No. 13. 53 p. [16 ref]

• Summary: Contents: Introduction. The cooking of soy beans (89 Filipino recipes, p. 7-35), incl. roasted soy beans, soy-bean soups etc.–most recipes use whole soybeans, but quite a few use tofu (tokua), soy sauce (toyo), soy-bean flour, or soy-bean milk, and a few use tahuri (brine fermented tofu) or soy-bean sprouts. Some common foods made from soy beans and methods of preparing them (p. 35-53): Soy-bean milk, condensed soy-bean milk, soy-bean milk powder, soy-
bean casein, soy-bean curd (tofu; *tokua* or *toqua*). *Tahuri* or *tahuli* (fermented tofu). Frozen tofu. Bean curd brains or *tofu nao*. Dry bean curd or *topu khan* (tofu-kan, dipped in burnt millet sauce and rubbed with fine salt). Fragrant dry bean curd. Thousand folds (thin layers of fresh tofu pressed in cheesecloth. “On standing, the thousand folds mold and develop a meatlike flavor. This is fried in sesame oil and served in place of meat”). Fried bean curd. Soy sauce (called by the Chinese “ch’au yau,” or drawing oil; or “pak yau” or white oil” by the Japanese “shoyu”; and the Filipinos, “toyo”). Natto. Hamanatto (p. 49). Yuba. Miso. Soy-bean flour. Soy-bean oil (used in the manufacture of lard and butter substitutes; also in paints, printing inks, etc.). Soy-bean meal. Soy-bean coffee. Soy-bean sprouts.

Note 1. This is the earliest English-language document seen (Oct. 2008) that uses the term “soy-bean casein” (or “soy bean casein” or “soybean casein”), probably to refer to soybean protein.

“When and by whom the soy bean was first introduced into the Philippines, no one can ascertain. The Filipino people have long known some important soy-bean preparations, such as soy sauce, or ‘toyo,’ bean curd, or ‘tokua,’ fermented bean curd or ‘tahuri,’ not knowing that they were prepared from this bean. The seed is known in some parts of the Philippines, where it is grown, as ‘utaao.”

“The main object of this pamphlet is to encourage the Filipino people to use more soy beans, and preparations made from them as food” (p. 3-4).

“Soy beans are grown in some parts of the Philippines. According to Doctor Roxas, Director of the Bureau of Plant Industry, 2,481 tons were grown in Batangas in 1921 and 4,218 tons, in 1930. However, the importation of soy beans in 1924 was 4,657 tons. Doctor Roxas says that soy beans can be grown in all parts of the Philippines” (p. 6). “Immature soy beans may be cooked in the same way as lima beans (patani)” (p. 7).

“The soy-bean curd was first produced by Whai Nain Tze, before the Christian Era and was introduced into Japan from China by the Buddhists. It was introduced into the Philippines by the Chinese and has become a very popular food in Manila and in places where there are Chinese who manufacture it for sale. ‘Tokua’ on account of its high fat, protein, and mineral content, is called by the Chinese as ‘meat without bone,’ or ‘the poor man’s meat.’” The Chinese use burnt gypsum (about 1.5% by weight) as a coagulant. In some cases, the curds are wrapped in individual pieces of fine cheesecloth about the size of a small handkerchief, then pressed lightly for a few minutes. They are “unwrapped, spread on shallow bamboo trays (bilaoo) and partially dried at room temperature. Then they are dipped in a weak solution of turmeric to coat the outside in light yellow coloring. Some manufacturers soak the small cakes of curd in brine solution for a short time, then dip them in a solution of burnt sugar or molasses and bake them slightly before putting them on the market.” 100 gm of dry soybeans typically yield 350 gm of tofu (*tokua*) (p. 41).

The section titled “‘Tahuri’ or ‘Tahuli’” begins with 2 paragraphs and ends with a table very similar to those from Gibbs and Ageaoili (1912): “‘Tahuri’ is manufactured in China and exported to the Philippines in large stone jars or in small tin cans. There are some ‘tokua’ manufacturers in Manila that manufacture ‘tahuri’ for local consumption. Those that are imported from China are preserved in strong brine solution and the cakes are broken during the shipment so the liquid becomes like a thick emulsion containing pieces of the cured curd.” It then contains a new paragraph: “In Manila, the Chinese method of manufacture is to pack the large pieces of soy-bean curd, about 5 inches long, 4 inches wide, and 2.5 inches thick, with much crude salt, in empty gasoline cans. The curd is allowed to cure for a period of several months. During the curing period the bean curd changes from white to a brownish yellow color and develops a peculiar salty flavor to which the Chinese and many Filipinos are educated” (p. 42). Note 2. No information about a fermentation microorganism or process is given.

“The bean curd brains known to many Filipinos as ‘tojo’ is the unpressed soy-bean curd. The method of making ‘tojo’ is almost the same as the method used in making ‘tokua’, only that a smaller amount of the coagulating agent is used, and the very soft but solid mass formed is left undisturbed in the wooden container until used. The Chinese used to peddle this preparation in a wooden pail-shaped container, through different parts of Manila, but on account of the Philippine Health Service regulations, this product is now sold in the markets only. / “The ‘tojo’ is served with a few tablespoonfuls of medium thick brown-sugar syrup, which gives it flavor, the ‘tojo’ being almost tasteless. Sometimes it is eaten with sweet oil, sauce, and vinegar, or with finely cut meat and spices.” (p. 43).

“Dry bean curd: The fresh bean curd when dipped in burnt millet-sugar sauce and rubbed with fine salt will keep longer than the ‘tokua’ and is called ‘topu khan.’ This preparation is usually eaten is soups.”

Fragrant dry bean curd or *hsiang khan* (“fragrant dry”) has the consistency of smoked sausage. “It is made by subjecting the fresh bean curd to great pressure, which eliminates much of the water content. The pieces of semidry curd are soaked in a weak brine solution in which is dissolved burnt millet-sugar and to which is added powdered spices. The curd is then dried to hardness. This preparation keeps indefinitely and is used in soup making and in vegetable dishes” (p. 43).

Note 3. Cruz and West (1932, p. 78) state that as part of a campaign by the Bureau of Science to encourage the Filipino people to use more soy beans, Miss Orosa “has made excellent cakes, cookies, puddings, sauces, soups, custards, ice cream, and other tasty preparations from Philippine soy beans.”
Note 4. The author pioneered the branch of the branch of the Home Extension Service in which home demonstrators helped women in solving their home problems. She started the organization as a food preservation unit under the Bureau of Science in 1923, starting with six home demonstrators that she herself trained. That group became the forerunner of the Home Extension Service in the Philippines. For details on her work see: In: A Half Century of Philippine Agriculture, Manila, Philippines: Liwayway Publishing. p. 236-37.

Note 5. This is the earliest English-language document seen (Nov. 2003) that contains the word “meatlike.”

Note 6. This is the earliest English-language document seen (Oct. 2008) that uses the word “Hamanatto” to refer to soy nuggets. Orosa’s description of Hamanatto is based on that of Sawa (1902). Address: Chief, Div. of Food Preservation, Bureau of Science, Manila.


Note 1. This is the earliest document seen (Feb. 2009) concerning soybeans in connection with (but not yet in) Nicaragua.

Note 2. This is the earliest Spanish-language document seen (Oct. 2011) that mentions fermented tofu, which it calls queso fermentado.

Note 3. This is the earliest Spanish-language document seen (June 2009) that uses the term semillas verdes to refer to green vegetable soybeans.


**Summary:** Peking is two cities. One the public city of teeming highways and loud vendors. The other, the Legation Quarter, is cold, rigid and formal, with cement roads. Here there are no jolly noises, no funeral or wedding processions with loud music; “no street vendors selling ‘stinking bean curds’ [fermented tofu; ch’ou doufu] or sugar candy.”

132. Boletín de Agricultura y Trabajo (Nicaragua Ministerio de Agricultura y Trabajo). 1933. Soya o soja (Soja Hispida Moench) [Soya o soja]. 5(48):19-20. June. 2nd Series. [Sp] • Summary: Contents: Introduction and history of the soybean (“it is also called ‘soya’”), with its extension in the United States. Climate. Soil. Fertilizer. Inoculation. Varieties widely cultivated in the USA (Biloxi, Peking, Virginia and Wilson Five for hay and ensilage. Ito-San, Manchu, Mandarin, and Tokio [Tokyo] for seed. Hahto for use as a food legume at the table (legumbre de mesa). Uses of the plant: Green manure, forage, pasture (pastaderos), hay, green forage. Food products made from the seeds: Flour, oil, soy sauce, cooked whole soybeans, coffee substitutes, soups, soybean roasts or steaks (soyas asadas), porridge or mush, soymilk (leche vegetal), condensed soymilk, fresh soymilk, casein, confections, soy cheese (tofu; fresh, dry, smoked, or fermented; queso fresco, seco, ahumado, fermentado). Food products: Dry soybeans (semillas secas) are used to make soy sauce, cooked soybeans, coffee substitutes, soups, roasted soybeans, vegetable milk [soymilk], condensed milk, fresh milk, casein, confections or sweets, and soy cheese [(tofu] fresh, dried, smoked, or fermented), and green vegetable soybeans (semillas verdes) are cooked and canned or served in salads. Enemies of the soybean.

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are "ground into industry), plus some statistics. In the USA some soybeans nutritional composition, and utilization (for feed, food, and 21, 1934." It contains a short overview of soybean history, before the Montreal [Canada] Section of the Society of Feb. 135. Phillips, J.B. 1934. The utilization of the soya bean. Transactions and Abstracts (London) 53(29):627-28. July 20. • Summary: This article is based on a “Lecture delivered before the Montreal [Canada] Section of the Society of Feb. 21, 1934.” It contains a short overview of soybean history, nutritional composition, and utilization (for feed, food, and industry), plus some statistics. In the USA some soybeans are “ground into flour and used in such articles as bread, macaroni, sausage, chocolate, baby food, etc. Most of the beans which are not for sale or forage are crushed and the oil separated... The annual consumption of soybean oil in the United States is approximately as follows” (in million lb): For paints and lacquers 9.0; soaps and candles 9.0; cooking oil, mayonnaise, sardines, lecithin manufacture 5.0; linoleum and oilcloth 4.0; printing ink 3.5; oleomargarine and lard substitutes 1.5.

“In Manchuria, where the soya bean is a staple article of diet, little meat is eaten; the protein of the bean resembles that of meat and may very well be substituted for it.”

“The uses of the oil cake are many and varied. When fermented, the meal produces a cheese which has a strong odor at first, but which decreases with age. The soya meal, after being heated with lime and then treated with caustic soda, produces an adhesive which is quite water-resistant and is used extensively on the Pacific Coast in the manufacture of plywood. It is also used as a cement in the manufacture of insulating boards intended for use in refrigerators. The soya meal may also be treated with salt solution and borax and the protein extracted. After precipitation, a pure casein is obtained which may be used as sizing for paper and as an adhesive.”

“Macaroni may contain as much as 30% soya flour, which is also used in the manufacture of cocoa. Some chocolate bars are known to contain 60% of soya flour. A plastic may be made from soya bean casein by the use of formaldehyde as in the case of milk casein. The soya bean is unique among vegetables in containing a relatively large amount of lecithin.” The commercial product is found to contain about 70% true lecithin and 30% oil or fat. Lecithin is used in the chocolate and baking industries. Address: Dr. [Canada?].

135. Phillips, J.B. 1934. The utilization of the soya bean. J. of the Society of Chemical Industry–Chemistry & Industry Transactions and Abstracts (London) 53(29):627-28. July 20. • Summary: This article is based on a “Lecture delivered before the Montreal [Canada] Section of the Society of Feb. 21, 1934.” It contains a short overview of soybean history, nutritional composition, and utilization (for feed, food, and industry), plus some statistics. In the USA some soybeans are “ground into flour and used in such articles as bread, macaroni, sausage, chocolate, baby food, etc. Most of the beans which are not for sale or forage are crushed and the oil separated... The annual consumption of soybean oil in the United States is approximately as follows” (in million lb): For paints and lacquers 9.0; soaps and candles 9.0; cooking oil, mayonnaise, sardines, lecithin manufacture 5.0; linoleum and oilcloth 4.0; printing ink 3.5; oleomargarine and lard substitutes 1.5.

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136. Kennedy, L.W. 1935. The soybean... A new American. Purdue Agriculturist (Indiana) 29(9):83, 86. June. • Summary: “This article was written with the aid of material taken from an undergraduate thesis submitted by E.A. Johnson, ‘34 [class of 1934]. Products of the soybean are rapidly becoming more important to agriculture and various manufacturing industries of the nation.” Soybean oil meal is an important livestock feed for cattle, hogs, sheep, and poultry. It is also “used extensively in the making of glue, water paints, fertilizer, celluloid substitutes, [plastic] gear shift knobs, etc. Breakfast food, diabetic food, infant food, macaroni, crackers, bean curd, soy sauce, vegetable casein, and meat substitute are popular in the list of foods made from soybean oil meal. The meal possesses a nut-like flavor and lends itself well to be used as human food.”

Crude soy bean oil is dark brown in color and has a “beany” odor. It is largely refined to make special oils for use as paints, varnishes, glycerine, enamel, the waterproofing of cloth, fabrics, papers, and sandpapers, the making of oilcloth, shade cloth, rubber substitutes, printers ink, lubricants, hard and soft soaps, insecticides, foundry core oil, and lighting fuels. The food products, salads, edible oils, and lard and butter substitutes are also prepared by a commercial process from soybean oil. In 1930 about 6,000,000 pounds of soybean oil, or one-sixth of the domestic crop, were used in the preparation of edible products.

Note: This is the earliest document seen (Sept. 2001) concerning the use of soybean oil in insecticides or other crop-protecting chemicals (pesticides).

“A new auto body finish from soybean oil is the result of experiments made by the Ford Motor Company of Detroit, Michigan.”

Also discusses “the vegetable soybean” which can serve as a supplement to the garden pea or lima bean. “In China vegetable soybeans have long been used as a delicacy on the table. They may be used green, or canned, or made into salads.”

“Dried soybeans serve as a good substitute for coffee and peanuts when properly roasted and prepared. The dried beans are also used in preparing soy sauce, boiled beans, baked beans, breakfast food, soaps, and vegetable
milk. From the vegetable milk, meat substitutes, infant food, confections, cheese, and fresh, dried, condensed, and fermented bean curd is prepared. Soybean milk has not received serious consideration in this country, but it has been successfully used as a food for growing infants in China.”

Address: Class of 1936.

137. **Product Name:** [Light House brand Soy Sauce, Soybean Jiang, Fermented Tofu].

**Foreign Name:** Jiang-you, Dou-jiang, Furu.

**Manufacturer’s Name:** Yeo Hiap Seng.

**Manufacturer’s Address:** 410 Outram Road, Singapore 3, Singapore.

**Date of Introduction:** 1935.

**How Stored:** Shelf stable.

**New Product—Documentation:** Letter from Alan Yeo of Yeo Hiap Seng. 1984. April; YHS news release 1990. Oct.; Letter from Charles Yeo of Yeo Hiap Seng. 1984 and 1991. Yeo Hiap Seng started in China in 1900. In 1935, during the Japanese invasion of China, when life was difficult and unsettled in Fukien [Fujian] province, Yeo Keng Lian sent his eldest son, Yeo Thian In, to Singapore to investigate possibilities there. The son founded the Yeo Hiap Seng Sauce Factory at 410 Outram Road, Singapore 3. He was joined shortly by the rest of the family. The company continued to make the same three fermented soy products that it had made since 1900 in China. In 1947 the growing business was moved into larger quarters at 950 Dunearn Road, its present location. The move out of China was a wise one, for in 1949 the three Yeo Hiap Seng plants in Fukien were taken over by the Chinese Communists. By the mid-1940s, Yeo’s quality soy sauce was a common sight in Singapore.

Note: This is the earliest known commercial soy product made in Singapore, or in Southeast Asia.


* **Summary:** Soy is mentioned frequently in the chapter on Japan. “One sauce reigns supreme in Japan—Shoyu, which replaces salt in many dishes and which is used in the cooking of almost everything: soup, fish, poultry, meat, and vegetables. It is the popular condiment with cold fish or meat and is added to salad dressing. It is made from the Soya bean seeds, wheat, and pure salt, and has a pleasant and distinctive flavor, unlike that of any of our European bottled sauces.”


Miso is said to be made as follows: “The proportions are 1 bushel of Soya beans, 1 bushel of malt, and 3 bushels of salt. The beans are squeezed and mixed with the malt and salt and kept in a cask for 6 months to mature.”

Concerning tofu: “Cubes of tofu are frequently mentioned in Japanese recipes. Tofu is made by soaking the dry beans in water for a day, pounding them in a stone mortar, straining into square molds and mixing with brine. They are then boiled till they become hard and firm.”

Address: Countess.


* **Summary:** This was an address to Section K (Botany) of the British Association for the Advancement of Science at Blackpool, Sept. 10, 1936. Discusses: Koumiss (effervescent drink), Egyptian Leben, Arrack, Japanese koji, shoyu, tamari, and miso, fermented tofu.

“There is a wide range of oriental foods produced by fermentation with *Aspergillus*. Chinese curd, To-fu, is made from soy-bean milk fermented with mould and ripened in brine. The curd is cut into squares which soon become covered with fungus. They are then placed in brine for further ripening. The curd is canned as white or red squares in a salty liquid.”

In Japan, four large industries are built on the use of *Aspergillus oryzae*. Their approximate total yearly output is as follows: Saké (rice wine) 812,000 kiloliters, shoyu (soy sauce) 902,000 kiloliters, miso (soy cheese) 1,690,000 kilograms, and shocho (distilled alcoholic liquor) [sic, shochu or shôchû, cheap spirits] 39,700 kiloliters. The annual value of all the fermentation industries is approximately £40,000,000.

“Molds of the genus *Penicillium* play a large part in the ripening of the Camembert-Brie, and the Roquefort-Gorgonzola-Stilton series of cheeses. Milk is first coagulated with rennet or dried calf-stomach linings.” Also: Mycorrhiza, Takadiastase, production of glycerin and yeasts in Germany during World War I. Address: O.B.E., President of the Botany Section.


* **Summary:** Rice is the chief staple food of the Filipinos. But the local diet would be improved by the addition of soybeans and their products. In April 1934 the Nutrition Research Laboratory, Bureau of Science, began to manufacture soybean milk. The method is described, the milk was used with good results in experiments with school children in Paco. Presently 8 liters/day of soybean milk are prepared for the Tondo and San Nicolas Community Health Social

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The article concludes: “Various soybean products, like ‘tokua’ [tofu], ‘toyo’ or sauce, ‘tahore’ ‘toho’ ‘tohu’ and other products made by the Chinese are prepared in rather simple ways and could be easily made by the Filipinos.”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the word “tahore” which probably refers to fermented tofu.

Address: Chief, Nutrition Research Lab., Bureau of Science [Manila, Philippines].


• Summary: A comprehensive, early work on the soybean. Gray was a Scotch physician. Contents: 1. Introducing the soya bean. 2. The soya bean plant and its cultivation. 3. The soya bean as food: Dietetics, immature green beans, mature dried beans, soya bean coffee, soya bean chocolate, soya bean sprouts, soya bean milk, soya bean flour (incl. Berczeller flour, Soyvita bread made by Wm. Beattie, Ltd., Glasgow), bean curd [tofu], soy (also called soya bean sauce, Chinese bean sauce, or shoyu), miso, fermented bean curd (p. 66-67). 4. Soya bean oil. 5. Soya bean trade. 6. The soya bean in agriculture.


In the chapter on “Soya bean oil” we read (p. 75): “In England, the bean oil trade is carried on by the following firms—The British Oil and Cake Mills Ltd., the ordinary shares of which are held by Lever Bros., Ltd., so that they are a branch of Unilever, Ltd.”

“The Hull Oil Manufacturing Co., Ltd., Hull, now merged in the foregoing concern.


“Messrs. J. Bibby & Sons Ltd., Liverpool.

“The Erith Oil Works Ltd., Erith” [Kent].

The first addendum, titled “Soybean products exhibited by the American Soybean Association” (at Washington, DC, p. 120-24) lists the following companies and each of the soy products that they manufacture: American Lecithin Corp. (Atlanta, Georgia), Archer-Daniels-Midland Co. (Milwaukee, Wisconsin), Armstrong Paint and Varnish Works (Chicago, Illinois), Battle Creek [Food] Factory (Battle Creek, Michigan), The Blanton Co. (St. Louis, Missouri), Cereco Co. (Tappan, New York), The Davies-Young Soap Co. (Dayton, Ohio), Detroit Graphite Co. (Detroit, Michigan), Eastern Health Food Stores Association (Washington, DC), Funk Brothers Seed Company (Bloomington, Illinois), Harshaw Essential Foods, Inc. (Cleveland, Ohio), Keystone Macaroni Mfg. Co. (Lebanon, Pennsylvania), Kloss, Jethro (Takoma Park, Maryland: Fresh [soybean] milk. Pumpkin pie [soybean milk and soybean flour]. Soybean cheese. Soybean bread [20% soybean flour]. Soybean buns. Soybean sprouts. Soybean cake), Laucks, I.F., Inc. (Bloomington, Illinois—home office, Seattle, Washington), Madison Food Company (Madison, Tennessee; Vigorost, Cheese [Tofu], Soybeans canned with Tomato, Soybeans canned plain, Dixie Fruit Crackers), Mead Johnson and Co. (Evansville, Indiana; Makes Sobee [Infant Formula]), Oriental Show-You Co. (Columbia City, Indiana), Paintcraft Co. (Galesville, Illinois), Prince Macaroni Mfg. Co. (Boston, Massachusetts), Purina Mills (St. Louis, Missouri; makes Cresol disinfectant, Purina turkey and growing fattening chow, Purina lay chow, Purina egg chowder, Purina breeder egg chowder, Purina fitting chow, Purina rabbit chow, Purina chick Growena chow, Purina 34% cow chow, Purina chowder, Purina bulky cow chow, Purina 24% cow chow, Purina pig and hog chow, Protena all mash starting and growing food), Shellabarger Grain Products Company (Decatur, Illinois), Soyex Company, Inc. (Nutley, New Jersey), Staley Sales Corporation (Decatur, Illinois), The Stamford Rubber Supply Company (Stamford, Connecticut), Dr. Roy Monier, President, Board of Managers, State Hospitals (Jefferson City, Missouri), United Drug Company (Boston, Massachusetts), Vi-tone Company (Hamilton, Canada), Woolsey Paint and Color Co., C.A. (Jersey City, New Jersey), Bureau of Chemistry and Soils, Department of Agriculture (Washington, D.C.). Page 120 adds: “The exhibit also contained some 200 soybean products, mostly foods, brought from the Orient by Mr. W.J. Morse, Senior Agronomist, Department of Agriculture, Washington, DC, U.S.A.”

Notes: Morse and P.H. Dorsett were in East Asia from 1929 to 1931, when they collected many samples of soybeans and soyfoods.

In the second addendum, recipes, the author notes that soy flour is widely used in diabetic diets. Two leading firms who make soy flour in England and who also incorporate it in various products are: Soya Foods, Ltd., Rickmansworth, Herts, and Dietetic Foods Ltd. 124 Victoria St., London, S.W. 1. “The former specialize in Soyolk which is flour prepared on the principles laid down by Professor Berczeller; it is a mealy powder, fatty to the touch. The latter firm are the sole distributors in Great Britain of the well-known ‘Heudebert’ Dietetic Food products, a French concern which makes different kinds of diabetic breads.” The following recipes are then given; * = Calls for Soyolk soy flour:

- Soybeans, southern style.

Note: This is the earliest English-language document
seen (Feb. 2000) that uses the term “soya bean sprouts” to refer to these sprouts. Address: M.D. (Scotch physician) England. Late medical officer to H.B.M. Legation, Peking, China. Lieut.-Colonel, Retired.


4. Culture in the various countries: 4a. The Americas (p. 38): Antigua, Argentina, Bermuda, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, USA (gives details on all varieties grown, and describes production, history, varieties, and cultural practices in North Carolina, Illinois, Indiana, Iowa, Maryland, Massachusetts, Mississippi, Missouri, New York, Ohio, West Virginia, Wisconsin, Conclusion), Guadeloupe, Guatemala, British Guiana, Dutch Guiana, British Honduras [Belize], Jamaica, Barbados, Martinique, Mexico, Montserrat, Peru, Puerto Rico, El Salvador, Trinidad and Tobago, Uruguay.

4b. Europe (p. 101): Germany, the Danubian countries, Austria, Spain, France, Great Britain, Hungary, Italy, Netherlands, Poland, Romania, Switzerland, Czechoslovakia, Turkey, USSR.


4d. Africa (p. 146): French West Africa, Algeria, Belgian Congo, Cyrenaica, Egypt, Eritrea, Madagascar, Morocco, Mauritius (Ile Maurice), Reunion (Réunion), Rhodesia, Anglo-Egyptian Sudan, Tripolitania, Tunisia, Union of South Africa.


B. Utilization of soya (p. 158): 1. The soybean in human nutrition and in industry: Whole soybeans, chart of the uses of whole soybeans, use of soya in the green state (green vegetable soybeans), soy sauce (dau-tuong of the Annamites, or toyo, named shoyu by the Japanese, or chau-yau or chiang yoo by the Chinese), condiments and sauces based on soya in the Netherlands Indies (tempe, ontjom, tempemori and tempe kedele [various types of tempeh and onchom, p. 168-70]), tao tjo [Indonesian-style miso], tao dji [soy nuggets], ketiap, ketiap benteng [Indonesian-style soy sauce], soymilk (le lait de soja), yuba (crème de lait de soja), tofu (le fromage de soja) and fermented tofu (des fromages fermentés, made by Li Yu-ying near Paris), soymilk casein (caséine du lait de soja, for industrial use, including vegetable albumin, or galalithe [galalith]; [isolated soy protein], and artificial wool), soy lecithin (lécithine de soja), soy flour (la farine de soja, incl. soy bread, soy pastries, and soy cocoa).

Note 1. This is the earliest document seen (Sept. 2010) that uses the term benteng ketiap benteng to refer to an Indonesian-style soy sauce.

2. Soy oil (p. 194): Food uses, industrial uses (including soaps, products resembling petroleum, paints, varnishes, linoleum, and artificial rubber), extraction, directory of U.S. manufacturers of materials and equipment for soybean processing, directory of U.S. and Canadian manufacturers of food products based on soya (produits alimentaires à base de soja. p. 205-06), directory of U.S. manufacturers of industrial soy products (p. 206-07).

3. Soybean in the feeding of domestic animals (p. 207): Forage, hay, silage, pasture, soybean seeds, the minerals in soybeans, soya as a feed for dairy cows, cattle, buffaloes, sheep, hogs, horses and mules, poultry.

4. Use of soya as fertilizer (p. 257). C. The trade of soya and of its by-products (p. 363): Production of soybeans in the principal countries, economic importance of soybean culture in the USA, soybean trade/commerce including tables of the major importers and exporters, and amounts traded annually in 1931-1934, price of soybeans, cost of production.

List by region and country of people and organizations that responded to a questionnaire sent by IIA (p. 273-76). Bibliography of main publications consulted, listed by region and country of publication.

Reunion (Ile de la Réunion): “The soybean (Le Soja) is only cultivated as an experimental crop, on a few square meters at the agronomic station” (p. 148).

Fiji (Iles Fidji): Soybean cultivation is not yet practiced in this colony; however soybean seeds are currently being imported in order to conduct a trial.

New Caledonia: In 1928 soybean cultivation was introduced to New Caledonia.

Note 2. This is the earliest document seen (Dec. 2007) concerning soybeans in Bhutan, Costa Rica, Dominican Republic, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Morocco, New Caledonia, Palestine, Peru, or Réunion, or the cultivation of soybeans in Bhutan, Costa Rica, Dominican Republic, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Mexico, the Middle East. Morocco, New Caledonia, Palestine, Peru, or Réunion. It is also the earliest document seen (Dec. 2007) concerning soybeans in connection with (but not yet in) Cyprus; it is stated that soybeans are not grown on the island of Cyprus. Soybean
culture is not practiced in the Italian colonies of Eritrea (Erythré, now part of Ethiopia) or Cyrenaica (Cyrénaïque, now part of Libya).

Note 3. This document contains the earliest date seen (June 2007) for soybeans in Bhutan, New Caledonia, or Réunion, or the cultivation of soybeans in New Caledonia (1928), or Bhutan or Réunion (1936) (One of two documents).

Note 4. This is the earliest French-language document seen (Sept. 2011) that mentions tempeh, which it calls “tempe” (p. 168). It notes that, in general, the indigenous people of the Netherlands Indies use soybeans mainly to make tempe, a product which, throughout central and eastern Java, takes the place reserved for onjim in western Java. Tempeh is found in two forms: either in large flat cakes which are cut at the time of sale into small square morsels, or wrapped in folded banana leaves. A detailed description of the preparation of each of these two types of tempeh is given as well as another type of tempe, called tempemori, which is made with soybeans and coconut presscake.

Soybean culture is not known to be practiced in the following countries or colonies: Antigua, Barbados, British Honduras (renamed Belize in about 1975), Trinidad and Tobago. Address: Rome, Italy.


**Summary:** The author begins by discussing the research of others on “the well known foodstuff Fu-Yü [fermented tofu, 2 Chinese characters are given] or preserved soy bean curd. Wei (1930) isolated the same species of *Mono-Mucor* from different samples obtained from Shaooshing of Chekiang [province] and Suchow of Kiango Province.

He adds that P.W. Liu, in his unpublished work, “isolated a species of *Mucor* from Mei-Tou-Cha [meitaouza; Chinese characters are given], or naturally fermented dregs of soy bean curd [i.e., naturally fermented okara], which is a common foodstuff in Wuchang and Hankow.” It is prepared by frying in vegetable oil or animal fat.

“No mention of the so-called Minchin [W.-G. mien chin, pinyin mianjin] fermentation has been made as yet in literature. Minchin is, chemically speaking, the gluten of wheat.” Rich in protein, it has a delicious taste. In some districts it is commonly eaten as a substitute for meat by Buddhists who do not eat meat. It is also occasionally used as a palatable dish at banquets. “Although we do not know definitely when it came to be used as an article of diet, it probably was at least hundreds or even thousands of years ago. Recently it has become a canning industry in large cities, San-Loh Wusih Minchin of Kiango province being a well-known example.”

The author then gives a detailed description of how raw wheat gluten is made in China. To the high-protein wheat flour, about 0.5% to 1% by weight of table salt is added before any water is added in a large earthen jar. The dough is allowed to stand for 1-2 hours under water before the starch is removed in a strainer. A high grade of minchin is one that is almost free of starch content, pale in color, and very sticky and flexible.

Raw wheat gluten is typically made into one of four end products: (1) Fresh minchin: The raw minchin is kneaded into desirable shapes then boiled and seasoned for eating. When prepared for sale at a market in hot weather, it is usually preserved in water to prevent rapid spoilage by bacteria; (2) Roasted minchin is prepared by roasting raw minchin in a flat pan over a fire. A small mass of raw minchin will bubble up into a large globose shape with a very loose and porous texture. It is usually used to prepare soups, or cooked with other foods, and can be purchased even in small grocery stores in some localities; (3) Fried minchin is prepared by frying raw minchin with vegetable oil and seasoning. Recently the preparation of this kind of minchin has become a canning industry, as noted above. It has an excellent taste and is especially appropriate for travelers; (4) Fermented minchin (fermented wheat gluten) is made by putting fresh minchin into a suitable container, usually an earthen jar, and covering it tightly. After 2-3 weeks at room temperature, it will be overgrown with molds and bacteria. Then an excess amount of table salt (sodium chloride), more than 10% by weight of the molded minchin is added. After thoroughly mixing the salt into the minchin, it is allowed to stand for 2 more weeks to age. It is then commonly cut into thin strips and used as a condiment with other foods. Usually the fermentation is carried on during the winter because in hot weather it spoils rapidly due to bacteria.

Minchin is most commonly eaten by the people in northern China, however fermented minchin is rarely heard of except in Wuchang, Hankow and Hanyang of Huple Province so far as the author knows. According to the “Investigation of diet nutrition of Chinese in Manchuria” by Lu (1934), the average amount of Minchin consumed a day by one person of different classes, and its nutritive value are as follows (Table 1): Physicians 14.4 gm of minchin, 3.2 gm of protein; Members of the bank 13.8 gm, 3.1 gm of protein; Officials 11.2 gm, 2.5 gm of protein; School teachers 3.7 gm, 0.8 gm of protein; Middle class families 1.8 gm, 0.4 gm of protein.

Minchin appears to contain a mixture of molds including *Paecilomyces variotii*, *Aspergillus flavipes*, *Cladosporium elegans*, *Fusarium orthoceras*, *Syncephalastrum racemosum*, *Trichothecium roseum*, and *Penicillium* species.

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “Fu-Yü” to refer to fermented tofu.

Note 2. This is the earliest document seen (Sept. 2011) concerning okara tempeh (which it calls Mei-Tou-Cha), and
the earliest English-language document seen (Sept. 2011) that uses the term “Mei-Tou-Cha” to refer to okara tempe. Address: Lab. of Applied Mycology, College of Agriculture, Hokkaido Imperial Univ., Sapporo, Japan.


**Summary:** Most of us who live in California have a favorite Chinese restaurant, where you can order the usual chop suey and chow mein, as well as the more typical Chinese dishes of distinction. The dollar dinner includes “almond chicken, made with bamboo shoots, water chestnuts, dried mushrooms, diced chicken and soy sauce.” And there are crispy “fried shrimps which you dip into ketchup and mustard sauce.” Or try the “bock choy served with Chinese cheese, which is really bean cake [tofu] fermented in wine and tasting much like Roquefort.”


**Summary:** Contents: Introduction. 1. Botanical characteristics and principal varieties. 2. Chemical composition of soya. 3. Alimentary physiology and the nutritional uses of soya: Seeds (energy value, protein, vitamins, use as a milk substitute), forage. 4. Different uses of soya: Agricultural, industrial (oil, casein, sterol), as human food (sprouts, tofu, fermented tofu, shoyu, miso, tuong of Annam, roasted soy coffee, soy bread for diabetics, the future of soya). 5. The economies of soya: Production, imports, exports. Conclusions. Address: Director, Station d’Agronomie et de Pathologie vegetale d’Avignon, France.


**Summary:** About *tofuyo*, Okinawan fermented tofu. Note: This is the earliest document seen (June 2004) that mentions *tofuyo* or Okinawan wine-fermented tofu. Address: Okinawa.


**Summary:** This book contains many commercial scale formulas / recipes. Chapter 2, “Description of raw materials,” includes brief descriptions of “corn oil (maize oil), cottonseed oil, arachis oil (also called peanut, ground nut, and earth nut oil), sesame oil (gingli oil, teel oil), soy bean oil, and rape oil” (p. 70-71).

Chapter 3, “Milk and milk products,” includes subsections titled “Infants’ milk, synthetic” (a recipe for a dry mix in which “Soya bean powder, 125 g.” is the main ingredient), “Soya bean vegetable milk” and “Soya bean curd” (p. 89). Concerning the milk: “Soya bean meal after the oil is extracted or whole soya bean meal may be utilized quite as well as the whole bean. The milk can be used successfully in numerous preparations, such as breads and cakes, in creaming vegetables, in milk chocolate, and in custards. After separating the liquid from the solid material, the residue is still very rich in nutritive substances and can be dried and used for cattle feed or made into flour for human food.”

Note: This is the earliest English-language document seen (May 2008) that uses the term “Soya bean vegetable milk” to refer to soymilk.

Concerning the curd: “This curd, after being drained or pressed, represents bean curd of [sic, or] tofu, which is extensively eaten and forms the basis of numerous fermented, smoked, and dried cheeses in China and Japan... In many cities of the United States having a large oriental population fresh bean curd may be found in Chinese and Japanese markets.”

Chapter 5, on canned foods, notes in the section titled “Dried beans” (p. 126) that “Soya” beans sold in cans.

Chapter 17, on “Bread” contains two formulas (p. 378-79) for “Soya bean flour bread,” the first containing 260 lb. wheat flour, 65 lb. “Soya flour,” etc., and the second containing 25 lb. “Whole soya flour,” 25 lb “Whole wheat flour,” etc. The straight dough method is used.

Chapter 23, titled “Health foods” begins (p. 445): “Natural and vitamin-laden health-building foods and drinks are essential for healthy muscles, nerves, glands, and for the growth and maintenance of a healthy, vigorous, and sound mind.” The best diets are those containing plenty of fresh foods and juices. “Nuts and soya beans are good substitutes for meats, fish, eggs, and sea foods.” A section in this chapter on the “Soy bean” begins (p. 447): “The soy bean is justly entitled to be called the king of the legumes. Not only because it is lowest in starch but also because, firstly, it is the most complete and best protein for both growing children and adults and, secondly, because of its unusually high mineral content being quite high in alkaline potassium, calcium, and magnesium... it is an alkaline food.”

Formulas for health foods include (p. 454-55): “Health dry cereals” (six formulas, two if which contain “Soy bean middlings” [medium size soy grits, probably made by cracking whole soybeans]). Coffee substitutes and health drinks (three formulas, the 3rd containing only 75 oz. roasted whole wheat and 25 oz. roasted soy bean middlings). The
next health-food subsection, titled “Flour, meals, etc.” states (p. 455): “Soy bean flour, with or without a high percentage of
fat, is used to make bread, biscuits, noodles, mayonnaise,
candy, etc.”

Chapter 24, “Acid-forming and alkali-forming foods,”
states: “When foods yielding an acid ash predominate in the
diet, a condition of acidosis may result unless the resulting
constituents are neutralized with alkaline ash foods.”

Next come two lists: (1) “Acid-forming foods, starting
with those foods having the least amount of acid-forming
ash.” The foods with the most acid-forming ash are: 1. White
bread. 2. Cheese. 3. Meat, chicken. 4. Fish, haddock. 5.

(2) “Alkali-forming foods, starting with those foods
having the least amount of alkali-forming ash.” The foods
with the most alkali-forming ash are: 1. Soy bean. 2. Olives.
Research Chemist; 2. B.S., Consulting Food Chemist and
Director of Shirley Labs., New York City.

149. Low, Henry. 1938. Cook at home in Chinese. New York,
NY: Macmillan. [xiii] + 274 p. Foreword by Lin Yutang. 21
cm.

• Summary: The names of recipes and ingredients in this
cookbook are in Cantonese. The Preface begins with an old
Chinese saying which states that the food of Kwanchow
[Canton, Guangzhou, Kwangchow] is well known to be
the best in China. “Only within the last few years has the
American public realized the deliciousness of Chinese foods,
prepared in the original Chinese style.” It is not necessary to
keep a large number of Chinese ingredients on hand in order
to enjoy these recipes. “If gourmet powder (mei jing [MSG]),
soy sauce (see yeou), black beans (dow see [fermented black
soybeans]), brown bean sauce (mien see), and black sauce
(gee yeou) are added to the ordinary household supply they
will see one through quite well.” “The author as had forty
years of cooking experience and is considered an authority
on real Chinese food.” Note: Most recipes call for 1-2
teaspoons “gourmet powder” (mei jing [MSG]).

A “Glossary of ingredients” (p. 5-18) lists the major
ones called for in this book, with the Chinese name
romanized in Cantonese and the Chinese characters for each.
Soy-related ingredients are: Beans, black (dow see). Cheese,
Chinese (foo yu) [fermented tofu]. Cheese, red (nom yu)
[fermented tofu]. Curds, bean (dow foo). Curds, bean, dried
(tiem jook [dried yuba]). Sauce, black (gee yeou). Sauce,
brown bean (mien see). Sauce, soy (see yeou).

Note: This is the earliest English-language document
seen (Oct. 2011) that uses the term “nom yu” to refer to
fermented tofu.

Soy-related recipes: Bean curd soup (Dow foo tong, p.
27). Bean curd and hairy melon soup (Jeat kuar tong, p. 27).
Bean curd and mushroom soup (Dow foo tso koo tong, p.
28). Chinese okra and bean curd soup (Sing kuar dow foo
tong, p. 29-30). Snails with black beans (Chow tien lor, p.
67). Sea bass with black beans (Dow see yu, p. 74). Sea bass
and vegetables with black beans (Sy wu yu, p. 75). Fried fish
with bean curds (Dow foo yu, p. 76). Steamed fish with bean
curds (Dow foo jing yu, p. 76-77). Smelts with brown bean
sauce (Jui suut yu, p. 84). Sturgeon with bean curds (Mun
leung dun, p. 84-85). Crab meat with bean curds [and soy
sauce] (Dow foo hai, p. 90). Shrimps with bean curds (Dow
foo gee ha, p. 99).

Boiled chicken with soy sauce (See yeou gai, p. 107-
08). Duck with soy sauce (Tung tze op, p. 141). Squab with
soy sauce (Tung tse gop, p. 156-57). Beef with bean curds
(Dow foo ngow yuk, p. 162). Roast pork with bean curds and
oyster sauce (Tar sheou ho yow dow foo, p. 172). Pork with
bean curds (Dow foo chow gee yu, p. 172). Pork with lotus
rot and red cheese (Leen gnow nom yu gee yu, p. 179-180).
Steamed spareribs with black beans (Chow pii yuk, p. 187-
88). Scrambled eggs with bean curds (Dow foo chow don, p.
199-200). Spinach with Chinese cheese (Chow bor choy foo
yu, p. 209).

The chapter titled “Cheese” (p. 221-23) has only one
entry and no recipes: “Chinese cheese (foo yu). The Chinese
do not serve their cheese as a separate course at the end of
the meal as Americans do, but see it as a main course. It is
eaten with hot rice. This cheese (foo yu), strictly speaking, is
not a cheese at all because it contains no milk. It is the bean
curd (dow foo) aged in Chinese wine. The flavor is marked,
and a taste for it is easily acquired by cheese-lovers.”

The author has an entire chapter titled “Chow mein”
(p. 243-52). Plain chow mein is almost the same as Chicken
chow mein, but with ½ cup less chicken. Fried noodles in
called “Jow mein.” Chow mein Cantonese is one of the
most popular luncheon dishes among the Chinese. Recipes
are given for Beef chow mein, Chicken chow mein, Lobster
chow mein, Shrimp chow mein.

Another entire chapter (p. 253-62) is devoted to “Chop
suey, including Plain, Chicago, Mixed vegetable, Mushroom,
Beef, Pineapple, etc.”; none of these recipes call for rice or
noodles.

150. Sia, Mary Li (Mrs. Richard H.P. Sia). 1938. Chinese
chopsticks: A manual of Chinese cookery and guide
to Peking restaurants. 2nd ed. Peking, China: Peking
International Women’s Club. xvii + 144 + 6 p. Frontispiece.
Illust. Index. 19 cm. [Eng; chi]

• Summary: Tofu recipes: Bean curd and shrimp egg (p.
1). Stewed pork with red bean curd and pork (with “1 large
piece of red bean curd” [red fermented tofu], p. 28). Stewed
spare ribs (with “2 T. [tablespoons] preserved red bean curd,”
p. 30). Bean curd and prawns (p. 45). Bean curd, eggs and
chicken blood (p. 77). Oxtail Soup (with black beans) (p.
81).

The “List of foodstuffs” (p. 130-36) mentions: Bean
curd, Bean Curd dry, and Bean curd preserved.

A recipe (p. 52) for “Steamed fish with black salted soy beans” (CC = Chinese characters given) (tou ch’ih) calls for “1 T. [tablespoon] black salted soy beans, 1 small piece ginger, chopped, 1 piece garlic, chopped.”

Note: This 2nd edition has a lovely cover. The names of dishes, restaurants, and their addresses are in English and Chinese.


• Summary: The author mentions briefly (p. 41) that she tasted “tofu-yu” [fermented tofu] from the banquet table at Shojun Danshaku’s home.


• Summary: Soy is discussed at length (usually in connection with Henry Ford Sr. and Edsel A. Ruddiman) on p. 22, 40, 42, 202-06, 208-11. Henry Ford is also discussed on p. 21-22, 30, 69, 76-77, 118, 144, 246.

“A few years ago, Henry Ford was ridiculed when he said the time would come when most of an automobile would be grown on the farm. Since then, Ford chemists have perfected processes whereby soy beans are converted into plastic substitutes for automobile parts formerly made of metal. Ford Chemist Russell Hudson McCarroll estimated that the use of plastics for interior window moldings alone would increase that company’s use of farm-grown metal substitutes twenty-five million pounds annually.” (p. 21-22).

“Dearborn was selected as the [first chemurgic] conference site because it was the home of Henry Ford, an industrialist who had demonstrated his understanding of the meaning of the farm problem, and because there were, in near-by Edison Institute, working exhibits of the processing equipment which Ford researchers had developed to convert soy beans into some thirty industrial products.” (p. 40).

At the chemurgic conference Russell Hudson McCarroll, a Ford chemist, described how soy beans are converted into raw materials for industrial use. “From the bean oil Ford chemists make a lacquer which is claimed to be superior to the pyroxylin paints usually used in coating metals. From the residue of meal after extraction of oil, Ford chemists make plastic parts for automobiles, these farm-derived parts being substitutes either for metals formerly mined or for rubber formerly imported.” (p. 42).

Chapter 10, titled “Ford links farm and factory” (p. 200-12) is about Henry Ford, chemurgy, and soy beans. “Do you recall the gibes that greeted his [Henry Ford’s] prediction that man would one day find a substitute for the cow, as revolutionary as the automobile which displaced the horse? It was very funny when the cartoonists and columnists leaped upon it gleefully—but it may not be so fantastic as it once seemed.

“Let’s investigate it.

“Come now to the foot of Elm Street, in Dearborn, to a rejuvenated farmhouse whose homelike exterior masks a modern laboratory.”

“Follow the truant chemurgists inside and meet Ford’s boyhood companion, Dr. Edsel a. Ruddiman, the food-chemist whose services were enlisted by his old deskmate. In the back room, once a farm kitchen, is an electric refrigerator, filled with food made from soy beans. Milk, butter and cheese—the latter, fresh, dried, smoked and fermented—are there, soy-bean products all. In the pantry are breakfast foods, macaroni, salad oils, crackers, diabetic foods, infant foods, flour, bouillon cubes, soups, confectons, coffee substitutes, sauces, gravies and beef substitutes—all produced from the soy” (p. 202-03).

“A wonder bean indeed!” “During the World War [I], when Germany faced famine, German chemists extracted from the soy the glutamic acid which became the basis of the ‘beef-tea’ that kept patients alive in hospitals.” The soy bean “gets into Heinz and Lea & Perrins’ sauces and into oleomargarine” (p. 203).

A full-page photo (between pages 206 and 207) shows Irénée du Pont and Henry Ford talking and enjoying a meal together at a table.


• Summary: On the title page: “Issued in commemoration of the thirtieth Anniversary.” The University of the Philippines was founded in 1908. The Foreword (by L.B. Uichanco, Dean, College of Agriculture) states that its College of Agriculture opened on 14 June 1909, at which time “scientific Philippine agriculture was virtually nonexistent.” The idea for the book originated with the former dean of the College of Agriculture, Dr. B.M. Gonzalez, before he was appointed president of the University of the Philippines. Soybeans and soyfoods are discussed extensively.

“Coffee adulterants” (p. 104), commonly mixed with ground coffee, include roasted ground corn, soybean, peanut, mungo, cashew, and sometimes ilip-ilip (Leucaena glauca).


The two main kinds of insecticides in 1939 (p. 223-31)
were stomach poisons (which kill when eaten; incl. lead arsenate, calcium arsenate, Paris green) and contact poisons (incl. concentrated tobacco decoction, as in Black Leaf “40”).

“Diseases of beans and other legumes (p. 319+) include downy mildew of soybean and rust of soybean.

A table (p. 448) gives the content of five vitamins found in various feeds incl. soybean seeds, soybean leaves, soybean meal, peanut meal, and peanut seeds.

“Leguminous silage” includes that from cowpea, soybean, and mango [mung bean] (Phaseolus aureus). Tables give: (1) The “Average digestible nutrients in feeds” incl. soybean (p. 459, 462).

(2) The “Nutritive value of foods” incl. seaweeds (ara-rosip, Gracilaria crassa, p. 534), mango sprouts (p. 536), green soybeans (p. 537), seguidilla or kalamismis (Psophocarpus tetragonolobus; fresh and sun-dried seeds, p. 538), soy products (p. 538-39 incl. soy sauce (toyo, Superior {Senkee and Co.}, Commercial), soy milk–boiled, soy residue (sapidal), soy residue after second drawing of toyo, soy curd (toqua [tofu]).

(3) “Foods as sources of minerals” (calcium, phosphorus, iron: p. 580-81), incl. miso or soybean mush, soybeans–baked flour, soybeans–baked sprouts, soy curd or toqua, soy sauce or toyo (four brands: Solo, Great Eastern, Violin, Rooster), tahuri or soybean curd preserved in strong brine solution (solid portion).

(4) “Foods as sources of vitamins” (p. 593-94) incl. bean–asparagus or cigarillas (Psophocarpus tetragonolobus), bean–mungo (in pods or sprouts), bean–soy (dry, green, or leaves), peanut butter, seaweed, sesame (p. 601). Address: Manila, Philippines.


In section 2, “The Legumes” (p. 210+), the first two entries are: (1) The soybean. Latin names. Chinese name: (CC = Chinese characters given), Ta Dou. “The yellow, black and green varieties are common in China and marketed from Manchuria, Tsingtao and Shanghai. The young soybean in the pod is a common article of diet in Shanghai, Chinese name, CC. Shanghai: Mau Deu; Peking, Mao tou. Followed by: season, price, nutritive value, and a recipe.

(2) Soybean sprouts. Chinese name, CC. Shanghai: Waung Deu Nga; Peking, Huong Tou Ta. Followed by: season, price, how to make, nutritive value, and serving suggestions.

“There are very many other soybean preparations of high nutritional value well worth adding to the diet. Soybean sauce (soy) with added spices is the basis of such things as Worcester [Worcestershire] sauce. Beancurd is really a king of junket containing good digestible protein, it can be added to soups or stews. Made fresh daily... A dry cake is made [pressed tofu], also spiced, pickled, fried and fermented. The latter is just like a kind of strong cheese.” Soybean milk is made by “grinding the [soy] bean with water, one part of bean to about 9 of water.

Photos (on unnumbered pages, against a black background, with a small cm ruler show): (1) Four young soybean pods with beans inside. Four soybean sprouts 8-10 cm long.


“Soy bean is grown in many parts of the Philippines where it is known as ‘utao’ and also as Chinese ‘Balatong.’ It is grown in large quantities in Batangas Province. The green pods are harvested in October and November and the dried seeds may be had in bulk in December and January. Just when soy bean was first cultivated in the Philippines is not known. For years casual plantings have been made but it is only in comparatively recent years that the cultivation has been seriously considered as an agricultural industry. Statistics indicate that consumption of soy bean in the Philippines has grown faster than production. They also show a growing appreciation of soy bean in the Philippines.”

Soy bean with shaved ice “is a very popular soy bean mixture introduced by the Japanese but now sold in nearly all refreshment parlors all over the Philippines. The preparation consists of a mixture of boiled red mongo and soy bean mixed with cream, brown sugar and ice shavings. This form of soy bean mixture is more nourishing than any other preparation just described on account of its cream and sugar content.”

The consumption of soy bean products in the Philippines “does not amount to very much. The reason for this apparent neglect is the general lack of sufficient information. It is desirable that the government should initiate the necessary
campaign to inform the people regarding the valuable nutritive properties of soy bean. Although the Bureau of Science since 1931 has been carrying a demonstration campaign to teach the public the different methods of cooking soy bean with the aim of popularizing its use among the masses, its efforts so far have not yielded the expected results. Another reason is the lack of a central body in the Philippines that can coordinate all the nutrition work to be carried out in that country. Furthermore, there is lacking a definite long range policy for the betterment of nutrition.

“The popularization among the masses of soy bean and soy bean products like soy bean curd, soy bean flour, and soy bean milk should be undertaken along with a more intensive campaign about its nutritive value carried on in the different schools all over the Philippines.”

Note 1. In section titled “Fermented bean curd or ‘Tahuri’” (4 paragraphs and 1 table), the text is a combination of that first presented by Gibbes and Agcaoili (1912) and Orosa (1932). Although the word “fermented” is used here to describe tahuri for the first time, no information about a fermentation microorganism or process is given.

Note 2. This is one of the earliest English-language documents seen (Sept. 2006) that uses the term “Soy bean” in a new way—as a singular noun, like corn or wheat, not preceded by “the.” Examples: “Soy bean is grown in many parts of the Philippines...” “...campaign to teach the public the different methods of cooking soy bean with the aim of popularizing its use among the masses,...” Address: Dep. of Physiology and Biochemistry, College of Medicine, Univ. of the Philippines.

156. Giraud-Gilliet, J. 1942. Le soja, aliment d’avenir: manière de le cultiver; 2 à 300 façons de le consommer [Soya, food of the future: How to cultivate it; 200-300 ways to consume it]. Saigon: Imprimerie de C. Ardin. 285 p. Index. [Fre]

• Summary: Contents: Dedication. Introduction. Part I: Summary study of soya (the soybean): Its cultivation. 1. The nature of soya: Its area of expansion. 2. Cultivation of soya: Soil, manure & fertilizer, seeds. 3. Interest in soya: Its richness in nutritive elements and comparison with other foods. Various possibilities for utilization: therapeutic uses for hygiene and diseases (vegetarian diet, diabetes, beriberi, diseases of the nervous system, anemia, slimming, milk diet), agricultural uses for fixation of nitrogen in the soil and as a fertilizer, use in the feeding of animals (green forage, dry forage, soybean cake, flour, seeds, germinated seeds, straw and pods, soymilk, milk), industrial utilization (soybean oil and its derivatives, glycerine, soy casein), use as human food (whole dry soybeans, soy sprouts, soybeans mashed or ground after they are cooked, soybeans cracked or crushed before they are cooked, fermented soybeans, soymilk, soymilk derivatives / foods made from soymilk {tofu / dâu-phu, yuba / tao hu ky, dry yuba rolls / phu chuc, beverages}, edible oil), utilization for social work (drops of milk, bowls of soya, inexpensive restaurants, battle against malnutrition and degeneration, for school gardens, pagodas, waste lands).

Part II: The main soyfood products and how to prepare them at home. 1. Soymilk, soymilk curds (tahu hoa), small white cheeses (petits fromages blancs {dâu-hu mięng}), folded sheets of yellow yuba (feuille jaune plissée de crème de soja {dâu-hu ky vang}), white sheets of yuba (feuille blanche unie {dâu-hu ky trang}), dried or smoked yuba (plaquettes séchées ou fumées {dâu-hu ky ngaot}), fermented tofu–like cream cheese (fromages fermentées: cancoillotte comtoise au soja). 2. Soy flour: Roasted soy flour, soy bread, sojenta (soy polenta), pasta (soy vermicelli and vermicelli of mung beans {dâu xanh} or song than). 3. Soy condiments. Solid condiments: natto and doujiang (taijung) and koji [sic, not a paste but used to make miso, doujiang, shoyu, and jiàng-you], liquid condiments: shoyu, jiàng-you (tsiang yeou), (tao yu), ketjap (Indonesian soy sauce), Vietnamese soy sauce (tuong).


• Summary: “Translations of a wide collection of fables, tales, poems, and excerpts from sacred books introduce the Westerner to the spiritual and cultural wealth of the Orient.”

In “Part Two: The wisdom of China” is a section titled “Six chapters of a floating life,” by Shen Fu (Translated by Lin Yutang); it is an autobiographical novel. Shen Fu lived 1763-1825, during the Qing dynasty, in Suzhou (in today’s central eastern China).

Page 980: Yün is the wife of the author; they deeply love one another. “To this Yün replied: ‘One eats bean-curd because it is so cheap and it goes with dry rice as well as with congee.’

“You yourself eat garlic, for instance, and I have tried to eat it with you. I won’t compel you to eat stinking bean-curd, but cucumber is really very nice, if you hold your breath while eating.”

“Yün also prepared pickled bean-curd mixed with sesame seed oil and sugar, which I found also to be a delicacy. We then mixed pickled cucumber with pickled bean-curd and called the mixture ‘the double-flavoured gravy.’ I said I could not understand why I disliked it at first and began to love it so now. ‘If you are in love with a thing, you will forget its ugliness,’ said Yün.’
• Summary: The story of the fall of Hong Kong in 1941, and the experiences of the author in the Stanley Prison Camp, established by the Japanese conquerors.

Page 80: “We drew up the package and examined it and found that it contained some bean curd cheese and two pomeloes... Bean curd cheese has much the flavor of a very strong Gorgonzola. We each had a square of about a quarter of an inch which flavored an entire bowl of rice.”


Note: Emile Perrot was born in 1867.


• Summary: Yuba is called “bean curd skin.” Mentions “red bean curd sauce” [nam yue?]. Katherine Bazore was born in 1895.


• Summary: This excellent dictionary, which romanizes Chinese words using the Wade-Giles system and arranged them in alphabetical order by sound, is a condensed version of the multi-volume dictionary by Giles, and a revised version of Matthews’ 1931 dictionary. Soy-related characters include:

Chiang (No. 661, p. 90)–Soy [sauce], pickled vegetables, pickled bean curd (chiang toufu) [fermented tofu].
Fu (No. 1930, p. 285)–Tofu.

Ju (No. 3144, p. 473)–Milk. The breasts; a teat, a nipple. To suckle. Fujiu (“rotten milk”)–A milky preparation from beans. [Note: Probably fermented tofu].
Shih (No. 5805, p. 813)–Cantonese soy [sauce], salted beans [soy nuggets] eaten with rice, gruel, etc.
Tou (No. 6478, p. 939-40)–See No. 6481.
Tou (No. 6481, p. 940)–Beans, oil expressed from beans, young bean plants, bean stalks, bean flour, bean curd, dried cakes of bean curd usually flavored with soy, underlings = bean curd officials, soft hearted, bean sprouts [mung]–used as a vegetable, bean pods, soy [sauce], bean-cake, four kinds of soya beans (ta-tou, hei-tofu, huang-tofu), (Glycine hispida).

Note: At Mao (No. 4357, p. 614, meaning “hair”) there is no entry for Mao tou = “green vegetable soybeans.” Address: China Inland Mission, Shanghai.


• Summary: Contents: 1. Introduction (he notes that World War II is “the war we have just lost”). 2. Soybean agronomy: Botanical characteristics, varieties (in Japan, China, Manchuria, USA), acclimatization trials in Europe, soybean cultivation (incl. inoculation), 3. Food and agricultural uses of soy: Chemistry of the soybean, alimentary physiology, as a feed for animals (soybean cake, forage, soybean seed and flour, soymilk mixed with 25% animal milk), other agricultural uses, as a human food (soy sprouts, tofu, fermented tofu, smoked tofu, how to make tofu), condiments–sauces (soy sauce miso, tuong of the Annamites, soy coffee, provisions / rations), human therapy (incl. infant foods).

4. Industrial uses: Soybean oil, casein, plastic materials (Sojalithe), vegetable lecithin, cellulose, sterol.

5. Soy in the economy: Production, imports and exports.

6. The present state of the soybean question in France–Conclusion.

On page 8 is an interesting map of France which shows:
(1) Twelve centers of agronomic research. (2) A shaded zone which is the area of optimal production of soybean seeds. It is in the southeast of France and along the eastern side of France all the way to the northern border. This zone includes (from southwest to northeast) the following centers:
Toulouse, Montpellier, Avignon, Antibes, Clermont, Dijon, and Colmar (in Alsace).

Pages 5-6: The first trials made by the agronomic stations in France date from 1901. Mr. Lechartier, director of the station at Rennes, concluded at the end of his observations, that the production of soybean seeds would be
more advantageous in a climate that was drier and warmer than that of Brittany.

These were the same conclusions that Mr. Brioux, director of the agronomic station at Rouen, arrived at some years later.

Starting in 1924 the agronomic station at Avignon, the central station for plant improvement at Versailles, in 1935 the stations at Colmar, Clermont-Ferrand and Dijon, and in 1940 the School of Merle (Bouches-du-Rhône), established soybean [germplasm] collections which originated in many different places, in order to test the earliest and most productive varieties that were adapted to each region.

Rouest and Rondet in the south of France, Dr. Balzli in Alsace and de Guerpel in Normandy were the main agronomists and selectionists who were passionately interested in the cultivation of Soybean in France.

Note: Rouen is the historic capital city of Normandy, in northern France on the River Seine. Address: Ingénieur Agronome, Directeur de la Station Régionale de Recherches Agronomiques d’Avignon, France.


*Summary:* This is a book about bread. The 1st chapter is “A short history of breads.” The chapter titled “Soy flour breads and biscuits” (p. 401-24) includes the following (p. 404-05): In New York’s Chinatown, stroll inquisitively along Mott, Pell, and Doyer Streets, and you will see how important the soy bean is in everyday Chinese life. “Fresh bean sprouts—some from soy and some from other beans—stand in large hampers in the shops; on the shelves around them are jugs and bottle of soy sauce, for the kitchen or the table.”

In Chinese shops corresponding vaguely to our delicatessen stores you will see Tèou-fu, or tofu, made fresh daily, in cream-white cakes like Philadelphia cream cheese, kept cool and moist in pans of water. It is made from soy bean milk much as cheese is made from cow’s milk or goat’s milk, and it was a staple commodity in Chinese cities more than two thousand years ago. The Chinese prepare it for breakfast, dinner or supper in many ways, and a favorite form is ready for you in the shops—Tsà tofu, the little cheeses fried in deep fat [deep-fried tofu puffs], that look like well-browned and rather robust doughnuts without holes. You can get them hot from the kettle and eat them with syrup or without; a Chinese laborer finds them sustaining and satisfying as a noon-hour meal.

“Tofu náo is of custard consistency and is eaten in soups and as a custard; Chien chang, or thousand-fold tofu, is made in thin layers rolled together and cut up like noodles for soup or fried in sesame oil. A brown, dry tofu, Hsiang khan [pressed tofu] is colored and flavored with caramelized millet sugar and eaten with soups and salads. There are many forms of preserved tofu cheese: smoked, salted, and packed in wine and brandy to be used in cooking or as a delicacy like cheeses of the Western World. Yuba, as old as soy beans from which it is made, is the dried creamy film from boiling soy milk, sold in flakes or sheets, or rolled into “bean sticks,” and it has been one of the most popular commodities in China and Japan for centuries.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “preserved tofu” or the term “tofu cheese” or the term “preserved tofu cheese” to refer to Chinese-style fermented tofu. Address: Chef Steward, Consulting food editor of Hotel Management and Restaurant Management magazines, food columnist of Gourmet magazine and author of various cook books.


*Summary:* In Chapter 7, “Social accommodations,” the section titled “Mess hall” states (p. 95): “On one occasion a badly cooked Chinese bean-curd cheese was served in the unskilled workers’ mess hall; after a disturbance, workers brought this dish to the shop to show the engineer and asked how they could eat such food and work.” Page 97: “The calcium intake [of the workers’ diet] might be adequate if the soy bean curd and pickled vegetables are taken into account.” Address: National Yunnan Univ., China.


*Summary:* Chapter three: The section titled “Soy bean curd” begins: “A man is making soy bean curd and setting it out for sale. It stands in shivering squares of white on a cloth which lines the flat bamboo tray.” Why is this artistic? Well, behind the man is “brown dried, pickled bean curd” which is used to enhance flavors. Also beautiful are the “brilliant red bean curd cubes hot with red pepper,” which add zest to breakfast. Also framed in the scene are “jars of soy sauce.” Making this sauce is an art unto itself, for the kind of water and method of fermentation, etc. each affect the finished soy sauce, which is the foundation of Chinese cooking.

An illustration shows a handsome and vital “Horse,” by Ju Pei-hung, part of an exhibition titled “Fifteen Contemporary Chinese Painters,” organized by the East and West Association, New York. Address: Author of “The Exile’s Daughter,” “Made in China,” etc.


*Summary:* Contents: Introduction. Review of the literature. Making soy sauce: Laboratory procedure, grades and
composition of soy sauce (there are 3 grades; the lower the grade, the lower the specific gravity of the soy sauce). Soybean cheese (sufu).

“An important microorganism for making soybean cheese is *Mucor sufu*, which was first isolated by N.S. Wei [sic, Wai] (J. of Chinese Agr. Soc. 1926). Other useful microorganisms for making this product are *Monascus* (e.g., *M. anka*, *M. purpureus*, *M. faligiosus* [sic, *M. fuliginosus*], *M. major*, and *M. pilosus*), yeasts and bacteria. Some of these have been isolated by the writer in the National Bureau of Industrial Research, China (Bulletin No, 126, 1941).

The procedure for making soybean cheese is described, starting with 300 gm of whole soybeans. After pressed tofu cubes are inoculated on the surface with any of various mold species, they are incubated at 25°C for 3 days. Then 600 ml of a 16% solution of table salt (NaCl) is added. The 2nd fermentation “usually takes two months after which the cheese and liquid are bottled, sterilized, and marketed.”

Note: This is the earliest document seen (Nov. 2011) that describes how to make fermented tofu at home or on a laboratory scale. Address: Univ. of Wisconsin.

• Summary: “The beginning and foundation of the Library of Congress Orientalia Collection was the great Chinese encyclopedia, the *Ssu k’u ch’uan shu*, a gift of the Empress Dowager of China.

“About 1914, Dr. Swingle, then head of the Office of Crop physiology and Breeding, Bureau of Plant Industry, U.S. Dept. of Agriculture, was able to secure the services of a Cornell graduate, Dr. Hing Kwai Fung, to make abstracts and/or translations of information in the *Ssu k’u ch’uan shu* regarding economic plants. Dr. Swingle interested Dr. Herbert Putnam, Librarian of Congress in increasing the holdings of Chinese books, especially gazetteers [sic, gazetteers] which contain local information. When Dr. Fung returned to China, he was given a modest sum for purchasing books. Dr. Fung was able to persuade the Commercial Press (the largest publishing firm in China, located in Shanghai) to act as receiving agent for books for the Library of Congress, and to ship them to Washington [DC]. Soon after, Dr. Swingle was sent to the Orient—in March 1918—by the Dept. of Agriculture.” There he made arrangements for collecting books in Tokyo and Shanghai.

“As American merchants and missionaries gradually penetrated into China, they sent home more and more plants and trees. The Arnold Arboretum, organized and directed by the great tree expert, C.S. Sargent, financed extensive trips to the Orient to obtain botanical specimens and seeds of ornamental trees and shrubs as well as photographs of them as they grew in their native habitat. These trees and shrubs revolutionized the garden and park plantings of the northern parts of the United States. The illustrated popular books of E.H. Wilson, who made many trips to the Orient for the Arnold Arboretum, helped to arouse interest in the very rich arboreal flora of China...

“The Plant Introduction Service of the U.S. Department of Agriculture was organized by David Fairchild in 1897; he did very extensive exploring for foreign economic and ornamental plants from 1898 on, and directed the Plant Introduction Service from 1909 to 1928. I was fortunate enough to be one of the first ‘agricultural explorers.’” Of these men Frank N. Meyer and P.H. Dorsett were outstanding, not only for the number and value of the plants they secured, but also for the detailed and accurate descriptions of every plant they sent to Washington.

“P.H. Dorsett some years later, during the twenties, traveled widely in North China taking many fine photographs of Chinese crop plants and writing descriptions of the culture, harvesting and curing of each. On these trips he collected many varieties of soy beans largely through the utilization of a new and potent method of securing the willing cooperation of all educated Chinese people. A complete translation, prepared by Michael J. Hagerty under my direction in 1917 of the chapter on soy beans contained in a standard Chinese work on economic plants (the *Chih Wu Ming T’u K’ao* by Wu Ch’i-chun) had been furnished the plant explorers looking for soy bean varieties. This translation, covering eighty-two pages, discussed several hundred varieties, telling where they were largely grown. In all cases the name of the variety and the name of the locality where it was grown were not only spelled out in English but also written carefully in Chinese characters. An index made it easy to turn to any variety under discussion and see what was said about its culture.

“This was a turning point in field explorations in China. Such indexed translations in the hands of foreign plant explorers insured the attention of all educated Chinese, who gladly directed the explorer to the nearest source of the various named varieties. I had learned this at first hand in 1915 when studying varieties of Citrus in southern China. Surprise and skepticism about the foreigners knowledge of Chinese books gave way to astonishment and warm approbation.”

“The soy bean is a striking example of the introduction of a new crop... Soy beans were sent from China to France as early as 1740 and from 1779 were grown in the famous Botanic Garden of Paris. Benjamin Franklin, who had been a member of the French Academy of Sciences since 1772, sent seeds back to the United States and urged that they be given a trial. But in spite of his plea, the soy bean remained merely a curiosity in this country for more than a century.

“In the late eighties [sic, 1890] Prof. C.C. Georgeson brought soy bean seeds from Japan, where he had been
teaching at the Agricultural College at Komaba, and planted them in a field on the campus of the Kansas State Agricultural College. I could see the stunted soy bean plants from the windows of the botanical laboratory where I was a ten-age research assistant. This variety, adapted to the perpetual spring climate of Komaba near Tokyo, did not do well on the bare Kansas hills, often swept by hot dry winds. And nothing happened. Soy beans did not arouse interest among Kansas farmers until many years after this failure.

“In the third decade of the twentieth century Dorsett sent to Washington more than 800 named soy bean varieties from China, Manchuria and Japan. These together with shipments secured by Dr. David Fairchild from his numerous correspondents in the Old World, especially in Asia, amounted by 1928 to a total of more than 2800 packages of soy beans, almost all named varieties but many of them duplicated, some of them many times. Meantime tests made by W.J. Morse, in charge of soy bean culture for the Bureau of Plant Industry, showed that many varieties had a narrow range of adaptability. Accordingly, from 1929 to 1931, Morse joined Dorsett in the Orient and these two experts, with trained Chinese helpers, brought to this country the largest single collection of soy bean varieties ever assembled. As soon as Morse returned from studying soy beans in Asia and attacked the problem of finding which Asiatic varieties adapted to the different regions and selecting and breeding to make them fit various American soils and climates, a remarkable change occurred in soy bean culture. Yields went up and plantings increased year by year...

“One of the best-known industrial uses for soy bean proteins is for making water-resistant glue. No less than 30,000 tons of soy bean glue were made in 1942 by a single firm and its licenses annually, most of it being used in the rapidly growing plywood industry. Soy bean proteins have been enthusiastically used by Henry Ford in his automobiles, being mixed with the more expensive phenolic resins, thereby reducing costs and also yielding a more plastic, freer-flowing mixture which takes dyes better...

“As long ago as 1917-1918 Dr. Yamei Kin set up under my general supervision for the U.S. Department of Agriculture a soy bean mill in New York City in the hope of supplying tofu to increase the bulk and food value of meat dishes served to soldiers in training at near-by camps. Dr. Kin succeeded in making excellent tofu. She even served to officers a meal composed entirely of soy bean dishes! However, it proved impossible to test tofu on a large scale at that time, since we could not get priority for transportation of soy beans from North Carolina, then the nearest region where they were grown on any considerable scale.

“A splendid example of a double fermentation is the soy bean cheese called nam yüe by the Cantonese and sufu in North China. It is preferred even to the best Roquefort as a salad dressing constituent by those who have had the opportunity to try it. It is made by Chinese masters of the cheesemaker’s art who believe that its fermentation is an insoluble mystery.

“Shih Chi-yien, then working in the American University of Soochow, published in 1918 the first English account of the most important fermented bean foods. He traced the making of tofu from soy beans back to the Han dynasty (A.D. 22). Ten years later Wai Ngan-shou [Nganshou], one of the first scientifically-trained Chinese microbiologists and fermentation experts, was able to isolate and identify as a new species of Mucor the mold that makes possible the nam yüe fermentation. It is a curious fungus, Mucor sufu, distantly related to the miraculous Penicillium notatum whose marvelous curative action has only recently been discovered. A third fermentation expert, Shih You-kuang, studied another soy bean fermentation product, meitauza, made by another species of Mucor, and published an illustrated account of it in German in 1937. In his review of the literature of Mucor fermentations, Shih You-kuang cites no fewer than thirty articles by eighteen authors all based on Chinese fermentations...

“Miss Elizabeth Groff, under my direction in 1918, made a thorough study of the fermentation of soy sauce in the famous factories of Canton, China, and published the first detailed account of the process in the Philippine Journal of Science for 1919.”

“It has been my privilege to assist in building up a great Chinese library in the Library of Congress, under the enlightened policy of Dr. Herbert Putnam, beginning in 1912. The Orientalia Division, headed by Dr. Arthur Hummel, is now the largest Chinese library outside of Asia and is probably larger than all the European libraries of Chinese books combined. It now contains, Dr. Hummel estimates, about 230,000 Chinese volumes (Chian) and some 20,000 more will soon be added in the form of bibliofilm copies of very rare works from the Chinese National Library, sent to Washington for safekeeping.”

Note 1. This is the earliest secondary document seen that mentions the early introduction of soybeans to America by Benjamin Franklin.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term nam yüe to refer to Chinese-style fermented tofu. It is 2nd earliest English-language document seen (Oct. 2011) uses the word “sufu” to refer to Chinese-style fermented tofu, and the first such document written by a Westerner. Photos show Dr. Walter Tennyson Swingle, and his wife Maude K. Address: Collaborator, Bureau of Plant Industry, USDA; Consultant on Tropical Botany, Univ. of Miami, Florida.


• Summary: This radio broadcast is a fascinating story–told
by many voices—of how the Japanese scientifically developed soybean production, utilization, and export in their puppet state of Manchukuo, and, how the USA intends to capture the soybean export markets lost by the Japanese when they lost World War II.

The Chinese speak of the soybean this way: “It is the poor man’s meat. It is the cow of China. It is meat without bones. The Japanese speak of it this way: If we could have held Manchuria, it would have guaranteed that Japan could never be starved out. American nutritionists speak of it this way: It is high in protein. It is rich in vitamins—in A, B-1, C, G, and E—and also in the bloodclotting vitamin K. Weight for weight it contains several times as much B-1 as beefsteak. And as for minerals: One-half cup of soy flour contains as much calcium as a whole cup of milk... [and] as much phosphorus as two cups of milk. And weight for weight, it contains as much iron as liver, twice as much iron as molasses, and three times as much iron as whole wheat flour. The soybean is a wonder food. One pound of soy beans is almost a complete one-day ration for an adult.”

The USA is now developing two famine-relief foods based on soybeans. The first contains 50% soybean, plus split peas, wheat flour, and a little peanut-meal, onion, salt, and fish-oil. Four million pounds of this mixture and twelve million pounds of another soy-based mixture are being sent “to the famine areas of China.” In other words, soybean are being sent from the USA to the land of their origin, “where they have been a mainstay for five thousand years.”

Discusses: The growing of soybeans in Manchuria. The Japanese takeover and extension of their control via the South Manchuria Railroad, whose terminus is Dairen. The importance of Manchurian soybeans to Japan. The Japanese Central Laboratory at Dairen and its research on soybeans. The two Japanese agricultural experiment stations in Manchukuo. Development of the benzine [benzene] solvent extraction process for soybean oil, “until there were 200 large bean plants in southern Manchuria.” Soybeans as a livestock feed in Manchuria. Use of soybeans as food in China: “Tofu is bean-curd... This is fermented tofu. It is very good. Tofu is eaten in several forms. Fresh, fermented, dried or frozen. Just about any way it is prepared, its food value is preserved... We also use the oil of the soy bean. And with the soy bean we make soy sauce.” Many Asiatic peoples also use soybeans to “make bean milk and bean flour.” “They roast them for confections [kinako]. They eat them green [green vegetable soybeans]. They sprout them [soybean sprouts] and they even make drinks of them.

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “fermented tofu.” Industrial uses of soybeans in America. How Dairen became Japan’s great center of the soy bean industry in Manchuria, and the Mixed Storage System. “About 55% of the soybeans grown in Manchuria are used for human food.”

“You see, its all tied together. The growing of the
In the big cities in the Islands, many of the diseases. "In the U.S. Regional Soybean Industrial Products Laboratory was established at Urbana, Illinois. The chemical and engineering research of that laboratory was transferred by an act of Congress from Urbana to the Northern Regional Research Laboratory at Peoria in July 1942.

“Removal of part of the laboratory to Peoria has resulted in an expansion of all phases of soybean research.” Dr. Reid T. Milner, formerly director of the U.S. Regional Soybean Laboratory, is now head of the analytical and physical chemical division of the NRRL “Technological and fundamental research on soybeans is being carried out by the oil and protein division of which J.C. Cowan is in charge. This group is concentrating practically all its activities on soybean oil and meal. Most of our new developments originate in this division.” The engineering and development division, headed by C.T. Langford, is translating laboratory developments to a pilot-plant scale. This division obtains cost data and evaluates the economic feasibility of the developments. “The fermentation division, headed by A.F. Langlykke, has examined the conversion of soybeans to soybean cheese [fermented tofu] and soya sauce.” Address: Director, NRRL, Peoria, Illinois.

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• Summary: Fermented soy and cereal-soy products found in East Asia may have special nutritive properties as a result of microbial action and they may fall into the group of products of the process which the author calls “biological ennoblment.” Table 1 includes various fermented soy protein foods from Asia: Soya sauce, fermented whole soya beans, and fermented bean curd. Address: Medical Research Council Human Nutrition Research Unit, National Hospital, Queen Square, London, W.C.1, England/England.

• Summary: Contents: Introduction. Description and history. Climatic and soil requirements. Varieties. Propagation. Preparation of the soil. Fertilizers and lime. Inoculation. Planting. Care of the crop. Harvesting and production: For day, for seed. Cost of production. Uses of soybeans. Diseases. “In the big cities in the Islands, many of the soybean products like soy sauce or toyo, tokua, tajuri [fermented tofu], tojo [soymilk curds], miso, etc. are becoming more popularly used by the Filipinos, and will be more so as their nutritive values become more fully realized. Already, in some sections of the country where soybean is being grown, the seed is used either as a green or as a dry vegetable. The dried bean is roasted and is eaten offhand or is used in adulterating coffee, and the bean in the dough stage is boiled and eaten like peanut” (p. 2).

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the word tajuri to refer to fermented tofu.

Table 1 shows annual imports (in kg) of soybeans and soybean products into the Philippines from 1929 to 1940, including dried beans, soy sauces, soybean meal, tausi (soy nuggets, salted), paste (miso), and total. By far the leading import (by weight) from 1929 to 1937 was dried soybeans. In 1929 some 4,574,497 kg were imported. This figure rose gradually (with ups and downs) to a peak of 5,660,575 kg in 1937, then fell sharply to only 237,666 kg in 1940. Soybean sauces were the No. 2 import, starting with 606,231 kg in 1929, rising to a peak of 1,441,563 kg in 1932, then remaining above 1,000,000 for most years thereafter. Imports of soybean meal started in 1935 with 660,699 kg; they reached a peak 1,023,303 in 1936 (the next year), then remained near 1,000,000 thereafter. Tausi was first imported in 1940, the amount being 151,571 kg.

Table 2 shows the value of these items (in pesos). In 1940 the imports of greatest value were soy sauces (120,346 pesos), soybean meal (50,682), and tausi (20,280).

“In the Philippines, while the plant has been under cultivation since the Spanish regime [1571-1898], it has not gained much headway due mainly to the lack of a variety suitable for commercial planting, and perhaps due to want of interest among farmers” (p. 4-5). The Philippine Bureau of Plant Industry has, to date, introduced more than 200 soybean varieties to the Philippines from the USA, China, Japan, Hawaii, Java, and India, but it presently recommends only a few varieties for commercial planting. These include Ami, which has long been cultivated there and is well adapted to the varied soil and climatic conditions.

Based on the results of a number of years’ trials in different regions of the Islands, the following varieties have been found to be productive: Yellow Biloxi Hybrid (introduced from Hawaii in 1936), Mis 28 E.B. Str. 3910 (introduced from India in 1937), Mis 33 Dixi (introduced from India in 1937), Head Green (introduced from the USA in 1935), and American Black. All of these varieties are good for May and June planting, and all but Yellow Biloxi Hybrid are good for September to December planting (dry season).

“In the Philippines, the green but fully developed pods are harvested, and the seed is cooked and eaten in practically the same way as lima bean or patani... In Lipa, Batangas, soybean in the dough stage is boiled in the pod and sold and eaten offhand” like peanuts. The more common soy
products made in the Philippines are soy sauce or toyo, tokua [tofu], tauisi [soy nuggets], and miso. “Soybean milk is being manufactured by the Bureau of Plant Industry in a limited scale and a big modern firm has started putting soybean milk and other products in the local markets” (p. 15-16).

Note 2. This is the earliest English-language document seen (Oct. 2008) that uses the word tauisi to refer to soy nuggets. Address: Chief, Horticulture Research Section, Bureau of Plant Industry.


**Summary:** In the chapter on “Cuba,” the section titled “Havana’s Chinatown” states (p. 33): “Further down the street is a Chinese vegetable shop. Here are sold choi, long white Chinese radishes, cress, and prickly cucumbers. Brown earthenware crocks filled with brine contain white chunks of bean curd cheese, which tastes like strong, fine Roquefort. Mixed with the Chinese vegetables are others which are native to Cuba,...”

At Wong Kow’s Restaurant he waits for “Wong Kow himself to prepare sweet-sour shrimps and diced spare ribs steeped in a sauce of [fermented] black beans and garlic.

“There are 32,000 people of Chinese blood in Havana alone. They have become a part of the fiber of Cuba’s life.” Chinese were brought to Cuba from Manila and southern Asia more than 100 years ago. The slave trade had been forcibly ended and the sugar plantation owners were in desperate need of substitutes for African slaves. “Cuba was the first foreign country to grant free, unqualified citizenship rights to the Chinese” (p. 33-35).

Note: The author, an American, has tried to describe the Caribbean as he actually saw it. Americans entered the Caribbean in great numbers during World War II, and in so doing they upset the economy of the lands they entered. “America cannot calmly draw out now and leave a wake of ruin. By the expenditure of huge sums of money, we have accepted a grave responsibility to the lands of the Caribbean” (p. xii).

174. Smith, Allan K. 1948. Re: Request for information available on the production of foods by fermentation, particularly from soybeans: Soya sauce, miso paste, and soya cheese. Letter to Lewis Lockwood, PhD in Shanghai, China, April 1. 2 p. typewritten. Typed, without signature (carbon copy).

**Summary:** Attached is Smith’s 7-page response from the Metropole Hotel, Shanghai, China, dated July 6 1948. He gives details on the processes for making miso, soya cheese [fermented tofu], katsuobushi, and soy sauce. “The questions on soy sauce were answered largely by Mr. Kung and Mr. C.T. Siao of the National Bureau of Industrial Research, 1313 Szechum Road, N. Shanghai, China. The questions on miso were answered by Quo Sih Gwan, a Chinese worker that has spent a number of years in Japan. No one around Shanghai knows anything about miso.”

A second letter from Dr. Smith dated 7 June 1948 (also from the Metropole Hotel, Shanghai), to Dr. Lewis Lockwood at NRRL, Peoria, Illinois, answers questions about miso, katsuobushi, and species of Aspergillus mold (3 pages).

Another letter from Smith to Lockwood contains questions concerning soy sauce fermentation from Drs. King and Siao.

The final letter from Smith to Lockwood, also dated June 7, contains a questionnaire originally from King and Siao about soya sauce and miso. Smith sends a copy of his responses to Lockwood and asks for suggestions Address: NRRL, Peoria, Illinois.


**Summary:** Page 58-59: Tahó [Taho]: tau (bean) + hu (anything very soft); Bean curd. Variations: toho, tojo. Same in Bikol. Tahu in Sambal. Soybean curd brains are unpressed soybean curd served with medium-thick brown sugar syrup.

Tahuli [Tahuli]. Variation of táhuri [tahuri], which see.

Táhuri [Tahure]. Variation of táhuri, which see.

Táhuri [Tahuri]: tau (bean) + höe (semi-liquid, comestible); Fermented soybean curd. Magtatahuri, a maker or seller of tahuri. Variations: tahure, tahuri, tahuli. In Aklanon, Bikol, tawri. Takim: tau (bean) + kim (salty); Salted beans.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Fermented soybean curd” refer to Chinese-style fermented tofu.

Page 64: Tokwa: tau (bean) + koa (dried, desiccated); Pressed soy-bean curd, or soy-bean cheese; used as an ingredient in pansiit, which see, or fried. Magtotokwa, maker or vendor of tokwa.

Tokua. Variation of tokwa, which see.

Page 65: Toyo: tau (bean) + in (oil); Soy-bean sauce, soy. Magtoyo, to dress or season with such sauce, to use toyo. Same in Sambal. Tawyo in Bikol. In Mandarin: tou yu. Address: Dep. of Oriental Languages, Univ. of the Philippines.


**Summary:** “I am enclosing further information on soy...”
HISTORY OF FERMENTED TOFU 110

• Summary: Dr. Smith collected 100 samples in Shanghai (58 samples), Nanking (13), Hangchow, Canton, Tokyo, Noda (near Tokyo, Japan), Korea (7).

• Summary: Pages 32-33 give a description of (including the place purchased and processing method) and page 35 gives the nutritional composition of the following products: Soybean cheese = Ch’ou tou fu lu. Soybean curd = Tou fu (coagulated with lime). Soybean curd, fermented = Tou fu lu. Soybean curd sheet = Ts’ian chang tou fu. Soybean curd, smoked = Tou fu kan. Soybean, fermented = Tou chi [soy nuggets]. Soybean, milk clot (oil skin) [yuba] = Yu pi. Soybean sprouts = Huang tou ya. Soybean, yellow (dried) = Ta tou. Soybean, yellow (fresh) = Mao tou.

A glossary on page 38 gives the Chinese name (in both Chinese characters, and in Wade-Giles romanization) for the soyfoods mentioned above.

“Soybean cheese, Ch’ou tou fu lu. Purchased in a shop in Sha Ping Pa. This curd is made by putrefying soybean curd, then sealing it in a preserve jar with wine and spices. After one month it can be eaten with sesame seed oil without cooking. The curd has a very strong odor and flavor and it is used as an appetizer by the wealthy and as a main dish by the poor in many provinces.”

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “tou fu lu” or the term “Ch’ou tofu fu lu” to refer to fermented tofu. Use of the character for “Ch’ou” may well indicate “stinky tofu.”

Note 2. This is the earliest English-language document seen (Feb. 2004) that uses the term “Tou fu kan” [pinyin: doufugan] to refer to smoked tofu. Address: Nutritional Biochemistry Laboratories, MIT, Massachusetts.

• Summary: Contents: Soy sauce in China. Sweet flour paste–Tien Mien Chang [Chiang]. Soy or vegetable milk (incl. Willis Miller, yuba). Soybean curd or tofu (incl. use in Buddhist restaurants to look like meat, poultry, or fish dishes).


• Summary: “Soybean curd, previously described, is the starting material for making all types of soybean cheese. In making the curd, it is pressed hard enough so that it can be cut into small cubes, these varying in size for different cheese preparations. Significant variations in the process, besides the microorganisms, are the proportions of salt and type of solution in which the cheese is aged. The cheese appears to vary somewhat with the locality in which it is produced, a variation due probably to the influence of climatic conditions on the activity of the fermenting microorganisms.

“At Hangchow they make a cheese product known as ‘Chee-fan,’ ‘Chee’ meaning cheese and ‘fan’ meaning small cube, hence a literal translation is ‘small cheese cube. This type of cheese was reported to be made in only two localities, Hangchow [pinyin: Hangzhou] and Shoshing [sic, Shao Hsing; pinyin: Shaoxing, in Chekiang (pinyin: Zhejiang) province], the home of the famous Shoshing wine. ‘Chee-fan’ is a brownish soft cheese. It has both an agreeable smell and taste. The following materials and proportions are recommended for making this cheese.”
A table shows: Soybeans 70 kg. Salt 25 kg. Yellow wine (Shoshing) 55 kg.

“In making the cheese the pressed soybean curd, prepared from the recommended amount of beans, is cut into cubes about ½ by ½ by ¼ inches. The cubes are inoculated with mold, salted, and placed in an appropriate storage house for about 7 days for development of mold. The mold (Mucor) is grown on wheat flour. It exists in Chinese mold of wine and is white in color. Also, Aspergillus glaucus, blue in color, apparently takes part in the cheese development. The cubes are next placed in an earthen crock or wide-mouth bottle of about 2-gallon capacity, and yellow wine and mold of wine are added. It is allowed to age in the wine for about 1 year.
“Tsue-fan is another type of cheese that translated literally means “drunken cheese”. The name probably reflects the use of wine in making the cheese. The materials and proportions for this cheese are: Table shows: Soybeans 70 kg. Salt 15 kg. Wine 35 kg.

“The pressed soybean curd, cut into cubes 1½ by 1½ by ½ inches, is boiled in water, cooled, and partly dried. It is molded and placed in yellow wine (rice wine) with wine mold added and aged for 6 months.

“Hon-fan is a red cheese that makes use of soy sauce in its preparation. The materials and their proportions are as follow: A table shows: Soybeans 70 kg. Salt 30 kg. Soy sauce 10 kg. Red mold (from Foochow) 0.75 kg.

“This cheese is made in the same manner as “drunken cheese” except that soy sauce rather than wine is used in aging the cheese. It was reported that red cheese is made only in the fall of the year.”

Note: This is the earliest document seen (Oct. 2011) that uses the term “Chee-fan” or the term “Tsue-fan” or the term “drunken cheese” or the term “Hon-fan” to refer to fermented tofu. Address: Northern Regional Research Lab., Peoria, Illinois.


• Summary: Page 1 states: “The text of this bulletin, with slight revisions, is as it appeared serially in The Soybean Digest, issues of February through June, 1949, although many additional photos appear herein. It is processed with the publisher’s permission.” Note: An enlarged 65 page edition was issued in July 1961.

Photos show: (1) Nine people in a field cultivating soybean with hoes near Nanking, China. All of these workers but one are women. July 1948. (2) “The three-man shovel, Korean version of the turning plow. The motive power is supplied by the man holding the ropes.” (3) A man and donkey threshing wheat with a stone roller. (4) A water buffalo and man pumping water from the rice fields. All parts of the pump and elevator are made of wood. Near Nanking, China, July 1948. (5) Windmill used for pumping water. The sails or vanes are mats woven from grass. (6) Children with baskets of soybean sprouts and inflated Chinese national currency in the market place at Canton, China. Aug. 1948. (7) Soybean milk for sale on the streets of Canton, China. Aug. 1948. It is in bottles, carried using a shoulder pole. (8) A wedge press for oilseed operations at Canton, China. Preformed disks of the flaked or ground meal are inserted in the slot and turned clockwise in the hollow log; pressure is applied with wooden wedges. July 1948. (9) Equipment for steaming soybeans preparatory to making soy sauce. Steam is passed upward through the wooden tanks from a boiler beneath. Peiping, China. 1948. (10) Soy sauce preparation. Steamed soybeans are placed in woven baskets or trays for 3 to 7 days to permit the growth of the mold Aspergillus oryzae. Nanking, China. July 1948. (11) Many earthenware jars for soy sauce production in a courtyard surrounded by houses. “Following the growth of a thick mold on the soybeans, they are mixed with parched and cracked wheat and placed with salt solution in earthenware jars for fermentation, which lasts 3 months to 2 years. Soy paste [chiang] is fermented in a similar manner but it contains less water and the fermentation period is about 3 months. Shanghai, China. Aug. 1948.” (12) “Soybean curd and vegetables displayed for sale in market place, Seoul, Korea. Aug. 1948.” (13) Squares of soybean curd covered with white mold on round, woven bamboo trays. “This is the first step in making soybean cheese. Canton, China, Aug. 1948.” (14) Two rows of large hydraulic presses in the mill of the China Vegetable Oil Company, Shanghai. June 1948. (15) Men loading round, hydraulic-pressed soybean cakes onto a truck, on the Bund. Shanghai, July 1948. (16) Men and an ox preparing a seed bed at a Japanese agricultural experiment station near Tokyo. 1948. (17) “A miso plant in Tokyo. The large tubs [vats] in foreground are used for the fermentation of miso. A part of this plant was destroyed by bombs during the war. Aug. 1948.” (18) Three men standing by presses destroyed during bombing raids over Tokyo. These presses formerly were used for filtering monosodium glutamate. July 1948. (19) Many stacked wooden tubs of ajinomoto (monosodium glutamate) ready for shipment at a plant located between Tokyo and Yokohama, Japan. Aug. 1948. This plant had a maximum production of 7.5 million pounds of ajinomoto in 1937. (20) Agricultural Experiment Station near Seoul, Korea. This station was built by the Japanese during their occupation of Korea. Later it was taken over and administered by the newly formed Korean Government. Aug. 1948. (21) A Korean boy standing in a field of sorghum interplanted with soybeans; this is a common practice in Korea. 1948. (22) A boy using a shoulder pole to carry two wooden buckets of night soil to the land. Korea. 1948. (23) A wooden shopper looking over the different varieties of soybeans in the market place at Seoul, Korea. Aug. 1948. (24) Outline map of Korea showing where principal varieties of soybeans are grown, the section in which each variety is found, the acreage, and production. Address: Head of Meal Products Investigations, Oilseed Crops Lab., Northern Utilization Research and Development Div., Peoeia, Illinois.


• Summary: This is a long (6-page) table with 3 columns:
(1) Product and port of entry. (2) Quantity. (3) Reason for detention. Note that the country of origin is not given.


Page 684: Port of San Francisco–continued.

Page 686: Port of New York–continued “Tuna (solid pack in soybean oil)–600 cartons–Decomposed; no English label; not “Tuna” but “Bonita.”


Note: This periodical was published once a month, 2 volumes a year (6 numbers per volume), from July 1934 to March 1974 by the North American Publishing Co. (New York). 80 volumes total.


• Summary: “Allan K. Smith of the Northern Regional Research Laboratory, Peoria, Illinois, recently returned to the United States from the Orient where he learned of countless uses for soy beans. In China, Japan and Korea he found soy beans being fermented, ground, and processed in various ways. In its motherland, Smith discovered, the soybean is a source of flour and cake, oil, bean sprouts, vegetable milk, various sauces and pastes, curd, cheese, and several other foods.” Describes how soy milk is made in China. One restaurant that Smith visited prepared more than 25 different dishes from soybeans.


• Summary: “I have even sampled Nan yoy kow yook, which is pork cooked with Chinese red cheese.”


• Summary: This is a long (4-page) table with 3 columns: (1) Product and port of entry. (2) Quantity. (3) Reason for detention. Note that the country of origin is not given.


Page 149: Port of San Francisco. “Bean Sauce–1,440 lbs.–Insect larvae. “Dried Bean Curd–1,800 lbs.–Insects, insect larvae. Note: This could be either dried yuba or pressed tofu (doufu-gan).


• Summary: This stylish little cookbook reflects the growing influence of Asian (especially Chinese) culture and cuisine in California–and the author’s enthusiasm for it. The recipe for sukiyaki (#93) calls for “a soy bean cake” [a cake of tofu]. A footnote to the recipe for Chinese spinach (#117) states: “The Chinese would add a piece of fermented bean cake to this; a piece of blue cheese gives much the same effect.”

Helen Brown uses “soy sauce” to season all of her Chinese- and Japanese-style recipes: Nos. 32, 60, 64, 73, 77, 87, 89, 91, 93, 117.

Note: This is the earliest English-language document seen (Feb. 2004) that uses the term “soy bean cake” or “a soy
bean cake” to refer to tofu. Address: Pasadena, California.

• Summary: The section on “Ingredients” describes each basic ingredient, and gives the Cantonese name plus Chinese characters, including: (1) “Soya sauce” (jeung yow) is an absolutely essential basic ingredient. It “can nowadays be found in almost all neighborhood delicatessen or grocery shops” (p. 21). (2) “Bean sprouts” (dow ngaah). “They are usually golden yellow in color and possess a strong flavor and a rather crunchy texture.” An illustration shows these sprouts, which appear to be soybean sprouts (p. 22-23).

(3) Two types of dried yuba (fooh jook and tiem jook), both illustrated. When soya bean milk is boiled, it separates into various layers; “the rich cream that rises is called fooh jook, and the settling sediment is called tiem jook [sweet yuba]. When dried, they look like stiff boards glazed with enamel, but after they have been cooked they become creamy and gelatinous. Tiem jook is used in fish dishes; while fooh jook is usually cooked in soup” (p. 30-31).

Note: This is the earliest English-language document seen (Oct. 2008) that uses the term fooh jook to refer to yuba, or the term tiem jook to refer to yuba—specifically to the thicker, sweeter, less expensive bottom yuba, called ama-yuba in Japan.

(4) Chinese sauces (jeung) come in bottles or cans (p. 32): (4a) Soya sauce (jeung yow) is an almost black sauce made from soya beans. The best substitute is Maggi. (4c) Bean-curd cheese (fooh yü) [fermented tofu] “Grayish-white little cubes of pressed bean-curd fermented in strong wine.” It may be used in cooking. (4d) Bean-curd cheese, Eastern style (naam yü) [fermented tofu]. Fermented in a brick-red sauce, it is usually used for cooking. (4f) Tiny black fermented beans (dow see) [soy nuggets]. In cooking, these are generally crushed and used to season other strong-smelling ingredients such as fish. They add “a delightful spiciness to the sauce.” (4g) A famous red sauce (hoy sien jeung) [Hoisinsauce]. This famous red sauce is often used in cooking shellfish and duck; it is widely served with Peking roast duck. There follows a description (p. 33) of how to make bean-curd cheese from fresh bean curd. (5) Oils and fats, incl. vegetable oils like soya bean oil, peanut oil, or sesame oil.

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the terms “Bean-curd cheese” (with hyphen) or “fooh yü” or “naam yü” to refer to fermented tofu.

Note 2. This is the earliest document seen (Sept. 2008) that mentions Hoisin sauce, whose Chinese name is hai-hsien chiang (Wade-Giles) or haixian jian (pinyin). Its main ingredient is soybeans.

Soy related recipes include: Pig’s feet soya bean soup (Jüh gerk fooh jook tong, with yuba, p. 80). Oyster sauce with fresh bean curd, p. 155). Many other recipes use soya sauce as a seasoning.

Note: This book was first published in 1950 by Greenberg in New York City (227 p., 24 cm). It was next published in 1952 by Faber and Faber in London (227 p., 23 cm). Grosset & Dunlap (1954) appears to be the third.

189. Product Name: Bean Cake (Ad).
Manufacturer’s Name: Quong Hop & Co.
Manufacturer’s Address: In: Hokubei Mainichi Nenkan [Hokubei Mainichi Year Book]. 1951. p. 17. Phone: YUkon 2-1739.

New Product–Documentation: Ad (½ page, horizontal). The top ⅓ of this ad is in English: “Quong Hop & Co., 133 Waverly Place, San Francisco 8, California. Phone: YUkon 2-1739.” A large photo shows a pint jar of Quong Hop fermented tofu. The front label reads: Since 1906. Quong Hop & Co. Bean Cake. Ingredients: Soy bean, alcohol, and salt. In Chinese (to right of photo): Since 1906 the old maker (shop). Many years of experience and using very selective ingredients. It is the best side dish with your evening drinks. Please buy at your local grocery store. Text similar to that at top of ad (in English) is repeated to left of photo in Japanese. Directory entry, p. 38. Category: “Fuyu wholesalers.”

190. Product Name: Bean Cake: Funyu.
Manufacturer’s Name: Quong Yuen Sing & Co.
Manufacturer’s Address: 727 Sacramento St., San Francisco 8, California. Phone: YUkon 2-1849.
Ingredients: Soya bean, alcohol, salt.
How Stored: Shelf stable.
New Product–Documentation: Ad (¼ page) Hokubei Mainichi Year Book. 1951, p. 17. A fairly large photo shows a pint jar of fermented tofu. The label (in English and Chinese) is hard to read except for the small words “Bean cake.” Ingredients: “Soya bean, alcohol, salt.” The
191. **Product Name**: Funyo Bean Cakes.  
**Manufacturer’s Name**: Sang Yuen Co.  
**Manufacturer’s Address**: 61 Broadway St., San Francisco 8, California. Phone: YUkon 2-1789.  
**Date of Introduction**: 1951. January.  
**Ingredients**: Soya bean, alcohol, salt.  
**How Stored**: Shelf stable.  

Note: This is the earliest English-language document seen (Oct. 2011) that uses the word “Funyo” to refer to fermented tofu (one of two documents).


- **Summary**: Table XI (p. 22), “Chemical and biological evaluation of proteins for growing rats,” contains 6 columns: Foodstuff, digestibility, Biological Value, Net Utilisation [NPU], Protein efficiency ratio, chemical score, and limiting amino-acid. “There is agreement in all methods of the high value of milk, eggs, and other foods of animal origin, and among those of vegetable origin, the proteins of soya bean flour hold a high place.” Values for soya bean curd [tofu] are also included. The next section is on supplementing proteins.

The long section titled “Pulses (legumes)” (p. 219-35) has this contents: Introduction. Dhals (Dals; peas which have been shelled, split and polished). Peanut. Bambara earth pea (*Voandzeia subterranea*). Soya bean: Importance in Asia, used in may forms: Nearly-ripe seeds [edamame or green vegetable soybeans], dry seeds, soya bean emulsion (‘Milk’)–contains a detailed description of how soya milk [Vitasoy] is made in Hong Kong, including exact amounts of all ingredients for 800 oz and the nutritional composition (%), soya bean curd (may be smoked or dried), fermented curds [fermented tofu], fermented beans (témé), soya bean sauce, sprouted soya beans, soya bean flours, mixtures of soya beans and cereals, milk substitutes (for infant feeding in China). The genus Phaseolus may be divided into two types: Those of Asian origin and those of New World origin (Americas). Cow pea (*Vigna sinensis, V. unguiculata*,


Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “fermented curd” to refer to fermented tofu.


A large photo of lovely Helen Brown in her kitchen adorns the rear dust jacket.

Talk with Akasha Richmond. 2004. Feb. 19. Helen Evans Brown and James Beard were very close friends. He wrote a nice passage of praise for this book on the dust jacket and their collected correspondence has been published as a book. When Beard died, Janet Jarvitz bought his superb book collection, opened a bookstore in the Los Angeles area, and preceded to sell it. Helen Brown married a cookbook collector, Philip, who was also her skilled editor. She made good use of his vast collection in developing her own recipes.

Note 2. Before she met her husband, Philip, Helen Evans Brown had a career as a successful caterer and was running a restaurant in New England. Philip courted her and persuaded her to head to the West Coast with him. Married for almost 30 years, they lived in Pasadena, California, from 1937 until her untimely death in 1964. In Southern California, Helen started work as a consultant to a Hollywood bakery and Philip began working in an antiquarian bookstore. Philip did much to build Helen’s book collection. He also acted as a taster, research assistant, and typist on book projects.

Address: Pasadena, California.
a vegetable diet (in China it is estimated that meat and eggs comprise less than 3% of the food of the peasants, compared with 21% among Americans. An estimated 95% of the protein consumed in China is of vegetable origin, and much of it comes from soybeans, which constitute about 20% of the basic diet in northern China).


“Red sufu is a red cheese. It is prepared in much the same way that sufu is, except that the curd cubes and red rice are placed in alternate layers in deep vessels where the brine fermentation is started. The red rice is a Chinese product made by growing the mold Monascus ruber in the grains of polished white rice until the entire grain is permeated with the coloring matter. The red rice contributes a pleasant taste and aroma to the red sufu cheese.

Note: This is the earliest document seen (Oct. 2011) that uses the term “red sufu” or the term “red sufu cheese” refer to fermented tofu.

Note: By 1975 Lockwood was at the Biology Dept., Western Kentucky Univ., Bowling Green, KY (see Smith & Berry 1975). Address: U.S. Dep. of Agriculture (Smith; NRRL, Peoria, Illinois).


A glossary at the end contains brief definitions of uncommon ingredients. Definitions of the soy-related ingredients above are taken from this glossary. Angkak is “red-colored grains of rice used as coloring for fermented fish.”

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the word tajure to refer to fermented tofu, or the word misu to refer to miso.

Note 2. On the title page is printed “4th printing–May 1956.” Address: P.O. Box 3288, Manila, Philippines.

197. Wong, Walter. 1954. The Chinese restaurant. Sanitarian (The) 16(5):236-42. March/April. See p. 240 * Summary: Page 240: “Foo Yee” or preserved soy bean cakes are the “Doe Foo” preserved in an alcoholic solution. The Chinese eat these directly from the jar, without further cooking, although a small quantity of oil is added before eating.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “foo yee” to refer to fermented tofu.

• **Summary:** The diet containing “soybean curd (Tou fu)” gave the best growth and calcification, followed by diets containing “dried yellow soybeans (Ta tou),... soybeans, fermented (Tou chi) [soy nuggets], then soybean fermented curd (Tou fu lu)” (also called “fermented soybean curd” in this abstract) [fermented tofu], last. Soybean curd production is encouraged where animal proteins are in short supply.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “soybean fermented curd” to refer to fermented tofu. Address: Columbia Univ.


• **Summary:** This hardcover Chinese cook book retails for $3.95. The contents and pagination are the same as in the original 1950 edition of the same title.


• **Summary:** The chapter titled *Aliments et boissons* [Foods and beverages] discusses fermented tofu.


• **Summary:** This is a sort of encyclopedia, with the entries listed alphabetically and no index. Under China (p. 165) is a list of “Some popular Chinese dishes” including “Nan Yoy Kow Yok–Broiled pork stewed with Chinese cheese.” Address: F.H.C.I., M.C.F.A., author, Retford in Nottinghamshire, England.


• **Summary:** “Soy cheese” is tofu. Starts by describing how to make tofu. A very interesting photo (p. 108) shows “Early soy cheese production in the United States” (probably at Madison College in Madison, Tennessee).

“Soybean curd contains 7 to 9 percent of highly digestible protein with little carbohydrates and no crude fiber, and therefore has been aptly described by the Chinese as ‘the meat without bones’” (p. 108). “From the soybean curd are derived three products of which the Chinese are very fond. They are Tofu Kan [pressed tofu], Tofu P’i [pressed tofu sheets] and fermented soybean cheese [fermented tofu]. These are briefly described below.

“Tofu Kan, or dried soybean curd, is made by filling a small straw or cloth bag with soybean curd and subjecting it to great pressure to reduce further the water content. The product [each cake] measured about 2½ by 2½ by ¼ inches and has the consistency of a soft rubber eraser. The dried soybean curd thus prepared may be seasoned with burnt millet-sugar or soy sauce flavored with tea or other spices.

“Tofu P’i, or soybean curd skin, is formed by pressing soybean curd between sheets of cloth under great pressure. The formed Tofu P’i is like a sheet of canvas about one foot square. It is generally used as a wrapper for sausage.

“Fermented soybean cheese is made in several forms and with different flavors. They are prepared by exposing cubes of soybean curd (from ½ by ½ by ¼ to 1½ by 1½ by ¼ inches) on matting to mould for a week or longer, and then placing it salted rice wine or salted soy sauce to age for 6 months to a year.

“Besides soybean curd and other soybean products, another food product derived from soy milk that is popular among the Oriental people is Yuba. The Yuba is the name given to the protein film that forms on the surface of soy milk when the latter is heated nearly to the boiling point. It is removed with sticks, hung on a line and dried in the form of sheets or sticks. Before being use, it is wetted back by soaking in water. The Yuba is sheet form is like Tofu P’i and finds similar uses.”

Note: This is the earliest document seen (Nov. 2010) in which Chinese author (Philip S. Chen, Ph.D.) uses the Japanese word “Yuba” to refer to this delectable soyfood, which is popular in both China and Japan. Its Chinese name makes no sense when translated into English—“bean curd skin.” Dr. Chen was a Seventh-day Adventist. Address: 1. Prof. of Chemistry, Atlantic Union College, South Lancaster, Massachusetts; 2. National Science Foundation Fellow, Cornell Univ.


• **Summary:** A recipe (p. 48) for “Steamed fish with black beans” calls for “1 T. [tablespoon] preserved Chinese black beans, 1 tablespoon chopped ginger, 1 button garlic, crushed.”


Note 1. This is the earliest English-language document seen (Nov. 2008) that uses the word “taofu” to refer to tofu.
Note 2. An almost identical edition of this book was published in 1959 by the same publisher. The recipe for black beans (p. 48) cited above also appears on page 48 of the 1959 edition.


• Summary: “Actinomucor; one of several monotypic genera of the family Mucoraceae, was originally described by Schostakowitsch in 1898 from ‘Taubenmist’ from Siberia. Schostakowitsch stated that the genus was closely related to Mucor, but differed in having branched stolons which gave rise to rhizoids and sporangiophores. He also stated that the genus was distinct from Rhizopus and Absidia, two other stoloniferous genera, because of the limited growth of its stolons and the different formation of its columnellae and sporangiophores.

Fermented tofu is not mentioned, but the species used to make it, Actinomucor elegans, is described and its taxonomic history is given. It has had twelve different scientific names between 1871 and 1946, including Mucor corymbosus (1871), Rhizopus elegans (1884), Mucor harzii (1888), Actinomucor repens (1898), Glomerula repens (1903), Mucor glomerula (1908)... and Actinomucor corymbosus (1939, 1946).

Note 1. Letter from Dr. Clifford W. Hesseltine. 1990. “Our own observations are in accord with the findings of Schostakowitsch... Actinomucor is the mold used in making Chinese cheese, and its nature is not well known, even to mycologists.”

Note 2. This is the earliest document seen (April 2003) that mentions Actinomucor elegans. Address: NRRL, Peoria, Illinois.


• Summary: Page 37: A recipe calls for “2 cakes Foo Yu (Chinese cheese).”

Page 39: A recipe for Tiem shuen yu (Sweet and sour fish) calls for “1 tablespoon thick soy sauce.” Note: Shi you is soy sauce.


• Summary: A novel / fiction. Dr. Bucholz is a New York psychoanalyst, born in Vienna. Page 193: “a dish of barbecued spare-ribs with black bean and garlic sauce. And then, as a side dish, some foo yee–fermented bean curd. It tastes like Stilton cheese.”

Without looking at Leslie, Bucholz said, “We’re having just a plain omelet.

“You mean you don’t want any of the specialties here?”


Acknowledgments.


Other figures: (1) Flow diagram of the miso manufacturing process (incl. koji). (2) Table showing total production of miso in Japan (about 1957) as reported by All Japan Miso Industrial Association. Factory made miso consists of: Rice miso 379,000 tonnes (metric tons), barley miso 146,000 tonnes, soybean miso 58,000 tonnes, total factory made 583,000 tonnes. Homemade miso of all types is 391,000 tonnes (67% of factory made). Total factory and home made: 974,000 tonnes. Ingredients used in this grand total: Soybeans 361,000 tonnes, rice 115,000 tonnes, barley 58,000 tonnes, salt 159,000 tonnes. (3) Table showing nutritional composition of rice miso, barley miso, and soybean miso. (4) Table showing composition of sweet miso, salty miso, and enriched miso. (5) Diagrammatic sketch of equipment used in making fresh tofu. (6) Flow diagram of a frozen tofu factory.

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Note: The author was in Japan from Oct. 24 to Dec. 24, 1957. The principal localities visited were: Tokyo, Yokohama, Tochigi City, Nagano, Matsumoto, Suwa, Hamamatsu, Nagoya, Kyoto, Osaka, Fukuoka, Kumamoto, Nagasaki, and Sendai. His trip was sponsored by the Agricultural Research Service and the Foreign Agricultural Service of the USDA, and the American Soybean Association (Hudson, Iowa).

Note: This is the earliest document seen (July 2000) that mentions “barley miso”–a type of miso made with barley koji, soybeans, and salt. Address: Head of Meal Products Investigations, Oilseeds Crops Lab., NRRL, Peoria, Illinois.


• Summary: This is basically a Cantonese cookbook; the Chinese words are written in Cantonese.


“1. Combine soy beans, salt, and water; bring to a boil and simmer for five hours; remove and strain. Pour into a jar and seal airtight, then age in the sun for six months.

“2. At the end of six months, add remaining ingredients, reseal and let age in the sun another six months.

“Note: This sauce is used for seasoning food. Not used in cooking.”


Note: This is the earliest English-language document seen (Oct. 2011) that uses the term Foo Jook to refer to dried yuba sticks.


Introduction: “Most of the recipes in this book appear constantly on the menus of the Chinese and Japanese restaurants of San Francisco, New York, and a few other cities that have a population segment with Chinese or Japanese ancestry.” Many recipes call for “soy sauce” and up to 1 teaspoon “MSG powder.”


Special imported ingredients (p. 68-71): Japanese–Canned foods: Bean curd, prepared black soy beans. Packaged foods: Miso (the light variety, fermented soy bean paste). Bottled foods: Fuyü (Chinese bean cake; Order top quality such as Quong Hop brand). Shoyu (soy sauce; Order top quality such as Kikkoman, Higeta, or Marukin). Chinese–Bottled foods: Soy sauce. Black beans (Dow Shee; for black bean sauce).


212. Kalnay, Francis. 1959. Soybean has all the answers (or nearly all). House Beautiful 101:174-75, 207-12. May. • Summary: The opening 2-page spread contains photos of many commercial soyfood products available in America at the time: Dr. Fearn’s Soy-O pancake flour (one with whole wheat and soya, and the other with just wheat and soya), Pure soya bean powder, and Soya bean granules, Wueat’s soya-protein bread, Wueat’s cookies, Wel-Pac kinako [roasted soy flour], Yamasa shoyu, Kikkoman shoyu, Oliver Tonkatsu Sauce (Tonkatsu are breaded pork cutlets), Hain soy oil (cold pressed), Amoy soy sauce, Prosperity soy sauce, Golden Sang Chan soy sauce, Madison Zoy-Koff, Hime aka-miso (Pacific Trading Co.), Hime yakidofu, Hime frozen bean curds, Delicious Edamame (Packed by Tokai Kanzume Co. Ltd., Nagoya, Japan), Quong Hop & Co. bean cake [tofu], Schiff soy lecithin, Oriental food shop black soybeans, Climax wheat and soy pure egg noodles (The Pfaffman Co., Cleveland, Ohio), and Prince Veta-Roni (Mezzani or Spaghetti; Prince Macaroni Co.). The subtitle reads: It’s a choice gourmet food. It’s as nutritious as vitamin pills. It comes in a dozen forms and makes a hundred dishes. The author uses soy-related words in a very modern way: “Have you ever noticed the way people who know food pronounce the simple word ‘soy’? Their facial expression changes instantly, and their tone of voice turns positively lyric. There are two serious reasons for their extraordinary respect for a bean so little and so innocent. The soybean is the most versatile legume imaginable... The glittering star in soy’s troupe of players is soy sauce (also called soya and shoyu)... The soy food industry is still in its infancy in the U.S. Yet the variety of soy products available is impressive.”

Note 1. This is the earliest publication seen (April 2001) that mentions Quong Hop & Co. in connection with tofu.

Note 2. This is the earliest English-language document seen (Aug. 2003) that contains the term “soya-protein” (or “soya-proteins”).


Note: This is the earliest document seen (Oct. 2011) that uses the word Chao to refer to fermented tofu.

A table gives the chemical composition of five samples of Chao sold in South Vietnam. They contain on average: moisture 76%, salt 11%, alcohol 5%, protein 7%, oil 3.5%. Culinary uses: In Vietnam, Chao—a true food condiment—serves to season various dishes and to aromatize or perfume (aromatiser) certain sauces. Because of its slightly tart and salty taste, it is much prized by vegetarians, for this soya cheese (fromage de soja) contains only vegetable proteins (protéines végétales). In vegetarian diets, it is incorporated into rice dishes and rice-based soups, and often accompanies various vegetables—such as cucumbers. Because of its low price, it is often used in place of tuong sauces—which are also made by enzymatic fermentation of soybeans. Among the upper classes in Vietnamese society, Chao is mixed with pimento, vinegar, sugar, and oil to make a tasty condiment called Chao tói ó’t, which is used to enhance the taste of dishes that contain no meat or fish. On the 1st and 15th days of each month, when Buddhists eat no meat, garlic, or onions, they enjoy this tasty condiment. In regular diets, one usually adds sugar, salt, oil, and pimento. The condiment thus obtained is used to add aroma to roasted or broiled meats, rice noodles, and various legumes. Sometimes it is used as a basting sauce for small pieces of chicken or pork. Address: Docteur en Pharmacie, Chef de Laboratoire, Institut Pasteur de Saigon.

Fried commonly for seafoods such as strong-smelling "Dow see are small fermented [soy] beans which are used yu is sold in bottles and does not require any cooking.

and tangy cheese. Commonly called Chinese cheese, foo bean curd is permitted to ferment, making a richly aromatic and can be boiled, stir-fried, or baked. Some of the fresh bean curd is permitted to ferment, making a richly aromatic and tangy cheese. Commonly called Chinese cheese, foo yu is sold in bottles and does not require any cooking."

"Dow see are small fermented [soy] beans which are used commonly for seafoods such as strong-smelling fish, shrimps or lobsters. They have a delightful spicy flavor and should be rinsed in water and crushed before using" (p. 46-47).

Vegetables: "Black beans (dow see). Sold by the ounce. Wash and soak for 10 minutes before using. Recipes: Lobster Cantonese (Chow lung har). Beef with green peppers and tomatoes (Fon care lot tzu ngow). Pork with tomatoes (Fon care gee) (p. 50).


• Summary: The total amino acid content of 16 kinds of soybean products were determined by microbiological assay method. These included tofu, fried tofu pouches (abura-age), okara, dried-frozen tofu, yuba, kinako (roasted full-fat soy flour), natto, and nyo-fu (fermented tofu). Address: National Food Research Inst., Tokyo.


• Summary: “Chinese cooking need not be limited to chop suey or chow mein... If you have been discouraged from trying authentic Chinese recipes because they are long and complicated, made with obscure ingredients such as fermented bean curd sauce, bitter melon or bok choy heart, try the following...”

Five Chinese-style recipes are given; three call for “soy sauce” as an ingredient.


• Summary: The author is as fine a writer as he is a potter and artist. June 15, 1953 (p. 98). Near the great extinct volcano of Daisen on the borders of Tottori Province, the author and friends climbed up the old rough stone-paved pilgrims’ way to the Kongoin temple. “There we were served the best meal I have eaten in Japan, vegetarian priests’ food, over which infinite pains had been taken... mountain potatoes, crisp fried bean curd and some soft curd mixed into a paste with crushed sesame seed.”

July 1, 1953 (p. 105): “A great feed of Continental sausages and Chinese riceballs stuffed with mincemeat and ‘Funiu.’ The last is a strange and fascinating decoction of fermented bean curd something like a smoky Camembert in taste and texture.”

August 19, 1953 (p. 132). In Nagano, Japan, the author and friends visited the very large and famous temple of Zenkoji. They noted “all the commercialized signs of Buddhist decadence, as far from Sakya Muni [Shakyamuni, the Buddha] as Rome from Christ... the vulgarized business of popular religion is equally sickening, East or West.

After that they made their way to a soba shop and the author ordered Soba Gaki which was not on the menu. “This was a kind of porridge no longer in fashion... We ate it first with shoyu sauce and then with sweet adzuki beans.”

Oct. 22, 1953 (p. 166). In Toyama the author and his friends had “lunch at a Buddhist vegetarian restaurant [probably serving shojin ryôri] which made me wish once again that I could share the meal and its setting with artist and craftsman friends in the West. The manner of serving surpassed all, it was the service of the heart. There is a saying that the Chinese eat with their stomachs and the Japanese with their eyes. The sheer beauty of each tray or dish of food, the quiet discretion. This represents a peak of culture and its home is in Japan.” Address: Japan.

27 cm.


Note: This is the earliest document seen (Oct. 2011) that uses the term “tsüe-fan” ("drunken cheese") to refer to a type fermented tofu.


Page 19 states: “The China National Government has taken an active interest in soybean milk for use by its army. Mr. Willis Miller, with offices and business connections with the Henningsen Produce Company in the Dollar Building (7th Floor) at 51 Canton Road, Shanghai, had just completed, at the time of my visit, the building of a soybean milk plant for the Chinese Government. The process is patterned after that of the International Nutritional Laboratories at Mt. Vernon, Ohio, for making a powdered or spray-dried milk. Mr. Miller also was supervising the installation of a vegetable canning plant for the same purpose.”

The text of this bulletin was previously published, serially, with slight revisions, in *Soybean Digest*, from Feb. to June 1949. Address: Northern Utilization Research and Development Div., Peoria, Illinois.


• **Summary:** The introductory paragraph states: “... Following are the basic principles of Chinese cooking as well as recipes for soups, meats, fish, and vegetables. Part 2 of the H&G’s Chinese Cook Book will appear in the October issue.”

The section titled “Glossary of recipe terms, ingredients” includes: “Bean curd: Squares of tender white ‘soy bean cheese’ made by precipitating the protein from soy bean milk.”

“Fen zu: Also called bean threads or cellophane noodles. Fen zu is made of pea starch [not soy]... When soaked in hot water, it resembles vermicelli but is translucent. When deep-fat fried in dried form, it puffs up light and crisp.”

“Fu Ju (or Foo Yee): Fermented bean curd, preserved in wine-flavored brine.”

On page 149 is a color photograph of a picture frame framing several Chinese food items with a Buddha figure in the middle background of the frame. The title of the article is across the top of the frame. The text starts on page 151 along with the author’s name.


• **Summary:** Gives the nutritional composition (food calories, moisture, protein, fat, carbohydrate, fiber, ash, calcium, phosphorus, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid) of 384 foods commonly used in Taiwan. In the section on “Legumes, seeds, and nuts,” the following soy products are included: Black bean (hei tou, black soybean; 37.1% protein, 15.2% fat), miso, soy bean (huang tou), soy bean curd (toufu), soy bean curd cake (toufu kan), soy bean curd cake, spiced (wu-hsiang toufu kan), soy bean curd cake, strip, soy bean curd, clot (toupi, yuba), soy bean curd, fermented, soy bean curd, fried (yu toufu), soy bean curd, pickled (furu, hu-zu), soy bean, fermented (tou chi), soy bean milk (tou nai), soy bean extracted residue (okara). Address: 1-3. Dep. of Biochemistry, College of Medicine, National Taiwan Univ., Taipei, Taiwan, China; 4. Taiwan Provincial Hygienic Lab.


• **Summary:** Contents of Chapter 15 titled “Sauces and similar products” (p. 152-58): Soybean sauce (toyo). Japanese soya sauce: Preparation of the starter, preparation of the material, inoculation, fermentation. Modified Chinese soya sauce. Coco sauce or coprameal sauce (The taste compares favorably with Chinese soy sauce and Japanese soy sauce). Hints and suggestions. Philippine bean sauces. The tao-si [taosi, soy nuggets], tokua [tofi, not fermented], tahore [taori, taore; probably fermented tofu], the tajo (unpressed tofu curds, usually served with medium brown sugar), mongo [mung bean] sprouts, soybean sprouts, Vetsin (contains 1 part monosodium glutamate, 7 parts lactose, and 3 parts salt). Includes a formula for Worcestershire sauce (which contains no soy sauce).

Note 1. This is the earliest document seen (May 2003)
that contains any Filipino word for unpressed tofu curds, usually served with medium brown sugar, tajo.

Note 2. The section titled “Tahore” (p. 157) states: “This product is simply taori whereby the already prepared taore is macerated to mass. Tokua (tofu) is used frequently with tahore. They are both popular food [sic, foods] among Chinese. The Chinese eat them with soft-boiled rice called ‘barabasa.’”

Address: Lecturer in Food Technology and Fermentation Technology, Manuel L. Quezon Univ., Manila.


• Summary: The contents of this edition is basically identical to that of the other 1961 edition published by the author. However the typesetting and the page numbers are different. Address: Lecturer in Food Technology and Fermentation Technology, Manuel L. Quezon Univ., Manila.


• Summary: Foo Jook [dried yuba sticks] and “red bean curd” are mentioned.


• Summary: The chefs and cuisine of Kwangchow (the ancient name for Canton, now spelled Guangzhou) are considered the finest in all of China (p. 28).

The chapter titled “Native condiments, sauces, and ingredients” includes: Bean curd (Tow Fu): “One of the most useful of Chinese ingredients,” it is usually pressed into ½-inch by 3-inch squares. Bland in flavor, it is a great mixer for highly flavored foods. “It is even delicious in its fresh state with spicy condiments and is known as ‘the meat without bones.’”

“Soybean skin (Foo Jook): Dried skin of soybean milk. Sold in packages, it is flat and thin, with a creamy-glaze appearance. Soak it before using in soups, or in smoother-cooking recipes.” It has an enjoyable chewy texture and slightly nut-like flavor.

“Soybean skin, sweet (Teem Jook): Similar but thicker than Foo Jook, its taste is slightly sweeter.”

Condiments (p. 51-54)—“Black beans, salted (Dow see): Cured, fermented small black beans... Should be soaked briefly and washed before use. A common use is to mash beans with garlic, creating a seasoning popular for both seafood and meats.”

Monosodium glutamate (Mei Jing): This flavor accent powder had its origin centuries ago in old China. “A charming story, which we like to believe, involved a contest in which several monks with gourmet tastes competed with each other to produce the most delicious batch of Loh Han Jai, the standard monks’ food consisting of a variety of various vegetarian ingredients... The winner had added one precious secret ingredient the others did not have—powdered dried seaweed [konbu, Laminaria japonica] which was later discovered to be the first crude source of monosodium glutamate. It was not until 1908 that Dr. Kikunae Ikeda, the great Japanese scientist successfully extracted Glutamic Acid from edible seaweed and from it crystallized monosodium glutamate and marketed it under the name of Ajinomoto. Then in 1921 Chinese
scientist Poo-Nien Wu of Shanghai developed a process for extracting monosodium glutamate from wheat protein and was marketing his discovery, Ve-Tsin, in China, Singapore, Malaya, and the Philippines to the amount of 350,000 pounds a year. Other raw material sources are corn, soybean protein, and desugared beet molasses.

Sauces (p. 54-55)—Bean sauce (Min See Jeong): A brown salty bean paste. Oyster sauce (Ho Yow). Plum sauce (Seen Mouie Jeong). Red seasoning sauce (Hoy Sin Jeong): A thick red sauce that contains soybeans as an ingredient. “A table condiment for Peking duck.”

Spiced red bean curd (Nom Yee): “A variation of bean cake fermented.” It has a slightly harder consistency, a brick-red color, and a pungent, aromatic flavor.

Soy sauce (See Yow): “For Chinese cooking, soy sauce is the great all-purpose and most indispensable of all sauce.” There are many grades and types. “For the ‘red cooking’ method, ingredients are incarabindied by the dark sauce. It may be used as a table dip, by itself, or mixed with mustard.” Unlike salt, it has “the taste of a beef essence.” It is made by the fermentation of cooked soybeans, roasted wheat, a yeast mold and salt. The best grades of Chinese soy sauce are still made by the old-fashioned, aged, natural fermentation process, rather than by the quickly made chemical hydrolysis method [HVP soy sauce]. The type know as Sang Chau, light and color and density, is the premier kind for flavoring and dipping. But unless you ask for it by name, “you will get the darker soy sauce or See Yow. There is no definitive record of the origin of soy sauce. “Reference to the sauce has been made as early as the Chou Dynasty [1045-256 BC], some 200 years before Christ!... Undoubtedly since its very origin soy sauce has been made in the home or as a village industry. As a manufactured product it started in 1688. With its long condimentary life, no wonder that, to the Chinese, soy sauce is the Sauce of Life.”

Vegetables (p. 81-87): Bean sprouts (Ngah Choy): This common and inexpensive little vegetable is overused in some Chinese restaurants as a “filler.” The name “literally means ‘vegetable for the teeth,’ implying a crunchy sensation. Bean sprouts are tiny shoots which grow from the soy bean. They are one of the trio of basic Chinese foodstuffs—bean sprouts, bean curd and soy sauce—derived from the wonder bean. The sprouts average two inches long, are opaque white and the bean head is yellow... Another variety of bean sprouts, germinated from a larger type of bean, is the Dow Ngah, or Big Bean Sprout. This variety grows a little longer, with a larger golden head, and the sprout is crunchier, but has a more raw ‘beany’ flavor. This variety is not used in Chinese restaurants.”

Soy-related recipes: Spinach with foo yee sauce (Baw choy foo yee, with “2 preserved bean cakes (Foo Yee) mashed with 2 teaspoons juice from jar,” p. 89). Shows how “any commonplace vegetable can be turned into an epicurean dish by simply adding preserved bean cake” [fermented tofu] and a touch of garlic. Try it “and you will discover why Foo Yee is often referred to as the miracle ingredient among Chinese condiments.”

Bean cake sauteed with meat (Dow foo yuke, with “8 bean cakes (Dow foo). Slice each bean cake into 6 pieces,” p. 99). Fresh asparagus chicken with black bean sauce (Lei soon gai kow, with “1 full tablespoon mashed fermented black beans (Dow see), combined with 1 clove mashed garlic and 1 tablespoon soy sauce, with a dash of monosodium glutamate,” p. 100).

Chinese cabbage with foo yee sauce (Siew choy foo yee, with “2 fermented bean cakes (Foo Yee) with 2 teaspoons juice from the jar,” p. 107). Mustard greens with foo yee sauce (Gai choy chow foo yee, with “2 fermented bean cakes (Foo Yee) mashed with 2 teaspoons juice from the jar,” and 1 teaspoon soy sauce, p. 109).

Steamed salmon with black bean sauce (Dow see jing sah-mon yee, with “2 tablespoons fermented Black Beans (Dow See), crushed to paste,” p. 131). Prawns with black bean sauce (See jup hah kow, with “2 tablespoons Black Bean Paste (Dow see), p. 133). Steamed fish with black bean sauce (Dow see seen gee jing yee, with “2 tablespoons fermented Black Beans (Dow see), crushed to a paste,” p. 141).

Dried oysters with bean curd skim (Ho see munn foo jook, with “6 sheets Bean Curd Skim (Foo jook) pre-soaked in cold water for 2 hours. Drain thoroughly. Cut in 2 to 3-inch pieces.” p. 143).

Note: This is the earliest document seen (Dec. 2010) that uses the term “Bean Curd Skim” to refer to dried yuba sticks. Continued. Address: 1. Chef, Chinatown; 2. Historian of Chinese life in America.


• Summary: Continued from page 146. Fish stuffed in bean cake (Jow yeong dow foo, with “8 square Bean Cakes (Dow Foo),” p. 146). Chicken wings with black bean sauce (See jup gai yik, with “¼ cup fermented black beans (Dow See). Rinse, drain and crush,” p. 158). Soy sauce chicken (See yow gai, with “10 cups soy sauce,” p. 170). Red bean curd chicken (Nom yee gai, with “2 tablespoons spiced red bean curd (Nom Yee)... 3 tablespoons soy sauce,” p. 171). Soy squab red fried (Hoong siew bok opp, with “2 quarts soy sauce,” p. 174). Taro root duck with nom yee sauce (Nom yee wu tow opp, with “1 square red bean cake (Nom Yee), mashed,” p. 184).

Spareribs with black bean sauce (See jup pai gwut, with “2 tablespoons fermented Black Beans (Dow See), crushed into paste, p. 192). Spareribs with red bean cake sauce (Nom yee pai gwut, with “2 tablespoons Red Bean Cake (Nom Yee),” p. 193).

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Almost all recipes in this book are based on meat, Chinese cuisine (arranged alphabetically by English name of translations from old books related to food). A dictionary of translation of that name. On some left-hand pages are short the Cantonese transliteration of that name, and the English the name written vertically in large Chinese characters, Joon. Food for the emperor (recipes; for each recipe is given school of Chinese cooking. Contents: Introduction, by Kee Joon. Illust. Index. 18 x 18 cm.


* Summary: See the edition published this same year by Gramercy Publishing Co., New York, NY. Address: San Francisco.


* Summary: This book is about the Mandarin or Peking school of Chinese cooking. Contents: Introduction, by Kee Joon. Food for the emperor (recipes; for each recipe is given the name written vertically in large Chinese characters, the Cantonese transliteration of that name, and the English translation of that name. On some left-hand pages are short translations from old books related to food). A dictionary of Chinese cuisine (arranged alphabetically by English name of food). Index to the recipes (by recipe type, and within that by English recipe name).

Almost all recipes in this book are based on meat, fish, or poultry. There are no soy-related recipes in this part of the book, although many recipes call for soy sauce.

The Dictionary includes: Bean curd (dou foo, with 2 recipes). Bean curd cheese [fermented tofu] (the two varieties are white bean curd cheese {foo yoo} and red bean curd cheese {narm yoo}). Bean curd, dried (tim jook [sweet dried yuba sticks; also spelled tiem jook]).

Note: This is the earliest English-language document seen (Nov. 2010) that uses the term tim jook to refer to dried yuba. Actually it refers to sweet dried yuba sticks.

Bean filling, sweet (doe sha, made from black soya beans, sugar, and a little oil. “This paste is available in Chinese bakeries, and is used in New Year’s cakes and other sweet pastries”).

Note: This is the earliest document seen (March 2011) that uses the term “Bean filling, sweet” to refer to a sweet paste, made of black soybeans, that is used as a filling like for cakes, like sweet red bean paste [azuki bean paste].

Bean sauce–see Soya bean condiment. Black bean sauce–see Soya beans, black fermented. Black beans–see Soya beans, black fermented. Brown bean sauce–see Soya bean condiment. Cheese, red–see Bean curd cheese.

Fermented black beans–see Soya beans, black fermented. Red bean sauce (shang she jerng; a popular canned cooking sauce consisting of mashed red soya {or often azuki} beans). Red cheese–see Bean curd cheese. Seaweed (purple laver, hair seaweed). Sesame oil (jee ma yo). Sesame seeds (jee ma).

Soya bean condiment (yewn she jerng. “Variously called soy jam and brown bean sauce, this condiment is prepared from the residue left when making soya sauce. Wheat is sometimes added to the condiment, which is fermented and then called Meen She Jerng. These condiments are most commonly use in cooking fowl; also in meat dishes).

Soya beans, fermented black (doo she. “Tiny fermented beans which are washed, crushed, and used to add a pleasant spiciness to dishes. They are often used in fish dishes to alleviate any strong smell. It is a prime ingredient in Cantonese lobster”).

Soy jam–see Soya bean condiment. Soya sauce. “The general term in Cantonese for soya sauce is She Yo. There are three main subdivisions: (1) Shang cho: Light brown, fine taste, light color. Used in cooking delicate foods were a heavy soya flavor is not desired. (2) Cho yo: Dark and thick, containing molasses, yet not too strong a taste. Used mostly in restaurants. (3) Jew yo: Most suitable for general cooking purposes and for use at the table. Also: Japanese soya sauce, which is prepared with the addition of malt [koji], is much respected by the Chinese.”

Sweet-sour sauce: The recipe, which is given, contains 1 teaspoon soya sauce.

Sweet vegetable sauce (hoi seen jerg [hoisin sauce]). “A canned red sauce prepared from soya beans, red rice, and garlic. It is used in preparing Peking Roast Duck, fish and shellfish dishes.”

“Tomato Catsup: Tomato catsup originated in China, as can be seen from the pronunciation of the Cantonese (Kair = tomato; Jup = sauce). Used in some braised dishes such as Shrimp Braised in Tomato Sauce.” Address: San Francisco.


This is a collection of the greatest classical recipes of China. All five major “schools” of Chinese cooking are represented: Shanghai, Peking, Yang Chow (120 miles northwest of Shanghai; pinyin: Yangzhou; Wade-Giles: Yang-chou), Szechuan, and Canton. Yu Lin Chuan, one of Old China’s most renowned restaurateurs, has selected these
recipes, all of which were translated by his daughter, Yu Wen Mei, and carefully tested by Charlotte Adams—to ensure ease of preparation by American homemakers.

The chapter on “Chinese ingredients” describes the following soy-related ingredients: Agar-agar, bean curd (fresh, or fermented), Hoisin sauce, laver (seaweed), red beans [azuki] (tiny beans used for making sweet bean paste), sesame oil, soy bean paste (very salty, or lightly salted). Hoisin sauce is “A delicious, thick, dark-brownish-red condiment, often used as an ingredient in cooked dishes, also as a side-dish sauce for dipping” (p. 2).

The chapter titled “Some tips on Chinese cookery” states (p. 7). Peanut oil is the preferred type of oil. If food is truly fine, “there is no reason whatsoever to add monosodium glutamate to it, and you will note that it is required in none of the recipes.” “We strongly suggest that you buy imported soy sauce by the quart. The soy sauce made here is much saltier than that which comes from Hong Kong, and its use therefore alters the recipes.” Many recipes are seasoned with soy sauce or soy bean paste.


Note: This is the 2nd earliest document seen (Sept. 2008) that mentions Hoisin sauce. Address: New York City.


*Summary*: One of the best publications on fermented tofu, this work was supported by a grant (FG-Ta-100) from the USDA Agricultural Research Service. Contents: 1. Introduction. 2. Experimental. Microbiological investigations (using sufu made at 3 factories in Taipei, Taiwan. All three used the same strain of Rhizopus chinensis). Many photos (magnification to 70 x to 700 x) show Rhizopus chinensis var. chungyuen, Mucor hiemalis and Mucor silvaticus. Procedures and results. Analyses. 3. Discussion. Mucor is the preferred mold. Summary of newly developed method. Appendix: (1) History of tofu. History of sufu. The ancient process for making fermented tofu. Salting. Table showing five varieties of sufu and their nutritional composition.

“Soybean cheese (sufu) has been produced in China for many centuries.” “Which kind of fungus is adaptable for the preparation of sufu is one of the keystone problems in studying this vegetable cheese.” The mycelial mat, grown on the cubes of firm tofu, should ideally be white (or slightly yellowish white), and “the mycelial mat should be dense and tenacious so that a film will be formed on the surface of the ‘pehtze’ to serve as an envelope to protect the finished sufu from distortion in its shape. ‘Pehtze’ means the bean curd freshly grown with the fungus but not yet processed and aged to become sufu)” (p. 75).

In Taipei, Taiwan, sufu is made in three factories; all three used the same strain of fungi, which we will designate as Rhizopus chinensis var. chungyuen. Sufu is also made at home. “It is well recognized by Chinese housewives that when soybean curd is covered with rice straw it will at last become pehtze of sufu. This may be explained by the fact that a kind of fungus naturally inhabiting on the rice straw may have the chance to grow on bean curd under favorable conditions.” Two strains of fungi were isolated from the rice straw: Mucor heimalis and Mucor silvaticus. Many photomicrographs of all three molds are shown. Kaoliang wine is preferred is the typical solution of 12% NaCl and 10% ethanol (generally added as rice wine or distilled liquor) (p. 76-83). “As to soybean cheese (sufu) it is not known when it first started. The Food Encyclopedia, written by Wang Su-Hsiung [pinyin: Wang Suxiong] (1861) of the Ch‘ing Dynasty [Qing / Manchu dynasty, 1644-1912] describes [the food] as follows:” Hardened tofu is difficult to digest and it is not good for children, old people or patients (ill persons). Sufu, which is prepared from tofu, is very good for patients. “Therefore, we may presume to say that soybean cheese has been put for sale [sold] long before the Ch‘ing Dynasty” (p. 92).

The five varieties shown in the table are: Rose sufu (to which some rose essence is added), Fermented rice sufu (tsao sufu, to which some pressed residue from rice wine {also called “fermented rice mash”}, cloves and orange peels are added), Red sufu (to which “red koji and soy mash” [red rice koji and sake lees] are added; red koji is boiled rice grown with Monascus anka [angkak]), and Kwantung Sufu [sic, Kwangtung Sufu from Kwangtung province in southeast China] (to which salt, red koji, red pepper and anise are added), and Yunnan sufu.

Note 1. This is the earliest English-language document seen (Feb. 2007) that uses the terms “rose sufu” “tsao sufu” “fermented rice sufu” “red sufu” “Kwantung sufu” “Kwantung sufu” or “Yunnan sufu” to refer to different types of fermented tofu. It is also the 2nd earliest English-language document seen (Feb. 2007) that contains the term “fermented tofu.”

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the word “pehtze” to refer to “bean curd freshly overgrown with the fungus but not yet processed and aged to become sufu.” Address: Inst. of Chemistry, Academia Sinica, Taiwan.


*Summary*: Contents: Preface. Introduction. History of legumes. Production and consumption. Composition and nutritive value. Methods of processing and cooking: Soybean preparations in East Asia (p. 48-52)–Germination (sprouted...
soybeans), soybean curd (tofu, incl. chou tofu or “stinking soybean curd”), soy sauce (shoyu), soybean paste (miso), tempeh, natto, hamanatto, soybean “milk,” fermented preparations from groundnuts. Groundnut tempeh, natto, hamanatto, soybean “milk,” fermented soybean curd), soy sauce (shoyu), soybean paste (miso), fermented preparations from groundnuts. Groundnut flour.

Effects of processing on nutritive value: Soaking, decortication, heating, germination, fermentation (mentions tempeh), effects of storage.


Soybeans are also mentioned on pages 15 (Table 1, “Important legumes”), 23 (Indonesia, soybean curd, soy sauce, tempeh), 23-24 (Japan, miso, shoyu, natto, tofu, Korea, Taiwan), 39-40 (carbohydrates in soybeans include “galactans, pentoses, and hemicelluloses which are poorly utilized.” Fats: only the groundnut and soybean are important sources of it), 55 (heating and trypsin inhibitor, methionine utilized.” Fats: only the groundnut and soybean are important sources of it), 55 (heating and trypsin inhibitor, methionine utilized. Fats: only the groundnut and soybean are important sources of it), 84 (Dean used soybeans to treat a protein deficiency), 84 (soybeans in India), 97 (soybean curd).

Appendix 1, titled “Legumes eaten by man” (p. 101-14), lists the various legumes by their Latin names. The entry for Psophocarpus tetragonolobus gives its vernacular names as “Goa bean, asparagus pea, winged pea, winged bean, sesquidillas.”

Note: This is the earliest English-language document seen (Aug. 2007) that uses the word “sesquidillas” to refer to the winged bean. Address: 1. Dep. of Human Nutrition, London School of Hygiene and Tropical Medicine; Former Director, Nutrition Div., FAO, Rome, Italy.


• Summary: A landmark, widely cited work on indigenous fermented foods. Interestingly, it makes no mention of amazake, or kanjang (Korean soy sauce). Contents: Tempeh. Ragi. Sufu (describes process, mentions pehtzes and the mold Actinomucor elegans NRRL 3104).

Color photos (sent by Dr. Clifford Hesseltine) show:
(1) Luxuriant growth of Actinomucor elegans mold on some skewered cubes of tofu in an incubator; on the top row are uninoculated cubes. (2) Cubes of sufu in their final form after removal from brine.

Thamnidium (meat tenderizer and flavor enhancer from the mold Thamnidium elegans). Miso. Shoyu (incl. tamari. “In China, shoyu is more of the tamari type, that is, more soybeans are used and less wheat,...”). Tea fungus. Ang-Kak (p. 179-81). Advantages of fermenting foods. The future of food fermentations.

The glossary gives brief descriptions of aga-koji, akakoji, amylo process, anchu, angkak, angkhak, ang-quac, anka, anchak, arack, arakk, atsumandie, awamori, bagoong, bakhar, beni-koji, benikoji, bragga, brem, busa, chao, ch’au yau (Chinese name for shoyu), chee-fan (a type of Chinese cheese or sufu), chiang (Chinese equivalent of miso), chicha, Chinese cheese (sufu), Chinese red rice (ang-kak), chiu-chu (Chinese yeast), chiu-niang (Chinese term for koji), chou [ch’i] (Chinese equivalent of koji), dahi, dawadawa (made from African locust bean–Parkia filicoidea; soy is not mentioned), dholka, dosai, fermentation of citrus, fermented fish, fermentation of maize, fermented minchin (wheat gluten), fermented soybeans (“a Chinese food prepared from small black soybeans.” See A.K. Smith 1961 [soy nuggets]), fish paste, fish sauce, fish soy, fu-yu, fu-yue, fuyu (see sufu [fermented tofu] for all 3), ginger beer plant, grib, hamanatto, hon-fan [fermented tofu], hongo, hung-chu, idli, injera, jamin-bang, java yeast, jotkal, kaffir beer, kanji, katsuobushi, katyk, kefir, ketjap, kimchi, kishk, kisello mleko, koji, kombucha (tea fungus fermentation), kome-miso, kuban, kuniss, kumys, kushik, kvass, kwass, kyoku-shi, lao-chao, leben, lebny, levain of khasia, levain of sikkim, lonjtom (ontjom), magou, mahewu, maize fermentation of the maoris, mazun, medusen tee, meen, meitauza, meju (fermented soybeans of Korea), mën, mien (Chinese yeast), mirin, mish, miso, moromi, mugi miso, mura, nappi, nata, natto, ngapi, nuo-mac, nukamiso, ontjom, patis, paw tsay, peh-khak, pehtze, peujeum, peyem, poi, prahoe, pulque, raggi, ragi, ranu, red pepper sauce, red rice, red sufu, sajur asin, saraimandie, sekihan, shiro koji, shottsuru, shoyou, sho-yu, shoyu, soja japons (shoyu), soti (a rice beer wine of India), South African fermented corn, soy, soybean cheese [fermented tofu], soy sauce, sufu, su fu [both fermented tofu], sweet flour paste, taette, tahuli, tahiru [both “Philippine fermented soybean curd?"], takuwan, tamari, tane koji, tao-cho [taotjo], taokoan [pressed or firm tofu, not fermented], tao dji (see taotjo {sic}), tao-si ([soy nuggets]; see Handbook of Philippine Agriculture. 1939. p. 132-43), tao-tjung, tao-yu, taotjo, tapej, tape ketan, tape ketella, tarhana, tea beer, tea cider, tea fungus, teekwass, teenschwamm, tempe, tempeh, tempeh bongkrek, tempeh kedelee, thamnidium, thumba, tibi, tien mien chang [chiang], tojo, tokua, torani, tosufu, toyo, trassi, tsue fan, twukar, uri, u-t-tiat, wunder pilz, yen-tsaai.

Note 1. This is the earliest document seen (Oct. 2011) that mentions Actinomucor elegans in connection with sufu [fermented tofu]. In 1966 Hesseltine describes it as the best mold for use in making this fermented food.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the terms “fuyu” or “fu-yue” or “chao” to refer to fermented tofu.

Note 3. This is the earliest document seen (July 2000) that mentions “mugi miso”–a type of miso made with barley
koji. By the mid- to late-1960s, macrobiotic companies in the USA were importing barley miso from Japan and labeling it “Mugi Miso.”

Photos show: (0) Clifford W. Hesseltine (portrait). (1-3) Rhizopus oligosporus mold, used to make tempeh (3 views). (4) Skewered cubes of sufu in an incubator, with one skewer of uninoculated tofu cubes and three rows of tofu inoculated with Actinomucor elegans showing luxuriant growth of mold. (5) Cubes of Chinese cheese [fermented tofu] removed from brine. (6) Dilution plate of tane koji showing different types of Aspergillus oryzae. Address: NRRL, Peoria, Illinois.


• Summary: “Ang-kak, or red-rice, is a product made by fermenting rice with certain strains of Monascus purpureus. Went. Our culture, NRRL 2897, used to carry on this fermentation was isolated from a sample of ang-kak bought in the Manila market in the Philippines.

“Ang-kak is used for coloring various foods including fish and Chinese cheese, and for manufacturing red wine in the Orient. It is used in China, Taiwan, and the Philippines, and presumably in many other countries of the Orient. It is stated also to impart flavor. The most recent authoritative account of this product and its fermentation is by Palo, Vidal-Adeva and Maceda (1961) at the Philippine National Institute of Science and Technology. According to them, it is known under the following names: red rice, Chinese red rice, ang-kak, ankak, anka, ang-quac, beni-koji, and aga-koji.

Church (1920) points out that strains of this mold may be isolated from many sources but only certain ones are suitable for the fermentation. They must produce a dark red growth on the rice, but also must form the pigment throughout the rice kernels, and must do this at low enough moisture levels to allow the individual grains to remain separate from one another.”

A long paragraph then describes how to prepare ang-kak on a laboratory scale. “After drying, ang-kak can be ground into a flour and used to color various foods mentioned above.” It contains two pigments: monoascorubrin (red) and monoscaflavin (yellow).

The glossary mentions synonyms for ang-kak: aga-koji [aka-koji], akakojio (Red rice in Formosa), angkak (Chinese red rice), angkak, ang-quac, anka, ankak, beni-koji, benikoji, Chinese red rice (ang-kak), red rice (used to make red sufu [= red fermented tofu]). Address: NRRL, Peoria, Illinois.


• Summary: This is the earliest document seen that mentions Yamazaki, who found the earliest reference to fermented tofu in China. Address: Norinsho Shokuhin Sogo Kenkyujo.


• Summary: In 1964 at the Botanical Congress in Edinburgh, Scotland, an American mycologist, Dr. C.W. Hesseltine, gave a fascinating account of the studies he has made of foods fermented with molds. A full account of his work has just been published in Mycologia. 1965. 57(2): March/April. This is a summary of that article, focusing on tempeh, sufu or Chinese cheese, miso, and shoyu or soy sauce. Address: D.Sc.


Address: Kikkoman.


• Summary: A superb, in-depth, pioneering study, based on extensive original field research in Japan. It is carefully documented with hundreds of original interviews and published sources properly cited in two different lists of sources (numerical and alphabetical) Contains 30 tables and 190 excellent photos–including 7 of the author.


Part III: Soybean utilization in Japan. 1. Utilization of soybeans for oil and meal (oil crushing history, soybean source, delivery of soybeans, the crushing industry, liberalization of soybean oil and meal, oil utilization in Japan, meal utilization in Japan). 2. Tofu (history, use of soybeans, manufacture, the tofu factory, marketing tofu products, recently developed tofu products, tofu as food, concluding comments). 3. Miso (importation, home production of miso, quantity of miso produced, soybean used for producing miso, kinds of miso, fermentation time, comparison of miso firms, manufacturing, packing
This typed manuscript was sent to Soyfoods Center in July 2004 by Tomoko Brandemuhl, the wife of the author. About the author (based on several interviews with Tomoko, July 2004): William Victor Brandemuhl was born on 30 Nov. 1940 at Iron Mountain, Michigan. He grew up in Florence, Wisconsin, then attended the University of Wisconsin at Madison. He roomed for 3-4 years with various Japanese cancer researchers at the university. He also became close to Tomoko Arai (born 12 Dec. 1937 in Tokyo), a Japanese woman, who was doing graduate studies in social work there as a Rotary International Fellowship student. William initially intended to graduate in June 1962, but stayed an extra year in order to pursue independent studies in Japanese language and soybeans. He became interested in the soybean and its history in an anthropology class taught by Dr. R.J. Miller; William finished his excellent research paper on soybeans in Jan. 1963. He also took one year of Japanese language instruction (night classes). William graduated in Jan. 1963 with a BSc degree in economics.

William obtained a grant (no strings attached) from Honeymead Products Co. of Mankato, Minnesota, to study soybean utilization in Japan. Only one American had studied this subject in Japan after World War II—Alan K. Smith of the USDA, who visited Japan and wrote short but detailed reports in 1948-49 and 1958. In Jan. 1963 Brandemuhl arrived in Japan and became research fellow at the Department of Agricultural Economics, Kyoto University, Kyoto, Japan. Between Feb. 1963 and May 1964 (15 months) he conducted field research on soybean utilization in Japan. In June 1963 (after William had been in Japan for 4 months), Tomoko completed her graduate studies, graduated from the University of Wisconsin, and (since her scholarship was finished), returned to Japan—to be with William and to help him with his research in Japanese, which he spoke only moderately well. She traveled with him throughout Japan and translated for him during the many interviews he conducted. At each destination, she spoke about America to the local Rotary club—which paid her transportation, room, and board. William’s monthly check from Honeymead paid for his room and board—but not for his travel and research, so he had to work part time doing English translation for a Japanese company. On trips, he took many photos using his expensive Nikon camera. Tomoko’s family lived near Kobe, where she and William were married on 8 Aug. 1964–three months after he finished his field research. Several days after the marriage, they returned to the USA to visit his parents in Florence, Wisconsin, and enjoy a wedding party there.

William now knew he wanted to pursue a career in international business. He was soon offered a job at Crocker Citizen National Bank (International Division) in San Francisco, California. They drove to San Francisco and got an apartment at 1701 21st Avenue; he began work that fall, and was soon learning the basics of international business. Every evening after work at the bank he returned home to


work on transforming his field notes into a manuscript. As he wrote the rough draft, Tomoko (a skilled pianist but not a skilled typist) typed it on a manual typewriter. The next day he would correct any mistakes and she would retype each page into final form. In 1965 he had the best carbon copy bound and sent it to Honeymead; he kept the original. It was never published and he received no academic credit for it.

On 26 May 1966 their first son and only child, Konrad Victor Brandemühl, was born in San Francisco. They bought a house in Pacifica. In 1967 he was offered a job with Caterpillar Tractor Co. (International Div.) in Peoria, Illinois. In 1968 he moved with his boss to work at Allis-Chalmers Manufacturing Co., West Allis, Wisconsin. In 1969 he was transferred to Tokyo, Japan, as Far East Representative of the company. In 1970 he was transferred to Singapore as Far East Manager of the company.

William and Tomoko later lived for about 10 years near Tokyo, Japan (mostly in Mitaka), and for a while in Singapore. Over the years he showed his typescript on “Soybean Utilization in Japan” to many people, but nobody was interested. In 1986 he started his own trading company, specializing in textiles, natural rubber, latex thread, and various machine mechanisms. Tragically, William died on 2 April 1998 in Bangkok, Thailand, of pneumonia, during a business trip. He loved the excitement of international business and interaction with people of different cultural backgrounds. Address: San Francisco, California.


• Summary: Preface, by Fu Tong (“Food is my whole life”). Introduction, by Helen Burke. The recipes are largely Cantonese, and soy nuggets (dow see) appear in quite a few: Pacific prawns and black soya beans (p. 40; with “2 tablespoons canned black soya beans”). Duck with black beans (p. 65; “1 tablespoon canned black [soya] beans”). Chicken and black beans (p. 73; “1 tablespoon canned black beans”). Soya eggs (p. 138; with “2 tablespoons dark soy sauce”).


Note: Many recipes call for “Ve-Tsin or monosodium glutamate.” It is known under many brand names: Accent (made in USA), Aji no Moto (made in Japan). Mei Yen (made by the Spice Islands Co. of California), Stress (made in Great Britain) and Ve-Tsin (made in Hong Kong). “Home cooks, in the wake of food manufacturers, are realising, more and more, the virtue of ‘M.S.G.’ under whatever name it is bought and it is growing in popularity. Like all seasonings and flavourings, ‘a little goes a long way.’” Address: 1. Food writer, London, England, and, British Columbia, Canada; 2. Owner of four Chinese restaurants in Europe.


• Summary: This is an expanded edition of the author’s 1953 book of the same title. Almost all the recipes in this book have Filipino names, with no English translation of those names. A surprisingly large number contain soyfoods (See Glossary at end). Misu is “a paste made of fermented rice and soy beans” [miso]. Tajure is “fermented soy beans, caked” (fermented tofu). Tausi is “fermented soy beans” [soy nuggets or fermented black soybeans with salt]. Tokua is “soy bean curd” (tofu). Toyo is Filipino-style soy sauce.

Soy-related recipes include: Chicken pastel (with toyo, p. 26). Arroz caldo with chicken (with 3 tbsp. patis or toyo, p. 45). Bañgus en tocho–2 (with 2 tbsp. each tajure and tausi, and 1 cake tokua, cut into pieces 3/4 inch long and 1/8 inch wide, p. 54). Bañgus in soy sauce (with 2 tbsp. soy sauce, p. 54). Bulanglang–1 (with 1 cup tokua, cubed and fried, p. 57). Burong isda (with 1 tbsp. angkak–fermented red rice, p. 59). Escabecheng apahap (with 4 pieces tokua, p. 71). Escabeche–Macao style (with 3 tbsp. toyo sauce, p. 71).

Kari-karing pata (with ground toasted peanuts or peanut butter, p. 79). Lumpia labong (with 5 bean cakes–tokua, p. 83). Lumperia sauce (with ½ cup toyo sauce, p. 84). Lumperia with peanuts (with 2 squares tokua–diced, 2 tbsp. toyo–soy sauce, and 1 cup ground peanuts, p. 85). Lumperia with ubod–2 (with 2 cakes tokua, and toyo to taste, p. 87). Misu-tomato sauce (with 2 tbsp. misu–soy bean paste, p. 92). Pancit “luglug” (with ½ cup soy bean cake–tokua–cut into small cubes, p. 97). Umba (with 2 tbsp. toyo and 1 heaping tbsp. tausi, p. 118). Pastillas de mani (with 1 can ground peanuts, p. 133).

On the page facing p. 186 is a full page ad for Suki Soy Sauce, made by the Philippine Shoyu Co., Liloan, Cebu, Philippines. It is “Pure and fully aged.”

Seven unnumbered pages later is a full-page ad for “Aji-no-Moto super seasoning... The purest vetsin ever.”

A glossary at the end contains brief definitions of uncommon ingredients. Definitions of the soy-related ingredients above are taken from this glossary. Angkak is “red-colored grains of rice used as coloring for fermented fish.”

Note: On the title page is printed “10th printing–1965” but no original publication date is given. Address: Philippines.


• Summary: A new book, Chinese Cooking for Pleasure, by Mr. Fu Tong and Miss Helen Burke has been published by Paul Hamlyn. A recipe is given. The book lists three establishments in London that specialize in Oriental supplies:
Bombyx Emporium (largest selection), Chinese Emporium, and Hong Kong Emporium. To the inexperienced, the bewildering array of new foods include “red bean curd [fermented tofu], black bean [black soya bean], yellow soy bean, and sesame oil.”


• Summary: This excellent, massive volume, by the blond-haired wife (a professional writer; photo shown on dust jacket) of a Greenwich Village sculptor, offers an in-depth introduction to Chinese cooking and ingredients, though it is unusually heavy on flesh foods and light on grain and vegetable dishes—as the following listing of recipes will show. In describing “The Chinese Diet” (p. 3-4) the author notes, “Meat does not predominate, vegetables do:... There are no dairy products: Butter, cheese and milk are practically unknown to Chinese cooking. (Cattle, few and far between, were more profitably put to work as beasts of burden.) Yet, with nutritional ingenuity, the Chinese created their own ‘cow’ which produced its own ‘dairy’ products. They took the lowly soybean, whose protein closely resembles that of meat, and transformed it in innumerable ways. They softened and ground the soybean, then mixed it with water, converting it first to milk, then to curd, and finally to cheese. (They also put it to many other uses: made it into sauce and jam; served its sprouts as vegetables; fermented, dried and roasted it; used it salty as a condiment, sweet in pastries.)”

Page 75 notes: Soy sauce should be used discreetly in light soups. If possible, it should be light soy. The dark variety can destroy a soup’s lightness and clarity; its strong taste can overwhelm flavors.


The chapter titled “Other Useful Information” tells more about bean curd.

The extensive Glossary of Chinese Ingredients (p. 844-72) contains the following soy-related entries: Bean curd (bean cakes; note that recipes call for a certain number of “cakes” of tofu). Bean curd sauce (see cheese, Chinese white).

Bean curd sticks (dried bean curd [dried yuba sticks = foo jook]; “Long, dried, cream-colored sticks, about ½
inch wide and 20 inches long, but bent in two. Are stiff and striated with an enamel-like surface. Sometimes called ‘Second Bamboo’ because they come from the residue or second layer of creamy bean curd [yuba]. Must be soaked; then they become chewy in texture, nutlike in flavor. Used as a vegetable with soup, steamed fish, stir-fried and braised pork... Other dried varieties include sweet bean curd sticks [tim jook or tim joke], which are similar but thicker, and are used in fish and vegetarian dishes”.

Bean paste, yellow (yellow sauce). Bean sauce, brown (see brown bean sauce). Beans, black (Type of beans not given. “Note: Sweetened black beans used as a pastry filling sold in Chinese bakeries”). Beans, black fermented beans (black bean sauce or salted black beans). Brown bean sauce. Cheese, Chinese red (red bean curd cheese, spiced red bean curd, or southern cheese). Cheese, Chinese white (bean curd sauce, white bean curd cheese, or white bean sauce). Five Spices (five-flavored powder or five-fragrance spice powder; star anise, anise pepper, fennel, cloves, cinnamon). Hoisin sauce (haisien sauce, Peking sauce, red seasoning sauce, red sauce). Vegetable sauce, sweet vegetable sauce, or sweet vegetable sauce; another variety is called Ten-Flavored Sauce). Pickles, Chinese (pickled vegetables; pickled in soy sauce). Red bean sauce. Soy sauce (soybean paste). Soy sauce (light, black, or heavy varieties). Hoisin sauce (p. 855) is a “Thick, dark brownish-red sauce, made from soy beans, spices, garlic and chili. Sweet and spicy.” Used in cooking and as a table condiment.

The chapters titled “Storing Information” and “Soaking Information” include such information on many of the foods listed in the glossary.


• Summary: A charming book by an Australian born woman of Chinese ancestry, copyrighted in 1961. She presently “conducts the Chinese Cookery course at East Sydney Technical College... She has also published features in the Australian Woman’s Weekly.” The foreword is by D.W. Grover, 1961 Head of Food School, East Sydney Technical College.

Chapter 1, “Chinese ways and means,” includes three sections on ingredients. The first such section, “Dried ingredients,” has an entry for “Bean curd (foo jook) [dried yuba sticks] (p. 7). This is sold in sticks or sheets [yuba]; soak in warm water for 10 to 15 minutes. It has little flavor of its own but is highly nutritious and is served with other foods to absorb their favour. Used in soups and braised dishes—the latter are served on days of fasting.”

The third such section, “Sauces and seasonings,” includes (p. 10-11): *Hoisin sauce* [Hoisin sauce, hoy sin jeung]: Obtainable in tins. This is made of [soy] bean flour and spices, very rich in flavour and color. It is easy to become accustomed to this taste.”

“Monosodium glutamate... It is of vegetable origin and used very sparingly and with discretion it enhances the natural flavour of foods. The Chinese version is a fine white powder called Ve-tsin. In Australia it is known as Zip.”

“Red bean curd [red fermented tofu]: A soy bean product, obtainable in tins. The red colour is added.”

“Soy sauce: Made from salted and fermented soy beans. No Chinese kitchen is ever without it. There are different grades, ranging from thin to thick, and the colour varies from light brown to dark reddish brown...”

*Taofu* [tofu]: Made from soy bean curd, a similar texture to soft cheese. It has no flavour of its own, but is highly nutritious. It is usually cut into blocks about one inch by 3 inches. In its fresh state it has a milky colour and is also cut into one-inch cubes and deep-fried.”

“White bean curd: Made from soy bean, salted and used as an appetizer or with other dishes.”

In Chapter 4, “Vegetables” (p. 31): “Bean sprouts can be cultivated in the kitchen by sprinkling green beans [mung beans] with warm water... The soy bean can also be sprouted, but usually the sprout is tougher.” In this chapter, the recipe for “Fasting food” (jie) (p. 33) calls for “3 sticks bean curd (foo jook)” and “4 blocks bean curds (taofu).” “This dish is eaten during the Moon Festival and on the second day of the
New Year."

In Chapter 7, “Seafood,” the recipe for Steamed whole fish with black beans (dow see jing yee) calls for “1 tablespoon preserved Chinese black beans (dow see)” (p. 69).

Note 1. Soy sauce and monosodium glutamate (typically ½ teaspoon per recipe) are called for in many recipes in this book.

(2) Rice with red beans (Hoong dow farm) calls for “4 tablespoons red beans (hoong dow)” (azuki beans) (p. 87). Address: [Australia].

• Summary: Discusses: Miso. Sufu, or Chinese cheese [fermented tofu]. Tempeh. Absence of aflatoxin in fermented food products. Table 1 shows mold fermented food products tested for aflatoxin and found negative. These include shoyu, miso, Chinese black beans (Soy nuggets from Taiwan), Hamanatto, moromi, soy tempeh, wheat tempeh, rice tempeh, wheat-soybean tempeh.

Concerning sufu: “The pehtzes [molded tofu cubes] are next brined in various solutions depending on the flavor desired. A typical brine would consist of 12% NaCl and 10% ethanol (sometimes added as rice wine). In other instances, only a salt brine may be used. The molded cakes are allowed to age for about 2 months. The finished cheese along with the brine is bottled, sterilized, and marketed as sufu.”

Of all the various Mucor species tested for use in making, the Actinomucor elegans used commercially is the best proteinase and almost the best lipase producer. “This same fungus is used in China to produce a food made by fermentation of wheat gluten” Address: Northern Utilization R&D Div., ARS, USDA, Peoria, Illinois.

• Summary: Mucor hiemalis NRRL 3103 is “a mold used in Chinese cheese (sufu) fermentation.” The optimal pH of the proteinase enzyme ranged from 3.0 to 3.5. “It is well known that the great majority of molds produce appreciable amounts of proteolytic enzymes, which may be cell-bound or extracellular according to the type of organism producing them.” Since tofu, the substrate on which these enzymes act in making sufu, has an extremely high protein content (60% on a dry weight basis), it is important that the proteinase enzymes be as abundant and as active as possible. Addition of NaCl to the growth medium released the proteinase enzyme from the mycelium. Proteolytic activity was greatest at a NaCl concentration of about 0.5 M. Address: Fermentation Lab., NRRL, USDA, Peoria, Illinois 61604.


• Summary: Includes sections on soymilk yogurt (cultured with Lactobacillus bulgaricus) and nyu fu [fermented tofu]. Chapter 6, Nyu fu notes that this is an ancient food that came from China and Taiwan, but has never become a part of Japanese cuisine. In the United States (and English) it is known as “Soybean cheese” and “Vegetable cheese,” while in China it is known as “Nyufu” as well as Chaw taufu, Sufu, Funu, etc.

6.1.2—Places of production and varieties: Nyufu is made mainly in the middle to southern four coastal provinces of China. These include (pinyin / Wade-Giles): Jejiang / Chekiang (Jap: Sekkô), Jiangsu / Kiangsu (Jap: Köso), Fujian / Fukien (Jap: Fukken), Guangdong / Kwangtung (Jap: Kanton). A lot of Nyufu is also made in Taiwan, which is located off the coast of Fujian province.

Since nyufu has been produced for a long time over a vast area, there are many varieties. A study conducted in the 1920s found the varieties shown in chart 6.1 in the Shanghai market (Shanghai is in Jiangsu province near the mouth of the Yangtze River).

(1) Pickled without mold on the tofu. (i) Jianning-dofu: Drain then dry the tofu, add salt, and pickle in jiang or the residue / dregs left after making soy sauce
(ii) Doufuru: Drain then dry the tofu. Sprinkle it with salt then pickle it in koji.
(2) Culture mold on small cubes of tofu until a fragrant white mycelium surrounds each cube, then pickle.
(iii) Jiangrufu: Pickle in jiang or the residue / dregs left after making soy sauce.
(iv). Honjiang rufu [red jiang fermented tofu]: Pickle in a mixture of red rice / angkak (a red koji made by growing Monascus mold on rice) and the residue / dregs left after making soy sauce.
(v) Zaorufu: Pickle is sake lees.
(vi) Hongrufu: Pickle in red sake lees.
(vii) Jiujia rufu: Pickle in white sake / daku-shu, like unrefined sake (doruroku).
(viii) Xiangrufu (fragrant rufu): Pickle in jiang with olive leaves, fragrant mushrooms, etc.
Dr. Masahiro Nakano was born in 1907. Address:
Mold-ripened cheese: Background (This type of cheese was first made in France during the Roman era. The name “Roquefort” first appeared in the year 1070. Roquefort is a mold-ripened cheese made from the milk of female sheep (ewes). The trade association of Roquefort makers is the Société de Roquefort manufacturers, species utilized for manufacturing process. Production of blue cheese by submerged culture techniques: Preparation of inoculum, production of mold-ripened cheese, a typical blue cheese manufacturing process. Production of blue cheese flavor by submerged culture techniques: Preparation of inoculum, flavor development, process modifications. There are many “cheese varieties in which typical flavor development is principally dependent upon the internal and/or external growth of mold. Blue (Bleu, Blue-veined), Gorgonzola, Stilton, Wensleydale, Gammelost, Nu-World, Camembert, Neufchatel, Mycella, Niva and Brie are produced in many nations...” But Roquefort is made only in France.

Note: Roquefort (sometimes spelled Rochefort in English) “together with Bleu d’Auvergne, Stilton and Gorgonzola is one of the world’s best-known blue cheeses. Though similar cheeses are produced elsewhere, European law dictates that only those cheeses aged in the natural Combalou caves of Roquefort-sur-Soulzon may bear the name Roquefort, as it is a recognised geographical indication, or has a protected designation of origin.”

In 1411 Charles VI granted a monopoly for the ripening of the cheese to the people of Roquefort-sur-Soulzon as they had been doing for centuries. “In 1925, the cheese was the recipient of France’s first Appellation d’Origine Contrôlée when regulations controlling its production and naming were first defined. In 1961, in a landmark ruling that removed imitation, the Tribunal de Grande Instance at Millau decreed that although the method for the manufacture of the cheese could be followed across the south of France, only those whose ripening occurred in the natural caves of Mont Combalou in Roquefort-sur-Soulzon were permitted to bear the name Roquefort” (Source: Wikipedia at Roquefort, Oct. 2011). Address: Dairyland Food Laboratories, Waukesha, Wisconsin.
makes up Chinese cuisine Seaweed, abalone, known as perlmoen, bamboo, lotus seeds, sea-slugs, fermented bean curd, crabs’ eggs, duck, pork, fish, rose petals and chrysanthemum wines, to name but a few, are commonly used. Snake soup and a fat puppy are...


• Summary: This report is quite similar to (but more detailed than) Wai’s 1964 article titled “Soybean cheese.” This report may have been published in Chinese as well as in English.

Contents: Summary. Detailed report. 1. Introduction. 2. Results: Manufacture of soybean cheese (description of the process), microbiological investigations, analyses (preliminary analysis, coagulation of soybean protein by calcium ion, changes of protein components during the preparation of soybean cheese, hydrolysis of lipids during aging of soybean cheese, some characteristics of the fungus Actinomucor elegans), machines of laboratory scale designed for the preparation of soybean milk and soybean curd used as raw materials for soybean cheese. 3. Discussion. 4. Conclusion. 5. Need for additional research. 6. List of publications. Appendixes. A. Historical (History of tofu in China). B. The ancient process (for making 5 types of sufu, and table showing the composition of each—Rose sufu, Tsao Sufu, Red sufu, Kwantung sufu, and Yunnan sufu).

Appendix C: Report on travel to Hongkong and Kowloon for the collection and investigation of fungi used for the manufacture of soybean cheese, by Shuh-Ming Chang and Shu-Chen Sung, Assistant Research Fellows of Institute of Chemistry, Academia Sinica, Taipei, Taiwan (p. 85-88). From 20-29 June 1964 they visited the following factories and collected mold samples from fresh pehtze: (1) Lo-San-Chi Sauce Factory at Sham-Chui-Po, Kowloon. It produces 3 types of soybean cheese ([fermented tofu]; Fusu, Nan-su, and Pepper-Fusu), soy sauce, and “other sauced products.” A description of the process for making soybean cheese is given. (2) Ming-Jean Sauce Nan-su and Canning Company near Clear Water Bay, Sing-Jea, Kowloon. (3) Chen-Mang-Chi Nan-su Fusu Factory, Chung Ching St., Sai Ying Pung, Hongkong. Sufu is the company’s only product. (4) Con-Ho Fusu Factory, Fuk Lo Tsun Road, Kowloon. (5) Kowloon Sauce Company, Queen’s Central Road. It makes sufu, soy sauce, and sauced products. (6) Chu-Rong Sauce Factory at Kam Tin, Sing-Jea. (7) Liao-Mar-Chi Fusu Factory, Shanghai St., Kowloon. It is located inside a market and sells tofu and soybean milk at the same time.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the terms “Fusu” or “Nan-su” to refer to fermented tofu.

Summary: Four fungi suitable for making fermented tofu were isolated: Actinomucor elegans, Mucor hiemalis, Mucor silvaticus, and Mucor subcontractus. “Although each fungus can be used for the fermentation, Actinomucor elegans is the best one. An improved method for the preparation of sufu was devised.” It is described. Four different solutions (containing Kaoliang wine or ethyl alcohol, plus salt) were developed. The pehtze (freshly grown fungi on cubes of firm tofu) can be preserved in these solutions for more than one year. The various enzymes and their activities were studied.


“The cheese fungi used in Hongkong and Kowloon have been isolated and investigated. The morphological photomicrographs (Figs. 14-17) show that the fungus is the same strain of Actinomucor elegans as that used in Taiwan.

(14) Sporangiophores and sporangia.¼ Magnification 180x. (15) Sporangiophores and sporangia.¼ Magnification 180x. (16) Columella.¼ Magnification 700x. (17) Sporangium.¼ Magnification 700x. Address: Principal Investigator, Research Fellow and Director, Inst. of Chemistry, Academia Sinica, Taiwan.


• Summary: “N.S. Wai of the Academy of Science, Taiwan, found that the key to making sufu without a beany flavor is to ferment with a pure culture of the fungus Actinomucor elegans. Using the production methods tested and modified by Wai, ARS [USDA's Agricultural Research Service] microbiologist C.W. Hesseltime says acceptable Western flavors can easily be incorporated into the soy cheese during the last manufacturing step, the brining process, by adding essences such as garlic, wine, or pepper.”

Photos show: Skewered, molded tofu cubes. A finished cube of sufu sliced in half.


• Summary: “Sufu is a Chinese soybean cheese. The ‘snafu,’ or problem was developing a fool-proof method of making good sufu without undesirable off flavors.” Professor Nganshou S. Wai of Taiwan did just that, working under a grant from the USDA.


• Summary: Taipei, Taiwan–Chinese cooking is now “enjoying its greatest prestige in the history of the West.” Yet it is ironic that when Americans think of Chinese cookery, they rarely think of Taipei or Taiwan.

When the instructor at a Chinese cooking class at the local Y.M.C.A. “used tofu, the common bean curd ingredient so frequent in Chinese cooking, a knowledgeable and well-oriented young American housewife told the story of how one of the military wives remarked: “‘You can’t even buy that here; at least we can’t find it in the P.X.’”

Note: P.X. stands for “post exchange,” a store operated by the Army and Air Force Exchange Service on US Army posts.

Claiborne also describes a traditional Shanghai restaurant, the Tung Sheng Lou, at 29-4 Jong Hwa Rd. in Taipei. They serve various unique dishes including “bean curd with 1,000-year-old eggs...” Crab “dipped into an excellent sauce of soy, vinegar and ginger. Followed... by an extraordinary and wonderfully inventive dish of fresh pork cooked with fermented bean curd and fresh spinach.”


• Summary: Page 89: “An unpretentious Chinese eating house with regular dinners and all the tried-and-true Chinatown dishes. But you can also get here some delicious and unusual specialties–Chinese sausage, salted vegetable with pork, and Chinese red cheese and pork.”


• Summary: In Chapter 4, “Fermentation,” is a section titled “soybeans” (p. 110-12) which discusses: Tofu or teou-fu, miso, sufu, natto, tempeh, taotjo and ketjap (shoyu / soy sauce).

“Frozen tofu (kori tofu, or koya dofu) is tofu that has been frozen for several weeks and dried. Aburage is fresh tofu dried in deep fat. Namage is fresh tofu that has been surface-fried.”

In Chapter 10, “Trends in food utilization,” is a section titled “Soybean” (p. 297-301) which discusses: Soybean products and fermented products (“These foods are all rather unknown among Western peoples, although they are eaten by millions of people and constitute some of the most common foods on earth.” Yet some “typical oriental soy foods,” such as tofu and tempeh, are finding acceptance in the West. One soy product that is widely used in most parts of the world is soy sauce. Soy flour and soy grits were first made commercially in the USA in the early 1930s. Milk made from the soybean is important in China {see Vol. I, Chap.

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Soybean protein, including soybean oil and defatted soybean oil meal (In 1961, 9.5 million tons of soybean oil meal was used in the USA, mainly for animal foods, with special grades used for food and industrial products, such as isolated soybean protein. Purified proteins extracted from dehulled and defatted meal, when toasted, are used in “Civil Defense emergency rations” and by the “international organization Meals for Millions.” Some 90% of the processed soybean oil in the USA now goes into food uses. Soybean oil is now the most important ingredient in oleomargarine {see Fig. 10.1}. About one-third of the soybeans moved off the farm are exported; Japan is our biggest customer {taking about 57%} followed by Western Europe {27%}, Canada {8%} and Israel {5%}). Soybean uses (Despite its nutritive value, “the soybean is not looked upon with favor in many areas” for two main reasons: it does not soften well during cooking and it is difficult to digest. Many other legumes share these problems, but they are generally require less cooking. When soy flour is used, alone or with cereal flours, the drawbacks almost vanish. “Soybean milk is not comparable to animal milk or human milk except in protein content.” And it usually has an unpleasant, bitter taste, but this can be removed at list cost by bulk processing. When soybean curd is made in the typical way, “many nutritious components are lost,” yet it is easy to digest. Soy sauce can be used only as a condiment because of its high salt content. Germinated soybeans make an excellent vegetable, which is rich in vitamin C).

Table 10-1 (p. 300) shows utilization of soybean oil (in millions of pounds) (1947-49 to 1967). The columns are: Shortening (the largest use and steadily increasing), margarine, cooking, salad and other edible oils (No. 2), total for food uses, total nonfood uses.  

Toasted soy protein (Made by General Mills, starting in Belmont, Iowa, and named Hi-Pro and Protein Plus. “The Belmont plant has been running at capacity to supply for American Civil Defense stockpiling of toasted soy protein”). MPF (Multi-Purpose Food) made by a joint venture between General Mills and the Meals for Millions foundation. Gelsoy (the “first vegetable protein found to have gelling properties). Promine (an edible soy protein). Fibroteen (soy protein spun into filaments). Soybean oil (The initial purpose of the U.S. soybean crushing industry was to obtain oil. The residual meal was considered virtually useless). Chapter 13, titled “The world food issue,” is about world hunger, which is “an ever-present specter for 2.3 billion people of the present world population of 3.4 billion.” These people are concentrated largely in warm parts of the globe. Also discusses “protein malnutrition” (the main problem) and the need for more animal protein. North America has an animal protein “intake nine times that of the Far East.” A section on “Plant milks” (p. 428-29), which are made from pulses and cereals, includes a subsection titled “Soybeans” which begins: “Soybeans form the basis of the most widely used and successful plant milks in China, Hong Kong, Indonesia, and the Philippines. Such milk has recently become available in Europe and the United States, primarily for clinical purposes”–for children allergic to the proteins in cows’ milk.

Notes: Many references, divided into English and non-English, books and papers, are given at the end of each chapter. Address: Michigan State Univ.


• **Summary:** Mentions tokua [tofu, also spelled tokwa] as an ingredient in Lumpia. The glossary mentions tajure (brine fermented tofu, also called tahuri), tausi (soy nuggets), and tokua.


• **Summary:** Another superb work in this superlative series from the editors of Time-Life Books. This book is about cooking in China, where the author lived (in Shanghai), before the 1949 Communist revolution.


China, the world’s oldest existing civilization, has the world’s most ancient cuisine–as well as one that is both great and profound (p. 6). When the Red Guards of China’s Cultural Revolution appeared in the 1960s, they “attacked every symbol of what they regarded as bourgeois culture. Among the targets in Peking were the city’s fine restaurants.” In the process they destroyed much of China’s culinary heritage–but only inside of China (p. 7). An article by Peggy Durdin in the *New York Times* was titled “Mao’s great crime against cuisine” (p. 184). Chinese food is, of course, about life, but it is also about health, and it can resonate on numerous symbolic levels (p. 7).

The southern provinces of China, Fukien, Kwantung, Yunnan, and Kwangi, enjoy tropical temperatures year round and more than 80 inches of rain. Here rice is the main crop. Yet China is a mountainous country, with 60% of its land at elevation 6,500 feet or higher; only 11% of its land can be cultivated (compared with 80% in the USA) (p. 10). Fukien, a coastal province to the south, makes the best soy sauce in China, and stewing is called “red cooking” because of the color imparted by the soy sauce (p. 16, 42).

Vegetable oil is very important in China because the
Chinese rarely use butter (p. 29). “For protein the Chinese depend heavily on the soybean, which has for this reason been called the cow of the East.” Soybean oil is used for cooking. Soybean milk is a good substitute for cow’s milk. And “doctors, even Western doctors—prescribe it for babies who cannot get mothers milk and are allergic to cow’s milk” [sic]. From soymilk one can make “bean curd, an exceptionally high-protein food known in China as ‘the meat without bones.’” Bean curd is made by curdling soybean milk with gypsum, then pressing the curds into pieces about 3 inches square by ½ inch thick. “The thickened curd skin [sic, yuba] is a food by itself, with a more concentrated flavor.” Fermented bean curd [fermented tofu] tastes much like cheese.” Both soy and mung-bean sprouts are used in China, “In one form or another the soybean can be found in dishes eaten at every meal” (p. 29).

A two-page color photo spread and legend (p. 61-63) shows (numbered) basic Chinese ingredients, incl. “13. Fresh bean curd. 14. Dried bean-curd skin” [yuba]. Buddhist monks and nuns in China are strict vegetarians; special foods have been developed for them. These include vegetarian “duck made from crisp beancurd skin, colored and shaped to look like the bird’s flesh” and “chicken roll in hoisin sauce, the ‘chicken’ made of soft soybean curd” (p. 64, 67, 70).

A full-page color photo and legend (p. 74-75) shows (numbered) Chinese sauces and condiments, incl. “1. Hoisin sauce. 3. Soy sauce. 8. Yellow-bean paste, or thick bean sauce. 11. Fermented black beans. 14. Red bean [azuki] paste.” “Among the best known of Chinese seasonings is soy sauce, which was mentioned in several Confucian classics as early as the Fifth Century B.C.” [sic]. Other condiments made from soybeans are bean paste (for preserving and flavoring meat) and hoisin sauce (widely served with Peking duck). “It is said that the best grades of soy sauce can take as much as six to seven years of aging to reach perfection, and that the making of superb soy sauce requires ‘as much art in its preparation as good French wines’” (p. 74-75, 77).

The controversy over M.S.G. is discussed. “A really god Chinese chef considers it a questionable shortcut for giving taste to second-rate foodstuffs, but most Chinese cooks admit that its use in certain dishes is perfectly valid” (p. 77-78).

The emperor Chien Lung (1735-1796), 4th ruler in the Manchu [Qing] dynasty, wrote an Ode to Tea (p. 91). In China there is an intimate association between eating and health (p. 91).

Recipes: “Steamed bass with fermented black beans Tou-shih cheng hsien yu” (with “2 teaspoons fermented black beans,” soy sauce, Chinese rice wine, and shredded fresh ginger root, p. 104).

Most festivals (each with a feast) in China are based on events of agricultural importance; the two most important are New Years and the Moon Festival (p. 155, 162, 164-65). A Peking duck is “brought to the exact degree of plumpness and tenderness through force-feeding,” then roasted slowly, suspended by hooks, in a mud-lined oven “until the thick, fat skin becomes golden in color. This crackled skin is the choice part of the dish.” The skin, a piece of the meat, a spring onion, and thick, sweet hoisin are served enfolded in a thin wheat-flour “pancake” (p. 158, 15).

The history of chop suey (unknown in China) and chow mein (had an honorable origin in China) are discussed (p. 178-79).

The first wave of Chinese to America came with the gold rush and transcontinental railway. Most were laborers from southern China. The first Chinatown in the USA was established in San Francisco (1850s), followed by New York City (Manhattan, 1870s). Most early American Chinese restaurants reflected their social status, serving inexpensive foods. In the early 20th century, as China’s Republican revolution was gaining momentum, a second wave arrived to study. These young people, also mostly from southern China, came from far more prosperous backgrounds than those in the 1st wave and they wanted better food. Restaurants were started or upgraded to suit their tastes. Thus, it “was the southern school of cookery that first spread over the world outside China” (p. 179).

China has three great regional cuisines: Cantonese (southern), northern, and Szechuan (p. 179). Six photos show “The Americanization of the fortune cookie: Assembly line at a factory in New York City’s Chinatown.” A two-page spread shows many of the “fortunes” found in fortune cookies (p. 195-97).


- Summary: A recipe for “Shua-yang-jou–Mongolian fire pot (rinsed lamb)” (p. 28-29) calls for “1 tablespoon fermented red bean curd, mashed.”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “red bean curd” or that uses the term “fermented red bean curd” (or “fermented red beancurd”) to refer to red fermented tofu.

The excellent “Guide to ingredients used in Chinese cooking” (p. 115-19) is identical to that found in the larger companion volume, The Cooking of China (Hahn 1968, p. 198-99). Address: Author, lives in England with her husband.


- Summary: “If someone should ask you about Sufu don’t be caught short. Tell them Sufu comes from Tofu, and the Chinese have known about it for centuries.” And you can tell them that Sufu may soon be available in flavors such as garlic, wine, or vinegar.

“Sufu [fermented tofu] is a soybean cheese made from Tofu, a soybean curd.” The Chinese have been making it for centuries. Recently a Taiwanese scientist has found a way to make Sufu without a beany flavor. And a USDA scientist says Western flavors can be added.


- Summary: “The Chinese have been making a soybean cheese called sufu for centuries; but it remained for U.S. and Taiwan scientists to develop a foolproof method of making good sufu with no undesirable off flavors, reports Dr. Clifford W. Hesseltine, a U.S. Department of Agriculture microbiologist. Research on sufu was conducted by Prof. Nganshou S. Wai of the Academy of Science, Taiwan, where he worked under a P.L. 480 grant from USDA’s Agricultural Research Service. Dr. Hesseltine, Northern Utilization Research Laboratory, Peoria, Illinois, was the ARS sponsoring scientist.

“Wai found that the key to making good sufu without a beany flavor is to ferment with a pure culture of the fungus Actinomacor elegans... Dr. Hesseltine says ARS scientists can easily incorporate acceptable Western flavors into the soy cheese.”


- Summary: “Fermentation of starch tubers such as cassava with fungal organisms such as Rhizopus can result in a food product with significant increases in protein content.” The cassava dough is inoculated then extruded (like noodles) into fermentation trays.

Table 1 shows many different “vegetable cheeses and related fermented foods.” The first such food mentioned is minchin, made from wheat [gluten] in China. The microorganisms used are Paecilomyces, Aspergillus, Cladosporium, Fusarium, Syncephalastrum, Penicillium, and Trichothecium species. This is an anaerobic fermentation of wheat gluten for 2-3 weeks at room temperature during the winter, with 10% salt added. The product is cut into strips and used as a condiment. Eaten as a meat substitute, it is rich in protein, nutritious, and healthy.


- Summary: Hakko tofu is a Japanese term meaning “fermented soybean curd.” This food, to be made from American-grown soybeans, was developed through a Public Law 480 project in Japan sponsored by the U.S. Agricultural Research Service (ARS). The ARS sponsoring scientist, Dr. Clifford W. Hesseltine, says this food contains high quality protein, based on a 21-day rat growth study; the PER is 2.7, compared with 2.2 for regular tofu.

The principal Japanese investigator, Dr. Tetsujiro Obara (at the Dep. of Agricultural Chemistry, Tokyo Univ. of Education) found that a 1:420 ratio of calcium sulfate to soymilk added at 158°F gave the best product.

Traditionally the enzymes from a mold were used to ripen the tofu, but the investigators experimented with commercial enzymes. Papain gave the best individual performance, but a mixture of papain, pronase, and bioprase gave optimum results for faster ripening and improved texture. For bacterial starters that lower the PH, the best results were obtained from a blend of half Streptococcus
cremoris and half S. lactis.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Hakko tofu” to refer to fermented tofu.


- Summary: This is a summary of the following article: Agricultural Research. 1969. “Hakko tofu: new food from soybeans.” 18(3):14. Sept.


- Summary: This is a summary of the following article: Agricultural Research. 1969. “Hakko tofu: new food from soybeans.” 18(3):14. Sept.


The author thanks for their help: Dr. Thai-Cong-Tung, Director of the Agriculture Research Institute, and Mr. Nguyen-Huu-Quyen, Manager of Eakmat Experiment Station.

“The history of soybean in Vietnam is meager, but the references by Loureiro (1790) and Rumphius (1747) mentioned the cultivation of soybean in Malaysia and Vietnam. Harmand (1877) collected wild soybean (Glycine laotica) in the Hue and Bassac areas, and the herbariums [herbarium specimens] are still available at the Agricultural Research Institute, Ministry of Agriculture, Vietnam.” Since the history of Vietnam is closely related to that of China, it seems likely that the soybean has been cultivated for many centuries in what is today Vietnam (p. 1).

In Vietnam, the soybean is still not a very familiar crop to the majority of farmers. Although the acreage has gradually increased since 1958, production had not yet reached 10,000 tons by 1967. According to the Agricultural Statistics Yearbook of Vietnam, in 1966 in South Vietnam, total soybean acreage was 6,610 hectares and production was 7,585 metric tons, or 1.148 tonnes/ha (p. 7). The main soybean producing provinces are all in the southern half of South Vietnam: Long-Khanh (40% of total South Vietnamese acreage), An-Giang (20.4%), Chau-Doc, Kien-Phong, and Binh-Dinh (5%). In 1963 some 1,440 tones of soybeans were imported and in 1966 some 100 tonnes were exported (p. 6).

Table 4 shows an estimate of the costs and returns per hectare of growing soybeans at the Eakmat Agricultural Experiment Station in Ban-Me-Thuot in 1968. The net income or profit from one hectare was about VN$26,000, which is larger than for any other field crops, including: cassava (VN$22,766), mung beans ($20,267), sweet potatoes ($19,269), upland rice ($6,828), corn ($6,569), and peanuts (VN$5,100).

Uses: “In Vietnam, the soybean is not commonly used in daily food, but a number of foods such as soy sauce, tuong [a soft kind of miso resembling Chinese chang in consistency, and sold in crocks], bean curd, vermicelli, soymilk, soybean wine, choa [fermented tofu, sold in bottles], soybean oil, [soy] bean sprouts, and green pods [green vegetable soybeans] are available in the market and they are gradually becoming popular among Vietnamese.

Note: This is the 2nd earliest English-language document seen (Oct. 2011) that uses the word “choa” to refer to fermented tofu.

Photos (p. 11-12) show: (3) Bean sprouts and cooked beans with tomato sauce. (4) A shop that sells soybean products in a Saigon market. Soybean paste [tuong] is in big chars, choa [fermented tofu] is in bottles in front, and bean curds [tofu] are in the front left corner. (5) A Vietnamese girl frying bean curds in the market. (6) Bottles with labels showing various kinds of soy sauces made in Vietnam.

The highest yielding soybean varieties in Vietnam are presently Palmetto and E-32. In trials, they yield about 1 tonne per hectare. Address: FAO Agricultural Officer. Phone:

**Summary:** The group prepared a cheese-like soy protein food by enzymatic treatment. They began by extracting soymilk. The enzymes papain, Bioprase, and Pronase were tested. Address: Dep. of Agricultural Chemistry, Tokyo Univ. of Education, Komaba 2-19-1, Meguro-ku, Tokyo, Japan.


**Summary:** This is the world’s best database for French-language publications related to food and nutrition. It first became available for use in Jan. 1970, and that is also the date of the earliest record in the database. It is produced by the Center for International Documentation on Industrial Utilization of Agricultural Products (CDIUPA), founded in 1965 by the French Ministry of Agriculture. CDIUPA is administered by APRIA (Association pour la Promotion Industrie Agricole), which is a member of the International Commission of Agricultural and Food Industries.

The current contents of the database is published in a monthly journal titled “Industries Agro-Alimentaires: Bibliographie Internationale,” which began under that title in Jan. 1983. It was preceded by Bibliographie Internationale des Industries Agro-Alimentaires. Bulletin Bibliographique (published from Jan. 1967 to Dec. 1982). In the monthly journal, the citations are grouped under 6 broad headings:
1. General (with 8 subcategories).
2. Agro-food industries (industries agroalimentaires; with 17 subcategories; Many documents on soyfoods are cited in subcategory N titled “Protéines d’origine animale, végétale, microbiologique, algues et levures aliments”).
3. Fermentation industries (with 6 subcategories).
4. Food microbiology.
5. Food toxicology.

Information related to soyfoods is likely to be found under the following headings in the subject index:

Aspergillus oryzae; Farine de soja (incl. soy flour, and roasted soy flour or kinako); Huile de soja (soy oil); Koji; Lait de soja (soymilk); Miso; Nato (incl. natto); Produit à base de soja (incl. dawa-dawa, cinema, soy cheese [western style], soy nuggets/Hamanatto, soynuts, soy ice cream, soy yogurt, thua-nao, yuba), Protéine de soja (soy protein products); Protéine de soja, Produit extrudé (extruded soy products); Protéines d’origine animale, végétale; Sauce de soja (soy sauce); Soja (incl. green vegetable soybeans); Soja, germe (soy sprouts); Sufu (fermented tofu); Temphe; Tofu. Address: Massy, France. Phone: (1) 69.20.97.38.


**Summary:** The section titled “Oriental fungus-processed foods (p. 263)” discusses: Broad differences between fermentation processes in the Occident and Orient, miso, shoyo, Hamanatto, tempeh, ang-khak, onjim, sufu, meitauza, ketjap, katsuobushi, and other fungus-fermented foods: Chee-fan (a type of sufu), fermented minchin (wheat gluten), fermented soybean prepared from black soybeans in China (soy nuggets), tao-cho, tao-si, and taotoj (the last 3 foods made from soybeans). Address: Dep. of Botany, Southern Illinois Univ., Carbondale, Illinois.


**Summary:** Sufu is fermented tofu. Synonyms include tosufu, fu-su, fu-ru [furu], toe-fu-ru [tofu-ru, doufu-ru], tou-fu-ru, teou-fu-ru, fu-ju, fu-yu [fuyu], and foo-yue.

Describes in detail how to make sufu on a small scale. Figure 1, “Flowsheet for the production of sufu, shows the three basic steps: (1) Preparation of soybean milk and soybean curd. (2) Molding. (3) Brining and aging.

When red rice and soy mash are added, “the final product is known as red sufu or hon-fang.” When fermented rice mash or a large amount of rice wine are added to the brine, the final product has a more alcoholic fragrance and “is known as tsui-fang or tsue-fan, which means drunk sufu. The addition of hot pepper to the brine would make hot sufu.” (3) Changes in soluble nitrogen and free amino acids in fermented tofu during aging; both increase rapidly during the first 10 days of the fermentation, then the rate of increase slows.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the terms “hon-fang” or “tsui-fang” or “drunk sufu” or “hot sufu” to refer to fermented tofu.

Lao-choao is a fermented rice product. Address: NRRL, Peoria, Illinois.

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HISTORY OF FERMENTED TOFU


- **Summary:** The itinerant merchant or peddler (t’iao-fan) sells his wares from place to place, moving on foot (sometimes “toting his goods in two baskets hung from a rhythmically bouncing pole”), by bicycle, etc. He sometimes sells in periodic markets, so common in developing countries.

Page 345: “These hawkers may be selling home-grown vegetables, fish, bean curd, ice cream, bamboo baskets... The hawker of prepared foods is often at once his own producer, distributor, and, of course, salesman. Bean curd milk (tou-chiang) [soymilk] and fried sticks of twisted dough (yu-t’iao) offer breakfast fare (Figure 4). Later in the day ‘stinky bean curd’ (ch’ou tou-fu) is peddled as a late afternoon snack. (Figure 5). Punctuality characterizes the daily arrival of the seller of any of these light foods...”

Figure 5, a black-and-white photo, shows a man frying ch’ou tou-fu at a pushcart stand.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the word “stinky” or the term “stinky bean curd” to refer a special type of fermented tofu.

Address: Asst. Prof. of Geography, State University College, New Paltz, New York 12561.


- **Summary:** With such a large number of people of oriental ancestry living along the Pacific Coast of the United States and in the islands of Hawaii–our 50th state–“plus the interest in oriental cooking by occidental people, it is hardly surprising that edible soybeans play a prominent part in the ingredients of many oriental dishes and prepared food products in the West.”

“But very few people have ever heard of a food that has been a staple in the oriental diet for centuries–bean cake.

“Bean cake, which includes tofu and Chinese cheese, is an excellent food, high in protein, and containing all the essential amino acids.”

“Being a soft-curd product, similar in consistency to our cottage cheese, fresh bean cake alone has no distinctive flavor. In fact, it is quite bland. However, it very quickly picks up the flavor of foods with which it is cooked... Thus it may be considered an ‘extender’ or ‘food supplement.’”

Briefly describes how to make “fresh bean cake” on a commercial scale, with calcium sulphate used to coagulate the soy milk (also called “bean milk”). “The residue [okara] usually ends up at the local hog ranch.”

The curded soy milk “is scooped into stainless steel trays, or forms, where any excess water is removed. The slabs are then put through another machine which, by means of wires or knives, cuts the cake into small cubes or rectangular pieces which are packed into jars or ‘see-through’ plastic trays with a very small amount of water. Printed heat-sealing cello tops are affixed along the top edges of the trays.

“The tofu-type bean cake is best when fresh, although if kept in water it will hold its freshness for several days in the refrigerator.

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“During the early morning business hours the freshly packed product is delivered to the colorful oriental food shops and restaurants or western supermarkets of the Pacific Coast and Hawaii. A 1969 news release stated that this product accounted for close to $3 million in sales by about 20 U.S. manufacturers and that only slightly over 50% of the consumers were of Oriental descent.

“Fermented-type cake: The fermented-type bean cake—Chinese cheese—is also a soy-milk-based product, but its manufacture is somewhat more complicated, lengthier, and closely guarded than the fresh type. When the fermentation process—which is a matter of days rather than hours—has been completed, the small yellow cubes are packed neatly in a solution of water plus alcohol, in hermetically sealed glass jars, to insure perfect keeping qualities. One large local producer [probably Quong Hop & Co.] is distributing his product in practically all the 50 states of the U.S. as well as shipping into Canada, South America, and even to Hong Kong!

“Of the fermented-type Chinese cheese, the most widely known, and used, is the yellow or Foo Yee, the taste of which can be compared to a mellow Camembert cheese, while the red, or Nam Yee, is more highly seasoned or spicy. The yellow is called for in many Chinese recipes. A jar will be found in most any Chinese-American kitchen, used mainly as a seasoning, as a cheese substitute, or a topping for macaroni or vegetable dishes.

“The red type—Nam Yee—being of a stronger, spicier flavor—is usually used as a condiment or a seasoning for flavoring roasts, steaks, or with fowl.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Nam Yee” to refer to fermented tofu.

“Oriental recipes calling for the use of bean cake are varied and most interesting. Very simply: bean cake can be eaten ‘as is’ with just a bit of sugar sprinkled over it, or dipped in soy sauce, to give it flavor. Or, it may be diced and scrambled with eggs for a breakfast dish, or prepared with pork—known as Tofu Yuk—or with beef.”


A note on page 1 of this manuscript states: “To be published in Part I of Seminar on Protein Food Promotion, November 22-December 1, 1970, Institute of Food Research and Product Development, Bangkok, Thailand.” This was an invited paper. Address: NRRL, Peoria, Illinois.


• Summary: This cookbook was first published in 1957 under the title: Festival Menus 'Round the World, by the same publisher with the same number of pages.

Page 39: A recipe calls for 1 tablespoon thick soy sauce.


• Summary: This comprehensive work, the result of at least 25 years of collaboration, contains over 1,000 recipes. The 4th printing (March 1977) proclaims prominently: “The first Completely Safe Chinese cookbook compiled in accordance with latest food research without MSG (monosodium glutamate).” Following introductory chapters titled “Chinese Cuisine: Background,” “Regional Chinese Cooking,” “Utensils for Cooking, Serving, and Eating,” “Cooking Preparations,” and “Cooking Techniques,” there is a detailed “Guide to Ingredients” (p. 22-57), which describes the following soy-related foods and gives Cantonese / Mandarin pronunciation: beans, black (wu dow / wu do); beans–black salted fermented beans (dow si / do shih; used as a condiment or flavoring agent [seasoning]. Aroma: fragrant, appetizing); bean cake, fermented (fu yu / fu yu [fermented tofu]); bean curd (dow fu); bean curd, dried (dried bean curd [dried yuba], p. 25, 47–tiem jook or fu jook pei / t’ien ch’u or fu pi chi); bean curd cheese, red (nam yu / nan yu); bean filling, sweet (dow sa / do sa; made from red [azuki] beans or green / [mung] beans); bean sauce, brown or yellow (mien see jiong); bean sprouts (large, from soybeans) (wong dow gna / huang do ya); hoisin sauce (red seasoning sauce) (hoy sin jiong / hai hsien jiang); soy sauce (dark lo tsow / lao tsou; heavy–jiong yow / jiang yu [jiang you]; light–sang tsow / sheng tsou; table soy sauce–sin tsow / shien tsou) “Dark soy sauce has caramel added for coloring. Heavy soy sauce, which has a slightly sweet smell, is also known as black soy. Light soy sauce is the most delicately flavored and is light brown in color. Japanese soy sauce, somewhere between the Chinese light and heavy, is preferable to domestic brands but inferior to Chinese brands.”

Vegetable steak (mien gon / mein jing) “Meat substitute made from wheat gluten. Shape: 3-inch square or round patty ½ inch thick.” Brown, chewy, and firm. Sold in cans.

Photos (black and white, p. 47) show fermented black beans, fresh bean curd, pressed bean curd, bean curd sticks and bean curd sheets [both kinds of yuba, but “bean curd sheets” on p. 47 are called “bean curd, dried”], brown bean sauce, and large fresh bean sprouts.
Recipes for “frozen bean curd” [frozen tofu]: Frozen bean curd with soybean sprout soup (Dung dow fu dow ya tong, Adapted, p. 90; with “2 cakes frozen bean curd” and “½ lb. soy bean sprouts.” “Defrost frozen bean curd by covering with cold water, letting stand 2 to 4 hours before cooking. Then cut each piece into 10 to 12 thin slices”).

Spareribs with frozen bean curd (Pai gwut shiu dung dow fu, Adapted, p. 320; with “4 cakes frozen bean curd”). Stir-fried frozen bean curd (Tsao dung dow fu, Peking, p. 422; with “6 cakes frozen bean curd. * Wrap 2 to 3 pieces fresh bean curd together in waxed paper, freeze until hard”).

Recipes for “pressed bean curd” [pressed tofu]: Pressed bean curd shrimp (Sha tze gahn si, Shanghai, p. 178, with “4 pieces pressed bean curd”). Golden strips with pressed bean curd (La jiao tsao san si, Hupeh, p. 112). Stir-fried pressed bean curd with pork (Dow fu gahn tsao ro si, Shanghai, p. 427). Stir-fried pressed bean curd with chicken (Dow fu gahn tsao gee si, Shanghai, p. 427).

Recipes for “soybean sprouts” [soy sprouts]: Spareribs soybean sprout soup (Pai gu dow ya tong, General, p. 112). Beef shank soybean sprout soup (Wu hwa niu ro hwang dow ya tong, General, p. 112). Braised soybean sprouts (Hung sao hwang do ya, Shanghai, p. 376).

Note 4. This is the earliest English-language document seen (Nov. 2008) that uses the term “hwang dow ya” or the term “hwang do ya” to refer to soybean sprouts. Address: USA.


• Summary: Written in both English and Chinese, this important document contains an detailed history of the company, which celebrates its year of founding as 1940.

(21) Packaging machine-Extrusion Foods Div.

A bar chart shows that annual sales grew from $5.1 million in 1960 to $17.0 million in 1965, to $30.0 million in 1969. The number of employees grew from 352 in 1960 to about 630 in 1970.

In 1937 K.S. Lo, the founder, who happened to be on a business visit to Shanghai, attended a lecture by Julian Arnold, then Trade Attache to the United States Embassy in Nanking. The subject was “Soybean–The Cow of China.” Lo left inspired to do something about the widespread nutritional diseases then found in Hongkong. “He applied to the government for a license to manufacture soymilk in 1938. He received such a discouraging and unfavorable reply from the Sanitary Board that he was forced to give up his plan. However, a year later, Dr. P.S. Selwyn Clarke took over the chair of the Sanitary Board, and day by chance he came across Lo’s application. He telephoned Lo and assured him that he would issue him the necessary license.

“Lo was overjoyed and immediately went to raise a modest capital of $18,000. He put up a small factory at Causeway Bay and the plant was opened in March 1940 by Sir Man-Kam Lo... Sales remained poor for the first two years. By the end of 1941, when the Pacific War broke out, the Company was almost on the verge of bankruptcy. The factory was occupied by the Japanese soon after Hongkong fell and Lo left for Free China [Taiwan]. In Sept. 1945 he returned to Hongkong and production was restarted in Nov. of that year.” Lo started to market his product as a soft drink through soft drink outlets, instead of like milk. Sales grew rapidly. By 1949 the company had accumulated enough capital to buy a piece of land and build a new factory in Aberdeen. In the meantime the company had also acquired the Greenspot franchise. So in 1950, the Aberdeen factory was opened and used for the bottling of Greenspot while Vitasoy remained at the Causeway Bay factory. In 1952 the bottle was changed to a soft drink bottle that was sterilized. Sales skyrocketed. In 1957 the company gave up the Greenspot franchise and acquired the Pepsi Cola bottling franchise. In 1962 a new 6-story, 300,000 square foot factory was opened in Kowloon. In 1964 the company invented a powdered soymilk. That year Lo was invited to present a paper at the “International Symposium on Oilseed Protein Foods” in Japan. His concepts caught the attention of UNICEF and FAO, which had been trying to find ways of increasing protein consumption in developing countries. A joint venture with Monsanto proved unsuccessful and was terminated last year. Monsanto was given a license to manufacture a powdered soymilk concentrate.

The company has created three new divisions. The Packaged Foods Division will be introducing in the spring a line of precooked foods which are ready for the table after simply heating. They include Chow Fan, Bar-B-Q Spare Rib, Dim Sum, etc. The Cheese Division will be launching this year 3 types of soymilk-based cheese spreads: Chinese Fu-Yu, European Blue Cheese, and English Cheddar. The Extrusion Foods Division is developing a high-protein weaning food, and hopes eventually to branch out into snack foods and meat substitutes.


• Summary: Also titled: The International Wine and Food Society's guide to herbs, spices, and flavorings. For a book published in 1970, this book contains a great deal of original and useful information. Note that the word “seasoning(s)” does not appear in the title or the index. For many entries, the equivalent word in various European languages is given. In addition, for plants, the botanical name and family are usually given. Contents: Black and white illustrations. Colour plates. Introduction: The history of flavourings, the importance of flavourings, the origin of this book (“I come to this subject as a traveller who has lived in a number of different countries”), the scientific basis of flavouring, scientific, popular and foreign names, synthetic and harmful flavourings, flavouring in practice, growing herbs. An alphabet of herbs, spices and flavourings (The entries are in alphabetic order). Appendix.

Soy related entries: Harvey’s sauce: “One of the old English sauces... In 1870, the courts decided there was no exclusive commercial right to the name ‘Harvey’s Sauce’, as there are recipes for it dating back to at least the 17th century.

“Though there are many formulae, it is, in general, based on walnut and mushroom ketchup–flavoured with anchovy, garlic, and often soy sauce and vinegar. It has the appearance of Worcestershire sauce, but is not hot although it does contain some chilli.”

Soy [sauce]–Soya bean: “The soy bean is undoubtedly the world’s most important legume.” It can be eaten as a fresh bean [green vegetable soybeans], as a dried bean and as soybean flour. It is a leading source of cooking oil “much used as a substitute for olive oil in Spain.” From it one can make a kind of milk [soymilk]. “In the East [East Asia], it is also fermented to make various kinds of curd and bean cheese. The soy product which concerns us is soy sauce.”

It originated in China and “is thought to have been brought from China to Japan by a Buddhist priest about A.D. 500. In the West it became well known during the nineteenth century. It is one of the ingredients of Worcestershire sauce and Harvey’s sauce.”


Also discusses: Ketchup, M.S.G., oil (“The word ‘oil’ is derived from ‘olive’”), sesamne (incl. tahina. “The pure oil is almost without taste or smell and does not easily go rancid in hot countries, which is one reason for its popularity”). Address: England.
is used to ferment corn meal for 22-24 hours. "The mash
not pure, is started in coarse whole wheat
fermented corn and soybeans. [54x89]
In South Africa, an interesting fermented native food
were isolated from native
India. [11 ref]
Impacts of Applied Microbiology, GIAM III. India: Univ. of
569 (at Sufu).
•
England: Commonwealth Agricultural Bureaux [for the]
& Bisby’s dictionary of the fungi. 6th ed. Farnham Royal,
& Bisby’s dictionary of the fungi. 6th ed. Farnham Royal,
Commonwealth Mycological Institute. x + 663 p. Illust. 19
• Summary: “Chinese cheese” is mentioned on p. 104 and p.
569 (at Sufu).
Impacts of Applied Microbiology, GIAM III. India: Univ. of
Bombay. See p. 403-20. Conference held in 1969 in Bombay,
India. [11 ref]
• Summary: Contents: Introduction: Nine advantages of
Magou (from South Africa).
“In South Africa, an interesting fermented native food
(magou) is now made on a modern industrial scale from
fermented corn and soybeans. Magou is prepared by the
fermentation of coarsely ground white corn meal (maize).
Pure cultures of Lactobacillus used in this fermentation
were isolated from native magou. The culture, which is
not pure, is started in coarse whole wheat flour.” Then it
is used to ferment corn meal for 22-24 hours. “The mash
fermentations. Westport, Connecticut: AVI Publishing Co. vi
+ 283 p. Illust. Index. 24 cm.
• Summary: Page 266: “Fermented soybean curd was
observed to enhance flavor and zest to a limited and
monotonous diet. Soybeans contain a very high amount of
glutamic acid; in fact, 18% of the amino acid of soybean
protein consists of this acid.” Address: Cornell Univ. and
New York State Agric. Exp. Station.
289. Sung, Betty Lee. 1971. The story of the Chinese in
Map. Index. 21 cm. Originaly published in 1967 under the
* • Summary: Page 206: “Add seasonings of fermented bean
curd, salt, and a little soy sauce. Put in just enough water to
keep the food from burning. Lower the flame slightly. Cover
the frying pan until the water boils (about two minutes)...”
290. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds.
p, Illust. Index. 22 cm. [134 ref. Jap; eng+]
• Summary: This is the best book published to date on
soyfoods in Japan; however it is written in Japanese.
Contents: 1. Classifications and varieties of soybeans (p. 1).
2. Physical characteristics of soybeans (p. 5). 3. Chemical
characteristics of soybeans (p. 9). 4. Standards and methods
of examining soybeans (p. 47). 5. Special characteristics and
problems of using soybeans for food (p. 53).
63). 7. Soymilk and various types of tofu: Aburage (deep-
fried tofu pouches), ganmodoki (deep-fried tofu burgers),
kōri-dofu (dried frozen tofu), soymilk, and yuba (p. 75). 8.
Fermented soyfoods: Natto (p. 123-40), shoyu (p. 141-67),
Other soyfoods: Kinako (p. 203-04), soy sprouts or moyashi
(p. 206-08), tempeh or tenpe (p. 209-17). 10. Quality and
usage of defatted soybeans (dasshi daizu) (p. 219).
11. New food uses of soybeans and especially defatted
soybeans (incl. 70% soy protein powder, soy protein curds,
soy protein isolate, surimi gel, spun soy protein fibers)
(p. 229). 12. Advice regarding supplying protein from
organizations such as the United Nations and FAO (p. 257).

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A 47-page translation of portions of this book (parts of Chapter 6 and all of Chapter 7) by Akiko Aoyagi and Chapters 8.1 and 8.2 by Alfred Birnbaum are available at Soyfoods Center.

Tokuj Watanabe was born in 1917. Hideo Ebine was born in 1921. Teruo Ota was born in 1926. Address: National Food Research Inst., Tokyo.


• Summary: On each page is one recipe and a half-page color photo of the prepared dish. The title of the recipe is written in English in large bold letters and is also given in (to the right) in small Chinese characters, just above the number of servings. Most of the recipes call for ¼ to ½ teaspoon of MSG; many call for soy sauce.

On unnumbered pages at the front of the book are (1) A two-page color photo, on a light blue background, of 39 different kinds with different seasonings.

(2) Description of some other special ingredients: “Hot bean paste” (pronounced ‘la jiao jiang’). This is made with red peppers [and soy beans] and has a very hot taste.” “Sweet bean paste” (t ‘ien mien jiang’). This is made with steamed, fermented bread (black color). Note 1. Why is this called “Sweet bean paste”? What kind of beans are used to make it?

“Soy bean paste (‘do ban jiang’). This is made with fermented soy beans (black color).” “Fermented black bean (‘do shr’). This is black [soy beans] which are then steamed, then marinated in soy sauce or salt.” “Pickled bean curd [fermented tofu] (‘do fu ru’ or ‘Chinese cheese’). This is bean curd which is dried and then pickled; there are many different kinds with different seasonings.”

(3) Helpful hints: “In all recipes you may substitute Worcestershire sauce for dark vinegar.”

In Chapter 3, “Pork and beef,” soy related recipes are: Shredded pork with sweet soy bean paste (with 1.3 tablespoons “sweet soy bean paste,” p. 39). Note 2. This is the earliest document seen (Feb. 2009) that contains the term “sweet soy bean paste.” See also p. 104 below.

Pork ribs with dried black fermented beans (p. 41). Pork in preserved bean sauce (p. 42).

In Chapter 4, “Sea Food,” is a recipe for Steamed carp with fermented black beans (p. 64).

In Chapter 5, titled “Bean curd and eggs” (p. 102-15) are recipes for: Stewed bean curd (with “½ squares bean curd”), Assorted dish with hot sauce (with “¾ tablespoon hot soy bean paste, ½ tablespoons sweet soy bean paste,” p. 104), Bean curd stuffed with minced pork, Ma-Po’s fried bean curd with pork, Bean curd leaf rolls with minced pork (With “bean curd wrappers”), Bean curd noodles with celery salad (with “4 oz. [storebought] bean curd noodles”), Vegetarian chicken (with “16 bean curd sheets”).

Also: Green peppers stuffed with chopped meat (p. 122, with “1 tablespoon fermented black beans, crushed”). Bitter gourd stuffed with fermented black beans (p. 126, with “2 oz. fermented black beans”). Eggplant with bean curd skin (p. 133, with “1 sheet beancurd skin” and “1 sheet nori” [sea vegetable]). Bean curd in earthen pot (p. 142, with “3 squares bean curd”). Address: 19 West Nanking Road, Taipei, Taiwan.


• Summary: Antibiotics (such as penicillin) have long been made from fungal cultures.

Tempeh made with Rhizopus oligosporus (strain NRRL 2710) was found to have natural antibiotic activity. That means the tempeh mold is capable of synthesizing an antibiotic. It is well established that antibiotics minimize infections. Conclusion: “The finding of antibacterial compounds produced by molds commonly used in Oriental food fermentations, therefore, offers a better understanding of the true value of fermented foods.” Address: NRRL, Peoria, Illinois.

293. Menezes, Tobias J.B. de. 1972. Alimentos e molhos obtidos por fermentacao da soja e de cereais [Foods and sauces obtained by fermentation of soybeans and cereal grains]. Boletim do Instituto de Tecnologia de Alimentos (Campinas, Sao Paulo, Brazil) No. 31. p. 49-63. Sept. [24 ref. Por]


Note: This is the earliest Portuguese-language document seen (Oct. 2011) that mentions fermented tofu, which it calls “sufu.” Address: Brazil.


milk, an onojum-type product. 10. Future of fermented soybean foods.

Tables: (1) Demand for whole soybeans in Japan (1964-1967) to make miso, shoyu, and natto. In 1967, only 4.5% of the soybeans used to make miso were used in the form of defatted soybeans, whereas the same year 91.1% of the soybeans used to make shoyu were defatted. The total demand in 1967 (in 1,000 metric tons) was miso 177, shoyu 169, and natto 47. (2) Chemical composition of soybean foods: Miso (salty light, salty light, soybean miso), natto, soybeans. (3) Annual production of miso (1956-1967). Production of 530,078 tons in 1956 decreased to a low of 453,956 tons in 1962, then rose to 520,510 tons in 1967. (4) Composition of miso in relation to time of fermentation and ratio of soybeans:rice:salt for three types of miso: White Composition of miso in relation to time of fermentation and ratio of soybeans:rice:salt for three types of miso: White


Soy related recipes: Teriyaki appetizer–Hawaii (with “1/2 cup soy sauce” and “2 pounds round steak, cut into strips,...” marinated and skewered, p. 660).

Tempura, with soy mustard sauce–Hawaii (with “1/3 cup soy sauce, preferably imported,” p. 663).

Miso-shiru (Bean paste soup)–Northern California (with “2 1/2 tablespoons miso paste {fermented bean curd paste [sic]},” and “1 fresh tofu {fresh bean curd}, cubed,” p. 667).

Ruby’s teriyaki–Northern California (with the sauce composed of “2 cups imported soy sauce,” mirin, 1 cup sugar, grated fresh gingerroot, catchup, monosodium glutamate and crushed garlic, p. 695). Note: The sauce can be used with beef (“4 pounds boneless top sirloin”) or chicken (2 1/2-3 lb).

Ruby’s sukiyaki–Northern California (with “2 cakes fresh tofu {fresh bean curd, see note}” and “1/2 cup imported soy sauce,” p. 696-97). “Note: Tofu is available in oriental food stores.”

Fried chicken in teriyaki sauce (with “2 cup imported soy sauce” and 1 cup sugar, p. 702-03).

A brief biography and portrait photo of Jean Hewitt appear on the inside rear dust jacket.


• Summary: Under East Asian soyfoods, mentions soy sauce, miso, natto, sufu, and tempeh. Address: Dep. of Biochemistry & Nutrition, Technical Univ. of Denmark, Lyngby, Denmark.


• Summary: Page 44: “Everyone knew of your mother down on the street near the river where the stores were, where the Chinese bought food from their homeland–salted eggs and pickled cabbage, dried fish and rice, eels and bitter melon, fermented bean curd, watermelon,...”


• Summary: One of the best and most comprehensive reviews on the subject, with extensive information on modern soy protein products. Each of the 12 chapters is written by an expert on the subject. Volume 2 was never published. Address: 1. PhD, Oilseeds protein consultant, New Orleans, Louisiana; 2. PhD, Director, Protein Research, W.L. Clayton Research Center, Anderson Clayton Foods, Richardson, Texas.


• Summary: “A new curd from soya bean milk which is
heat-stable, suitable for the preparation of a meltable cheese by the hot-pack process, is prepared by adding 1-10% of fat and 0.5-5.0% of skim milk solids to soy bean milk, pasteurizing, homogenizing, forming the curd, preferably by lactic acid bacteria, at a temperature below 120ºF, heating to a temperature between 140º and 170ºF, and draining until the moisture content of the curd is between 60 and 80%.” A recipe for “Fu Yu soya cheese spread” is given.

Note: This is the earliest English-language document seen (March 2007) that uses the term “soya cheese” or “Fu Yu soya cheese” to refer to a Western-style soy cheese.

Address: 1. South Chatham, Massachusetts; 2. HKSBP, Kwun Tong, Kowloon.


• Summary: Contents: Preface (by Prof. Sarwono Prawirohardjono, Chairman, ASEAN Permanent Committee on Science and Technology). Introduction: The soybean (Glycine max), soybean meal and oil, food uses, industrial uses, scope of the bibliography (“excludes references to non-alimentary utilisation of soybeans” and to “references to alimentary utilisation where the harvested plant has not undergone processing by either fermentation or oil extraction”), terminology of soybean processing (soybean not undergone processing by either fermentation or oil to alimentary utilisation where the harvested plant has non-alimentary utilisation of soybeans” and to “references to alimentary utilisation where the harvested plant has not undergone processing by either fermentation or oil extraction”), terminology of soybean processing (soybean meal, soy flour and gits, solvent extraction, miscella, desolventizer-toaster, defatted soy flour, low-fat soy flour, high-fat soy flour, full-fat soy flour, lecithinated soy flour, soy protein concentrates, soy milk, Saridele, yuba, soybean curd [tofu], aburage, koritofu [kori-dofu, dried frozen tofu], soy protein isolate, protein fibre products {spin, spinertettes}, expansion-expansion products, fermentation products {ontjom, Neurospora sitophila, soysauce, shoyu, Aspergillus oryzae, koji, moromi, tamari, koikuchi, natto, miso, tempeh, Rhizopus oligosporus, soybean cheese, sufu, Mucor sufu}, Zygosaccharomyces).


• Summary: “This is a short review of what is chiefly known at present of this wonderful bean, which only a few years ago, constituted a strange and exotic food.” Contents: Introduction. Composition and nutritional value. Green soybeans. Sprouted soybeans. Soybean flours. Isolated proteins. Soy-food products of the Far East: Kinako, soymilk, yuba, “tofu or curd–soycheese,” aburage, natto, Hamanatto, tempeh, miso, shoyu or soy sauce. Soybean oil. Lecithin.

Concerning tofu: Tofu made in the regular way “is called ‘Fresh Tofu.’ It does not keep long, even under refrigeration, unless it is further processed. For this purpose it may be canned, frozen, fried, smoked, or fermented.”

Note: This is the earliest English-language document seen (Aug. 2011) that contains the term “soycheese”; it uses this term to refer to regular tofu.


• Summary: Mail bag: An importer in Jersey City, New Jersey [on the west bank of the Hudson River, across from lower Manhattan, New York], asks if we have ever found a Chinese cheese.

“As far as we know, there is none, except among those border nomad people who raise horses and cattle. There is, however, fermented soybean curd, available in cans and jars, which makes a wonderful, rank cheesy dressing for vegetables and pork.”


Soybeans flow through a crushing plant as follows: First, they are cracked to release or loosen the hull and to break the cotyledon into about 4 parts. Shakers and aspirators separate the hull from the cracked cotyledons and rollers flake them. “Purified petroleum hydrocarbons known as hexane extract the oil from the flakes and the solvent is recovered. Moistened flakes are heated to inactivate the antinutritional factors and are converted to feeds for livestock and poultry. A small proportion of the flakes goes to a wide variety of soybean protein products including flour, isolates, and concentrates.”
Tables show: (1) Utilization of soybean in U.S. in million pounds, every 5 years from Oct. 1933 to 1970 (Kromer 1970). (2) Use of soybean meal in the USA for feeding livestock and poultry (million tons). In 1969, the estimated amounts used were as follows: Cattle 3.43. Hogs 1.69. Other livestock 1.73. Total livestock: 6.85. Broilers 3.07. Poultry 1.28. Other poultry 1.10. Total poultry 5.45. Total livestock + poultry 12.30. Note that cattle are the single biggest users. (3) Bleaching soybean oil (process, % clay and type, change in Lovibond color rating). (4) Effect of bleaching, citric acid, and light exposure on soybean salad oil. (5) Specifications for soybean oil. (6) Effect of linolenate content on flavor of soybean oil at elevated temperatures. (7) Composition of certain edible oil products from soybean oil and related products (salad oil, hydrogenated-winterized soybean salad oil, hydrogenated soybean oil liquid shortening, plastic shortening types I and II). (8) Changes in iron and copper content of soybean oil in commercial refining. (9) Properties of all-purpose and high-stability shortenings from all-hydrogenated vegetable oils and blends of animal fat and/or vegetable oil (iodine value, melting point, % linoleic acid, solid fat index (% solid at temperatures indicated)). (10) Typical analyses for mellorine and cookie and confectioner’s fat. (11) Analytical data for typical margarine oils low and high in polyunsaturates (iodine value, melting point, % linoleic acid, solid fat index (% solid at temperatures indicated)). (12) NSPA—tentative lecithin specifications (NSPA, 1969-1970). (13) Composition of soybean lecithins. (14) Approximate composition of soybeans and meal products (whole bean, cotyledon, hull, hypocotyl, meal {cake–extruded, flakes–solvent extracted, dehulled flakes–extracted, mill feed–separated hulls, mill run–separated hulls}). (15) Amino acid analysis of soybean meal (44% protein and 49% protein {dehulled}) and corn. (16) Amino acid analysis of blends of soy flour with cereals and milk (Inglett 1968; Corn soy milk {CSM}, Millet soy milk, Wheat soy milk, etc.). (17) Partial formulas for young swine and boiler rations in percent total rations. (18) Partial formulas for dairy feeds (14% protein). A supplement to forage or roughage. (19) Soybean grits and flour–screensize. (20) Composition of soy flour. (21) Composition of 4 types of soy protein concentrates. (22) Uses for high-protein soy products (protein 70 [concentrates] and protein 90 [isolates]). Note: This is the earliest English-language document seen (Dec. 2004) that uses the term “protein 90” to refer to a soy protein isolate. (23) Amino acid analysis of fractions derived from dehulled extracted flakes (Rackis et. 1961, 1970). (24) Effect of cooking in salt solutions on texture of structured granules. (25) Composition and use (1,000 metric tons in 1964 and 1967) of soybeans for traditional foods in Japan (Use of whole soybeans in 1967 in 1,000 metric tons: Miso 169. Shoyu 15. Natto 47. Tofu 329. Total 642. Use of defatted flakes or grits in 1967 in 1,000 metric tons: Miso 8. Shoyu 154. Natto 0. Tofu 77. Total 284).


The glossary defines the following soy-related terms: Misu–paste made of fermented rice and soy beans. Tajure–
fermented soy beans, canned. Tausi—fermented soy beans. 

116 p. Index. 18 cm. [38 ref]
• Summary: In the chapter titled “Soybeans” (p. 31-49), the 
author discusses tofu (and how to make it at home with or 
without fermentation), meitauza (fermented okara), hakkotufo 
(a newly developed high protein food; fermented 
soybean curd), suf (Vietnamese call it Chao), shoyu, miso, 
ketjap (thick Indonesian soy sauce [probably ketjap manis]), 
temphe, Hamanatto, natto, Tao-cho from Malaysia, and Tao-
si from the Philippines.
Note: The author has collected her information (both 
correct and incorrect) for a number of sources, which she 
does not cite directly, although she does have a bibliography.

immigrants in North America. Translated by Shinichiro 
Nakamura and Jean S. Gerard. Seattle, Washington: 
Executive Committee for Publication of Issei, c/o Japanese 
Community Service, 1414 S. Weller St., Seattle, WA 98144. 
xxviii + 1016 p. Illust. Index of personal names only. 24 cm. 
Translation of Hyakunen Sakura. [100* ref. Eng]
• Summary: This massive book is basically a history of 
first-generation Japanese immigrants to Pacific Northwest 
(especially Washington, Oregon, and British Columbia), 
focusing on the great struggles and hardships they met, 
written from the viewpoint of individual Japanese who 
tell their stories (often in the first person), and compiled 
by a Japanese journalist. The book was first published in 
Japanese. Access to the wealth of information it contains 
is crippled by the lack of a subject index. So if one were 
looking for information about tofu, miso, or soyfoods, one 
would have to read the entire book. The index of personal 
names is well done.
At the very front of this book are very interesting maps 
of the old Japanese districts of the following cities: Seattle, 
Tacoma, and Spokane, Washington; Portland, Oregon; 
Vancouver, British Columbia, Canada. Unfortunately, 
none of the maps are dated. The name and location of 
each Japanese organization or business is shown clearly in 
English. In the part on “Japanese exclusion,” the section 
titled “The smell of race” [very interesting] (p. 227-28) 
states: “Exclusionists especially point out that Japanese 
favorite foods and condiments, such as miso, soy sauce, 
radishes and pickles, are intolerable [in smell]... The 
neighboring whites complained loudly that they just could 
not stand the smell of cooking soy sauce... A Japanese 
smells like miso, and whites in general exude faint waves of 
the odor of butter and cheese. The smell of their underarm 
perspiration is really strong.”

In the part on “Railroads,” the section titled “Life of 
Yoshiichi Tanaka” notes that he worked with a gang of young 
Japanese bachelors who were all trying to save money. 
For breakfast they had miso soup, which was delicious, so 
everyone ate more, which caused food expenses to rise. “So 
we skimmed on miso and merely added salt for flavor.” For 
lunch they sometimes had “fish cooked in soy sauce, or a 
half cake of tofu (bean curd cheese), or radish, carrots and 
beef boiled hard with soy,...” “In the Japanese restaurant in 
Seattle we could fill up on miso soup, rice and pickles for 
only 10¢...”

The part on “Alaska” (p. 355) is mostly about work 
in the canneries: “We shipped Japanese foods such as rice, 
soy sauce, miso, dried kelp [kombu] for soup base, dried 
sea slugs,... fu (a light cake made of wheat gluten), dried 
seaweed,...” Page 359 mentions soy sauce and miso soup 
with salmon.

The part on “Sawmills” states (p. 402): “The food 
was Japanese–first class rice imported from Japan,... and 
koyadofu (a dish made from bean curd). For breakfast they 
served miso soup with vermicelli in it. Lunch was rice, and 
fish and vegetables boiled hard with soy sauce.” On Sundays 
they had red bean soup with mochi (rice cake).
Under “Supplementary food” (p. 408-09): The meals 
were mostly Japanese. Breakfast: miso soup... Dinner: 
Sukiyaki. “Some people bought things from Seattle stores 
like bottles of pickled bean curd (funyua), salted sea urchin, 
fermented soy beans [natto], salted plums, or seaweed 
preserved by boiling in soy sauce (nori no tsukudani)....”
In 1907 we spent $5 to $6 per month for food, and it 
was poor. For breakfast we ate miso soup and rice;... for 
lunch rice cooked together with aburage (fried bean curd)... I 
bought canned salmon and poured soy sauce and sugar on it 
for dinner. For Saturday dinner we had sukiyaki.
Page 410” Breakfast was tofu in miso soup with pickles 

In the part on “Agriculture,” we read that Japanese 
immigrants to American sometimes enjoyed Japanese 
soyfoods. In about 1910, in Fife, a farming community near 
Seattle, in about 1910, Gunji Fujimoto “had miso soup and 
pickles for breakfast” (p. 440). In about 1916, in Hood River 
(northern Oregon), Henry Nakamura wrote that Japanese 
population increased, the amount of soup was increased.
by adding water, not miso. The contents of the soup were always wakame (seaweed), all year long... “Mr. Endo laid in a huge stock of left-over seaweed and fried dried bean curd, and miso, soy sauce and pickles”).

Part 20, “On the Streets,” states that “The old Japanese towns in Seattle, Tacoma, Portland, and Vancouver (Canada) can hardly be traced today.” The author has tried to reconstruct maps of these towns “in roughly the period of the 1920s, but not in any specific year” (p. 779-80). In Nov. 1908 Masanao Hanihara, Secretary of the Japanese Embassy, issued a report on his investigations of living conditions of Japanese in the western USA (p. 791). He found the Japanese still lived “at the level of immigrant laborers;” the conditions in their communities were “extremely low and chaotic.” “The Japanese in these areas hardly mix with white residents, while sometimes they approach or mix with Chinese. There are many ill effects from clique-ishness.” “The majority of Japanese workers lack knowledge of English, so whenever they make contracts they sign papers blindly” (p. 795-96). Hanihara estimated the Japanese population of various states as follows: Washington 9,000 to 10,000, Oregon 3,500 to 4,500, Wyoming 1,000 to 1,500, Idaho 1,000 to 1,500, Montana 1,000, and Alaska 1,000. The largest Japanese community in the region was in Seattle (about 4,000 Japanese). “Shinzaburo Ban of Portland is almost the top among successful Japanese on the Pacific Coast.” His business, S. Ban Co., headquartered in Portland (where he arrived in 1891), acts mainly as a contract agency for Japanese laborers—a sort of employment agency, “and his (where he arrived in 1891), acts mainly as a contract agency for Japanese laborers—a sort of employment agency, “and his store supplies sake, miso, soy sauce and other such Japanese foods and small items to the laborers” (p. 789-93; see portrait photo p. 792). A sidebar (p. 793, by Raisuke Tamura, Seattle) notes that “However long they lived in the United States, Japanese had to have Japanese food... Around 1906 I imported from Japan vegetable foods such as lotus root, Japanese radish [daikon], gobo (burdock), zenmai (fern), abura-age [deep-fried tofu pouches], nigari (bittern, a tofu coagulant), tsukuneimo, yamaimo, and so on, in hundred-pound baskets, and sold them to sawmills and railroad camps” (p. 793).

The 1 January 1916 edition the Hokubei Nenkan listed all businesses operating in various Japanese towns. These included two “tofu-makers” in Seattle, Washington (p. 800), at least one tofu maker in Tacoma, Washington (p. 804). Tacoma had a Japanese population of 931 in 1915–721 males and 210 females). Spokane didn’t have a Japanese town as in Seattle and Tacoma, but in 1915 it did have a Japanese population of 536 (462 males and 74 females).

The map of old-town Portland, Oregon, probably from about 1935, shows 90 Japanese businesses located between 1st Ave. and 7th Ave. (running north-south) and between W. Burnside and N.W. Glisan (running east-west). Among these are two tofu manufacturing companies. “Ota Tofu Mfg.” is located on 5th Ave. between Everett and Flanders. [Note: The actual address was 86½ 5th N]. “Fukei Tofu Mfg.” is located on N.W. Davis between 3rd Ave. and 4th Ave.


• Summary: Preparation and properties of the following soy-based product groups are given: Beverages: traditional unfermented soy milks, traditional fermented—yogurt-like milks, simulated milks based on soy protein isolate incl. fermented yogurt-like types, still non-carbonated beverages, carbonated beverages.


“Table vegetable, green soybeans, and [soy] bean sprouts. Available in canned form, also fresh in season in some areas. Dry beans can be sprouted in home.

“Soups. Protein fortification as thickener (soy flour, soy protein concentrate, or soy protein isolate) or in high protein noodles or croutons. Oriental use of yuba.” Address: Anderson Clayton Foods, Richardson, Texas.


• Summary: Dining: The Japan Inn, now in its 3rd year of operation, located at 1715 Wisconsin Ave., NW (Georgetown), continues to rank as one of the finest Japanese restaurants in Washington, DC. To make the broth for Miso soup, begin with a Japanese seaweed called “sea tangle” [kombu], then remove it after it has imported its flavor. Add dried bonito flakes to produce a delicate, fish-tasting broth.

“Bean cake [tofu], mushrooms, and chopped green onions
Shabu-shabu comes with two dipping sauces. One of these is made by mixing soy [sauce], vinegar, two kinds of sake, seaweed and dried bonito flakes. The other contains sesame seeds, oil, and paste. Shabu-shabu “also contains hot pepper, aged soy bean cake, soy sauce and two kinds of sake, one of them [mirin] sweet.”

Note: The meaning of “aged soy bean cake” is unclear. It could be fermented tofu, although that is rarely used as an ingredient in Japanese cookery.

• Summary: On Feb. 26 Mr. Kushi, a macrobiotic teacher, lectured on: Tekka—“Tekka is used not only as a condiment, but also for medicinal use. Tekka is made from three different roots—carrots, burdock, and lotus roots.” The “volume of miso is flexible... Homemade tekka is traditionally made in a cast iron frying pan.” The Japanese word “tekka” derives from tetsu (which means iron) and ka (fire). “For medicinal use, yang miso is better.”

Miso and miso manufacturing, including how to make malt (rice koji) (8 pages). Note: This section indicates that Mr. Kushi has some basic knowledge of the subject but there are many errors. 1. Koji is not malt (which refers to soaked, germinated cereal grains), but molded cereal grains or soybeans. 2. Koji kin is not malt bacteria, but koji molds. 3. One does not add enzymes to miso and enzymes do not grow. Even modern miso factories do not add enzymes when making miso. 4. The entire mixture is not stirred after 20-25 days to add oxygen. Kushi says you must keep miso for a least 6 months, but to cure sickness it must be kept for 2-5 years. Miso soup can compensate for the bad qualities of meat and eggs—so everyone should eat miso soup daily. Soup stocks and miso soup.

On Feb. 27 he discussed: General outline for making shoyu—soy sauce (4 p.), including discussions with Kikkoman on making natural shoyu starting with whole soybeans. In the early years after 1973, Kikkoman wanted to make natural shoyu and sent Kushi several samples, but he turned them all down, in large part because Kikkoman on making natural shoyu starting with whole soybeans. Erewhon is buying shoyu from 3 companies in Boston or on our Ashburnham land, I really hope we can obtain either by purchasing them in Chinese shops or ordering them by mail (several sources, with addresses, are given...) These include: “fresh ginger root, dried bean curd, dried bean curd [pressed tofu; doufu-gan], sheets [yuba], sesame seed paste, sesame seed oil,... soy sauce,... red bean paste [azuki, also called “1 can sweet red-bean paste” (p. 164)], hot bean sauce” (p. 21)).

Fish with hot spicy bean curd sauce (Tou-pan la-yü, with “1 tablespoon Szechwan hot bean curd paste,” p. 50). Five-

In San Francisco’s Chinatown, where the shops are predominantly Cantones, the “dry goods store provides me with pressed bean curd and bean curd sheets [yuba, doufu pi]....”

Talk with Cecilia Chiang. 2008. Nov. 15. She says that “bean curd sheets” refers to yuba or doufu pi; pressed bean curd to doufu-gan. “Hot bean sauce” is la douban jiang, which is douban jiang with hot chili peppers; both are made with soybeans. Red bean paste is the same as “sweet red bean paste,” made with azuki beans (xiaohong douan), and the same as Japanese an. Address: 1. Founder and owner, The Mandarin restaurant, Ghirardelli Square, San Francisco, California.


• Summary: The authors investigated growth conditions for maximum protease production by Rhizopus oligosporus, Mucor dispersus, and Actinomucor elegans. In East Asia, the first of these three molds is used to make tempeh, and the latter two are used to make sufu. Enzyme yields for all 3 were higher in solid substrate fermentations than in submerged culture. Of the 3 substrates tested–wheat bran, wheat, and soybeans–wheat bran was the best for enzyme production. The optimal conditions for maximum enzyme production were as follows: Rhizopus oligosporus, 50% moisture at 25°C for 3-4 days; Mucor dispersus, 50 to 63% moisture at 25°C for 3-4 days; Actinomucor elegans, 50 to 63% moisture at 20°C for 3 days. Address: NRRL, Peoria, Illinois.


• Summary: Soy-related recipes include: Deep-fried bean curd with sesame sauce (p. 91, with “4 cakes bean curd,” each of which is cut into 9 pieces, dried on paper towelling, then deep fried at 375°F). Chicken and bean curd stick soup (p. 109, with “¼ pound bean curd stick” [dried yuba sticks]). Bean curd and greens soup (p. 115, with “1½ pieces fresh bean curd” [tofu]). Stir-fried eggs with soybean sprouts (p. 226). Stir-fried eggs with bean curd (p. 227, with “2 fresh bean curd cakes or 1/3 pound homemade bean curd”). Bean curd sautéed with eggs (p. 258, with “4 cakes fresh bean curd”). Stir-fried bean curd with black mushrooms (p. 259). Stir-fried bean curd with squash (p. 260). Homemade bean curd with soybeans (p. 261-62, curded with vinegar or gypsum / calcium sulfate. The residue [okara], which is called “Soybean pulp, may be added to ground beef up to a 1 to 2 ratio.” Step 8. “Remove curd from bag and mix with salt” is a new invention in making tofu—which ends up with a texture like cottage cheese and seasoned with salt). Homemade bean curd with soybean powder (p. 262-63, curded with vinegar or gypsum). Celery cabbage creamed in soy milk (p. 269, with “4 heaping teaspoons soybean powder.” “2. Place soybean powder and water in a pint jar. Tighten lid and shake well. Add cornstarch and honey to soybean ‘milk’”). Soybean sprouts with celery (p. 273). Spinach in soy sauce (p. 276). Vegetarian dish of the Buddhists (p. 277-78, with “2 ounces dried bean curd” [probably dried yuba sticks] and “3 cakes fresh bean curd”).

“A guide to Chinese cooking ingredients” (p. 289-324) and “Glossary” (p. 325-26) describe: Bean curd (dow foo–tofu, incl. pressed curd [fermer], canned bean curd {somewhat less creamy than the fresh}). Bean curd, dried (foo jook [dried yuba sticks]; tiem jook is sweeter than foo jook). Bean curd cheese (fooh yu [fermented tofu]). Bean paste, yellow (wong dow sa). Bean sauce, brown (min see jeung). Beans, black soy (ket tou). Beans-black fermented (dow see). Hoisin sauce (hoy sin jeung. “A soybean-based sauce..."). Soybean sprouts (Da dow nghah).


• Summary: This is a translation of Gastronomie pratique. The Joy of Cooking (1963, p. 542) states that the author “refers to soy, Worcestershire, catsups, tabascos, and other such commercial condiments as ‘sauces violentes,’ which mask out all other flavors.”

Page 44: “83. The catjang is a fermented bean curd.”

Note: The author, whose real name was Henri Babinsky, was of Polish ancestry, born in 1855 in Paris and died in 1931. The 1st edition (314 p., 20 cm) was published in 1907 by the same publisher in Paris. The 2nd edition (636 p., 26 cm) was published in 1912.


• Summary: Page 119: “We’ve told a million stews that New York is an acquired taste, like yak butter or fermented bean curd, but it doesn’t do any good. They arrive on their vacations, wide-eyed and giggly, convinced that this is where
the action is..."


*Summary:* This original edition, published in London, is smaller in height, has no illustrations, and 13 fewer pages than the American edition published the same year. The recipes are the same, but on slightly different pages; For details, see the American edition (1974).


*Summary:* Originally published in 1974 in London, England, as “Chinese Vegetable and Vegetarian Cooking” by Faber & Faber, Ltd. However that book is smaller in height, has no illustrations, and 13 fewer pages than this American edition. The entire text has been lightly edited and re-set for American cooks and readers. The recipes are basically the same, but on slightly different pages, and with some titles slightly changed (e.g., from “sesame jam” to “sesame paste,” p. 133).

In the Introduction, under “Flavoring,” the following soybean products are listed: Soy sauce, black beans (salted), soybean paste (yellow and black), bean-curd cheese (red and yellow). Soy-related recipes include: Steamed bean curd with peanut butter sauce (p. 50). Hot-marinated bean-curd sticks [dried twisted yuba] with quick-fried [mung] bean sprouts (with “yellow bean-curd cheese” [fermented tofu], p. 60-61). The Lo Han dish of the monks’ mixed vegetables (with tofu, and “red bean-curd cheese” [fermented tofu], p. 72-73). Hot assembly of shredded bamboo shoots and bean curd... (with tofu and “bean-curd cheese” [fermented tofu], p. 74). Hot assembly of chestnuts, sliced lotus root, gingko nuts, peanuts, Chinese mushrooms, and bean curd (with tofu and “white bean-curd cheese” [fermented tofu], p. 75). Hot black bean and tomato sauce (Ratatouille Chinoise; with salted black beans and soybean paste, p. 82-83). Basic bean-curd soup (p. 105). Enriched bean-curd soup (p. 105). Soy eggs (with soy sauce, p. 125).

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the terms “yellow bean-curd cheese” or “red bean-curd cheese” or “white bean-curd cheese” to refer to fermented tofu.


Note 2. This is the earliest English-language document seen (June 2003) that uses the term “sesame paste.”


*Summary:* Nyufu is made by partial dehydration of tofu followed by inoculation with *Actinomucor repens*. After the mold mycelium covers the surface, it is immersed in soy sauce moromi mash for aging. During ageing, the moisture content decreases, while the contents of salt, reducing sugars, and amino nitrogen increase. Only small amounts of lysine and amino-butyrate are found in nyufu. Formic and acetic acids can be detected at every step, whereas propionic acid and isobutyric acid can be detected only in the moromi mash and nyufu. Isovaleric acid is found in nyufu. Butyric acid is found after inoculation with the mold. Address: 1-3. Dep. of Nutrition, Tokyo Univ. of Agriculture; 4-5. National Food Research Inst., Tokyo.


*Summary:* Descriptions of and flow sheets for the production of the following basic soyfoods are given: Miso, shoyu (*salza de soya*), natto, tempeh, sufu (fermented tofu), and soy yogurt. A table shows the nutritional composition of each of these foods as well as yuba and kori-tôfu (dried-frozen tofu).

Note 1. This is the earliest Spanish-language document seen (Sept. 2011) that mentions tempeh, which it calls “tempeh.”

Note 2. This is the earliest Spanish-language document seen (Feb. 2004) that uses the term “kori-tôfu” to refer to dried-frozen tofu. Address: Faculdad de Quimica, UNAM, Mexico.


*Summary:* This pioneering work started the “tofu revolution” in America. Contents: Preface. Acknowledgements. Part I. Tofu: Food for mankind. 1. Protein East and West. 2. Tofu as a food: Introduction, rich in high quality protein (NPU, biological value, protein score, amino acid content), high protein complementarity (tofu contains an abundance of lysine, an essential amino acid that is deficient in many cereal grains; increase usable protein by combining tofu with wheat, rice, corn, etc.), easy to digest, an ideal diet food, low in saturated fats and free of cholesterol, rich in vitamins and minerals, a health-giving natural food, backbone of the meatless / vegetarian diet, free of chemical toxins, low in cost, easily made at home, quick & easy to use, versatile.

3. Getting started: Introduction, buying and storing tofu, basic ingredients (whole-wheat flour, miso [rice-, barley, and soybean miso, special Japanese miso, Chinese chiang], oil, brown rice, salt, shoyu [natural shoyu, shoyu, Chinese soy sauce, synthetic or chemical soy sauce], sugar, vinegar, monosodium glutamate {MSG}), Japanese kitchen tools (each illustrated), preparatory techniques (salt rubbing, rinsing and pressing leeks and onions, soaking burdock root, agár, wheat gluten and kampyo [kanpyo], parboiling, reconstituting dried sea vegetables {dried hijiki, wakame, kinugoshi tofu has a texture so smooth that it seems to have been strained through silk.” It is made from concentrated soymilk}). 12. Grilled tofu (incl. sukiyaki). 13. Frozen and dried-frozen tofu. 14. Yuba (incl. many meat alternatives such as Yuba mock broiled eels, Buddha’s chicken, Buddha’s ham, sausage). 15. Tofu and yuba in China, Taiwan, and Korea (incl. Savory tofu {wu-hsiang kan}; see p. 258 for illustrations of many meat alternatives, incl. Buddha’s fish, chicken, drumsticks, and duck, plus vegetarian liver and tripe, molded pig’s head, and molded ham). One type of Korean soybean miso is called kotsu jang [{sic, kochu jang}]. When tofu is served with miso [Korean-style, Tenjang] as the dominant seasoning, and with rice, “it becomes the popular Tenjang Chige Pekpem” (p. 262). 16. Special tofu.

Note: This is the earliest (and only) English-language document seen (March 2009) that uses the word “Tenjang” to refer to Korean-style soybean jang (miso).


Appendices: A. Tofu restaurants in Japan; many are vegetarian: In Tokyo: Sasa-no-yuki / Sasanoyuki, Goemon, Hisago, Sanko-in, Shinoda-zushi, Dengaku (south of Tokyo in Kamakura). In Kyoto: Nakamura-ro, Okutan, Takocho, Izsuen, Junsei, Nishiki, Hakuun-an, Rengetsu, Sagano, Sorin-an. Tea ceremony cuisine (Kaiseki ryori), Zen temple cookery or Buddhist vegetarian cookery (Shojin ryori), Tea ceremony cookery from China (Fucha ryori), Wild gathered cookery (Sansai ryori). A directory of these and others, with addresses and phone numbers, is given (p. 312).

B. Tofu shops in the West (Directory of 43 shops in

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the USA, 3 in Europe, and 3–7 in Latin America (Mexico City, Rio de Janeiro and Sao Paolo, Brazil). C. People and institutions connected with tofu. D. Table of equivalents. Bibliography. Glossary. Index. About the authors (autobiographical sketches; a photo shows Shurtleff and Aoyagi, and gives their address as New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo, Japan 177). SENDING TOFU IN THE FOUR DIRECTIONS.


Note 1. This is the earliest English-language document seen (March 2007) that uses the term “Tofu ice cream” to refer to soy ice cream or that contains a recipe for “Tofu ice cream.”

Note 2. This is the earliest English-language document seen (March 2000) that uses the term “Tofu Cheesecake” and the first to give a recipe for a tofu cheesecake.

Note 3. This is the earliest English-language document seen (May 2000) that uses the term “Tofu Sour Cream” (p. 109) or that contains a recipe for “Tofu Sour Cream.”

Note 4. This is the earliest English-language document seen (Dec. 2003) that uses the term “tofu milkshake” or that gives a recipe for a shake made with tofu.

Note 5. This is the earliest English-language document seen (Feb. 2004) that uses the word “stringy” to refer to natto.

Note 6. This is the 2nd earliest English-language document seen (Nov. 2011) that uses the term “dried-frozen tofu.”

Note 7. This is the earliest English-language document seen (March 2004) that describes preparatory techniques for tofu (p. 96-98).

Note 8. This is also the earliest English-language document seen (March 2004) that contains the term “smoked tofu.”

Note 9. This is also the earliest English-language document seen (March 2004) that uses the term “kinugoshi tofu” to refer to silken tofu.

Note 10. As of March 2007, the various English-language editions of this book have sold more than 616,000 copies.

Note 11. This is the earliest English-language document seen (June 2011) that uses the term “tofu lees” to refer to okara (see p. 22, 77).

Note 12. This is the earliest English-language document seen (Aug. 2011) that contains the term “Modern Western soybean foods” (see p. 69), a term that Shurtleff would soon replace by the more accurate “Modern soy protein products.” Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.


Doufu-ru [fermented tofu]: white fermented tofu (pai doufuru, incl. 5 different types such as red pepper, sesame oil and red pepper, five-spice, etc.), red fermented tofu (hung doufuru, nanru, nanyu, made by adding Chinese red fermented rice (ang-t Sao) to the brining liquor to give it a deep red color, thick consistency, and distinctive flavor and aroma; soy sauce is generally used in place of rice wine; another variety is rose essence fermented tofu), stinky fermented tofu (tsao-doufu, ch’ou doufu, incl. green stinky fermented tofu), chiang-doufu (prepared by pickling firm cubes of tofu for several days in either Chinese-style miso (chiang) or soy sauce).

Soymilk (doufu chiang, dou-chiang, dou-nai, dou-ru): Widely enjoyed as a spicy hot breakfast soup (p. 204) or a warm, sweetened beverage (p. 207). Sometimes sold bottled by street vendors.

Yuba: Much more popular and much less expensive in China and Taiwan than it is in Japan. Called bean curd “skin” or “sheets” in most Chinese cookbooks, yuba is known in Mandarin as doufu-p’i (“tofu skin”) or doufu-i (“tofu robes”). Remarkable Chinese ingenuity and creativity in giving the semblance of meat. In the display case of attractive restaurants or marketplace yuba shops are perfect replicas of

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plucked hens, roosters, and ducks, light-brown fish (complete with fins, gills, eyes, and mouth), juicy hams, tripe, liver, rolled meats, red sausage links, deep-fried drumsticks, and a life-sized pig’s head—all made from yuba. Most of these imitation meat dishes are prepared by pressing fresh yuba into a hinged (wooden or aluminum) mold, clamping the mold closed, then steaming it until the yuba’s shape is fixed. Su-tsai restaurants specialize in Buddhist vegetarian cookery. Names of prepared dishes: Buddha’s Chicken (suchi), Buddha’s Fish (suyu, sushi), Buddha’s Duck (suya), Vegetarian Tripe (taoto) or Liver (sukan); Molded Pig’s Head (tutao), Molded Ham (suhuo), Sausage Links (enchan), Buddha’s Drumsticks (sutsai tsui), Deep-fried Duck (suya). A full-page illustration (p. 258) shows these products. Fresh yuba. Dried yuba (kan doufu-p’i, incl. sweet yuba and Bamboo yuba (fuchu)). Tofu and yuba in Chinese cookery: Mandarin cookery, congee (rice porridge), “red broiled” sauces (hong-sao), meatless days, vegetarian restaurants.


Note 1. This is the earliest English-language document seen (Feb. 2004) that uses the word “doufu” to refer to Chinese-style tofu. Note 2. This is the earliest English-language document seen (Oct. 2008) that uses the word “tofu skin” to refer to yuba. Address: Lafayette, California.


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in its many forms, is completely unlike anything prepared in Japan or, for that matter, any food familiar to most Westerners. Known in English as Chinese cheese, tofu-, bean curd-, or soybean cheese, or preserved- or pickled bean curd, it is called doufu-ru, furu, rufu, or dou-ru in Mandarin, fuyu or funan in Cantonese (and in most Western tofu shops run by Cantonese masters), and sufu or dousufu in Shanghai and in most scientific literature. The latter terms, which mean ‘molded milk,’ are not at all familiar to most Chinese.”

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “doufu-ru to refer to fermented tofu.

“Doufu-ru has a soft–almost creamy–consistency and strong flavor and aroma reminiscent of Camembert cheese. Most varieties, seasoned with minced red peppers, are quite sharp and hot on the tongue, so that a little bit goes a long way. Widely enjoyed as a relish and seasoning, doufu-ru is prepared and sold in special Chinese pickle-and-miso shops rather than in neighborhood tofu shops. Traditionally, it was also prepared in many homes and farmhouses. The process of fermentation and preservation in a brining liquor enables this variety of tofu to last for as long as one to two years, even in semitropical climates, and its low cost makes doufu-ru especially popular among the poorer classes. Like cheese, wines, miso, shoyu, and many other fermented foods, doufu-ru gradually improves in flavor, aroma, and texture as it ages. As mold enzymes break down and digest the protein in the tofu, the latter’s sharp flavors mellow and its consistency softens: well-aged doufu-ru virtually melts on the tongue. After the tofu has ripened for 6 to 8 months, its color turns from yellowish white to a soft light-brown, and the wine-and-salt brining liquor, too, grows richer and mellower.

“Fermented tofu is the only traditional soybean product made in the manner of Western cheeses, that is, by ripening tofu with a mold. Although one would think that soymilk could easily be made into cheeses similar to those prepared from dairy milk, repeated attempts to produce such cheeses—even in modern Western laboratories—have until very recently met with failure. But unlike Western cheeses, doufu-ru is immersed in an alcoholic brine during ripening and is generally sold still immersed in the brining liquor in pint bottles or small cans. To prepare doufu-ru, 3/4- to 1¼-inch cubes of doufu or firm tofu are inoculated with spores of a mucor-type mold, then incubated in a warm place for about 3 to 7 days until each cube is covered with a dense mat of fragrant white mycelium. The molded cubes are immersed in the brine, which generally contains Chinese rice wine and red peppers (or other spices and seasonings). After ripening for one to two months in the brining liquor, the bottled tofu is shipped to Chinese markets where it is often allowed to age for another two to four months before being placed on sale. It is said that if the doufu-ru remains motionless when the jar is spun quickly on its axis, it has been properly aged and is ready to use.

“In China, the most popular ways of serving doufu-ru are as a seasoning for congee (hot breakfast rice porridge) or rice, as an appetizer or hors d’oeuvre with drinks, or as an ingredient in stir-fried dishes or simmered sauces, used to add zest and flavor. The brining liquor is also used in many of these preparations. In Western cookery, doufu-ru is delicious used like Camembert or Roquefort cheese in dips, spreads, dressings, and casseroles. Recipes for each of these preparations are given at the end of this chapter.

“The ideographic character for fu in doufu-ru (also used in the word doufu) means ‘spoiled.’ The character for ru means ‘milk.’ These characters have an unusual and very ancient etymology. Although the Chinese had a highly developed civilization long before the beginning of the Christian era, they never developed the art of dairy farming or, consequently, of making cheese. But their northerly neighbors, the Mongols, whom the Chinese regarded as uncivilized barbarians, were quite skilled in the preparation of fine goat’s cheese. The Chinese called this cheese furu, or ‘spoiled milk.’ Centuries later, the Chinese learned how to prepare their own variety of fermented cheese, but from soy rather than dairy milk, probably with some help (or at least inspiration) from the Mongols. And the name which they had used derogatorily for the Mongolian cheese gradually came to be used for their own tofu cheese: their insult boomeranged and remains with them to this day. Consequently some modern Chinese and Japanese—especially those operating expensive restaurants—write the character fu in the words tofu, doufu, and doufu-ru with a different character which, although pronounced ‘fu,’ means ‘affluent, ample, or abundant.’

“Records show that doufu-ru was being produced in China by the fifteenth century and that it may have originated much earlier. The technique for making fermented tofu spread from China to Vietnam (where similar a food called chao is now prepared) and to the East Indies (where tao tuan is made.) A type of fermented tofu called tahuri is also produced in the Philippines by packing large (4- by 4- by 2½-inch) cakes of firm molded tofu into cans with a large quantity of salt. Neither sake nor brine is used in the process. After ripening for several months, the tofu is yellowish brown and has a distinctive salty flavor.

“The four basic types of Chinese fermented tofu are white doufu-ru, red doufu-ru, tsao-doufu ("tofu fermented in sake lees"), and chiang-doufu ("tofu fermented in miso or soy sauce"). The brining liquor used for each is also a popular ingredient in many Chinese recipes, especially in dipping sauces. Called doufu-ru chih, it often contains various spices or minced red peppers which make it a zesty seasoning.

“White Doufu-ru (Pai doufu-ru): In most of China and in the West, this is the most popular type of fermented tofu. Unless it is specifically being contrasted with the red variety, it is generally called simply doufu-ru. The tofu’s flavor,
color, and aroma can be modified either by changing the salt or alcohol composition of the brining liquor or by adding different combinations of spices and seasonings. The most common brine contains about 10 percent alcohol and 12 percent salt; some contain little or no alcohol, while others may contain more than twice as much alcohol as salt. One brine of the latter type yields “drunken cheese” (tsui-fang) and another yields “small cheese cubes” (chih-fang).

“At least five different varieties of white doufu-ru are sold in markets and marketplace stalls by placing pressed tofu squares into a crock containing sake less, crushed leaves, and a green mucor mold. After the tofu has fermented for 12 hours or more, vendors peddle it in the streets. Ch’ou doufu means ‘foul-smelling tofu.’ While many Chinese themselves dislike its strong aroma and flavor, slippery texture, unusual color, and aftermath of bad breath, its devotees claim that once a taste is acquired for this unique food, it is for evermore regarded as a great delicacy.

“Chiang-doufu: Prepared by pickling firm cubes of tofu for several days in either Chinese-style miso (chiang) or soy sauce (chiang-yu), this product has a reddish-brown color and a salty flavor. In some cases it is dried briefly or fermented with mold before being pickled; sake lees are occasionally mixed with the chiang. This tofu often has much the same rich sweetness as Japanese Finger Lickin’ Miso (p. 31). Chiang-doufu sauce (chiang-doufu chih) is prepared by mixing the pickled tofu with its pickling brine, then grinding the mixture until it is smooth; it is used as a condiment for Chinese lamb or beef dishes.”

On page 262 are three illustrations of Doufu-ru, followed by 15 recipes for using doufu-ru and its brining liquor in the following recipe types: (1) Dressings, spreads, dips and hors d’oeuvre (8 recipes). Sauces, egg dishes and with grains (7 recipes).

The last recipe, Doufu-ru with hot rice (serves 2) states: This is the most popular way of serving doufu-ru in China. The dish is generally served for breakfast. Some people prefer to use the tips of their chopsticks to take a tiny piece of doufu-ru with each bite, whereas others like to mix the doufu-ru with the hot rice or rice porridge (congee) before starting the meal.

2½ cups freshly cooked Brown Rice or Rice Porridge (p. 50)
2 to 4 cubes of doufu-ru (white or red)
2 tablespoons thinly sliced scallions or leeks (optional)
“Place the hot rice in large individual serving bowls and top with doufu-ru cubes and, if used, sliced scallions.

Note: This book contains the largest number of recipes for using fermented tofu, seen (Oct. 2011) in any Western-language cookbook to date. Address: Lafayette, California.


• Summary: The culmination of the materia medica tradition in Japan. Contains a very early reference to fermented tofu. Address: China.


• Summary: This book is filled with lovely woodcuts from the Horace Carpentier Collection, East Asiatic Library, University of California, Berkeley. Only 11% of China’s land area is arable compared to 80% in the USA, yet today its population, mostly squeezed into the eastern third of the country, is four times that of the United States. The best soy sauce in China comes from Fukien [Fujian] and Amoy. The Classic of Mandarin cuisine reached its zenith around 1800, when Yuan Mei wrote volumes about food; these are still considered to be definitive studies of Chinese gourmet cooking in the Mandarin style. There is one entire chapter titled “Bean curd” (p. 57-63).


The glossary (p. 178-84) defines: Bean cake, fermented, and fresh (2-inch squares, 1 inch thick). Bean curd cheese, red (nam gooye). Bean-curd cake, deep fried. Bean-curd sheets or sticks, dried [yuba] (“Creamy beige-colored thin sheets. Used for vegetarian (Buddhist) dishes congee or as substitute for egg roll skins. Stick form is used mainly for soup... Always soak in warm water to make pliable before proceeding with recipe”). Bean curd, sweet (“Comes in dried, flat sheets, about 6 inches by 1½ inches. Mocha in color; no sweet taste”). Bean paste, hot. Black beans, fermented (= Fermented black beans. “Small black beans preserved in salt. Very pungent and moist. Almost always used with garlic and ginger in sauces. Rinse with warm water and mash before using. Purchased in plastic bags by weight in Oriental markets”). Brown bean sauce (“Also known as yellow bean sauce and ground bean sauce”). Fish soy. Hoisin sauce (“Thick, smooth, dark reddish brown sauce made from soybeans, spices, sugar, chili and garlic. Mildly sweet in flavor”). Soy sauce (light vs. dark with caramel added). Address: San Francisco, California.


• Summary: Page 16: “I carefully lift it out with a spatula, spread it with foo guey (Chinese fermented bean curd similar to brie cheese) and savor it as an after dinner treat, a kind of Oriental cheese and crackers.” Address: San Francisco, California.


• Summary: Table 12 (p. 175A) gives an “Invoice of Stores for the use of Chinese Emigrants on the Lord Elgin on the voyage from Amoy to Demerara [Guyana, formerly British Guiana] in 1852.” One of the items listed is “90 jars surd [sic, probably curd, i.e. fermented tofu] peculs.” Pecul, a variant of the word “picul” (also spelled picol or pikol) is a Chinese unit of weight, typically equal to 133.33 pounds. Demerara is both a river and a county in Guyana.

The source of this table is given as “B.P.P., A.S.S., China, Vol. III, 144.” If this product is fermented tofu, then this document contains the earliest date seen for soybean products (fermented tofu) in Guyana, South America, or Latin America (1852); soybeans as such had not yet been reported by that date.

Talk with Arnold Meagher. 2001. Feb. 12. His thesis was submitted and approved in early 1975. Shortly after receiving his degree, he left this field and has had no involvement with it since. He can think of no good sources of information on the foods that Chinese took with them as they left China as coolies. He now lives in Eufaula, Alabama. Address: Davis, California.

Hall, Inc. 86 p. Illust. by Shirley Chan. Index. 22 cm.
Summarized in Soybean Digest, Sept. 1975, p. 43. [7 ref]

**Summary:** This excellent book for children discusses beans in legend and history, how to grow them, and their future as a low-cost protein supplement. Includes experiments, bean recipes, and games.


Page 2: "Kuan Yu, a great war god in Chinese folktales, was a bean curd [tofu] seller in his youth."

Pages 12-13, a brief (and partially accurate) history of the soybean, begin: “Soybeans are native to eastern Asia. The oldest written records of them date back to 2838 B.C. [sic], when Emperor Shen Nung of China wrote a description of the plant.” Also mentions: The five sacred grains, soybean “milk,” tofu, yuba, soy sauce, soybean paste, soybean sprouts, soybean oil, Engelbert Kaempfer, first introduced to the United States around 1800 when a ship brought some to Philadelphia [Pennsylvania], Commodore Perry (1854), USDA tested about 10,000 different kinds. Now soybeans are the number one U.S. cash crop, accounting for more than 75% of the world’s soybean supply. Soybeans are used as foods for humans (in the form of oil, flour, soy sauce, “milk substitutes, and meat substitutes and ‘extenders’”) and feeds for animals. They are also used in the manufacture of more than 250 industrial products, including paints, soaps, lubricants, adhesives, and fertilizer.

Page 16: “In China, beans were a good luck symbol. A person who wore a string of soybeans hidden around his neck was believed to possess magic powers to do amazing feats. Three dark soybeans soaked in sesame oil for three days were used to foretell the future.”

The chapter “The life story of the bean” (p. 18-29) gives (with illustrations) a simple and accurate description of the bean seed and how it grows, discussing the hilum or seed coat, the two cotyledons in which food for the young growing plant are stored, the embryo nestled (a plant in miniature) between the cotyledons, with its two tiny leaves (the plumule), a little root (the radicle), and a stemlike part connecting them (the hypocotyl). When the seed is planted, and it germinates or sprouts, the “embryo root pokes its tip out through the micropyle and grows out into the soil. Tiny root hairs form along the growing root. They take in moisture and dissolved minerals from the soil.” The hypocotyl grows until it “suddenly pushes up out of the soil—the first part of the seedling to emerge. It is bent over, for the cotyledons are still buried in the soil.” The hypocotyl continues to grow. In a day or so the seed coat splits, then the top of the plant pops up out of the soil. “The empty seed coat is left behind, buried beneath the surface.” Now the young bean seedling is growing straight up. The two seed leaves at the top unfold and grow quickly. Below them on the stem are the two cotyledons. As sun shines on the growing plant, its leaves, cotyledons, and stem begin to turn green—a turning point in the life of the plant.

For a while, the growing plant takes the food it needs from the reserves stored in the two cotyledons. But as these reserves are used up, they shrivel and finally fall off. Now the young plant must create its own food using chlorophyll and photosynthesis.

Chlorophyll traps energy from the sun. When examined under a magnifying glass, one can see that the surface of a plant leaf contains many tiny openings called stomates, which are usually open during the day and closed at night. “When the stomates are open, gases from the air pass freely in and out.” Air is about 80% nitrogen, 20% oxygen, plus smaller amounts of carbon dioxide, water vapors, and other gases. In the leaves, “carbon dioxide and water are combined, using the sunlight energy trapped by chlorophyll, into sugar, starches, and other complicated chemicals. Scientists call this process photosynthesis (photo means light, and synthesis means a putting together).” The by-product, oxygen, passes out into the air through the stomates; it is the gas that humans and other mammals need to breathe.

Describes the underground activities related to plant growth, nodules, bacteria that live symbiotically in the roots and fix ammonia and nitrogen. Also describes the bean flower, its parts, self-pollination, the key role of bees, and how the seeds are formed from the flower.

The chapter “The soybean—Number one” (p. 36-39) describes the current status of the soybean in the USA. The chapter “Beans for the future” discusses modern developments such as CSM, soyfoods such as sufu, tempeh, miso, spun soy protein fibers, soybean meat analogs, textured vegetable protein (TVP).

When a bean seed sprouts, how does it know which way is “up”? “Could you ever get a seedling with its roots pointing up in the air and its shoot poking down into the soil?” Supposing you cut off all sunlight? No, plants have a built-in gravity sense which scientists call “geotropism.” A plant hormone called an auxin causes the plant to bend upward—and toward the light (heliotropism). In 1888, the symbiotic partnership between legumes and nitrogen fixing bacteria was first discovered by Hellriegel and Wilfarth. There are short-day plants, long-day plants, and day-neutral plants; flowering will not begin until the length of days and nights is just right (p. 54-59). Bean recipes (p. 70-75).

Address: 1. Prof. of Biology, Staten Island Community College, New York City; 2. Translator of Russian scientific materials.


Most people in the West are now familiar with soya sauce. For most Westerners, the growth of mould on a food is generally associated with the deterioration of that food—with only a few exceptions, such as England’s Blue Stilton cheese, or Roquefort, Brie, or Camembert cheeses from France.

Note: “Molds of the genus Penicillium play a large part in the ripening of the Camembert-Brie, and the Roquefort-Gorgonzola-Stilton series of cheeses.”

“Koji is the central feature in most fungal food preparations.” Traditionally, koji was made in baskets made of woven bamboo, which provided very good aeration. How non-toxic molds came to be used for koji in humid subtropical or tropical regions remains a mystery. In Japan, the seed-koji (tané koji) is “made by growing Aspergillus sojae or A. oryzae on steamed polished rice, which in China, a mixture of wheat bran and soyabean flour is the preferred substrate.”

To make Hamanatto, soyabean are initially fermented with Aspergillus oryzae. “A Malayan dish called Tao-Cho and one from the Philippines called Tao-Si seem to be somewhat similar...” Address: Univ. of Strathclyde, Glasgow, Scotland.


**Summary:** The relatively well-studied soy-based fermented foods in South-East Asia are tempe, sufu (soy cheese), onjtom tahu [okara tempeh], tau chiow ([tauco, taucho], soybean paste), soy sauce, and thua-nao (natto). These are shown in Table 1, with the microorganisms responsible for fermentation, substrates, uses, and principal references given for each. “It can be noted that only a very limited range of genera of fungi are involved in these fermentations, namely Rhizopus, Aspergillus, Neurospora, Actinomucor and Saccharomyces. Furthermore, within a genus only a very limited number of species are actually utilized, for example Aspergillus sojae in soy sauce fermentation, and Neurospora intermedia in onjtom tahu fermentation.

“Regarding onjtom tahu fermentation, the fungus used was formerly erroneously listed as Neurospora sitophila (Dwidjoseputro, 1961).”

The authors then use analyses of conidia color and crossing experiments based on meiotic sterility to show that the cultures on okara tempeh (onjtom tahu) belong to a single species, Neurospora intermedia.

Note: This is the earliest English-language document seen (March 2009) that uses the word “tau chiow” to refer to Indonesian-style miso. Address: Dep. of Genetics and Cellular Biology, Univ. of Malaya, Kuala Lampur, Malaysia.


**Summary:** Table 1, “Main fermented foods using molds, yeasts or bacteria in Southeast Asia,” contains four columns: Name of fermented food, raw materials, main related microorganisms, and remarks (incl. names in other countries). Fermented foods listed include amazake (tapé / tapeh in Indonesia, with Rhizopus instead of Aspergillus oryzae), tempeh, sufu, onjtom, natto (soy bean fermented with Bacillus subtilis var. natto; Teranatto is same as original miso, Taois in Philippines).

Table 2, “Main fermented foods using molds plus bacteria, molds plus yeasts, yeasts plus bacteria and molds, or yeasts plus bacteria in Southeast Asia,” contains the same four columns. Fermented foods listed include soy sauce (Aspergillus oryzae, Saccharomyces rouxii, Pediococcus halophylus; called Jan [kanjang] in Korea and Thua nao [sic] in Thailand), Miso (same 3 microorganisms as in soy sauce). Address: Tokyo Univ. of Agriculture, Dep. of Agricultural Chemistry, 1-1, Suragaoka, Setagaya-ku, Tokyo.


**Summary:** “Two Far Eastern soybean favorites–tofu and tempeh–turn up exciting new menu and nutrition ideas in the OGF Research and Development Group’s latest tests...

“At this time, Dr. Schwartz is inviting a limited number of adventurous OGF readers to help him evaluate the ease and dependability of his method and tempeh’s potential as a new food for Americans. Readers who would like to join R & D’s modest ‘Soybean Task Force’ should write to Nancy Bailey, R & D Readers’ Service, Rodale Press Inc., Emmaus, Pennsylvania, 18049. Those selected will receive soybeans, culture, and complete instructions for making the simple incubator and tempeh itself.”

Contains a recipe for Tofu Loaf with Onion and Cheese from The Book of Tofu by Shurtleff and Aoyagi.

Note: This is the earliest document seen (March 2003) that mentions tempeh, published by or in connection with Rodale Press.


**Summary:** A brief introduction to soy flour, sprouts, whole dry soybeans, roasted soybeans, bean curd cakes [tofu], fermented curd, bean curd skin [yuba], dried bean curd sticks, bean paste, miso, black beans [soy nuggets]. With
illustrations from *The Book of Tofu* by Shurtleff & Aoyagi.


**Summary:** This attractive book of Chinese cooking from the Wei-Chuan Cooking School is a bilingual Chinese / English edition. On each page is one recipe and a 1/3-page color photo of the prepared dish. The title of the recipe is written in Chinese in large bold characters and is also given (to the right) in smaller bold letters in English. Above the number of servings is the province or region of China from which the recipe comes (e.g., Szechuan, Cantonese, Peking, Hunan, etc.) Most of the recipes call for ¼ to ½ teaspoon of MSG; many call for soy sauce.

The introduction (p. 2-17) contains: (1) Seasonings for Chinese cooking, incl. soy sauce. (2) Instruments [utensils] for Chinese cooking. (3) Culinary idioms (basic techniques, such as cleaning, cutting, heating the pan, stir frying, etc.). (4) Arrangement of seating order at feast. (5) Arrangement of the dinner sets at a feast. (6) Arrangement of food and menu. (7) Basic principles of arranging the menu. (8) Sample menus for banquets or ordinary meals. (9) Commonly used vegetables (2-page color photo, incl. “9. yellow soybean sprouts”).


“2. Sweet bean paste (‘t’ien mien jiang’). Made from ground, fermented steamed bread and spices” [soy is not mentioned]. “3. Soy bean paste (‘do ban jiang’). A thick black paste similar in taste to sweet bean paste, but made from fermented soybeans.” “8. Fermented black beans: Small black [soy] beans which have been marinated in soy sauce and salt and are used to flavor steamed fish and meat or in stir-fried dishes.” “10. Pickled bean curd or Chinese cheese [fermented tofu] (‘do fu ru’). Bean curd cubes which are first dried and then mixed with wine, spices and salt and allowed to ferment. It is used to season braised pork and duckling.” “21. You tiau. A deep-fried crispy Chinese cruller...” “Kau fu: A spongy type of vegetarian ingredient made from wheat gluten” (see p. 151). “Fried gluten ball (‘mien jin pau’): A type of light, round, deep-fried ball made from wheat gluten and water.” “Su tsang: A type of long thin roll made of wheat gluten and water.”


One section of the book titled “Bean curd & eggs” (p. 140-49) contains various tofu and yuba recipes, including: Ma-Po’s bean curd (Szechuan, p. 140). Vegetarian chicken loaves (with “16 sheets bean curd skin” [yuba], Shanghai, p. 147). Eggplant rolls with chopped pork (with “1 sheet bean curd skin, Taiwanese, p. 148). Stuffed bean curd rolls (with “8 bean curd sheets (bai ye), Shanghai, p. 149). Bean curd is counted in squares. Address: Taiwan.

338. Revelle, Roger. 1976. The resources available for agriculture: The physical resources of earth, air, fire (energy) and water are large but essentially fixed. The biological and social resources, however, are far from being pressed to the limit. *Scientific American* 235(3):164-68, 170, 172-74, 177-78. Sept.

**Summary:** Pages 170 and 172 discuss the importance of microorganisms and fermentation. “The fermentation process not only adds distinctive flavors, which are prized in their own right, but also often augments the content of riboflavin and other vitamins. Sauerkraut and yogurt are familiar fermentation products in American diets; tempeh, ragi, sufu, shoyu, ang-kak, tea fungus and mizo [sic, miso] are among those eaten in Asian countries.” Address: Director, Center for Population Studies, Harvard Univ., Massachusetts.


“The Institute of Food Research and Product Development, Kasetsart University, initiated several soybean utilization pilot projects five or six years ago. Using soybeans alone or combined with other ingredients, we have

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developed a range of products, such as baby foods, kaset protein, and snacks. Tests indicate that these foods are highly acceptable, being both palatable and nutritious. Some of these products are soon to be manufactured commercially by small-scale industries. This paper is a description of the soy food processing methods developed by the Institute."

Address: Inst. of Food Research and Product Development, Kasetsart Univ., Bangkok, Thailand.


• Summary: Contents: What is the joy of soy. Whole, dry soybeans (“My favorite way to cook whole, dry soybeans is to pressure cook them”). Soymilk. Tofu. Sweet tofu. TVP. Okara. This vegan cookbook was inspired by The Farm, a large spiritual community in Tennessee, where the author and her children lived for several years. “When I arrived on The Farm, I thought I didn’t like soybeans... Now I love soybeans and soymilk—not because my tastebuds have changed and I’ve acquired a new taste for them, but because I’ve learned new ways to cook soybeans so that they taste good to those same old tastebuds.

“The recipes in ‘The Joy of Soy’ have been developed through feedback from members of The New Life Co-op (326 S. Main St., Pleasantville, New Jersey), where products made from them have been selling rapidly for the past nine months.”


341. Product Name: Chinese-Style Tofu [Doufu (Firm Tofu), Hsiao Dou-gan (Tofu Cubes Fried in Spices), Ch’ou-doufu (Redolent Fermented Tofu), Yu-doufu (Deep-fried Tofu), Pai-yeh (Pressed Tofu Sheets), Kan-ssu (Pressed Tofu Noodles), Doufu-hwa (Curd in Whey)].

Manufacturer’s Name: American Food & Candy Co.

Manufacturer’s Address: 166 San Lazaro St., Sunnyvale, CA 94086. Phone: 408-773-0612.

Date of Introduction: 1976.

How Stored: Refrigerated.


Talk with Jim Pong of Pure Land Co. in Hayward. 1998. Oct. 21. American Food & Candy was started and owned by Old Mr. Wu in about 1976 in Sunnyvale; his given name was Mei. He worked closely with his daughter, Cynthia, and her husband, Richard Liu. Jim also used to work there.


• Summary: Contents: Introduction. Discussion: Inocula for fungi may be prepared in a number of forms or states. Sufu or Chinese cheese. Mold cheese made from milk. Tempeh. Chinese yeast and similar products (incl. ragi and murcha). Koji. Industrial production of Aspergillus oryzae spores (tane koji).

Six desirable inoculum characteristics are discussed.

Address: NRRL, Peoria, Illinois.


• Summary: Contains a great deal of information on and recipes using soyfoods. Chinese food expert Barbara Tropp says this book has the best glossary available, and has very creative and interesting but drab recipes.

Hoisin sauce is a ground bean sauce to which sugar, garlic, and other flavorings have been added. It is the most popular commercially prepared flavored bean sauce.

Civilized Chinese patterns of eating were established by Confucius. The second great influence was Taoism, which advocated a simple diet, natural foods, and the basic belief that proper eating leads to good health. The third great influence was Buddhism, which was opposed to killing, so advocated a vegetarian diet. The art of vegetarian cookery was initially developed mainly in Buddhist monasteries; later it spread to private homes and restaurants.

To make good meatless broths use soybeans, soy sprouts, tough or wilted vegetables, mushrooms, and / or bamboo shoots. To make soy sprouts, it is best to use new-crop soybeans, which have the highest germination rate. This book contains many recipes that call for sea vegetables. Soy sauce is widely used in Chinese vegetarian recipes.

Chapter 3, titled “Soybeans, soybean products, and other legumes” contains much useful information and recipes. A diagram titled “Chart of soybean products” (p. 53) shows the complex relationships, includes Chinese characters for each product, and shows a few soy products that are not in the Glossary: Fermented soybean curd (Fu ju), comes in white (pai), red (hung) and spiced (lu). The many interesting recipes, each with a Chinese name (with Chinese characters) and an English name include: Su huo t’ui and su chi (Mock ham), Su ya (mock pressed duck), and Wu hsiang tou fu kan
(Seasoned pressed bean curd).

Glossary (soybeans, soybean products, and legumes, p. 208-13; Chinese characters are given): “Fresh young soybeans–Mao tou.” Delicious. They are in season in the early fall. “They come in dark fuzzy pods and are sold by weight. Young soybeans are like corn and should be eaten as soon as they are picked from the plant. They may be cooked with or without the pods.”

“Dried soybeans–Huang tou.” Yellow soybeans.

“Soybean sprouts–Huang tou ya.” Sold by weight. Best when made in cooler weather. “When bought fresh, they will keep in the refrigerator for 2-3 days, or longer if kept in a brown paper bag inside a plastic bag.”

“Soybean milk–Tou chiang:... usually served hot as a beverage with breakfast.”

“Soybean milk skin–Called by many names [Fu yi, fu p’i; see p. 53]. Each region has a different name for it, as does each food processor, and the thickness shape and wrapping may be different.” Four kinds are readily available in Chinese food stores” (1) Erh chu is “cut into rectangles 1½ x 4 inches and 1/8 inch thick. The pieces some stacked and wrapped in paper, in half- or one-pound packages.” (2) Yuan chu comes in sticks. When reconstituted, its thickness is about the same as erh chu. (3) San pien fu chu is half-moon shaped. When still soft, it is folded into 6 x 10-inch rectangles then dried. It is thinner than erh chu. (4) Fu yi “is the thinnest of the bean milk skins. It is paper thin and almost transparent. When dried it is very brittle, and must be handled very gently. It is used mainly to wrap fillings. It comes in stacks of 8-10 sheets...”

“Soybean milk residue–Tou fu cha;” [okara]. Can be a delicious ingredient in cooking. “What is not used for food is made into a feed for animals or put into the ground as fertilizer.”

“Curdled soybean milk–Tou fu hua;” [calcium sulfate]: A “white substance which comes in powdered form. It is used to coagulate soybean milk to make tou fu (bean curd).”

“Tender soybean curd–Nen tou fu: When some water is removed from the curdled bean milk, it is known as fresh tender bean curd. It is cut into squares 4 x 4 by 1½ inches. Firm soybean curd–Lao tou fu: When a coagulant is added to the boiled bean milk of a different concentration and some of the water is removed, the milk becomes firm bean curd. It is firmer than the tender bean curd and is cut into 3 x 3 x 3/4-inch squares.

“Fresh bean curd sheet–Pai yeh: Fresh bean curd sheet looks almost like a sheet of unbleached muslin. When it is frozen, the color turns darker, to a light brown. It is made into square sheets of various sizes. It is used to wrap fillings and it is also sometimes cut into short strips and cooked in dishes along with seasoning vegetables. Pressed bean curd sheet is best eaten fresh...”

“Pressed soybean curd–Tou fu kan–plain: When even more water is pressed out of firm bean curd, it becomes Pressed bean curd... it is almost like a firm cheese.” It may be bought either plain (Pai tou fu kan) or seasoned (Wu hsiang tou fu kan). “The seasoned curd is cooked in soy sauce and star anise [pa chiao], giving it a brown color.” The white pressed bean curd should be soaked in salt water (made of 1 tablespoon salt to 4 cups water) in a covered container. The seasoned pressed bean curd should be soaked in salt water and soy sauce. If stored in the coldest part of the refrigerator, they will keep for several weeks.”

“Fried soybean curd–Yu tou fu:... The bean curd is cut into 1½ inch cubes and deep fried in oil until a golden crust forms outside, which the inside... remains soft.” It is “sold by weight, usually in half- or one-pound bags.”


Glossary (condiments and seasonings, p. 219-23): “Soy sauce–Chiang yu:” The “most important seasoning liquid in Chinese cooking. Comes in light or dark, thick or thin. Dark or thick is Lao ch’ou. Light or thin is Sheng ch’ou. Soy sauce also comes in different “flavors, such as mushroom soy sauce and, for nonvegetarians, shrimp roe soy sauce. Flavored soy sauces are used mainly for dips and for special flavors in salads, noodles, and as a final touch to a dish.”

Note 2: This is the earliest document seen (June 2011) that uses the term “mushroom soy sauce” to refer to a type of dark soy sauce flavored with mushrooms.

“Salted black beans–Tou shih:” These beans [fermented soybeans] are “used to flavor bland foods, such as eggplant or bean curd.” They are never eaten alone.

“Brown bean sauce–Yuan shai shih:” Made from “fermented soybeans and wheat flour mixed with salt and water. The beans in the sauce may be either ground (to make ground brown bean sauce–Mo yuen shih), or left whole. To this basic beans sauce, spice and other seasonings are added [in different proportions], creating many varieties” in “different regions of China. In Szechuan, large amounts of hot peppers and crush Szechuan peppercorns are added; in the northern provinces, garlic and scallions are used...”

“Hoisin sauce–Hai hsien chiang:” A “ground bean sauce to which sugar, garlic, and other flavorings have been added. It is the most popular commercially prepared flavored bean sauce. It is used for cooking, or very often as a dip for deep-fried batter-dipped vegetables.”

“Sesame paste–Chih ma chiang:” “Sesame oil–Ma yu:”

The section on Oriental vegetables is a long subsection (p. 66-67) on soybean and Japan. Soy related: Crisp chicken teriyaki (with soy sauce made into teriyaki sauce, p. 14). Tofu salad (with 1 pound soybean cake, p. 15). Fu yu spareribs (with ¼ cup fu yu, fermented bean cake, p. 19).

The section on “Ingredients and equipment” (p. 22-31) begins with a full-page color photo in which we can clearly see: Azumaya tofu in a white plastic film-sealed tub, a plastic bag of “salted black bean” (ingredients: Black beans, ginger and salt), small pieces of deep-fried tofu, miso in plastic tubes, Kikkoman soy sauce in a large rectangular can, Aji-no-Moto in a red can, etc. The text discusses: Soy sauce (“The one essential ingredient in Chinese and Japanese cooking”). Japanese sauces, seasonings, and pickles (“For example, besides soy sauce, you can find low-sodium soy sauce {for specialized diets}, sukiyaki sauce, teriyaki sauce, and soup base for noodles,” p. 24).

Note: This is the earliest English language document seen (May 2011) that mentions “low-sodium soy sauce.”

Chinese sauces, seasonings, and pickles, includ. the following which contain soy sauce: oyster sauce, brown bean sauce, Szechwan bean sauce, sweet bean sauce, hot bean sauce. Fermented black beans.

Bean cake–fresh and fried (“Soybean cake is almost as much a staple in Oriental cooking as rice.” The regular type is called tofu in Japan and dow-foo in Chinese. But there are other varieties: softer, firmer, dried, fried {comes in cubes, squares, and oblongs...} Fermented bean cake, also called red bean curd, white bean curd, or fu yu, is often sold in jars. Miso, used mainly in Japanese cooking, comes in many colors).

Bean sprouts mean mung bean sprouts. Foods from the sea include Japanese kombu and nori.


Soy related: Miso soup recipes (3, p. 34). Age-zushi (p. 52). Melting spareribs with black bean sauce (with 2 tablespoons fermented black beans, p. 63). Pork roast with miso (p. 64). Stuffed bean cake (with fried bean cake, p. 64). Sukiyaki (with 1 pound square tofu {soybean cake} cut into 1-inch squares, p. 66-67).

In the section on Oriental vegetables is a long subsection titled “Soybeans” (with a color photo of green soybeans growing on a plant, p. 94-95) which includes how to grow them in a home garden. The soybean plant has its own time clock, which gets its signal for flowering from the sky. “Short nights (long days) delay flowering; long nights (short days) speed up flowering.” Soybeans need a special inoculant of nitrogen-fixing bacteria. Describes how to cook and shell the beans in the pods, and to serve them cool, while still in the pod, as is commonly done in Japan.


• Summary: Contents. Foreword. Acknowledgment.

A summary of soybean area, production, and yield in the Philippines, 1959-1975 follows: The number of hectares used for planting soybeans went from 1,690 ha. in 1959 up to 2,200 ha. in 1962, and then decreased annually until it was only 1,240 ha. in 1973. However, a record high of 2,780 ha. was reached in 1974, followed by 2,018 ha. in 1975. Production of soybeans was low in 1959-60, only 571.8 and 981.3 tons, respectively. By 1962, however, production had increased to 2,066.9 tons, but decreased steadily over the years until 1974. In 1974, a maximum of 2,214.0 tons was produced. The corresponding annual yields (tons/ha.) reflect the sharp rise of soybean production in 1961-62 and the ensuing decline of the industry throughout the rest of the 1960s and early 1970s, until 1974, when production soared to new heights. Address: PCARR (Philippine Council for Agriculture and Resources Research), Los Banos, Laguna, Philippines.

Undated. No index. 27 cm. Spiral bound. [65 ref]

• Summary: Contents: Introduction. Home and village traditional soybean foods by country. 1. Soybean food uses and production in Asia. Soaking dry soybeans. In China: Tou chiang (soybean milk; preparation, ways of serving), tou fu (soybean curd; yen-lu is the Chinese name for nigari), tou fu nao (soft curd), tou fu kan (dry / firm bean curd), chien chang (pressed tofu sheets), yu tou fu (fried tou fu), tung tou fu (frozen tou fu), tou fu pi (protein-lipid film; yuba), huang tou ya (yellow bean sprout or soybean sprout), mao tou (hairy bean, green soybean, or immature soybean), dry soybeans (roasting and frying, stewing and boiling), roasted soybean flour. Fermented soybean foods. Production and consumption of soybeans (China and Taiwan).

Japan: Tofu (soybean curd), kinugoshi tofu, processed tofu products (aburage or age, nama-age and gammo), kori tofu (dried-frozen tofu), yaki tofu (grill tofu), yuba (protein-lipid film), soybean milk, gō (ground soybean mash), daizu no moyashi (soybean sprouts), edamame (green vegetable soybeans), whole soybeans, kinako. Fermented soybean foods: Production and consumption.

Korea: Tubu (soybean curd), soybean sprouts, whole green soybeans, parched or roasted soybeans, boiled soybeans, soybean flour, soysauce, bean paste [Korean soybean miso], natto (no Korean name is given), production and consumption of soybeans.

Indonesia: Tahu or tahoo (soybean curd), bubuk kedele (soybean powder), tempe kedele, tempe gembus [the name in Central and East Java for okara tempeh], oncom tahu [the name in West Java for okara onchom], other soybean products (soybean sprouts, green soybeans, roasted and boiled soybeans, kecap or soysauce, tauco or bean paste [miso]), food mixtures (Saridele, Tempe-fish-rice or TFR, Soy-rice baby food, soybean residue [okara]-fish-rice), production and consumption of soybeans.


8. Recent simple soybean processes, other than traditional. Simple village process for processing whole soybeans: Equipment, process, sanitation requirements, quality of product, evaluation of product in formulas and procedures for family and institutional use in developing countries. NRRC village process. Foods from whole soybeans developed at the University of Illinois (drum dried flakes, canned and homecooked soybeans, soy beverages and beverage products, spreads, snacks).

Ways of cooking and serving soybeans in the American diet. 9. Industrial processes. Industrial production and selling prices of edible soybean protein products. 10. Barriers to acceptability and utilization of soybeans in food and research recommendations: Availability. Cultural and social factors. Texture. Flavor. Nutrition and food safety. Technology development. Technology transfer. Research recommendations [concerning each of the above barriers]. Concerning Morocco: Cereal-soy blends have been used extensively in Morocco; in fiscal year 1974 some 14.7 million lb were shipped to Morocco. Mmbaga (1975) reported that soy flour is being used in making porridge, with 1 part soy flour to 3 parts maize / corn flour.

Tables show: (1) Soybean production and imports in Taiwan, 1962-1975 (tonnes = metric tons, p. 33). Production rose from a 53,000 tonnes in 1962 to a peak of 75,200 tonnes in 1967, then fell to 61,900 tonnes in 1975. Imports skyrocketed from 62,400 tonnes in 1962 to a record 827,300 tonnes in 1975. (2) Consumption of soybean foods in Taiwan, 1964-1974 (kg/capita/year, p. 34). Total soybean foods not including tofu rose from 1.08 kg in 1964 to a peak of 2.61 kg in 1972 then fell to 1.99 kg in 1974. Consumption of tofu (80% water) rose from 18.75 kg in 1964 to a peak of 33.89 kg in 1972, then fell to 32.04 kg in 1974. (3) Supply and disposition of soybeans in Japan, 1971-1974 (p. 49). Total supply is beginning stocks, plus domestic production, and imports. Total disposition is crushing, plus traditional foods and feed. In 1974 imports accounted for 87.5% of the supply, and crushing accounted for 71.0% of the disposition.

Note: This is the earliest English-language document seen (Feb. 2004) that uses the word “tubu” to refer to Korean-style tofu. Address: Northern Regional Research Center, Agricultural Research Service, Department of Agriculture, Peoria, Illinois 61604.


• Summary: A rough photocopied manuscript with a yellow cover, created in response to a letters from many people requesting information on how to start a tofu shop. Contents: 1. So you want to start a tofu shop or soy dairy? 2. Setting up shop; The community shop, the traditional shop, the steam-cooker shop, the pressure cooker shop, the soy dairy, the modern factory. 3. Ingredients. 4. Scientific data concerning the tofu-making process. 5. Tofu. 6. Firm tofu. 7. Using okara and whey. 8. Deep-fried tofu: Cutlets, burgers, and pouches. 9. Soymilk. 10. Soymilk ice cream, yogurt, kefir, mayonnaise, and cheese. 11. Silken tofu & soft tofu (Silken tofu is made from concentrated soymilk). 12. Lactone silken tofu. 13. Grilled tofu. 14. Wine-fermented tofu. 15. Dried-frozen tofu. 16. Yuba.

Appendix A: People and institutions connected with tofu & soymilk production. B: Sketches of tofu and yuba shops in Japan. C: So you want to study tofu in Japan? D: Table of equivalents.

Note 1. This is the earliest English-language document seen (March 2010) that uses the term “silken tofu” to refer to Japanese kinugoshi tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “wine-fermented tofu.” Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549; 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan.

348. Chen, Steve. 1977. Re: Tofu and fermented tofu in Taiwan. Letter to William Shurtleff at New-Age Foods Study Center, Oct. 14. 1 p. Typed, with signature on letterhead. • Summary: The following are personal estimates, with guarantee of their accuracy. The Taipei and Taiwan Tofu Associations have about 1,300 members but there are about 2,500 tofu shops in Taiwan.

About 100,000 tonnes (metric tons) of soybeans are used each year to make tofu and its related products. Roughly 1,000 tons of this amount are use to make fermented tofu (doufu-ru).

The population of Taiwan is about 14.8 million. Daily per capita consumption of fermented tofu is very small, about 0.5 gm. One kg of soybeans will yield about 2.5 kg of fermented tofu. About 200 to 300 shops in Taiwan make fermented tofu. They are essentially small, family-type operations with 2-3 workers per shop. Address: Country Director, American Soybean Assoc., P.O. Box 3512, Taipei, Taiwan. Phone: 7815880.


Anka is also known as ang-kak, angkak, angquac, beni-
kjör, aka-kjör, and red rice. It is used and is a commercial product in the southern provinces of China, in Taiwan, the Philippines, Thailand [and Okinawa].

In Taiwan, approximately 200 tons/year of anka are made. The average yearly per capita consumption here is about 12 grams.

Historically, Anka was apparently first noted in the Yuan (Mongol) dynasty (1260-1368). It was introduced to Taiwan by wine makers from Fukien [pinyin: Fujian] province of southern China about 100 years ago (Su and Wang, 1977). It is used to add both color and flavor to many foods including hung-lu chiu (red soybean cheese) [fermented tofu], and fu chiu (rice wine). A number of countries are gradually adopting natural pigments to replace coal-tar dyes, which may be carcinogenic. With anka there is no evidence of toxicity or carcinogenicity.


There is one table.


Chinese sufu (tau-hu-yi) is a highly flavored, creamy fermented tofu made in a two-step fermentation process: (1) Overgrow cubes of firmly pressed tofu with a mold belonging to the genus Actinomucor; Rhizopus, or Mucor; (2) Immerse these cubes, each covered with a fragrant white mycelium, in a salt brine / rice wine mixture and allow to stand for several months.

The salty flavor of sufu is suggestive of anchovies; most types are soft and pale yellow. Typical “cubes” are 2 to 4 cm square and 1 to 2 cm thick. Red sufu is colored with hung chu or red fermented rice, which is derived from the culture of another mold, Monascus purpureus.

Because of the numerous dialects used in China and the difficulties of phonetic rendering from Chinese to English, the following synonyms for sufu have been found: tosufu, fu-su, ku-su, rou-tsu, rou-tsu, rou-su, ro-su, foo-su, and foo-yue. “Other names by which the product is known are to-fu-zu in Mandarin, and tau-zu (tso-hu-yi) in Taiwanese. Sufu is the name that first appeared in the literature. Literally, sufu means “molded milk,” and tosufu means “molded bean milk.”

It is not known when production of sufu began, however according to Nganshou Wai (1964): “The Food Encyclopedia, written by Wang Su-Hsiung (1861) of the Ch’ing Dynasty [Qing / Manchu dynasty, 1644-1912] describes the food as follows: ‘Hardened tofu is [difficult to digest] and it is not healthful for children, elderly persons or ill persons. Sufu, which is prepared from tofu, is better because it is aged; it is very good for patients.’

In 1977 in Taiwan, annual production of sufu was about 10,000 tons and consumption was about 12 gm per person per week.

A figure (p. 555) shows a flow sheet for the production of sufu from 1 kg of soybeans (Source: L-P. Lin 1977).

Traditionally sufu was made in the spring or fall. After the tofu is made and pressed, it is cut into pieces about 8 x 8 x 2 cm., each weighing about 70 gm. Traditionally tofu was exposed to bright sunlight for several hours to both sterilize and dry the surface. Traditionally the tofu was inoculated by placing it on rice straw, but this leads to quality that is not uniform because of contamination. Twenty or more trays are piled up and placed in a room at 10-20ºC. After 3-7 days, when a white mycelium can be seen growing on the surface of each piece of tofu, they (the pehtze) are removed from the trays and salted.

In the modern method, the tofu is cut into cubes, placed in an oven at 100ºC for 10 min, then inoculated on the surface with Actinomucor elegans NRRL 3104.

The traditional pehtze are transferred to large earthenware jars, each having a capacity of 700 liters. Each layer of pehtze is sprinkled with a layer of salt. After 3-4 days, when much of the salt is absorbed, the pehtze are removed, washed with water, and put into a smaller jar for (about 80 liters, typically earthenware) processing. First a dressing mixture, which is different for each type of sufu, is placed in the jar. (1) To make red sufu, for example, red rice koji (angkak) and soy sauce mash are added. (2) To make tsao sufu, rice wine mash, cloves and orange peels are added. (3) To make Kwantung sufu, red chili pepper, anise, salt, and red rice koji (angkak) are added. (4) To make rose sufu,
some essence of roses is mixed into the dressing. Alternate layers of dressing and pehtze are packed into the jar until it is about 80% full. Then brine with a concentration of about 20% NaCl (table salt) is gently poured in. For some types of sufu, Shaoxing (pinyin: Shaoxing) wine can comprise part of the brine. Finally the mouth of the jar is covered with the sheath leaves of bamboo shoots and sealed with clay. After 3–6 months of fermenting and aging, the sufu is ready to eat.

A description of nyufu is given, based on Okada et al. 1974.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the word “nyufu” to refer to fermented tofu. Address: Dep. of Agricultural Chemistry, National Taiwan Univ., Taipei, Taiwan.

- **Summary:** Discusses each of the following foods briefly and gives sources of further information: Kinako (roasted soy flour), soymilk, yuba, tofu, kori tofu (dried-frozen tofu), aburaage, namaage, kinugoshi tofu, sufu, soy cheese (Western style), soy yogurt, ganmodoki, natto, Hamanatto, koji, tempeh, miso, tao-tjo [Indonesian-style miso], kochu-jang, shoyu, and ketjap.

Note: This is the earliest German-language document seen (Oct. 2011) that uses the word “sufu” to refer to fermented tofu. Address: Institut fuer Lebensmitteltechnologie, Frucht- und Gemueseetechnologie, Technische Universitaet Berlin, Koenigin-Luise-Strasse 27, D-1000 Berlin 33, West Germany.

- **Summary:** Chou or chau tofu is a type of fermented tofu. After deep-frying, it has a special odor and a spongy structure. Tofu used for chou tofu should be firmer than regular tofu. It is steeped in a fermentation liquor (consisting of pickles, dried shrimps, and salted egg) for 6 hours at room temperature. Chou tofu [ch’ou toufu] is usually eaten immediately after deep frying, with pickled vegetables, chili paste, and soy sauce.

- **Summary:** Page 326 states: Soybeans—the fifth of the classic Five Staples (or Five Grains)—are usually the most important, although other legumes make a surprisingly good showing in south China, no doubt because soybeans grow better in the north. The soybean “produces more protein per acre and per pound than any other common humanly edible crop, plant, or animal. This has caused them to become more important than any animal food as a protein provider in China. The Chinese have long recognized their similarity to animal products and, indeed, have built up a huge cluster of imitation-meat foods (probably developed originally by, and certainly now associated with, vegetarian Buddhists). The Chinese lack of interest in dairy products is almost certainly, in part, a result of the fact that the soybean provides the same sorts of nutrition more economically—though a desire to differentiate themselves from the border nomads and to be independent of them in food economy must also be taken seriously as an explanation. (It is the classic Chinese explanation of the phenomenon but has been dismissed by those moderns who believe that all traditional explanations must necessarily be wrong.)

“Further discourse on the soybean belongs properly in the following section on food processing, for the soybean is used neither in its raw state nor, usually, in a simple boiled or roasted form. There are good reasons for this. The soybean, being so nutritious and succulent, has been faced with intense natural selection pressure by seed-eating insects and other animals; surviving soybean strains contain whole galleries of poisons and other unfortunate chemicals, which protect the seeds against destruction but make them dangerous food in the uncooked and unprotected state (Committee on Food Protection 1973). Simply prepared soybeans are not very digestible, since heat bonds some of the nutrients into hard-to-digest form in the intact bean. Thus almost all soybeans consumed in China are fermented, ground into flour, and then processed, sprouted, or otherwise milled.”

“The soybean is so famous that one is surprised to discover from Buck that the broad bean outranks it in some parts of south China.” However in genetically susceptible individuals, Vicia faba produces favism, a condition characterized by acute anemia and other unpleasant symptoms. Other important sources of protein are black soybeans (a variety of soybean mentioned by Buck) and sprouts from mung beans and soybeans (tou ya). Bean sprouts bridge the gap between grains and vegetables (ts’ai) (p. 326-27).

“A huge bowl of rice, a good mass of bean curd, and a dish of cabbages—fresh in season, otherwise pickled—is the classic fare of the everyday south Chinese world.”

“The New World vegetables stand out as a special class because of their common and recent origin in China and their extreme importance. The white and sweet potatoes have become staples, as has corn. In addition to these, the peanut (Arachis hypogaea) has become the most important oilseed through much of south China, as well as a much used food” (p. 328). The peanut came from South America. Today, peanuts have become more important in areas where they are grown than rapeseed. Peanut and rapeseed oils are polyunsaturated and contain plenty of linoleic acid, a
dietary requirement (p. 333, 343, 348). Mushrooms and their relatives are widely used in vegetarian dishes (p. 332).

The section on food processing (p. 337-41) notes that tragic practice of polishing rice, which removes most of the nutrients including fiber. There are many questions about the origins of pasta. Egg noodles probably originated in China. Italian spaghetti is similar to Chinese origins of pasta. Egg noodles probably originated in China. The technology of soybean process is too complex to discuss except briefly in this chapter. Most important is the production of bean curd or tou-fu (Cantonese tau-fu, Hokkien tau-hu). Hokkien cooks prefer a drier, firmer bean curd. Bean curd is often sold fried. The skin resulting from boiling soymilk [yuba] is skimmed off, dried, and widely used. “Other closely related processes produce the range of imitation meats developed by vegetarians, specifically Mahayana Buddhists. Credible imitations... are made for chicken, abalone, and other white meats, and even beef and pork. The West has picked up the idea and developed it much further, climaxing in the production of textured vegetable protein (TVP), but has—characteristically!—ignored the problem of making the result taste good. The ideal in the West seems to be to make it tasteless” (p. 339).

Concerning fish farming (p. 334-35): “Some fish, however, a pond-reared. Those that have been effectively domesticated are carp. These have several advantages: they produce vast amounts of protein per acre; they do not have to be specially fed since they eat algae and weedy grass and small animals of the ponds and pond fringes; they can live in foul water, and thus in stagnant ponds and market fish barrels; they are efficient converters, putting a large percentage of their feed into growth; and relative to other fish, they are easy to breed in captivity. The first fish farmed in the world were probably the Chinese carps.” However, no mention is made of soybeans being fed to the fish. Address: 1. Assoc. Prof. of Anthropology, Univ. of California at Riverside; 2. Riverside, California.


• Summary: “Soybean grows easily as a companion crop with kaoliang or corn. It is consumed all over China” in various forms; as bean curd [tofu], soybean milk, tou fu nao (“bean brain”–slightly coagulated soymilk, softer than tofu), tou cha [okara] (“the finer remains of the soybean from which the bean milk has been extracted is usually fed to pigs, but can be the poor man's ta'si [side] dish”).

Young soybeans in pods, freshly picked from the plant, are boiled in water or baked on the fire and consumed as snacks. They are served with soy sauce and sesame oil and eaten by using the teeth to scrape the beans into one's mouth.

Other soybean products consumed in north China include: soybean sprouts (eaten after submersion in boiling water for 1-2 minutes), “fermented bean curd (fu ju), molded bean curd (ch'ou tou fu), dried bean curd [pressed bean curd] (tou fu kan) (p. 301).

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term ch'ou tou fu or the term “molded bean curd.” Address: 1. Evanston, Illinois; 2. Prof. of Anthropology, Northwestern Univ.


Legumes (tou) were an important part of the Chinese diet in T'ang times. Soybeans (ta tou = large beans) had a variety of uses and received considerable attention from the T’ang pharmacologists, who claimed to have discovered that the beans had different effects on the body depending on the way they were prepared. For example, when stir-roasted they were excessively heating, boiled they were too chilling [cooling], made into a relish (shih = soy nuggets) they were very cool, but pickled to make chiang (Chinese-style miso) they were balanced. However when stir-roasted and taken in wine, they were said to be curative of certain kinds of paralysis. The young shoots of a variety of soybean called “white legume” (po tou) were much admired for their flavor, either cooked or raw, and were said to be good for the kidneys (p. 90). Also important in the diet were “true” millet (chi; Panicum miliaceum), foxtail millet–also called spiked or Italian millet (su; Setaria italica), shu was the common word for glutinous millet and no was that for glutinous rice, various sea vegetables such as purple-leaved laver, green laver or “sea lettuce,” and the sugary sweet tangle (p. 91), Far Eastern eggplant or brinjal (p. 93), and the jujube—which resembled the Western date (p. 95). Sesame seeds were chiefly of interest as a source of oil, but they were also fried and eaten (p. 98).

Concerning animal milk, there is the widespread idea that a line divides East Asia into two cultural groups: One depends on milk products (Indians, Tibetans, and many Central Asian nomads), and the other (which includes the Chinese) rejects them with loathing. “Indeed some evidence for this classification can be found at every period of Chinese history, even though warm milk was regarded as a highly nutritious food from very ancient times (Cooper and Sivin...
1973, p. 227). It seems, however, that after Han times, when the intermingling of Chinese and Altaic customs became pronounced to a new degree, the barrier of prejudice broke down, and by T’ang times milk products formed a significant part of the diet of the upper classes.” Probable reasons for this change are given. “Milk was modified in many ways. It was curdled to make, for instance, (ju fu), analogous to bean curd [tofu]. Indeed, much more popular than unaltered milk were a number of fermented or soured derivatives.” Three of these, which formed a hierarchy, were given special attention and spiritual significance corresponding to the development of the Buddha spirit: kumiss (lo, the lowest), kaymak or Devonshire cream (su), and clarified butter (t’i-hu, the highest) (p. 105-06).

Fresh ginger had a cooling property if used with the skin intact, but was warming if the root was peeled (p. 111).

The section titled “Pickles and preservatives” notes that the most characteristic and traditional Chinese methods of preserving involved fermentation processes which reduced "proteins into their component amino acids and amides by the action of enzymes, ferment, and molds. A very special species of pickle was called chiang, which has been aptly translated ‘bean-pickle.’ The word chiang appears in altered form as the first syllable of the Americanized Japanese expression for shoyu–soya. However in pre-modern times, chiang was not necessarily a soybean product. Indeed the word was sometimes applied to pickles based on meats and seafoods (Shih 1959, p. 84-85; Fan Sheng-chih Shu)... I shall use the term bean-relish to represent the Chinese word shih, the name of a popular relish of decomposed soybeans that assumes a dark color by interruption of the hydrolytic process or by drying at a high temperature (Shih 1959, p. 87). The name was given to a number of similar concoctions, some prepared with wine, some with vinegar, some with brine, and so on. The differences were frequently local. One authority mentions a variety peculiar to a region in Honan that was made from steamed soybeans, with salt and fagara added. It matured in two or three days of warm weather. It was said that this salty pickle could be kept for ten years without spoiling.”

“The milky bean curd–also known to Westerners by its Japanese name, tofu (Chinese tou-fu)–was a ferment made from many kinds of beans and peas. It was an ancient and familiar product (S.C. Li 1965 ed. of Pen-ts’ao kang-mu, 25:5).” Note: The author must be referring to fermented tofu, which was usually made from soybeans.

In the discussion of fish farming (p. 102) no mention is made of soybeans being fed to the fish. Address: Prof. of Oriental Languages, Univ. of California at Berkeley.


• Summary: These three color photographs (each 3½ by 5 inches) were taken on 9 Jan. 1978 by William Shurtleff during a research trip (Jan. 6-15) to The Philippines. They show: (1) A container with squares of brine-fermented tofu on a table. In the glass jar are black soy nuggets (tao-si). (2) A single cube of fermented tofu on a spoon held over a sheet of paper. In the small cup are soy nuggets. (3) Tao-si being
generally use bacteria and non-flamentous fungi, whereas Oriental fermentation procedures generally use filamentous fungi. The following foods are discussed: Cheeses (particularly Roquefort and Cheddar), sufu, yoghurt, meat, fish, soy sauce, miso, tempeh, and ang-kak. Flow sheets show the production of sufu and soy sauce.


• Summary: Foods are fermented to improve the flavor, color, aroma, and texture, and to remove toxic constituents. Occidental fermentations generally use bacteria and non-flamentous fungi, whereas Oriental fermentation procedures generally use filamentous fungi. The following foods are discussed: Cheeses (particularly Roquefort and Cheddar), sufu, yoghurt, meat, fish, soy sauce, miso, tempeh, and ang-kak. Flow sheets show the production of sufu and soy sauce.


• Summary: An introduction to tofu, based on a talk with Dr. Genevieve Ho, home adviser, UC Extension Service; she was born in China and educated in the USA.

The use of bean curd in China was recorded in about 160 BC during the Han dynasty. With this long history of development and refinement, and with continuous regional and local innovation, it is easy to understand why bean curd has become so tremendously popular in China and in nearby countries, and why so many varieties exist today.

Ho adds that “fermented bean curd has sufficient vitamin B-12 to prevent pernicious anemia.”

In East Asia, “Buddhists do not eat anything that contains blood. Nor do they eat milk, eggs, or shellfish.” In this vegan diet, tofu is a very valuable food. “Strict vegetarian restaurants serve dinners and banquets made of food from only plant sources.” Main dishes include mock chicken, mock fish, and mock sausage.

In our world, with increasing population and decreasing food supply, the soybean is “invaluable in helping us to return to original foods as opposed to converted foods.” When a food is converted from a plant to an animal food, it requires 7-11 units of plant protein to obtain 1 unit of animal protein. “No wonder I am always trying so hard to get people to eat more bean curd.’ See also The Book of Tofu by Shurtleff and Aoyagi (Autumn Press, Box 469, Soquel, California 95073; $6.95). Includes 4 recipes for bean curd supplied by Dr. Ho. One of these, Hot spicy bean curd, includes “1½ teaspoons hot fermented bean paste” and “1 pound fresh bean curd, cut into ½-inch cubes” as ingredients.

A photo shows Dr. Ho at a market in Chinatown. A comparative nutritional evaluation chart gives the nutritional composition of soybean curd, pressed soybean curd, milk (cow’s, whole fluid), and soybean milk. Address: Times staff writer.

362. Product Name: Miso Cheese (Tofu Fermented in White Miso).

Manufacturer’s Name: Soy Plant (The).

Manufacturer’s Address: 211 East Ann St., Ann Arbor, MI 48104. Phone: 313-663-0500.


Ingredients: Firm tofu, miso.

Wt/Vol., Packaging, Price: Sold fresh in slices in a deli.

How Stored: Refrigerated.

New Product–Documentation: Interview with Steve Fiering. 1988. June 10. He is at 30 Newell Rd., Palo Alto, California 94303. Phone 415-326-7123. “This product was developed in the fall of 1978 by a person name Jura (pronounced Ju-RAH) McDowell, who was a black American Rastafarian and a vegan from Alabama. He made very firm tofu, sliced it into ½-inch-thick slices, and embedded it in young, usually sweet white miso in a crock. Some of the miso they made in house, and some they bought from Westbrae, who bought it from Miyako/Cold Mountain in Los Angeles. The tofu was not wrapped in cheesecloth. After about 4-6 weeks they would remove the tofu, scrape off the miso for use later in cooking, then sell the tofu slices in the deli. The tofu was never pureed (like Simply Natural did) to give a cream-cheese consistency. By the time it had been through the fermentation it has lost the rubbery aspect of its texture. It was pretty soft, but we never processed it any further. It was sort of like the cream cheese you buy in a slab, wrapped in a piece of Saran. It was always quite tasty when we would make it. I always thought it was great, and a great original idea. It was very rich, kind of like Brie. We used to love it when we could get it. We just never sold it outside our Soy Deli and even in the Deli we usually had a very limited amount of it. People would use it as a spread. It was quite expensive for us to make, probably over $6 a pound, mainly because of the cost of the miso. That was prohibitive, so it never really became anything. We could never make any money on it. Jura also made delicious stuffed tofu pouches (Agé) and yuba rolls that were sold in the Deli. He did a lot of experimenting.”
Walter Louie arrived at Wo Chong in about 1949. He stopped making it because he was short of manpower.

Note: This is the earliest document seen (April 2001) that contains tofu industry or market statistics for smaller companies. Address: 790 Los Palos Manor, Lafayette, California 94549. Phone: 283-3161.


• Summary: Chapter 9, “Traditional fermented food products (p. 224-53), by Larry R. Beuchat, is cited separately.

In Chapter 13, “Metabolites of Fungi Used in Food Processing” (p. 368-96), by R.J. Bothast and K.L. Smiley, the section on enzymes (p. 378) begins: “Fungal enzymes have been used for hundreds of years, especially in the Orient. However, modern industrial enzyme technology probably started with Takamine (1894) [Note: In Sept. 1894 he was issued two U.S. Patents for “Process of making diastatic enzyme,” Nos. 525,820 and 525,823] and his work with Aspergillus oryzae. Today many industrial enzymes are of fungal origin.” These include α-amylase (from Aspergillus oryzae and A. niger), glucoamylase, pectic enzymes or pectinases, naringinase, invertase (sucrase), α-galactosidase, lactase (Beta-D-galactosidase), protease (from Aspergillus oryzae), rennet (called rennin, if pure; from Mucor pusillus, Mucor miehei, or Endothia parasitica; used in many types of cheeses), and glucose oxidase, cellulase, lipase, catalase.


Tables show: (1) Some fermented foods of fungal origin. For each food is given: Product name, geography, substrate, microorganisms, nature of product, and product use. Soy-related products include: Chee fan, Chinese yeast, Hamanatto, ketjap, meitauza, meju, miso, shoyu, sufu, tao-si, taotjo, and témépé.

“Yukiwari-natto is made by mixing itohiki natto with rice koji and salt, and aging at 25 to 30ºC for about two weeks.” Note 1. Yukiwari natto is natto resembling miso, featuring the stickiness (nebari) of natto and the sweetness of koji. It is made by a two-step fermentation. Another process: (1) Make the natto and the koji, separately. (2) Mince natto finely and mix it with koji, shoyu, and dashi made from kombu. Ferment at 30-33ºC for 30-40 days.

Note 2. This is the earliest English-language document seen (Aug. 2006) that mentions the term yukiwari-natto (or yuki-wari natto). Address: Dep. of Food Science, Agric. Exp. Station, Univ. of Georgia, Experiment, GA.


• Summary: The author concludes that soybeans are most likely to be the protein source of the future. Chapter 2, “The Cinderella Bean” (p. 32-53) and Chapter 3, “Soybeans, Oriental Style” (p. 54-71) both discuss the benefits of soybeans. Pages 37-38 note that soybeans were once called “haybeans” and their hay was called “haybean hay.”

Note: This is the earliest English-language document seen (Oct. 2011) that which uses the term “haybean” or “haybeans.”

The work of the USDA Northern Regional Research Lab. (NRRL) with soyfoods is described at length. While at the NRRL she first encountered “sufu.” In “Chinese markets, sufu is not called sufu but ‘bean curd’ or ‘bean cake.’ As soon as I saw sufu I realized it has an image problem—not as unappetizing as natto, but distinctly unpleasant. Picture grayish chunks of some odd-looking material floating in a murky liquid, like biology specimens in a bottle, and you have a typical bottle of sufu.

“Sufu looks so bad that my husband, who has faithfully eaten a number of odd-looking sources of protein that I have purchased over the years, refused it. It took a little courage for me to tackle one of the grayish lumps myself but I finally ate one. To my surprise, it was good, rather like a tangy dairy cheese but with a distinctive, nonbeany flavor of its own” (p. 60-61).

Chapter 6, “It Ain’t (Just) Hay,” is about alfalfa leaf protein and leaf protein concentrate. Research on leaf protein “really started during World War II, when British scientist N.W. Pirie suggested the use of leaves to augment dwindling meat supplies... Pirie’s proposal never got underway during the war because of the costs involved, but after the war he was given a laboratory where he carried out most of the pioneering work on leaf protein.”

Chapter 9, “SCP: Promises, Promises,” is about single-cell proteins such as the bacteria Cellulomonas and Pseudomonas (the champion, which can double its weight in 9 minutes). A probable culprit in SCPs is “nucleic acids, which have been shown to cause elevated uric acids in humans if used over an extended period of time. Raised uric acid levels lead to gout, kidney stones, and gallstones. Some
The following soy-related foods are mentioned: Koji inspection.


In the section on “Oriental fermented foods” (p. 387-91), the following soy-related foods are mentioned: Koji (chou in Chinese), soy sauce, tamari sauce, miso, tempeh, natto, soybean cheese or tou-fu-ru. Address: 1. Univ. of Wisconsin 2. Univ. of Maryland.


On page 102; both refer back to page 96.

Footnote 40: Breakfast may include “dried bean sticks” [dried yuba sticks]. Dinner includes a main dish “plus one small dish. “The small dish could be salt fish, preserved olive, fermented bean curd, sweet pickles or plum sauce.”

Note 1. Footnote 40 refers to a menu listed in Chinese World, 28 Feb. 1910 for three meals served in one day at Angel Island. Complaints about food were common so the government agreed to have the food provided by private concessionaires—the first one being a firm run by a Chinese man, Fong Wing (Kuang Zhujing) and his white partner. The dinner meal consisted of a main course plus one small dish—as described above.

Footnote 42. “... pork and mustard greens soup, fermented bean curd (Tues.); pork with greens, salt fish (Wed.); pork with dried bean sticks, plum sauce (Thurs.); pork and winter melon soup, bean curd with soy sauce (Fri.),...”

Note 2. Footnote 42 mentions another menu provided by the white concessionaire who won the next bid. A similar menu was offered which also included fermented bean curd, plus dried yuba sticks and tofu. Address: Vice president and past president of the Chinese Historical Society of America in San Francisco and an instructor in Asian American Studies at the University of California, Berkeley.


On page 102; both refer back to page 96.
mushrooms or shrimp roe are also available.

“Black bean sauce is a near relative of soy sauce, being made from salted, fermented black soy beans. Again, mention must be made of the three main types of soy bean pastes: hot (with chillies), sweet (with flour, sugar and spices [t’ien mien chiang]) and yellow, which is very salty indeed... Hai Hsien [Hoisin] sauce combines garlic, chilli, beans and ginger with other elements.”


Also: Sweet red bean paste (hung tou sha hsien, with small red beans [azuki], p. 278).

Glossary (p. 302-11; all Chinese words are given only in Chinese characters, which we have romanized in pinyin) incl.: Beancurd (doufu). Beancurd, dry (toufu gan). Beancurd cubes, fried (za doufu). Beancurd cubes, preserved (la furu, spicy fermented tofu); also known as preserved beancurd and Chinese cheese. Beancurd skins, dried (fupi) [doufu pi, yuba]. Beancurd sticks, dried (fuzhu); used frequently in vegetarian cooking. Beancurd pastes (gan shi jiang). Sauces produced from soya beans and other ingredients: Hot bean paste (xiang shi la jiang), soybean paste (mo shi jiang), “sweet bean paste (tian shi jiang); produced from fermented black soy beans, flour, sugar and spices. Substitute: Hoisin sauce.” Note: This is the earliest document seen (Feb. 2009) that uses the term “sweet bean paste” to refer to a Chinese paste made with soybeans. Yellow bean paste ( dou ban ji). Bean sprouts: Shoots of the mung bean or the soya bean (da dou ya cai), the latter being much larger and stronger flavoured. “Black beans (dou shi): Salted, fermented black soy beans, Lightly salty in flavour. Used as seasoning. Will keep indefinitely in dry conditions. Chinese cheese (see beancurd cubes, preserved). Dry beancurd (see beancurd, dry). Flour—“High gluten flour (gao jin fen): A special kind of ‘strong’ flour, which gives extreme elasticity, making it possible to roll out the dough to very fine layers. Used for wonton wrappers.” Fried beancurd cubes (see beancurd cubes, fried). “Hoisin sauce (hai xian ji): A seasoning sauce or condiment made from red beans (hong dou) [azuki], soy beans, sugar and spices. Sweet-spicy and tangy in flavour. Sold in cans or jars... Also known as Seafood Sauce and Barbecue Sauce.” Hot bean paste (see bean paste). ‘Lu Shui’ sauce (lu shui zi, in Cantonese ‘Lu Soy’). A ‘master sauce’ or more accurately, a stock made with soy sauce, sugar, five spices and ginger. Used for simmering foods, particularly poultry. It gives a rich flavour and deep brown colour. For recipe see p. 157. Note: Widely used in Shanghai, and in Jiangsu and Zhejiang provinces). “Mao tou green peas (mao dou): Small beans, grown in the north, with dark-green, slightly hairy pods, which should be removed. Substitute: lima beans.” Monosodium glutamate. Oyster sauce (hua you): A viscous dark-brown sauce made from oysters and soy sauce through a process of fermentation. Used as a flavouring and/or colouring agent as a condiment. Sold in bottles.” Preserved beancurd (see beancurd cubes, preserved). Red beans (hong dou), [azuki]. Soy bean paste (see bean paste). Sweet bean paste (see bean paste). Yellow bean paste (see bean paste).

Talk with Cecilia Chiang, founder of The Mandarin restaurant in San Francisco. 2009. Feb. 16. She has this book. The authors of this book are not well known in China; they are mostly amateurs. The best Chinese cookbooks are written by Fu Peimei, a lady who was a real authority on all the different styles of Chinese cooking; she is no longer living. Many of her cookbooks are in both English and Chinese. Concerning “Bean paste,” some of these are no longer available, even in the USA. Cecilia says Sweet bean paste may be something like t’ien mien chiang. Hoisin sauce is not used in Beijing, Shanghai, or anywhere in northern China; it is used mainly in Canton and south China. Cecilia thinks “Sweet bean paste” (t’ien shih chiang, p. 303) may be used only in Hong Kong. Most Chinese have never heard of this kind of sweet bean paste. True Cantonese food is quite different from that of Hong Kong. Cecilia knows Cantonese cooking very well; she goes there several times every year. Cantonese make the best soups, the best steamed fish and steamed chicken, and also their famous pork sausage (la chong?). Beijing cookery uses hard tofu, but most soft and silky tofu is imported from Japan.

upating of a graph of U.S. soybean production (p. 1). 
Updating (to 1976) of a table on U.S. and world production 
of important oilseeds (soybeans, cottonseeds, peanuts, 
sunflower, rape, sesame) (p. 2). Minor textual changes on 
pages 18-19. Addition of a table showing distribution of 
the 3 leading soybean varieties in 14 major states and the 
percentage of acreage harvested for each variety in 1976 
(e.g., in Illinois, Williams accounted for 25.1% of harvested 
acreage, Amsoy 17.3%, and Wayne 12.8%). And updating of 
a table on U.S. soybean production by state showing acreage 
harvested, yield per acre, and production for 1974, 1975, and 
1976 (p. 32).

The foreword, chapter titles, and index have not been 
changed at all. Note: Vol. 2 was never published. Address: 
Oilseed protein consultant, Protein Technology, Richardson, 
Texas.

Beijing, China: Shang wu yin shu guan. 976 p. 27 cm. (Eng; 
Chi)

* Summary: This comprehensive dictionary uses pinyin 
romanization / transliteration, with accents; Chinese 
characters are given and defined in English. It contains 
over 6,000 single-character entries, including characters with 
variant tones. There are over 50,000 compound-character 
entries and over 70,000 compound words, set phrases and 
examples. The Chinese title is Han Ying ci dan. Soy-related 
terms include:

Page 92: chi, douchi; see Douchi below.
Page 125: Dadou (soybean, soya bean).
Page 164: Doubanjiang (thick broad-bean sauce).
Doubing (defatted soya beans cake; bean cake). Douchi 
(fermented soya beans, salted or otherwise [soy nuggets]).
Doufu (bean curd [tofu]). Doufufang (bean-curd plant 
[tofu shop]). Doufugan (dried bean curd [pressed tofu]).
Doufunaor (jellied bean curd). Doufupi (skin of soya bean milk [yuba]; thin sheets of 
bean curd). Doujiang (soya-bean milk). Douqi (bean stalk).
Dousha (sweetened bean paste). Douyou (soya-bean oil).
Douzha (residue from beans after making soya-bean milk; 
bean dregs [okara]). Douzhipin (bean products [soyfoods]).
Pages 210-11: Fu (rotten, putrid). Furu (fermented bean 
curd). Fuzhu (dried bean milk cream in tight rolls [dried 
yuba sticks]).
Page 294: Huangdou (soya bean, soybean [yellow 
soybean]).
Page 324: Jia (pod). Jiaguo (pod, legume).
Pages 336-37: Jiang (1. A thick sauce made from soya 
beans, flour, etc. 2. Cooked or picked in soy sauce, such 
as pork or braised pork; tomato sauce, ketchup). Jiangcai 
(vegetables pickled in soy sauce, pickles). Jiangyou (soy 
sauce, soy). Jiangyuan (a shop making and selling sauce, 
pickles; sauce and pickle shop).

Page 459: Maodou (young soya bean [edamame, green 
vegetable soybean]).
Pages 470-71: Mianjin (gluten [wheat gluten]). Miao 
young plant, seedling).
Page 487: Nai (breasts, milk, suckle, breast-feed [dounai 
= soymilk]).
Page 553: Qi (beanstalk). Page 561: Qu (leaven, yeast, 
Aspergillus [kogi]).
Page 661: Taijiquan (a kind of traditional Chinese 
shadow boxing [taichi]).
Page 972: A brief Chinese chronology [of dynasties].
Note 1. This is the earliest English-language document 
seen (Feb. 2004) that uses the word “doufugan” to refer to 
Chinese-style tofu.
Note 2. This is the earliest English-language document 
seen (Oct. 2008) that uses the term “doufupi” (regardless of 
hyphenation or spacing) to refer to yuba. Address: Peking, 
China.

condensed edition of The Book of Tofu. Letter to William 
Shurtleff at New-Age Foods Study Center, Jan. 26. 1 p.
Handwritten (in pencil) and signed.

* Summary: He received the condensed version from 
Shurtleff and Aoyagi. “I think that the compact format 
should reach a large readership. Excellent work!”

“...I particularly liked your having created a separate 
section on ‘Fermented Tofu,’ and of course I noticed your 
updating the sections on nattō, Daitokuji nattō & hamanattō. 
No doubt you did considerable revision.

“...On rereading some parts of the original edition for 
comparison I did have some questions (I am not sure if I had 
brought them up with you or not):

“...P. 312, unabridged. 4 Chinese characters (CC). You 
have read as ‘Nishiyama Sodo,’ though when I went there 
it was told it was called ‘Seizan Sodo.’ (Incidentally it was 
perhaps the case is that same as with 2 CC, which can 
always heard this read as ‘Fusa Ryôri,’ not ‘Fucha,’ though 
when I went there I can remember).

pp. 309, 312, unabridged; p. 385 revised = 4 CC. I have 
ever heard this read as ‘Fusa Ryôri,’ not ‘Fucha,’ though 
perhaps the case is that same as with 2 CC, which can 
alternatively be read ‘sadô’ or ‘chado’ [the way of tea]. Note: 
Major Japanese dictionaries and glossaries all say fucha 
ryôri.

“Incidentally, have you seen the new Shufu-no-tomo 
English translation out on Shojin Cooking ($7.95)?”

374. Shurtleff, William; Aoyagi, Akiko. 1979. The book of 
tofu: Food for mankind. Condensed and revised. New York, 
Aoyagi Shurtleff. Index. 18 cm. [60 ref]

* Summary: This book has been extensively revised 
and updated. Many names of Japanese tofu have been


This new edition features: (1) New recipes: Over fifty new American-style tofu recipes including Creamy Tofu Dressings, Tofu Teriyaki, Tofu Burgers, Tofu Eggless Egg Salad, and the like. The key to the book is an updated list of favorite tofu recipes plus suggestions for incorporating them into a weekly menu (p. 56). (2) New sections: An extensive new introduction to Soy Protein Foods (p. 66), dairylike products made from tofu (p. 150), dairylike products made from soy milk (p. 302) including soy milk yogurt (fermented), ice cream, kefir, mayonnaise, whipped cream, popsicles, butter milk, and soy shakes. (3) New chapters: Fermented Tofu and Varieties of Tofu in East Asia. (4) New basic methodologies: The key recipes for homemade tofu and homemade soy milk have been simplified and improved. (5) Updates: A complete listing of the 120 tofu shops and soy dairies now operating in the West; over 60 Caucasian-run shops have opened in the past two years. (6) New Americanized tofu names: Including tofu burgers, tofu cutlets, silken tofu, wine fermented tofu, and fresh soy puree. (7) No sugar.

Page 110: “In Japan, tofu is also called momen-goshi (‘cotton-filtered’) to distinguish it from its popular counterpart kimu-goshi (‘silken tofu’).” Note 1. This is the earliest English-language document seen (March 2004) that uses the term “silken tofu.”

Note 2. This is the 2nd earliest English-language document seen (Oct. 2011) that contains the term “Wine-fermented tofu” (p. 361).

In Jan. 1988 a new printing (but not a new edition) of this book (the 13th), slightly revised, appeared. It had a new cover and many new small illustrations. The subtitle was “Protein Source of the Future–Now!” The heading: “The World’s Bestselling Book on Tofu.” Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.


• Summary: Gives the local, vernacular name for and a description of many varieties of tofu found in China and Taiwan, Indonesia, South Korea, Philippines, Thailand, and Vietnam.

China and Taiwan:

China, with a population of 15 million people, has about 2,500 tofu shops. There are no statistics yet available on the number of shops in mainland China, but if the proportion of shops to people is the same as in Taiwan, we can expect there to be 158,000 shops serving China’s 950 million people. Unless otherwise stated, all Chinese terms are standard Mandarin. The “t” in toufu is pronounced like the “d” in “doe.”

Chinese-style Firm Tofu (toufu; dowfu or daoufu in Cantonese). The most popular type. Coagulated with calcium sulfate (gypsum) and sold in 3-inch squares weighing about 4½ ounces each. Contains 10 percent protein. One special type made in Shantung province is called t’ai-an toufu; another made in Anhui province, Chunnan, is called pa-kung-shan toufu.

Pressed Tofu (toufu-kan): Similar to firm tofu but pressed until as firm as ham. Contains 22 percent protein. Often simmered in mixtures of water and burnt millet sugar, molasses, turmeric, or tea to create a variety of colors and flavors and increase shelf life.

Five-Spice Pressed Tofu (wu-hsiang toufukan or hsiang toufukan): Made by simmering pressed tofu squares in a mixture of soy sauce, oil, and “five spice powder” (ground anise, cinnamon, cloves, plus fennel and Szechuan chili powder or ginger and nutmeg). Now prepared in San Francisco, it has a flavor and texture resembling smoked ham.

Soy-sauce Pressed Tofu (chiang-yu toufu-kan): Made by simmering small squares of pressed tofu in a mixture of soy sauce and water.

Pressed Tofu Sheets (pai-ye or ch’ien-chang): Tofu pressed into very thin sheets that look like a 6-to-12- inch-square of canvas.

Pressed Tofu Noodles (toufu-ssu or kan-ssu): Made by cutting pressed tofu sheets into noodlelike strips.

Pressed Tofu Loops (pai-ye-chieh). Made by cutting pressed tofu sheets into ½-inch-wide strips. Each is then tied into a simple overhand knot.

Salt-dried Tofu (toufu-kan): Made from squares of pressed tofu that are rubbed with salt, tied together with strands of rice straw, and hung in the sunlight to dry.

Hard tofu (lao-toufu): A general term for all tofu that is not soft.

Chinese Silken Tofu (shui-toufu, nan-toufu, nen-toufu, or shih-kao toufu): One popular type is like a soft Japanese silken tofu; another is so soft it cannot be cut into cakes.

Smooth Soymilk Curds (toufu-nao): Literally “tofu brains.” Sold in the West as Tofu Pudding. Sold by street vendors in China topped with a brown sugar & peanut sauce.

Curds-in-Whey (toufu-hua or rou-hua): Literally “tofu flowers.” Available at some Chinese restaurants in the West.

Deep-fried Tofu (yu-toufu or cha-toufu): A general term
Hollow Deep-fried Tofu Cubes
Made by deep-frying 1-inch cubes of firm tofu.

Sautéed Tofu (kuo-lao toufu): Made by thinly slicing firm tofu and frying it over low heat in a skillet until it turns a rich brownish yellow.

Frozen Tofu (tung-toufu or ping-toufu): Made by setting firm tofu out overnight in the snow.


Soymilk (toufu-chiang tou-chiang, or tou-ru): See Chapter 10.


Indonesia:

Over 11,000 tofu shops make tofu for this country’s 130 million people.

Indonesian tofu (tahu): Similar to Chinese firm tofu (toufu). In many shops, the whey, allowed to stand overnight until it ferments, is used as the coagulant. Pressed tofu simmered in turmeric (also called simply tahu) is popular.

Deep-fried Tofu Cubes (tahu goreng): 1¼-inch cubes deep-fried fresh by market vendors. Served crisp and hot, often with a fiery chili perched on top.

Tofu Chips (krituk tahu): Salted tofu sliced into long, thin strips and sun-dried. Broiled until crisp, then eaten as a snack or topping for Gado-gado (cooked vegetables with peanut sauce).

Fermented Tofu (taokoan or takoa): Steamed and pressed into thin slices before being fermented.

Okara (ampas tahu): Usually made into delicious okara tempah or okara onchom.

South Korea:

There are more than 1,000 tofu shops scattered throughout this country of 32 million population. If there were a proportional number in North Korea, there would be 470 shops for 15 million people.

Korean Tofu (tubu): Slightly firmer than its Japanese counterpart; not as firm as Chinese tofu.

Deep-fried Tofu Strips (yubu): Each strip is about 7 by 1 by 3/4 inch. Unique.

Soymilk Curds (sun tubu): Widely used.

Okara (piji): Also popular.

Philippines:

Philippine Tofu (tokwa): Identical to Chinese firm tofu (toufu).

Soymilk curds (tajo): Pronounced ta-HO; made by Chinese. Sold topped with a little brown sugar.

Brine-fermented Tofu (tahuri): Made like Chinese brine-fermented tofu but with an Aspergillus elegans mold and a little soy sauce in the brining liquor.

Thailand:

Thai Tofu (t’o-hu): Identical to Chinese firm tofu (toufu). Made mostly by Chinese.


Soymilk (nom tua-liang): Sold hot each morning by Chinese. A thin soymilk is called nam tao-hu.

Soymilk Curds (t’o-huey): Sold by street vendors, topped with grated gingerroot and brown sugar syrup.

Red Fermented Tofu (t’o-hu yee): A Chinese product. Sold in 2-inch squares wrapped in either banana leaves or paper.

Lactone Silken Tofu (t’o-hu lord or tau-hu lawd): A modern product.

Vietnam:

Vietnamese Tofu (dau hu or dau phu; these and all of the following terms are spelled with many diacritical marks): Similar to Chinese firm tofu.

Smooth Soymilk Curds (dau hu): Similar to the Chinese product of the same name. Served warm in a sauce of brown sugar and ginger.

Fermented Tofu (chao): Similar to Chinese fermented Tofu.

Soymilk (sua dau nanh): Identical to Chinese soymilk.

Pressed Tofu Sheets (mi cang): Identical to the Chinese product.

Yuba (dau phu true): Identical to Chinese yuba.

Note 1. This is the earliest English-language document seen (Feb. 2004) that uses the word “daufu” to refer to Chinese-style tofu or the word “tokwa” to refer to Philippine-style tofu.

Note 2. This is the earliest English-language document seen (Oct. 2010) that uses the word “nan-ru” to refer to fermented tofu. Address: P.O. Box 234, Lafayette, California 94549.


3. Soybean food uses in Europe and U.S.S.R.


• Summary: Contents: Abstract. Introduction. Soy Sauce: Fermented soy sauce: Japanese and Chinese styles of soy sauce and their characteristics. Manufacturing process. Comparison of fermented soy sauce with chemical soy sauce. Fermented soy paste. Chinese soybean cheese (sufu). Fermented whole soybean (natto). New fermented soybean products. A photo shows Fukushima. Fig. 3 shows two chromatograms comparing the organic acids of fermented and chemical (HVP) soy sauce. Fermented soy sauce has an abundance of lactic acid, whereas HVP soy sauce has an abundance of formic acid. Address: Kikkoman Foods, Inc., P.O. Box 69, Walworth, Wisconsin.

• Summary: The section titled “Fermented Cereals and Grains” gives basic information about the following fermented soybean foods: Tempeh, soy sauce, miso, and sufu or Chinese cheese. Address: Dep. of Food Science and Nutrition, Univ. of the Philippines, Diliman, Quezon City, Philippines.


Table I shows the population, population growth rate, and average national income per capita in ten Southeast Asian countries. Indonesia has by far the largest population (136.9 million), followed by Vietnam (47.3). Khmer republic (Cambodia) has the highest population growth rate (2.8%), followed by the Philippines (2.7%); Singapore has the lowest (1.3%). Singapore has by far the highest average national income per capita ($US2,510), followed by Malaysia ($720), then Maunhthai (Thailand–$350); Khmer Republic and Laos have the two lowest per capita incomes ($70). Table II shows the nutritional composition of tempeh, oncom, bongkrek, and tauco per 100 gm. Table III shows 7 fermented vegetable protein foods in Southeast Asia: Tempeh, bongkrek, oncom, tauco kecap (shoyu), ang-kak, and sofu (sufu); for each is given the microorganism used, substrate, nature of product (solid, liquid), and area where article is sold commercially. Table IV shows the composition and nutritional value of TFR (Temppeh-Fish-Rice), as developed at the National Research Institute, Bogor, Indonesia. A photo shows F.G. Winarno. Address: Bogor Agricultural Univ., Fatemeta, IPB, Jalan Gunung Gede, Bogor, Indonesia.

380. Shurtleff, William. 1979. Notes on visit to Quong

Summary: Quong Hop is the leading (and perhaps the only) manufacturer of fermented tofu in North America. We were allowed to study and photograph the process in detail, and all our questions were answered. The entire process is described, with illustrations, in Tofu & Soymilk Production, by Shurtleff & Aoyagi (1979) in the Chapter 16 titled “Fermented tofu” (p. 283-86). Taken that day, photos show: (1) A man standing next to rolling rack of skewered inoculated tofu cubes, which are about to be incubated. (2) Pouring brining liquor over mold-covered tofu cubes packed into empty glass jars. (3) A close-up view of the previous view showing labels of the two different types of fermented tofu made by Quong Hop & Co.—Bean Cake (Fu-Yu) and Pepper Bean Cake (with hot chili flakes in the brining liquor). (4) A sample of well-molded tofu cubes.

Also describes the process and equipment used by the company to make tofu. The soybeans are ground in a Rietz disintegrator. The whole system is run by a control panel from Japan. “You must have an in-house repairman for the control panel says owner Stanley Lee. From the slurry tank, the slurry is pumped into a two-chamber continuous cooker. The slurry fills the chambers and cooked slurry exits by overflowing. It works well. The cooked slurry is then pumped onto a vibrating screen and down into the Brown soymilk extractor. The soymilk from the screen is run directly into a huge steam-jacketed holding tank. The soymilk extracted by the Brown is run back into the slurry tank. Curding is done in barrels. Pneumatic pressers are used to press the curds into tofu. Vacuum packaging with a Multivac vacuum packager. Then pre-weighed labels are applied with a Hobart. But the labels are too small and unattractive; need two labels per package.

Tofu burgers: Run through three-patty former. Arrange on trays. Deep fry on screens in batch oil fryer. Slow. They have an oven for Savory Baked Tofu, which is pre-dipped in hot teriyaki sauce mixture. Address: Lafayette, California 94549. Phone: 283-3161.


Summary: Gives a brief overview of the history. Discusses what Dr. Smith sees as the bright future of tofu and fermented tofu, and the work of Dr. Harry Miller.

“I do know from past experience that an excellent fermented cheese product can be prepared [from soybeans]. You will find a description of the use of soy milk in making cheese an chapter 10 and eleven in our book” [Soybeans: Chemistry and Technology]. Address: 4 Nacozari Lane, Hot Springs Village, Arkansas 71901.


© Copyright Soyinfo Center 2011
“Finally we would like to suggest several fermented foods that might be possible candidates for future development outside the Orient. These are miso, natto, hamanatto, and sufu.” Address: NRRC, Peoria, Illinois.


Note 1. This is the earliest English-language book seen with the term “soymilk,” spelled as one word, in the title.

Note 2. This is the earliest document seen (Feb. 2002) that mentions tofu jerky or any kind of soy jerky.

Note 3. This is also the earliest English-language document seen (Feb. 2004) that uses the word “quark,” or “queso blanco.” or “panir” in connection with soy cheese or tofu.

Note 3. This is also the 2nd earliest English-language document seen (Feb. 2004) that uses the term “smoked tofu,” but the first that uses it in its modern sense.

Note 4. This book was first printed on 1 Aug. 1977 in a photocopied and rough-typed edition with a yellow and black cover.


There are two types of “Redolent fermented tofu (ch’ou or tsao tofu): (1) Drunken (tsao-toufu-ru): Age plain or molded tofu cubes in a mixture of sake lees (chu-tsao) and a large portion of rice wine. For variety add cloves and orange peels.

Green (ch’ou tofu): Age plain squares of pressed tofu (toufu-kan) for at least 12 hours in a crock containing a mixture of sake lees, and a green Mucor mold.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the word “redolent” to describe ch’ou tofu.

Illustrations–line drawings: (1) Fermented tofu on

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• Summary: Contains a discussion of regular tofu, fermented tofu (ch’ou tou fu, tou fu ju), tofu sheets (“bean curd skin,” pai yeh), tofu noodles (kan szu), fried tofu, pressed tofu (tou fu kan), and yuba in East Asia, how tofu is made, and 11 recipes. A full-page color photo shows a dish of “Cold bean curd with carrot and celery...” The recipe is given.

Taipei in the morning in Taipei is teeming with food smells, including the aroma of “deep-fried Chinese crullers.” But in stark contrast to the delightful panorama of aromas “was a putrid odor that defied classification. That baffling pungent smell, present throughout the entire day in every part of the city, I soon traced to stinky bean curd (ch’ou tou fu), a favorite snack of the Chinese.”

Vendors of this unsavory delicacy can be found all over the city with their portable deep fryers. “The children in my Chinese family’s house, all great fans of the stuff, used to race outside excitedly with empty plates at the stinky bean curd man’s call (The smell usually preceded him by two blocks).”

“This foodstuff is a type of fermented bean curd which is generally deep-fried and eaten with a choice of soy sauce, vinegar, mashed garlic, and chili paste.” It is but one of many bean curd products made by the Chinese.

When a coagulant is added to hot soymilk, the “liquid is transformed into a delicate custardlike substance. Chinese love to eat bean curd in this tender state—sometimes adding a little cornstarch as a stabilizer— with a sugar syrup and softened peanuts or flavored with sesame oil, scallion and pickled vegetable.”

The tofu recipes are: (1) Leng teng tou fu (Cold bean curd with red-in-snow; from Szechwan, with five 3-inch squares of bean curd). (2) Pan kan szu (Cold bean curd with carrot and celery; from Szechwan). (3) Ma p’o tou fu (Spicy bean curd; from Szechwan). (4) Hung shao tou fu (Red-cooked bean curd with vegetables). (5) Tung ku p’a tou fu (Braised bean curd with black mushrooms; from Szechwan). (6) Hsieh jou p’a tou fu (Stir-fried bean curd with crab meat). (7) Pa pao la chiang (Eight-treasure stir-fried vegetables with pork; from Szechwan). (8) Hsiang tou fu (Stuffed bean curd pockets, from Canton). (9) San hsien kan szu t’ang (Three-flavor bean curd soup; from Shanghai). (10) Kuo t’ieh tou fu (Panfried stuffed bean curd). (11) San hsien tou fu tun (Steamed three-flavor molded bean curd).

386. So, Enshi. 1979. Taiwan no hakkô shokuhin [Fermented foods of Taiwan]. Hakko to Kogyo (Fermentation and Industry) 37(2):102-12. [Jap; eng+]

• Summary: Includes a good map of Taiwan and its prefectures. In 1976 there were 433 soy sauce manufacturers in Taiwan. Taiwanese divisions of grading soy sauce plants numbered as follows: A (Ko) class, 39; B (Otsu) class, 12; C (Hei) class, 223; others 159. They produced the equivalent of 1,681,870 dozen bottles/month. Each bottle contains 540 ml of soy sauce, so 12 bottles contain 6,480 ml or 6.48 liters or 1.712 gallons. Thus Taiwan produces 10.89 million liters a month or 130.71 million liters/year of soy sauce. This is equivalent to 2.878 million gallons a month or 34.53 million gallons a year. Taipei prefecture produced 46.8% of this total, followed by Changhua prefecture with 10.7%.

Soy sauce was initially made by monks. Because they didn’t eat meat, it gave them important protein and fat. Gradually, it became more popular and spread to all parts of China. Monks also transmitted the method of soy sauce production to Japan and all over East Asia. It is said that around 1230 A.D., the Zen monk, Kakushin of Kofukuji, Kishu Yura, went abroad to southern Sung in China and brought back to Japan fermentation methods of Miso and Kinzanji Miso.

There are 3 types of soy sauce produced and sold in Taiwan today: (1) Tou-yu, soy sauce (daizu shoyu) which originated in China, (2) Inyu, black bean sauce which is the traditional Taiwanese soy sauce, and (3) Chemically prepared soy sauce (kagaku shoyu) which was invented in Japan. Processing techniques for making Koji and pressure-straining methods have made great progress in recent years. Address: Kokuritsu Taiwan Daigaku Kyoju, Ken Nogyo Kagaku Kenkyu-jo sho-cho, Nôgaku Hakase.


• Summary: This is largely a compilation of information from many other books and articles. On the cover is a color painting of The Gardener (or Vertumnus), from his series, The Four Seasons, c. 1590, by Giuseppe Arcimboldo (or Arcimboldi) of Milano.

In Chapter 12, on China, the section titled “Meats and alternates” (p. 110-13) notes that the soybean is called the “Chinese Cow” [sic, “Cow of China”] because of its versatility. Soybeans are used as whole dry beans and as sprouts, or they can be made into a firm white curd called “Chinese cheese” [sic], which can be used in many different ways. Soybean milk may be used in much the same way that westerners use cow’s milk. They are fermented to make the favourite condiment, soy sauce. “Bean curd sauce is fermented bean curd that is packed in jars and sold as red bean curd sauce or white bean curd sauce,...” Cantonese

In Chapter 30, on Japan, the section titled “Meats and alternates” (p. 336-37) notes that products made from soybeans include: (1) “Shoyu, a sweetish soy sauce made from wheat and barley [sic], soybeans, salt, and water.” (2) Miso, or “fermented soybean paste,” used mostly for flavouring soups [miso soup]. (3) Tofu, or soybean curd, is a staple in Japanese cookery. “Its smooth, custard-like texture and bland flavour make it an ideal ingredient. It is extremely versatile and readily absorbs other flavours. Many “restaurants in Japan take great pride in their tofu dishes.”

In Chapter 31, on Korea, the section titled “Fruits and vegetables” (p. 350-51) discusses soybeans and their products at length. Soy sauce is used to season kim (nori) and other edible seaweeds. Soy sauce is an ingredient in “hot pepper mash” [kochu jang]. Soybeans are used to make “soybean mash” [doen jang]. Dry soybeans are roasted in an iron pot, then ground, and the roasted soy flour is used as a garnish over rice cakes [mochi] or plain cooked rice; children enjoy eating the coarser roasted bits that are sifted out of roasted flour or meal. Soybeans sprouts are eaten lightly cooked as a vegetable. Soybeans are also made into tofu (tou bu); a brief description of the process is given, in which the drained curds are left in their hemp bag to form a firm cake, which may be cut, dipped into soy sauce, or fried in sesame oil. “Oil can also be made from the soybeans, but it is not commonly used or prepared.”

Although commercial soy sauce, made in factories, is now widely available, many Korean households still prepare their own soy sauce each fall. Boiled soybeans are pounded, molded into a cone shape, and set to dry until hard. They are then wrapped with rice straw, hung from eves, rafters or ceilings, and allowed to ferment for several weeks [until they become meju]. During the winter, these fermented cones may be stored in huge rice-straw bags kept in a cool place.

In the spring, break the cone into small pieces and place in a large earthenware jar, nearly filled with water. Add salt, spices, red peppers, and a few charcoal lumps. Leave this in the sun for a few days [sic, 30-60 days] until the molded soybean chunks float to the top and the resulting liquid turns black. Ladle out and filter the black liquid, then boil it to make soy sauce. The solids remaining in the jar are used as soybean mash [after the charcoal is removed].


  • Summary: Table 3, “Daily food guide for vegan adults” (p. 30) recommends soy milk, tofu, and fermented soybean curd [fermented tofu].

The section titled “Weaning infants on vegan diets” (p. 40-44) also discusses soy milk and The Farm in Tennessee. Soy milk is also recommended for pregnant and lactating women (p. 54-55).

Chapter 9, titled “A pair of unusual diets,” discusses macrobiotic diets and frutitarian diets. The author is quite critical of a number of macrobiotic practices and teachings: Studies have shown nutritional deficiencies. Restricted intake of liquids may lead to kidney stones and kidney failure. “The greatest danger of a macrobiotic diet is not to adults but to newly weaned infants... Don’t wean infants on Kokoh... Wean them instead on either milk or fortified soy milk.”

Page 93 states: “Soybeans are among the most valuable of vegetarian foods, not only because of their high-quality protein but because they can be made into soy milk and tofu (soybean curd)... Two other soy products that are widely used in the United States are soy sauce and miso.” Pages 96-97 discuss soy milk and textured vegetable protein (TVP).

  • Summary: “Combines recipes and cooking tips with information on the history and lore of every kind of vegetable from artichokes to yams.”

The recipe for Mongolian fire pot (Shua yang jou) (p. 224-25) calls for (in the “Sauce”): “5 teaspoons canned fermented red bean curd.”

The section titled “Soya beans, mung beans, and bean sprouts” (p. 459-61) notes that bean sprouts are easily grown at home. Soya beans have been grown in China since at least the Western Chou dynasty (1027-770 B.C.).

During the Tang dynasty [618-906 AD] in China, Buddhist vegetarians, in their temple kitchens, “were the first to turn soya bean-curd [sic, yuba] into imitation meats, imitation poultry and imitation fish, which they prepared with great tastiness.” The practice continues in China to this day.

Recipes are given for: Stir-fried bean sprouts. Chop suey. Note: When speaking of “bean sprouts” she does not distinguished between soy sprouts and mung bean sprouts. Address: Broad Town & Trôo, England.

  • Summary: A superb and beautiful book, loaded with beautiful color photos printed on glossy paper. It identifies
four regional schools: Peking (Northern school). Shanghai (Eastern School). Sichuan (Western school). Canton (Southern school). The Pearl River delta, with Canton as the capital of Guangdong (W.-G. Kwangtung) province, “is undoubtedly the home of the most famous of all Chinese cooking styles... Because Canton was the first Chinese port opened for trade, foreign influences are particularly strong in its cooking.” Note: Likewise, what most Westerners have traditionally thought of a “Chinese cooking” comes from Canton.

Archaeological evidence shows that by 5000 B.C. the people of north China had begun to settle down, to farm, and to make painted pottery and cooking utensils. Written records first appeared in about 3500 B.C. “Later, during the Chou dynasty (11th century to 221 B.C.) soy beans were added to the Chinese diet” (p. 32.).

Northern soy-related recipes: Fried bean-curd [tofu] (with 2-3 cakes of bean curd) and a color photo of “A bean-curd factory run by a unit of the People’s Liberation Army on the outskirts of Peking” (p. 53). Rinsed lamb in fire-pot (with 2 cakes of bean curd, fresh or frozen, p. 68-71). The Yangtse [Yangtze], China’s longest river, is a natural divide between north and south in China. Those in the north eat more wheat and soybeans (p. 94).

Shanghai / eastern soy related recipes: The Yangtse River has already traveled 3,000 miles before it reaches its Lower Plain where many crops, including soy beans are grown (p. 98). A page titled “Buddhist and Taoist dishes,” notes that they are vegetarian (actually vegan), since “Chinese vegetarians are not allowed anything remotely connected with animals, including eggs or milk. They get their protein mainly from the soy bean and its by-products, such as bean-curd and imitation meat. Curiously these imitation meats (known as vegetarian meat, chicken, fish, and so on) bear an amazing resemblance to their fleshy counterparts in form, texture and flavor.

“For some unknown reason, the best vegetarian restaurants [in China] are to be found in Shanghai—a thriving commercial center and seaport...” (p. 119). Buddha’s fry (with 1 oz. dried bean-curd skin [yuba], p. 120-21). A small color photo shows sheets of dry yuba. Eight treasure bean-curd (p. 132). “This recipe used to be called ‘Prince’s Bean-Curd’ and originally appeared in Sui-yuan Shihtan (Recipes of Sui-yuan), by the 18th century man of letters and gourmet, Yuan Mei.” A small color photo shows fresh bean-curd on a wooden table in a Chinese market stall. Bean curd a la maison (p. 144).

Sichuan / western soy related recipes: Bean curd fish in chili sauce (p. 164). Steamed beef with ground rice (with 1 tablespoon {15 ml} salted black beans, crushed). ‘Pock marked woman’ bean curd (Mabo doufu, with salted black beans, p. 173). This is another nationally popular dish that originated in Sichuan. The woman was the wife of a well-known chef who worked in Chengdu about 100 years ago; she created the dish. Hot and sour soup (with 1 cake bean curd, p. 174). Fish soup (with bean curd, p. 181). Soy braised duck (with Hoi Sin sauce and soy sauce, p. 182).


Glossary of main ingredients (p. 219-21) has entries for: Bean-curd (tofu, incl. dried bean-curd skin). “Bean sauce: Sometimes called ‘Crushed bean sauce,’ this thick sauce is made from black or yellow [soy] beans, flour and salt. It is sold in tins... (N.B. Black bean sauce is very salty, while yellow bean sauce is sweeter with sugar added).” Bean sprouts: Of the two kinds, yellow soy bean sprouts are sold only in Chinese provision stores.

A large excellent photo (p. 219) shows: 1. Hoi Sin [hoisin] sauce in white bowl. 2. Salted black beans in can. 3. Light soy sauce in bottle. 4. Dark soy sauce in bottle. 5. Red bean-curd sauce in small brown crock. 6. Crushed yellow bean sauce in bowl. 7. Yellow bean sauce in white bowl.

“Chili paste: Also called ‘Chili purée,’ is made of chili, soy bean, salt, sugar and flour. Sold in jars; will keep almost indefinitely.” “Hoi Sin sauce: Also known as barbecue sauce. Made from soy beans, sugar, flour, vinegar, salt, garlic, chili, and sesame.” “Red bean curd sauce: A thick sauce made from fermented bean curd and salt. Sold in cans or jars, will keep indefinitely.” “Salted black beans: Whole bean sauce, very salty.” Sesame seed oil: Chinese typically use vegetable oils; soy bean oil is very widely used. Soy sauce: “The darker colored sauces are strongest and more often used in cooking, whereas the lighter are used at the table.”


• Summary: The Introduction notes: “Everybody who has lived through the last couple of decades in the West has noted the tremendous expansion in the desire for increased sensuality; for the freer and fuller use of our senses of sound, sight, taste, and touch” (p. 1).

“Chinese meals are communal meals.” Chinese food and cooking “are undoubtedly one of China’s unique contributions to the sum total of the world’s civilization” (p. 3).

Note: This book calls for the use of monosodium glutamate in many recipes.

heavy soy-sauce has a flavor of its own...”


Hot noodles with soy jam and fresh vegetables (with “6½ tablespoons soy jam or paste,” p. 102).

The title chapter “Vegetable and vegetarian dishes” (p. 106-21) begins: “There are three background factors in Chinese vegetable and vegetarian cooking which give them strength, tradition, and variety.

“The first of these is the widespread use of soy beans and their by-products [soyfoods] which, as we have already seen, add a great deal of flavoring power to Chinese meat cooking, as well as the cooking of other foods. One must also recognize that the use of bean curds is of great importance—for shear versatility—for shear versatility they have few equals in the whole realm of food materials.”

This type of cooking is derived “principally from Buddhist monastery and temple cooking. “Soy beans and their by-products (soy sauce, soy paste [jiang], soy cheese [fermented tofu], soy bean curd, and fermented salted black beans) act as a common denominator between meat and vegetable dishes.”

The “Basic vegetarian stock” has three main ingredients: fresh and dried mushrooms and mushroom stalks, 1½ lb yellow [soy] beans, and ¼ teaspoon MSG. The technique of “Splash frying” is used in the recipe for “Splash-fried bean sprouts” (p. 112). Soy related: Vegetarian toasted ‘shrimp’ (with 2 cakes bean curd and 1 teaspoon bean curd cheese, p. 119). Vegetarian spring rolls (with 2 cakes bean curd 1 teaspoon bean curd cheese, p. 119).

Spare ribs with black beans (Chinese style) (with “2 tablespoons fermented black beans,” p. 142).


The Glossary (p. 343-46) includes entries for: Bean curd. Bean curd cheese (“It is used extensively for flavoring, and is often eaten in small quantities with congee [plain, boiled rice porridge] for breakfast in China”). Bean sprouts (“Young sprouts of the mung bean”). Black beans (Fermented) (“Small, black, salted soy beans”). Hoisin sauce (“Literally translated it means ‘Sea-Fresh Sauce.’ The ingredients are soy sauce, soy paste, ground yellow beans, garlic, sugar and vinegar”). Light soy sauce. Monosodium glutamate (“It can be eliminated from the recipes if desired”). Red bean curd cheese. Soy jam (soy bean paste) (It is somewhat less salty but often tastier than soy sauce).

Note: This book was first published in 1974 by William Collins Sons & Co. in London.
325-26). Fish sauces. Taro. Address: Prof. Emeritus Cornell Univ. and New York State Agric. Exp. Station.


For each food is given: General description, method of preparation, composition [chemical / nutritional]. In addition for tempeh is given: Tempeh-like products, biochemistry and physiology of *Rhizopus oligosporus*, changes occurring during fermentation, nutritional value.

“Soy sauce “is known as chiang-yu on China, shoyu in Japan, kecap in Indonesia, kanjang in Korea, toyo in the Philippines, and see-iew in Thailand. In the Western World the product is often referred to as soy sauce.” Japan is the leader worldwide in sauce production; it has the largest fermentation capacity in Ontario is about 35 million bushels per year.

The CSP Foods Plant in Altona, Manitoba, has in some years crushed limited amounts of soybeans imported from the U.S.

“Development of short season varieties: The justification for the effort to develop a large acreage outside of southwestern Ontario as been the magnitude of imports of soybeans, meal and oil. This has been and continues to be sizeable. The situation (in metric tons = tonnes) is outlined below for the 1977/78 crop year: (1) Whole soybeans: Production 527,361. Imports 262,835. exports 64,173. Domestic crushing 728,400.

(2) Soybean oil: Imports 28,100. Exports 1,400. Domestic production 125,600.


Letter (e-mail) from Dr. H. Voldeng of Agriculture and Agri-Foods Canada. 2010. Feb. 16. The original “article” was not an article but a manuscript that was sent to the publishers of this volume; they reduced the length slightly. It was never published separately, no longer exists, and cannot be cited separately. Address: Agriculture Canada, Ottawa, Ontario.


For each food is given: General description, method of preparation, composition [chemical / nutritional]. In addition for tempeh is given: Tempeh-like products, biochemistry and physiology of *Rhizopus oligosporus*, changes occurring during fermentation, nutritional value.

“Soy sauce “is known as chiang-yu on China, shoyu in Japan, kecap in Indonesia, kanjang in Korea, toyo in the Philippines, and see-iew in Thailand. In the Western World the product is often referred to as soy sauce.” Japan is the leader worldwide in sauce production; it has the largest fermentation plant and uses the most advanced technology.

Hamanatto: Products similar to Japan’s hamanatto are known as tou-shih in China, tao-si in the Philippines, and tao-tjo [sic] in the East Indies [Indonesia]. A typical process for making hamanatto in Japan, based on information supplied by Dr. T. Kaneko of Nagoya Univ., Japan, is as
follows: Wash soybeans, then soak, steam until soft, drain, and cool. Mix with parched wheat flour in the ratio of 2 parts soybeans to 1 part flour. Inoculate the soybeans with a short- or medium-stalked strain of \textit{Aspergillus oryzae}. Incubate for 1-2 days until the beans are covered with a fragrant mycelium and have become soybean koji. Pack the soybeans in a container [wooden keg] with (for example) 2.5 kg soybean koji, 650 gm salt, 3.6 liters water and some freshly sliced gingerroot. Cover the container tightly and age under pressure for 6-12 months. Remove beans from liquid and dry them in the sun to give hamanatto. The composition of the brine may differ among manufacturers.; thus the finished hamanatto differs somewhat in taste and appearance. “Japanese hamanatto is rather soft, having a high moisture content. Chinese tou-shih has a much lower moisture content... and therefore is not so soft. Tao-tjo tends to have a sweet taste because sugar is often added to the brine.”

Shoyu in Japan: Although there are more than 4,000 shoyu makers in Japan, the largest 4-5 companies produce about 50% of the total.

Note: A wide variety of dairy cheeses, especially of French origin, are made with surface mold growth. Typical varieties are Camembert, Coulommiers, and Brie. Address: NRRC, Peoria, Illinois.


\textbf{Summary:} Liver cancer is found with unusually often in certain parts of China, especially along the north shore of the Yangtze river, at its mouth. A survey reports that the cause appears to be the drinking of “stagnant, highly polluted ditch water.”

“The report notes that the Chinese commonly eat fermented bean curd and other moldy [mold-fermented] foods, yet the liver cancer incidence seems unrelated to such eating habits.”

Rather, the report points the finger at toxic substances washed from the fields, such as pesticides and fertilizers. The start of the unprecedented increase in liver cancer, it is reported, coincides with the local introduction of organo-chlorine pesticides such as DDT. “Their effect ‘should not be lightly excluded.’”


\textbf{Summary:} “During a two-week tour of China with a group of 15 American chefs and food writers, I sampled Chairman Mao’s favorite–Stinky Bean Curd–at the Fire Palace Restaurant in Changsha” (a port, and the capital city of Hunan province).

Note: Mao Zedong was born on 26 Dec. 1893 at Shaoshan, Xiangtan, Hunan province, China–during the Qing Dynasty. Changsha was the site of Mao Zedong’s conversion to communism. Address: Food editor, Christian Science Monitor.


\textbf{Summary:} One of her most memorable dinners in China was at the Fire Palace Restaurant in Changsha, Hunan province–a favorite eating place of Chairman Mao, who was born in this province and attended and taught school there.

This restaurant dates back to the Ching Dynasty. Mao’s last visit was on 14 April 1958. “We were served the Stinky Bean Curd (\textit{Chou Tou Fou}), which was fine, interesting, but not very exciting in flavor, I thought, although it is a favorite Chinese snack food.

“It looks like a dark brownie, 3 or 4- inches square, pungent, with a smoky, caramel, interesting taste. Made from an ancient recipe, it is a bean curd made of broad beans that have been marinated in sesame oil, red pepper, and other ingredients, then deep-fried and eaten with a choice of soy sauce, vinegar, mashed garlic, and chili paste.”

Note: Most “stinky bean curd” in Taiwan and China is said to be made from soybeans, not broad beans \textit{(Vicia faba)}. Could it be made from different beans in different parts of China? Address: Food editor, Christian Science Monitor.


\textbf{Summary:} Table 1 gives, for each food, the name, area or country, microorganism used, substrate, nature and uses. The following soy-related foods are included: Soy sauce (\textit{chiang-yu}, shoyu, toyo, kanjang, kecap, see-ieu), miso (chiang, doenjang, soybean paste, tauco), Hamanatto (toushih, tao-si, tao-tjo [sic, tao-tjo = tauco is Indonesian-style miso]), sufu (fu-ru, fu-ju, tou-fu-ju, bean cake, Chinese cheese), tempeh, bongkrek, onjom (oncom), natto. Address: NRRC, Peoria, Illinois.


\textbf{Summary:} Discusses shoyu, tempeh, wheat soya tempeh, sufu, natto, koji, miso, ragi, and soy yogurt. Address: USDA NRRC, Peoria, Illinois.


\textbf{Summary:} Thanks for the two beautiful slides. “We didn’t have any slides of the actual production of sufu.”

Tempeh should be cooked before it is eaten since the \textit{Rhizopus} mold “is still alive and there are members of the Mucorales which can grow in the body of diabetics and those using anticancer drugs that reduce resistance. They apparently get in by growing in breaks in the skin.
and lining of the digestive tract.” So, like other soyfoods, tempeh should not be eaten as a raw food. Address: Chief, Fermentation Lab., USDA/NRRL, Peoria, Illinois.


• Summary: “Except for *Mucor dispersus* NRRL 3103 and *Actinomucor elegans* NRRL 3104, all the other molds tested produced both extra- and intracellular phytase.” Molds were tested that make the following fermented foods: Sufu, tempeh, Lao-chao, soy sauce, and miso. Address: NRRC, Peoria, Illinois.


• Summary: Table 3 shows fermented foods prepared in Thailand from legumes and cereals. Fermented foods having soybeans are the main substrate are: See iew (a condiment, made in central and south Thailand using bacteria, molds, and yeasts). Thuao niao (main dish, made in north Thailand using bacteria). Tao hoo (tofu, main dish, made in central and south Thailand using bacteria, molds, and yeasts). Tao jiao (flavoring, made in central and south Thailand using bacteria, molds, and yeasts). Tao si ([soy nuggets], flavoring agent, made in south Thailand, using molds).

A survey of all soy sauce factories in Thailand was conducted in 1975. Representative samples were analyzed for both pathogenic organisms and aflatoxin, but neither was found (Biological Science Division, 1975-1976).

Note: This is the earliest English-language document seen (Feb. 2004) that uses the word “Tao hoo” (or “Tao-hoo”) to refer to tofu. Address: Biological Science Div., Dep. of Science Service, Ministry of Science, Technology and Energy, Thailand.


• Summary: This paper gives a brief history of the development of food fermentation technology in the Philippines, including fermented soy products such as toyo (soy sauce), tausi (or tao-si [soy nuggets], called “taoushih” by the Chinese and “tiao jto” [sic] by the East Indians), tahuri (fermented tofu, sufu, or Chinese cheese. Cubes of tofu are inoculated with an *Actinomucor* mold; angkak is often used to impart a red color), and miso (called chiang in China). A related product is angkak, or “red rice,” made by fermenting rice with the red mold *Monascus purpureus*. Went for coloring and flavoring. The science of fermentation can be said to have dawned in the mid-1800s when Louis Pasteur discovered that every fermentation process was associated with a corresponding organism. Before World War II the use of microorganisms for the processing of foods was an unexplained field of study in the Philippines. The four pioneering studies from 1934 to 1937 included one by Yenko and Baens in 1940 the use of rice as a source of carbohydrate in the production of soy sauce. The first scientific investigation (1934, with nata) was done in the University of the Philippines, College of Agriculture in Los Baños, Laguna, and the last three studies were pursued in the former Bureau of Science, now the National Institute of Science & Technology (NIST).

There are no local written reports or scientific investigations of tausi, tahuri, or miso. Their manufacture is dominated by Chinese in the Philippines. Much attention, however, has been given to the production of soy sauce (toyo). Reviews of studies conducted in the Philippines have been given by Soriano (1975) and Soriano and Pardo (1977). Work is presently being done at NIST on the replacement of soy beans with local beans, and wheat with rice, cassava or banana flour in the production of soy sauce. Address: National Inst. of Science and Nutrition, Manila.


• Summary: Many of Singapore’s fermented foods are traditional indigenous foods. These include: (1) Fermented soy beans used in the koji to make soya sauce. (2) Fermented whole soya beans, which are preserved in brine (soy nuggets) or made into a paste (like Chinese soybean jiang). (3) Fermented cubes of tofu.

Of these fermented food products, only the fermentation process for making soya sauce has been studied at length by the National University of Singapore and the Singapore Institute of Standards and Industrial Research. Their findings of improved *Aspergillus* mutants for the production of better quality soya sauce have been reported at a previous ASEAN Workshop on Soya Sauce Manufacturing technique (1978 Singapore). “The Department of Scientific Services has analysed samples of fermented ‘Tofu,’ soya beans, soya sauce and shrimp paste and found that aflatoxins were absent in these fermented products.” Address: PhD, Dep. of Scientific, Outram Road, Singapore 0316.

Summary: “For many centuries, soybeans have meant meat, milk, cheese, bread, and oil to the people of Asia. Because of their great food value, they not only have long had a definite place in the oriental diet but now belong in the diet of America and of the entire world. In Europe, the use of soybean products in the quotidian diet is still limited, however it is sure that they will be an important factor in the balanced diet of the future.”

Note 1. Soyfoods Center has a 16-page English-language translation of this article.

Note 2. Webster’s Dictionary defines quotidian (derived from the French quot = as many as + dies = day) as “occurring every day.” Address: University of Nancy, France.


Summary: “Han Suyin’s eloquent autobiography, covering the years from 1949 to the present, offers a unique portrait of the persons and events that have formed today’s Red China.”

Chapter 12, titled “Survival: 1960-1961” states (p. 302): “Before I left Chengtu, Sixth Brother procured for me an enormous ten-kilo caulked basket of pickled beancurd [fermented tofu]; that wonderful red beancurd made in Pihsien, the small town where our family had lived for three centuries or more. How had they obtained it? Nowhere had I seen beancurd that year. ‘From a farmer I know...’ The countryside ate up its own beancurd,... Sixth Brother had cycled twenty-five kilometers back and forth, after his work, to get the beancurd for me. It had such a wonderful beancurdy tang that my room in the hotel was redolent with it; and outside in the corridor I would find groups of curious people, standing still, breathing in the beancurd smell... The Family looked at the beancurd, and our mouths watered as we contemplated the paunchy container, but no one would share it with me. ‘It’s yours. It’s yours.’”

Note: The strong, redolent smell of this beancurd suggests that it was probably ch’ou toufu or “stinky tofu.” Address: Lausanne, Switzerland.


Summary: Contains 6 recipes, one for each of their products, with a color photo of each. The products are Soy Milk, Savory Baked Tofu, New Leaf Tofu Burgers, Fresh Tofu, Deep-Fried Tofu Cutlets, and New Leaf Tofu Dressing. The top half of one panel shows an old black-and-white photo of two men standing in Chinese food store, surrounded by wooden, boxes, sacks, and shelves. Plainly visible on the back wall is a wooden plaque with two large gold letters bearing the company name. [Note: In a 1986 leaflet from Quong Hop & Co. we are told that this photo was of “The Family Store, 1911”]. The Chinese characters for “Quong Hop” appear on the back wall. The text reads: “The traditional soy foods of China have been our family’s business for three generations. Since 1906, when our doors opened in San Francisco’s Chinese settlement, we have maintained a firm commitment to quality in every product we manufacture. In 1976, we were the first company to pioneer a return to the use of traditional, time-proven methods and completely natural ingredients in the commercial manufacturing of fresh tofu and soy milk. Today, our organic Nigari tofu is widely regarded as the finest made. To further develop the expanding soy foods marketplace, we are now offering a complete line of vacuum-packed soy products. Our historical commitment to quality and, more recently, to the adaptation of soy foods to the American marketplace, have placed us at the forefront of the ‘Soy Foods Revolution’. We offer a growing line of soy products based on Western Recipes, including Tofu, Burgers, Creamy Tofu Dressing, and soon Tofu Salad and other items.” Address: 161 Beacon St., South San Francisco, California 94080.


Summary: Tao-jeow is Thai miso. Sufu is fermented tofu. The author uses the terms tao-nou and thuo-nao throughout; he even misspells it when citing Sundhagul 1970. It is sold as a paste or chips. Soy sauce (the Chinese type), soy paste and fermented soybean curd are commonly available throughout the country although
they are more common in the Chinese community. Tao-nou, however, is the product which is popular in the northern part of the country. Flowcharts show the processes for producing soy sauce and tao jeow, tofu and sufu, and thuo-nao.

Address: Dep. of Microbiology, Faculty of Science, Mahidol Univ., Rama VI Rd., Bangkok 4, Thailand.


• Summary: This vegetarian cookbook, which contains more than 180 recipes, demonstrates vividly how much Chinese vegetarian cookery depends on soyfoods—especially tofu (bean curd). The glossary includes excellent descriptions of bean curd—fermented red (nan-ru), bean curd—fermented white (tofu-ru), bean curd—pressed threads or noodles, bean curd sheets (tofu-pi [yuba]), bean curd sheets (er-ju), bean curd sheets—pressed or hundred-leaf (bai-yeh), bean curd sticks (folded bean curd sheets), brown bean paste or brown bean sauce, bean paste–Szechuan hot bean or spicy soy, bean sprouts—soy or yellow, fermented or salted black beans, Hoisin sauce, Oyster sauce (with soy), soy sauce, soy sauce—light or thin.

The chapter on soups stocks notes that soybeans or soybean sprouts have a delicate flavor and are most suitable for making stock. Soy sprouts, which are much larger than mung bean sprouts, have a more chewy texture and a very sweet, delicate taste; they are often used to strengthen the flavor of a dish (see recipe p. 90).


Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “red fermented bean curd” to refer to red fermented tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “white fermented bean curd” to refer to regular white fermented tofu. Address: Cornell Univ., Ithaca, New York.


• Summary: Contents: Fermented soybean foods. Non-fermented soybean food. Conclusion. References.
The following statistics show the amount (tons) of whole soybeans/defatted soybean grits/total of whole and grits consumed for various soybean foods and feeds in Japan in 1976.

Fermented soyfoods: Shoyu (soy sauce) 10,000/165,000/175,000, miso 190,500/5,000/195,500. Natto 69,000/0/69,000.

Non-fermented soyfoods: tofu and aburage (fried tofu pouches) 411,500, 55,000/466,500. Kori-toufu (dried-frozen tofu) 29,000/0/29,000. Others 16,000/75,000/91,000.

Animal feeds: 30,000/1,950,000/1,980,000. Thus total use for foods and feeds is whole soybeans 756,000. Defatted soybean grits 2,250,000, total of both 3,006,000. By type of use, animal feeds account for 65.9% of total Japanese usage of whole soybeans and defatted grits, non-fermented soyfoods account for 19.5%, and fermented soyfoods account for 14.6%. The top three food users are tofu (466,500 tons, 45.5% of all food uses), miso (195,500), and shoyu (175,000). There are 35,000 tofu plants in Japan.

Fermented soybean foods described are shoyu (soy sauce; 5 types), miso (3 basic types, 6 varieties), sufu (Chinese soybean cheese), tempeh (fermented soybean cake), natto (fermented whole soybeans; itohiki-natto and hama-natto), and fermented soy milk (recently a new fermented soybean product appeared on the market in Japan. It is a soy milk drink fermented by lactic acid bacteria).

Non-fermented soybean foods described are tofu (soy milk curd), aburage (fried tofu pouches), kori-toufu (dried-frozen tofu), yuba (coagulant film of soy milk), kinako (roasted soybean powder), moyashi (soybean sprouts), and soybeans. Production, chemical composition, and use of each of these foods is discussed. Address: Kikkoman Foods Inc., P.O. Box 69, Walworth, Wisconin 53184.


• Summary: The title page states: “Including new recipes kitchen-tested by Master Chef Sun Pui Wong, Executive Chef, Kan’s Restaurant.” This book is almost identical to the original 1963 edition. However Roman numerals have been assigned to the front matter, so the recipes are on different pages. None of the original soy-related recipes or definitions have been changed or deleted.


• Summary: This is a remarkable book, another painful example of American racism and insensitivity. The majority of the approximately 175,000 Chinese immigrants (most from Canton) who came to the United States from 1910 to 1940 passed through the detention center at Angel Island—the West Coast counterpart of Ellis Island. Here they awaited jurisdiction on the outcomes of medical examinations, interviews, and immigration papers. It was an ordeal that left many scars. Some wrote poems on the walls of the center to express their grief or sadness. The poems, written on facing pages in both Chinese and English, are divided into chapters. There are also many transcriptions of interviews, each accompanied by a Chinese person’s name, age, and date, plus some footnotes of explanation.

In the chapter on “The detainment” Mr. Dea, age 26, writes in 1939 (p. 74): “We would get up in the morning and there was no set time for this, and have plain congee with fermented bean curd. Then, after breakfast, we could go out and exercise...”

In the same chapter, Mr. Low, Kitchen helper, 1923-25, wrote (p. 77): “The main dish included soup, and the following served in turn: vermicelli and pork, dried bean curd and pork, potatoes and beef, dried greens and fish... The small dish was usually either salted fish, fermented bean curd, or hoisin sauce.”

Footnote 20: Soya bean is one ingredient in hoisin sauce. Address: California.


• Summary: Contents: Introduction. Bean sauce: Soy sauce, black bean sauce (in-yu [inyu]), in-si or tou-si (made from the dried mash of black bean sauce). Fermented jam: Tou-chiang (Taiwanese miso), tou-pan-chiang (made from sprouted broad beans; soy is not used), tien-mien-chiang (made with wheat flour; no soy). Fermented tou-fu: Tou-fu-ju (also named sufu, soybean cheese, or Chinese cheese), chou-tou-fu (also named fetid bean curd [stinky tofu]). Anka (also called ang-kak or red koji, made by growing a Monascus mold on rice). Discussion. Color photos are given of in-si (tou-si) and the pehtze of fermented tofu overgrown with Mucor mold species. A flowchart is given describing the production of most of these foods.

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term “Tou-fu-ju” to refer to
fermented tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term “fetid bean curd” to refer to stinky tofu.

In 1978 there were 433 soy sauce plants in Taiwan (39 produced a class-A product, and 12 produced class B; most were unclassified) with an annual production capacity of 160,000 kiloliters. This is equivalent to an annual consumption of 9 liters per capita. The 8 largest manufacturers control 45% of the Taiwanese market. 25% of the soy sauce is 100% fermented, 5% is HVP chemical soy sauce, and 70% is a blend of the two. “Originally, whole soybean was used as the protein source. Now it is replaced by defatted soybean [meal], and the whole soybean is used only when high quality soy sauce is desired. The Chinese National Standards (CNS) for soy sauce were established in 1954 and have since been revised several times. On 24 Oct. 1971 the CNS 423 was established. Grade A soy sauce must have the following composition in gm/100 ml: Pure solid matter excluding NaCl > 12, total nitrogen > 1.3, formol nitrogen > 0.56, and pH from 4.5 to 5.3. The corresponding figures for grade B are: Pure solid matter excluding NaCl > 9, total nitrogen > 0.9, formol nitrogen > 0.40, and pH from 4.5 to 5.3.

In-yu or black bean sauce is undoubtedly Taiwan’s oldest prepared condiment. In-yu is different from soy sauce in that it is produced from black [soy] beans and its flavor becomes stronger as it is cooked. Therefore it is used by many families in frying and cooking meat. Currently, in south Taiwan, the market for in-yu is about 30% that of soy sauce.

Production of Taiwanese miso (tou-chiang) is currently 11,000 tons. Per capita consumption is decreasing.

Fermented tofu (Tofu-fu-ju) is produced both commercially and domestically. The annual production is about 10,000 tons while weekly consumption is about 12 gm per capita. Address: Dep. of Agricultural Chemistry, National Taiwan Univ., Taipei, Taiwan.


• Summary: “The symposium was jointly sponsored by ASPAC Food and Fertilizer Technology Center (FFTC), President Enterprises Corporation, and Food Industry Research and Development Institute (FIRDI). The information contained in this book is a blend of theoretical considerations and practical applications on the Oriental food fermentations. In addition to the above, it includes some studies of microbiology and biochemistry relevant to the discipline, which have hardly caught due attention before.

The welcoming address is by Paul C. Ma, director of FIRDI. Opening remarks are given by Carson K.C. Wu (director of the Food and Fertilizer Technology Center), and by Chin-yuan Kao (president of President Enterprises Corporation, who generously paid for the printing of the proceedings, and who notes that Taiwanese consume 9.3 liters of soy sauce per capita). Address: 1. FIRDI; 2. FFTC.


• Summary: This article is indebted to: Simonds, Nina. 1979. “Chinese cuisine: Bean curd.” Gourmet. Sept. p. 28-29, 84-91.

The soybean, which offers extraordinary versatility as a human food, can be transformed into soybean milk, “the soybean milk skin [yuba] derived from the milk, the bean sticks [bamboo yuba] made from the milk skin, the also edible sediment given off by the milk [okara], untreated bean curd [regular tofu and perhaps silken tofu], pressed bean curd which produces bean curd noodles [pressed tofu noodles], more tightly compressed bean curd cakes, and frozen-and-thawed bean curd [dried frozen tofu].” Note: This is the earliest English-language document seen (Nov. 2011) that uses the term “frozen-and-thawed bean curd” to refer to dried frozen tofu.

In the process of making “pressed bean curd, another soybean food is created—bean curd skin [pai yeh, pressed tofu sheets], which should not be confused with soybean milk skin [yuba]. Dried bean curd skin,” which needs no refrigeration and is often stuffed, for example with chopped meat, is sold by weight by Chinese specialty shops throughout the world; five or six sheets weigh one ounce.

“There is a whole family of foods made from fermented bean curd” [fermented tofu]. Bean curd can be fermented in various ways. Bean curd loaves, for example, can be stored for the winter in a cool dark place; micro-organisms from the air cause fermentation. “The loaves acquire a fungoid coating, which has to be scraped off, and as far as I know is not used for food,...” Fermented bean curd, which has been called “soybean cheese,” is easier to digest than unfermented bean curd. Bean curd can also be marinated in rice wine, flavored with spices, and then allowed to ferment. A most unusual type of fermented tofu is stinky bean curd (sh’ou tou fu), a favorite Chinese snack. In Taipei, there are many street vendors who ply the streets with their portable deep fryers. This fermented tofu is usually deep-fried and usually eaten with one’s choice of soy sauce, vinegar, mashed garlic, and chili paste.

Other fermented foods include miso, natto, hamanatto (which is of Korean origin), tempeh (of Indonesian origin), and shoyu (Soybean sauce, soy sauce).

“It is said that the best grades of soy sauce can take as much as six to seven years of aging to reach perfection, and that the making of a superb soy sauce requires ‘as much art in its preparation as good French wines.’”
Flavorings are added to some Chinese soy sauce “various herbs, especially citronella; spices (ginger); aromatic vegetables (onions); and not only fermented fish, but even fermented chicken meat. To produce three liters (3.1 quarts) of sauce requires on kilogram (2.2 pounds) of beans.

“Fukien has the reputation of producing the best soy bean sauce in China and consequently stews many foods in it, giving them a color which has caused the culinary techniques of this region to be called ‘red cooking.’”

Soybean sauce is “often an important ingredient in many more complicated sauces–for instance Hoisin sauce in China and Worcestershire sauce in England.”


- Summary: The traditional teachings of both Buddhism and Taoism prohibit the eating of any food that requires killing animals, birds, fish, or other sea creatures. For this reason “the native culinary genius of China has produced a superb vegetarian cuisine. It has flourished for centuries, mainly in Buddhist monasteries.”

Now Stella Lau Fessler has written “Chinese Meatless Cooking” which contains authentic recipes. The next step is to locate a store in your town that sells Oriental foods. Tofu, sesame oil, and even shiitake mushrooms are now widely available.

“Soybeans make an impressive showing throughout the recipes: As tofu in many forms (did you know there’s a fermented tofu, ‘tofu-ru,’ which aficionados compare with blue cheese?), as soybean milk, and even as just plain soybeans, boiled fresh in the pods.”


- Summary: Tofu was first introduced into Japan in the 8th century; from that time until about the 12th century it was called “okabe.” Source: Tomomi Kono. 1970. Encyclopaedia Japonica. Tokyo: Shogakukan. Vol. 13, p. 227. Please see enclosed photocopy.


In Japan today, several factories produce 50,000 to 100,000 packages of packaged tofu per day.

By separate mail, Dr. Fukushima is sending a copy of a color slide showing Kibun’s Soena. Address: Kikkoman Foods, Inc., Walworth, Wisconsin 53184.


- Summary: The fire pot (the Chinese version of a chafing dish) is specially popular during the Spring Festival, which Americans call Chinese New Year. In Mandarin it is called huo kuo, while in the Cantonese dialect it is ta pin lou. Popular ingredients include tofu, “frozen tofu” (made by slicing and freezing fresh tofu), soy sauce, and red fermented tofu. One recipe is given for Aline Berman’s fire pot, and another for Fire pot sauce.


- Summary: Contents: Abstract. Methods of preparation: Bean curd (tu fu), bean curd derivatives (tough bean curd, smoked tough bean curd, dried soybean sheets, fried bean curd, vegetable chicken), fermented bean curd (fu ru), dried bean milk cream (fu tsu [bamboo yuba]).

For 4,000 years soybean have been one of the main crops cultivated in China. The history of extracting protein to prepare tofu is about 1,000 years old. The soybean was important not only as a food but also as a seasoning. The earliest fermented soybean products were dou-jiang (soybean ch’iang) and dou-chi [soy nuggets]. The preparation of these two products was recorded briefly in On Medical Emergency Treatment written by Si Yu during the Western Han Dynasty (100 B.C.). [Note: This is the Chi chiu p’ien by Shih Yu.] Later, these procedures were described in detail in the People’s Agricultural Calendar written by Ci-zi during the Han Dynasty (200 A.D.). Illustrations of techniques appeared in 600 A.D. in special chapters of The Principal Methodology of Economics, by Jia Si-Yi.
According to historical literature of the Min [Ming] and Qing [Ch’ing] Dynasties, the preparation of bean curd [tofu] was first recorded in Han Zi, written by Liu An, King of Huai Nan (179-122 B.C.). In the book of Qin-Yi, Tao Gu (907-960 A.D.) said that bean curd was a common food in the market of the south Huai district.

Fu ru is the fermented form of bean curd. The earliest record of this is in the book called Night Dialogue Under the Shade, written by Li Ri-huo (1636-1661). He said that fu ru was prepared between summer and autumn in the Qi Men district and briefly described the procedure. In a famous book on Chinese herbal medicine, Compendium of Materia Medica, the author, Li Shizen (1518-1593), describes the preparation technique in detail.

Later, these procedures were described in detail in the People’s Agricultural Calendar written by Cui-Zi during the Han Dynasty (200 A.D.). Illustrations of techniques appeared in 600 A.D. in special chapters of The Principal Methodology of Economics, by Jia Si-Yi. Address: Oil and Fat Research Inst., Shaanxi, China.


This paper discusses traditional Oriental soy protein foods which are growing rapidly in popularity in the USA among non-Asian-Americans.

“Generally speaking, soy sauce is divided into two groups: fermented soy sauce and chemical soy sauce. Fermented soy sauce has a long history as a human food, whereas chemical soy sauce has a history of only several decades. In fermented soy sauce, the proteins and carbohydrates contained in the materials are hydrolyzed very slowly under mild conditions below 30ºC for over six months, whereas in chemical soy sauce they are hydrolyzed quickly by hydrochloric acid at 80ºC for 8-10 hours. Chemical hydrolysis is a cheap and rapid process, but during the hydrolysis, various secondary reactions occur and produce undesirable compounds, e.g. dark humins, furfurol, dimethyl sulfide, hydrogen sulfide, levlinic acid and formic acid, which are not present in fermented soy sauce. Furfurol, dimethyl sulfide and hydrogen sulfide, which have strong, bad odors in themselves, are derived from pentose, methionine, and sulfur-containing amino acids respectively. Furthermore, tryptophane, one of the nutritionally important amino acids, is destroyed almost completely. As shown in Figure 1 [two chromatograms], the main organic acid of fermented soy sauce is lactic acid, whereas the main organic acid of chemical soy sauce is formic acid. Levlinic acid, present in chemical soy sauce, does not exist naturally.

“To improve the odors of chemical soy sauce, semichemical soy sauce was devised. It is made by hydrolyzing raw soybeans with a lower concentration of hydrochloric acid (7-8%) as the first step, followed by fermenting the hydrolysate with osmophilic yeasts in the presence of wheat koji.” In Japan, chemical soy sauce is not used as a soy sauce in itself, but as an extender for fermented soy sauce.

Table 1 gives the typical chemical composition (per 100 ml) of the five varieties of traditional soy sauce in Japan, including Bé [Baumé; a measure of the relative density of liquids], sodium (koikuchi is lowest at 17.6%, usukuchi is highest at 19.2%), total nitrogen (koikuchi has 1.55 gm, tamari has 2.55 gm or 65% more), formol nitrogen, reducing sugar, alcohol (koikuchi is 2.2%, by far the highest), pH (ranges from 4.6 to 4.8), and color.

A brief description of each of the five traditional varieties: (1) Koikuchi: This “dark-colored” shoyu is by far the most popular of the five types of fermented soy sauce in Japan, comprising 85% of the total. It is an all-purpose seasoning with a strong aroma, complex flavor, and deep, reddish-brown color. These characteristics are mainly derived from the use of equal amounts of wheat and soybeans in the koji; (2) Usukuchi [light-colored] shoyu is characterized by a lighter, red-brownish color and a milder flavor and aroma. It is used mainly for cooking when one wishes to preserve the original flavor and color of the food itself. As in koikuchi, equal amounts of soybeans and wheat are used in the koji, but the fermentation is done under conditions which prevent the development of a dark color. (3) Tamari shoyu has a higher amino acid content, but it lacks aroma. The koji is made primarily from soybeans with little or no wheat. (4) Saishikomi [twice-fermented] shoyu is made using equal amounts of wheat and soybeans in the koji, but using raw (unpasteurized) soy sauce instead of salt solution, which is mixed with the harvested koji. Saishikomi is characterized by aroma and full-bodied taste. (5) Shiro [clear, or “white”) shoyu is made by using a very high ratio of wheat to soybeans in the koji, and further by fermentation under conditions which prevent dark color development. It is characterized by a very light yellow to tan color, though the amino acid content is very low because of the low soybean content in the koji. Flow sheets show the process for manufacturing koikuchi, usukuchi, and tamari shoyu. Each has three basic parts: Koji making process, brine fermentation process, and refining process.

Concerning soy sauce production and consumption: The total annual production of soy sauce in Japan in 1979 reported by the Japanese Agricultural Standard (JAS) was 1,252,431 kiloliters (kl). In 1979 in Japan, about 70% of the soy sauce products in Japan were purely fermented, 25%
contained some semichemical soy sauce, and the remaining 5% contained chemical (HVP) soy sauce. The most recent estimates of annual consumption of soy sauce in the USA are as follows: Fermented soy sauce 17,850 kl; Chemical (HVP) soy sauce 25,500 kl. Within fermented soy sauce, production of kokuchi soy sauce is estimated to be 16,500 kl/year.

In Japan an “instant tofu powder” is actually a spray-dried soy milk. This product was made and introduced by Nihon Tanpaku Kogyo (Japan Protein Industry) about 15 years ago (ca. 1966) and was used mainly as a raw material for making regular or silken tofu in order to save time. “Recently, however [1973], the product was placed on the market as an instant powdered tofu [named Hausu Hontōfu] by Hausu [House] Foods Co.”


  • Summary: Page 543: “And so, in a nondescript village only ten miles from the city, I shared rice porridge and fermented bean curd with Mr. Cheh Wang Teck, the happy-go-lucky practitioner of a Chinese cult so old and complex that it really doesn’t have a name.” Address: Senior staff writer.

  • Summary: A table shows production statistics for 25 types of soyfoods. Number of manufacturers in the USA, Canada, Other West, Total; Tons of raw soybeans/year used by each food. Yield of food from 1 unit weight of soybeans. Wholesale value. Retail value. Number of people employed. Address: P.O. Box 234, Lafayette, California 94549.

  • Summary: Methods of preparation are given for the following soyfoods: Tofu, soy sauce, miso, hamanatoto, sufu, tempeh, natto. A table gives local names, descriptions, and uses for traditional East-Asian non-fermented soyfoods: “Fresh green soybeans (mao-tou, edamame),” soybean sprouts (huang-tou-ya, daizu no moyashi), soybean milk (tou-chiang), protein-lipid film (tou-fu-pi, yuba), soybean curd (tou-fu, tubu, tahoo, touhu, taufoo, dou-fu, dan-fu), and soybean flour (tou-fen, kinako). Local names, organisms used, substrate, and description of the product are given for traditional East-Asian fermented soyfoods: soy sauce, miso, hamanatoto, sufu, tempeh, and natto.

  Note: This is the earliest English-language document seen (Feb. 2004) that uses the word “taufoo” to refer to Chinese-style tofu. Address: NRRC, Peoria, Illinois.

  • Summary: This article was first published in the Journal of the American Oil Chemists’ Society (1981, Feb. p. 96A). Address: Oil and Fat Research Inst., Shaanxi, China.


  Note 1. This is the earliest publication seen that uses term “Tofurei” to refer to tofu shops/manufacturers. The term was coined by Gabriele Furth-Kuby of Ahorn Verlag.

  Note 2. “Sojaquark” is used to refer to soymilk curds rather than to tofu. Published in a hardcover edition only. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

  • Summary: The Introduction states: “The original IFIS word list, issued in 1970, did not attempt to give more than the barest outline of the relations between the terms encountered. In 1977, therefore, an FSTA Thesaurus was published, in which the basic structuring of the material found in FSTA..."
was set out. The Thesaurus was designed to give maximum compatibility with the EEC Multilingual (English / French / German / Italian) Food Thesaurus, published in 1979 (and itself based largely on the FSTA system for the English version), and to take into account the needs of on-line users."

The terms are divided into headings (main terms or descriptors), which are printed in capital letters, and lead-in terms (non-descriptors) printed in lower case. Additional information is included in square brackets. The following abbreviations show the types of relationship between terms: 

- **BT** = broader terms.
- **NT** = narrower terms.
- **RT** = related terms.
- **UF** = used for lead-in term followed by "see" heading (e.g. bean curd see TOFU).

**Soy-related terms:**
- **Beverages:** UF soy milk. Lecithins: BT Emulsifiers, Phospholipids. UF phosphatidylcholine.
- **Legumes:** NT Soybeans. Miso: BT Soy Products. natto: see Soy Products. Sauces: NT Soy Sauces. soy flour: see Soy Products. soy milk: see Beverages; Soy Products.
- **Soy Products:** BT Soybeans, Vegetable Products, Fermented Products. NT Miso, Soy Proteins, Soy Sauces, Soybean Oils. UF natto, nyufu, soy flour, soy milk, sufu, tempeh, tofu, tsukudani, vital.
- **Soy Proteins:** BT Protein Products, Soy Products, Proteins Vegetable. RT Textured Vegetable Proteins. UF okara protein, Promine [Central Soya Co.], Supro 620, yuba.
- **Soy Sauces:** BT Fermented Products, Sauces, Soy Products. UF moromi, shoyu.
- **Soybean Oils:** BT Oils Vegetable, Soy Products.
- **Soybeans (Glycine max):** BT Legumes, Oilseeds. NT Soy Products.

**Note:** This is the earliest document seen (Sept. 2003) that is a thesaurus containing terms related to soybeans and soy products. Address: IFIS (International Food Information Service), Lane End House, Shinfield, Reading RG2 9BB, England.


**Summary:** This interview with Jim Miller begins with the early history of Quong Hop & Co. The characters “Quong Hop” can be translated as “expanding oneness” or “immense unity.” The company is one of the largest tofu makers on the West Coast, and, so far as the company knows, “it is the oldest in the country having been started shortly before the 1906 earthquake and fire in San Francisco. Founded by Lee Sing How on Wentworth Street in [San Francisco’s] Chinatown, the company spent the year after the earthquake in Oakland, and then returned to San Francisco to a new location on Waverly Place.

“During those early years, tofu was manufactured daily on the premises and sold.”

“It was customary for many in San Francisco’s Chinese community to get up at dawn and go to their local tofu shop—which had been open since 2 a.m.—and buy their daily needs.”

Quong Hop did well as a business until the start of World War II when a shortage of soybeans occurred, since almost all of the company’s soybeans used at that time were imported from China. So Quong Hop “stopped making regular tofu and restricted its product line to regular tofu, a product used as a condiment.”

In the early 1960s the company moved to a new location on Folsom Street, maintaining its factory but eliminating its retail store.

Then the natural foods movement arrived and Quong Hop was swept up in it. In 1971 the company decided “to expand its product line back to what it had once been, several varieties of tofu and soymilk.” But Quong Hop’s main customers remained basically the same; Chinese Americans.

In 1976 Quong Hop began using completely natural ingredients—including natural nigari.

Today Quong Hop’s products are distributed to three main types of markets: (1) Oriental groceries and restaurants. (2) health and natural food stores. (3) supermarkets and other restaurants.


**Summary:** In Peking, the Mongolian ‘hot pot’ “is a doughnut-shaped charcoal-heated chafing dish. The pot, which has a central chimney (i.e., the hole of the doughnut),
is associated with the Muslim minority, who do not eat pork.”

Donglaishun Restaurant is Peking’s best-known “hot pot” restaurant, and now that cold weather is setting in, this way of cooking and its thinly sliced “rinsed mutton” are coming back into their own.

“You make your own sauce, fiery or mild to suit your taste buds, out of sesame oil, shrimp sauce, fermented bean curd sauce, chili oil, garlic, and coriander.”

“Muslim dietary habits, trampled on during the Cultural Revolution [1966-1976], are again being respected.”

Address: Staff correspondent.


• Summary: “Isaac Bashevis Singer, the author: I’m a vegetarian, I eat neither meat nor fish. I’m not going to kill a turkey as an expression of my gratitude to America.”

“Betty Bao Lord, author of ‘Spring Moon’: For Thanksgiving we always have Mongolian hotpot... On the table there is a tray of sesame oil, soy sauce, shrimp paste, peanut butter, chili peppers, fermented bean curd and fresh eggs. Each person mixes his own sauce to taste.” Address: Staff correspondent.

435. Product Name: [Tofurin Tofu Cheese (With Miso)].

Foreign Name: Tofurin.


Manufacturer’s Address: Meeuwenlaan 70, 1021JK, Amsterdam, The Netherlands.

Date of Introduction: 1981.

Ingredients: Tofu, miso.


Manna Bulletin. 1983. 5(4):1 June. The price of Tofurin has been reduced from 3.90 to 3.45 guilders.


• Summary: Pages xv to xvi give a brief biography and photo of Dr. Clifford W. Hesseltine, winner of the tenth Charles Thom Award on 14 Aug. 1980, presented by the Society for Industrial Microbiology. Dr. Hesseltine knew Dr. Charles Thom and was strongly influenced by him, even though the two men never worked together.

“Dr. Hesseltine’s studies on the taxonomy of the Mucorales have resulted in a classification now in worldwide use... The research of Dr. Hesseltine on mycotoxins is world famous. He has directed the aflatoxin project of the Fermentation Laboratory, NRRC...”

Just 100 years ago the first pure cultures of fungi were made by Brefeld, a German, who published his results in 1881. The development of submerged culture of penicillin production began in 1941 at the NRRL. The USA lost its leading role in industrial fermentation early in the 1960s due to weakness in research in many fields. Address: NRRC, Peoria, Illinois.


• Summary: This “comprehensive, illustrated guide to the art of Chinese cooking provides step-by-step instruction in the basic techniques of Chinese cuisine and more than one hundred traditional recipes.

Page 217: “Sauce: 2 cubes fermented red bean curd.”


• Summary: The Indian woman author of this creative book presents 21 recipes for bean curd (tofu), 7 for tempeh, and some for yuba and miso. Green soy beans with sauce (p. 7). Cabbage with miso (p. 15). Eggplant slices with white miso (p. 22-23). Fresh soy beans, steamed (p. 57). Spinach with fermented bean curd (p. 59). Stuffed yellow squash (with yuba, p. 62-64). Pecel (Vegetable salad with spicy peanut sauce, plus tofu and tempeh; p. 73-74). Tempura (with tofu; p. 75-77). Soy bean sprouts (how to grow; p. 100). Soy-bean
and mung-bean sprouts seasoned with sesame oil (p. 105). Tempeh, Fried tempeh, Fried, preseasoned tempeh, Sambal goreng tempeh kering (Sweet and sour tempeh), Tempeh cooked in coconut milk (p. 108-110). Thai fried rice (with Red Bean Curd or Nam Yee [red fermented tofu]; p. 150-51).


General information (p. 418-36; lots on soyfoods, see: bean curd [regular, fried, fermented (Nam Yee), pressed, pressed seasoned], kochu chang [jang], miso, soy-, tempeh, yuba). Sources (of ingredients; p. 437-40). Address: New York City, NY.


• Summary: The section on “Anti-nutritional factors in pulses” discusses those found in many legumes (such as haemagglutinins, trypsin inhibitors, phytic acid, flatulence factors) and those of importance in specific legumes; for soybeans, only heat-resistant trypsin inhibitors are mentioned. The section on “Basic bean cookery” gives general guidelines and tips (never add salt until beans are cooked tender). A table (p. 54) shows that soybeans require the longest cooking time of any bean listed.

The section titled “A-Z pulses” gives details (incl. the scientific name) concerning many legumes listed alphabetically. Includes adzuki, kura mame [sic, kuro mame = black soybeans] (p. 65), and winged beans. By far the longest section is on soy beans (p. 71-82). Contents: Introduction. Nutritional values. Dried soy bean products: Soy grits, soy coffee, soy flour (full fat, medium fat, fat free), soy nuts, soy milk, soy yolk (a concentrated form of soy flour), textured vegetable protein, soy splits, tofu powder. Fermented soy bean products: Black beans–fermented, chao, chee-fan, chiang (Chinese miso), Hamanatto, ketjap, koji, meitaauza, miso, mame miso, Hatcho miso, kome miso, mugi miso, natto, okara. Soy sauces: Introduction, Chinese soy sauce, ketjap, synthetic sauce, tamari. Sofu [sic, sufu], tahuri, tamari, tao-cho, taokoan or tao koan, taotjo or tao dji, tempeh, tofu. Tofu from whole beans (homemade recipe).


The rear cover states: “These books fight a war against junk food–and win.” The author is a woman.

Note: This is the earliest English-language document seen (Feb. 2004) that uses the word “tao koan” (or “tao-koan”) to refer to tofu. Address: United Kingdom.


• Summary: Page 83: “Changsha is famous for its marionette and shadow puppet theatres and visitors can also try the various restaurants offering hot and spicy Hunanese food. The regional specialty is chou doufu –stinking beancurd!”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term chou doufu.


• Summary: Soy related entries include: Bean curd (incl. tofu). Bean-curd cheese [fermented tofu]. Bean paste and
bean sauce (incl. Red bean paste) is sweet and made from adzuki beans. Yellow bean paste is made from soybeans and is salty and pungent. “Fermented salted black beans” is made from a black variety of soybeans; these salted black beans can be used to make “black bean sauce” which can be used as a flavoring in fish, lobster, chicken, and pork dishes.

Soybean (incl. soya bean, soja bean, flour (“pork soya links” used in Britain during World War II), sprouts, soy oil, soy sauce, soymilk, vegetable yogurt [soy yogurt], vegetable cheese [soy cheese], tempeh, bean curd skin [yuba], miso, tamari, soy sauce, soy protein isolate, soy granules or grits, textured plant protein [textured soy protein]). The name in four European languages is given.

Soy sauce or shoyu (It “is said to be one of the ingredients of Worcestershire sauce.” Incl. the “very heavy Indonesian ketjap (ketjap manis or ketjap benteng), which is a type of soy sauce,...”). The name in four European languages is given.

Textured plant protein (a high-protein foodstuff manufactured from plants (soybeans, peanuts, wheat, cottonseed, etc.). “Originally it was aimed at the vegetarian market.” Also called “textured vegetable protein” in the USA. Incl. textured soy flour, textured soy protein gel and fibers.

Worcestershire sauce: Begins with a history (starting in 1837) based on the fanciful story so widely known. “Thus was born what is probably the world’s best-known and most ubiquitous bottled sauce, one which has become a standard flavoring in...

Ingredients: Soybeans, water, nigari, magnesium chloride.
How Stored: Refrigerated.

Richard Leviton. 1983. Trip to Europe with American Soybean Assoc. Oct./Nov. Unpublished manuscript. p. 26-28. See history of the company. Philip Marshall and Peter Fagan started their partnership in Cauldron Foods in Sept. 1981. Philip was previously a partner with Paul Jones, and at the time he joined with Peter he was already a Bristol tofu maker selling some tofu in bulk to the converted. They now make 1,200–1,500 lb/week of tofu, all in one day. They are planning to do a fermented tofu spread.


Letter from Neil Robinson. 1989. Aug. 7. The three major tofu products in Britain, as far as I know, are (1) Tofeata Tofu by Haldane Foods (Hera), Leicester, England; (2) Cauldron Foods, Bristol, England; (3) Truehealth Tofu by Birchwood Foods, Wrexham, Wales.

Talk with Philip Marshall, founder. 1990. March 29. Cauldron Foods was founded in 1980 and began to produce tofu in late 1981 in Bristol. This was a pioneer tofu company in England.

Note: This is the earliest record seen (April 2001) in connection with Cauldron Foods Ltd.


The domestic supply of soybeans has never been sufficient to meet national demands for food, feed, and industrial uses. Total domestic soybean production in 1978 was reported to be 7,099 metric tons. Approximately
176,000 metric tons of soybeans, costing $30.8 million, were imported.

“To boost domestic production, the government has launched projects like Masaganang Maisan, the white corn and feed grains program, and the National Soybean Development Program...

“Researchers at the University of the Philippines at Los Baños have produced bottled soymilk (Philsoy) using the hot water grind technique... Fermented soybean products, such as soy sauce, soy cheese (tokwa [tofu]), soy paste (miso), soy curds (tahuri [tofu in brine]), and canned salted beans (tausi) are the most common soybean products used as ingredients in traditional Filipino dishes. A cheese-like product served with sugar syrup (taho) is sold by ambulant peddlers in urban centers.” Address: Prof. of Plant Pathology, College of Agriculture, the Univ. of the Philippines at Los Baños.


9. Other: Analysis of the soynuts industry in the U.S. North America’s larger soyfoods delis, cafes & restaurants. The soybean crushing industry; overview.

10. Soyfoods terminology and standards (Glossary of soyfoods terms): I. Traditional nonfermented soyfoods: Fresh green soybeans, okara, roasted soy flour (soy coffee, soy chocolate), soybeans, soymilk (soymilk ice cream, soymilk soft serve, frozen soymilk yogurt, soymilk mayonnaise, soy shakes, soy nog, soymilk whipped cream), soynuts, soy sprouts, tofu (regular tofu, deep-fried tofu {deep-fried tofu cutlets called nama-age or atsu-age in Japan, deep-fried tofu burgers or burger balls, called gannomodoki or hiryozu in Japan, deep fried tofu pouches (called aburage in Japan; the words “deep-fried” may be dropped from the names after the initial usage, and in recipes or on package labels, if desired), silken tofu {made without separation of curds and whey, called kinugoshi in Japan; modern types, all made with glucono delta-lactone as coagulant, and all known in Japanese as juten-dofu, are packaged lactone silken tofu, bagged lactone silken tofu (fukuro-dofu), sealed lactone silken tofu (buro-dofu), and Ever-Fresh Lactone Silken Tofu (in Tetra-Pak)}, grilled tofu, frozen and dried-frozen tofu. (Note: It is illegal to describe the latter product as “freeze-dried tofu,” since freeze-drying is a completely different process), terms associated with making tofu {fresh soy puree, a coagulant or curding agent, forming box, filter bag or pressing sack, tofu comes in cakes, not blocks}), whole soy flour, flakes, and grits, yuba.

II. Traditional fermented soyfoods: Fermented soymilk products (soymilk yogurt {Soy Yogurt, Soyogurt, Soygurt}, acidophilus soymilk, soymilk kefir, viili, piima, buttermilk {Soy Kefir, etc.}), fermented tofu (wine-fermented tofu, brine-fermented tofu), miso (rice miso, barley miso, soybean miso, Chinese soybean chiang), natto (thua-nao from Thailand and kenima from Nepal; all are non-salted), soy nuggets (Chinese soy nuggets know as shih, tou-ch’ih, tou-shih, or dow-si; savory soy nuggets called Hamanatto in Japan, Daitokuiju soy nuggets called Daitokuiju natto in Japan, Philippine soy nuggets called tausi or tao-si in the Philippines, Indonesian soy nugget paste called taouco, formerly spelled tao-tjo, Malaysian soy nugget sauce called tao-si), soy sauce (shoyu. The five basic types of Japanese shoyu are: regular shoyu called koikuchi shoyu in Japanese, light-colored shoyu called usukuchi shoyu, tamari shoyu, clear shoyu called shiro shoyu, and rich shoyu called saishikomi shoyu), tempeh, other fermented soyfoods.

III. Soy oil and modern soy protein foods: soy oil, defatted soy flour, flakes and grits, soy protein concentrate, soy protein isolate, textured soy protein products (TSP, TVP) is a registered trademark of the Archer Daniels Midland
Company and cannot be used as a generic name for this product), meat analogs (foods typically made from spun soy protein fibers to resemble meat, fish, or poultry products).


12. Key institutions working with soyfoods in the West: The Soyfoods Center, Soyfoods Association of North America, INTOSOY, American Soybean Association, Bean Machines, Inc., Soycrafters Apprenticeship Program, USDA Northern Regional Research Center, Sojaquelle.

About The Soyfoods Center.
Note: This is the 2nd market study published by Shurtleff. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


• Summary: Gives the names of all the various soyfoods in Spanish. Note: A typed list of these names is published in Soyfoods Industry and Market: Directory and Databook, 1985. 5th ed. p. 164.


• Summary: On 1 April 1982, Ebine retired from the National Food Research Institute (NFRI).

In the 1971 book Daizu Shokuhin (by Watanabe, Ohta, and Ebine), the chapter on Nyufu [fermented tofu] was written by Ohta.

In 1981 Kubin started to sell commercial soy yogurt in Japan. Address: Japanese Society of Food Science and Technology, 2-1-2 Kannondai, Yatabe-machi, Tsukuba-gun, Ibaraki 305, Japan.


• Summary: Today’s column is about vegetarianism. “The Vegetarian Society has recently come up with a new symbol, a green V for restaurants, pubs, eating houses and snack bars to display.”

Vegetarian Restaurants in England, compiled by Leslie Nelson (published by Penguin) is a useful guide.

“The Seven Sheaves in the East West Centre [macrobiosis] (188 Old Street, London, EC1) is another remarkable restaurant, where I ate my first bowl of tempeh–a fermented tofu [sic] high in protein. It tasted of field mushroom, white truffle and–dare I say it?–grouse.”

Note: Tempeh, which is a cake of fermented soybeans, is completely different from tofu, which is not fermented. And fermented tofu is much different from regular nonfermented tofu.


• Summary: Contents: What is tofu? Taste. Texture.
A

1983.–The population of Korea is about 40 million and the constructing a plant to start making soymilk in Feb. Marusan's (Japan) technology to make soymilk. They are Meiji in Japan to make soymilk. A pharmaceutical company, is planning a joint venture with start making soymilk. Also, I head that Tôa Shokuhin (K.K.), and Sangan) are going to have some sort of equipment to cartons (each 200 cc). Also other dairy milk makers (Sojû Kibun in Japan, is going to make 120-130,000 Tetra Brik soymilk. The plant is built on a lot of 4-5,000 tsubo and has but the sugar content is 10%, which is sweeter than Japanese contains added fat and sugar to make it closer to dairy milk.,

Tsuchiya visited Korea again. They had developed their own method of making soymilk and the soymilk plant had been expanded. Now they produced 500,000 bottles a day (180 cc each, retort sterilized); they call it Vegemil / Vegemeal. It contains added fat and sugar to make it closer to dairy milk., but the sugar content is 10%, which is sweeter than Japanese soymilk. The plant is built on a lot of 4-5,000 tsubo and has 24 retort sterilizers; each machine has 2,500 bottles capacity. Tôhô Yuryô, as part of a Korean technical joint venture with Kibun in Japan, is going to make 120-130,000 Tetra Brik cartons (each 200 cc). Also other dairy milk makers (Sojû and Sangan) are going to have some sort of equipment to start making soymilk. Also, I head that Tôa Shokuhin (K.K.), a pharmaceutical company, is planning a joint venture with Meiji in Japan to make soymilk.

Also, Lotte Chilsung Beverage Co. is planning to use Marusan's (Japan) technology to make soymilk. They are constructing a plant to start to make soymilk in Feb. 1983.—The population of Korea is about 40 million and the GNP 24,000 million won (unit of currency) a year; it is the largest in Asia. But it is a tough war for market share among these fine companies.

Soymilk in Taiwan (p. 57-61): People who were born in Taiwan [the former Japanese colony of Formosa (1895-1945)] have Japanese food habits and don't like soymilk as much as the Chinese. Also, Taiwanese young people don't like soymilk much. In mainland China people only drink water that has been boiled and cooled—just as they do with tea. The same with soymilk. They boil soymilk in a flat pan (hira-nabe) for 20-30 minutes before selling it. The buyers don't buy it without seeing that it has been properly boiled. If you cook soymilk in a flat pan for a long time, you can eliminate much of the beany smell and flavor; the antigestion substances, and harmful bacteria. They don't care about a little burned flavor, bitterness, or beany flavor. But this is ancient wisdom. There they continue to drink soymilk up to this day and it is still very popular. It is said that the annual sale of soymilk in Taiwan is about 5,000 million yen.

In China, sellers of ice candy (like ice Popsicles) call out loudly kaishui bingo. Kaishui means boiled and cooled water. Bingo means Popsicle.

In the Philippines, about 10 years ago, the University of the Philippines developed soymilk and a blend of soymilk and coconut milk for American children. It was test marketed among the students and teachers of elementary schools, junior and senior high schools, and universities. It was acceptable only to comparatively well educated people. A 200 ml bottle (about 7 ounces) sold for 15 cents, making it more expensive than most others drinks. The taste was plain but the bean smell was not completely removed. In October 1982 Dr. William G. Padorina and other economically influential people came to Japan at the request of President Ferdinand Marcos and studied Marusan's soymilk plant. They are planning a Food Development Symposium in Feb. 1983 and they would like to have nutritious soy products that contain coconut oil (they account for 70% of the world's production). They have asked Marusan to cooperate in the effort.

In Denmark, a company named Starna [Nutana?] makes various soyfoods such as textured soy flour (daizu nikkü), defatted soymilk, and soymilk. They are selling these products in Denmark and neighboring countries. The Book of Tofu by Shurtleff and Aoyagi is mentioned on pages 46 and 117.

Ozakaki Marusan makes a soy yogurt named Tôgurt / Tôguruto in Japanese. The character tô, which means bean, is also the first character in the word tôfu (p. 71). Address: Technical consultant, Okazaki Marusan, Japan.

Part III (p. 39-64) titled “Soymilk around the world,” has chapters on the USA, Korea, Hong Kong, China, Taiwan, Southeast Asia, and Europe. Soymilk in America (p. 47-52) includes a 1975 table showing major manufacturers of soymilk and soy-based infant formula, their location, and the names of their products. Soymilk in Koreap (p. 53-54): In 1968 the Keijo Shison Shokuhin Kenkyujo made soymilk using the regular tofu making equipment adjusted to make a product as similar as possible to dairy milk, then bottled it in cider bottles, pasteurized it, and sold it. They made 500 to 800 bottles a day and sold it nationwide. It was brownish in color and tasted like soybean cooking liquid; there was no comparison between that and today’s soymilk in quality. The head of this research lab was Dr. Son Zaien, who also ran the children’s hospital and was a professor of pediatrics at Seoul Medical University. As a pediatrician his concern was that the soymilk promote the growth and health of children; he was not concerned about its acceptance among adults. The children accepted it within 2-3 days. Later, in May 1982, Tsuchiya visited Korea again. They had developed their own method of making soymilk and the soymilk plant had been expanded. Now they produced 500,000 bottles a day (180 cc each, retort sterilized); they call it Vegemil / Vegemeal. It contains added fat and sugar to make it closer to dairy milk., but the sugar content is 10%, which is sweeter than Japanese soymilk. The plant is built on a lot of 4-5,000 tsubo and has 24 retort sterilizers; each machine has 2,500 bottles capacity. Tôhô Yuryô, as part of a Japanese technical joint venture with Kibun in Japan, is going to make 120-130,000 Tetra Brik cartons (each 200 cc). Also other dairy milk makers (Sojû and Sangan) are going to have some sort of equipment to start making soymilk. Also, I head that Tôa Shokuhin (K.K.), a pharmaceutical company, is planning a joint venture with Meiji in Japan to make soymilk.

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complicated flavor. It is good to drink millet brandy
(awamori) as you nibble on tofuyo. People used to make
tofu at home but it takes too much time, so nowadays it is
found mainly at specialized restaurants.

Tofu is cut into squares about 1 inch on a side and the
pieces are dried in the shade for a few days until they get
slimy. They are washed with millet brandy and immersed in
rice malt which has been moistened with millet brandy. You
may start to eat tofuyo after one month, but it seems to reach
its peak of flavor after 6 months. Tofuyo is a type of cheese
created in Okinawa, where tofu and millet brandy are loved.
It is sold at Urizen, 388-5 Anni, Naha city, Okinawa. Phone:
0988-85-2178. Hours: 5:30 p.m. to midnight. Closed the 2nd
and 4th Sunday of each month.

Note: As of Nov. 2011 awamori is made from Thai-style
long-grained Indica rice (not millet) and black koji mold,
indigenous to Okinawa; after distillation it is often aged like
whiskey.

453. **Product Name:** Maggy Jim’s “Bean Cake Dressing.”

**Date of Introduction:** 1982.

**New Product—Documentation:** Talk with Jim Miller, V.P.
Marketing & Personnel, Quong Hop & Co., 161 Beacon St.,
South San Francisco, California 94080. (Phone: 415-873-
commercial Western-style prepared food using fermented
tofu as a primary ingredient was introduced. Called “Maggy
Jim’s Bean Cake Dressing” it was a Roquefort-style salad
dressing sold in a bottle as part of a six-pack of bottled
dressings and sauces. The fermented tofu was imported from
Hong Kong.

puzzles. 5 vols. Hong Kong: Stockflows Co. 24 cm.

• **Summary:** Vol. 2, p. 1099 contains an entry for the Chinese
caracter “Fu,” which means “rotten, putrid, stale, corroded,
bean curd,...”

  * **Doufu** is “bean curd.”
  * **Furu** is “fermented bean curd.”
  * **Fuzhu** is “dried bean milk cream in tight rolls” [i.e., shaped into tight rolls]. Fuzhu
  might also be called “dried yuba sticks.”

  Note: Vol. 2 contains pages ix + p. 675-1358.

in human nutrition. 2nd ed. Rome, Italy: Food and
Agriculture Organization of the United Nations (FAO). viii +
152 p. Illust. 28 cm. The original edition was 1964. [Eng]*

• **Summary:** Contents: Preface. Introduction. History of
legumes. Production and consumption. Composition and
nutritive value. Methods of processing and cooking. Effects
of processing on nutritive value. Toxic substances. Legume
proteins. Observations on the value of legumes in human
feeding. The place of legumes in human diets. Appendixes.
References.
During the “three disastrous years”–the period from 1959 to 1961–after the Great Leaf Forward, there was extensive starvation in China, but the number of those who died were never made public (p. 199).

Tang remembers the time that “prisoners were given some pieces of bean curd to eat. She was so overjoyed that she didn’t want to eat all of it at once but kept some of it apart and managed to ferment it. She says that it was the most delicious thing that she ever ate in her life” (p. 213). Address: Time magazine correspondent, China.

• Summary: Contains basic information (sometimes interesting, often superficial, with quite a few errors) about some 4,000 foods and beverages, including worldwide staples (potatoes, soybeans, apples), local specialties, delicacies, major brand-name products (Coca-Cola) and oddities (penguin eggs, grasshoppers). With 200 line drawings, 150 black-and-white photos, and 50 color plates.

See entries for soybean (incl. black soybeans, fermented tofu, miso, soybean flour, soybean milk, soybean oil, soy sauce, tempeh; tofu, “white soybeans”), and Worcestershire sauce (which “is said to contain more than 100 ingredients, including soy sauce, vinegar, molasses, chili, anchovies, garlic, shallots, tamarinds, limes and many spices”).

Tofu: “A fermented form of this, called stinky tofu, is a favorite snack of the Chinese. It has a pungent smell and is usually deepfried [deep fried] and seasoned with soy sauce, vinegar, mashed garlic or chili paste. The food value is high...” (p. 643).

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “stinking tofu.”

Also has entries for: Almond, chufa, peanut, peanut butter, peanut oil, seaweed (incl. algae, dulse, laver, rock weed / sea wrack, agar-agar, carrageen, kelp), sesame (with illustration of leaves, flower, and pods). Address: Freelance writer, Oceanside, California.


• Summary: Chapter 12 (p. 492-538; 129 refs.), by H.L. Wang and C.W. Hesselton, is titled “Oriental Fermented Foods.” It discusses: Soy sauce, miso, tempeh, onjom, Hamanatto (known as tou-shih in China, tao-si in the Philippines, and tao-tjo in the East Indies [No! Tao-tjo is Indonesian-style miso], sufu (also called Chinese cheese or bean cake), natto, idli, ang-kak, fermented fish products (incl. nuoc-mam), absence of mycotoxin in fermented foods, summary. Address: Vice president, Amber Labs, Milwaukee, Wisconsin.

• Summary: This is a remarkable book by one who is part “of a new generation of American chefs and food writers.” The Pinyin system of romanization, which was of romanization, “which was officially adopted by the People’s Republic of China in 1979, has been used for most of the Chinese words in this book” (p. vi).

A map of China (facing page 1) shows the individual provinces and the four main culinary schools: northern, western, eastern, and southern—as explained on pages 1-4. Taiwan is considered part of the eastern school. The southern school is comprised of only two provinces: Guangdong (which includes the city of Guangzhou–formerly named Canton) and Guangxi.

Soyfoods are used and discussed liberally throughout this book. The section titled “Condiments, seasonings, and special ingredients” (p. 5-11) gives detailed discussions of hoisin sauce, oyster sauce, soy sauce (the three grades are light, medium and heavy, with light having a delicate and slightly more subtle flavor than the other varieties), sweet bean sauce (and bean pastes including brown bean paste and yellow bean paste), fermented black beans (and black bean sauce).

The next section, “Selected fresh and pickled vegetables” (p. 11-14) has an entry for bean sprouts (the two main types are sprouted from mung beans {which are green} and soybeans {which are yellow}; soybean sprouts have a stronger flavor and require longer cooking).

Soy related recipes: Beef with noodles in a pot (with “2 cakes bean curd,” p. 76). Cold spicy noodles (with “2 cakes bean curd, about 3 inches square and 1 inch thick,” p. 80).

One chapter, titled “Soybeans and bean curd” (p. 113-29) begins with a charming introduction to “stinky bean curd” (fermented tofu). As evening fell after dinner, luscious
scents and fragrances filled the air. Yet there was a "putrid smell that defied classification. What was that baffling, pungent odor, present in every part of the city." After a bit of research she soon discovered that it came from "stinky bean curd (chou dou fu), a favorite snack of the Chinese." Vendors of this unusual "delicacy ran rampant all over the city with their portable deep deep-fryers. My Chinese surrogate sister and brothers, who were great fans of the stuff, used to race outside, armed with empty bowls and chopsticks, at the sound of the stinky bean curd man's call. (The smell usually preceded him by two blocks, giving everyone plenty of notice.) It is "made by fermenting fresh bean curd squares in a brine with assorted spices and pickled vegetables." The resulting cakes are deep-fried... until golden and eaten with soy sauce, vinegar, mashed garlic, or chili paste."

The soybean is used to make various Chinese seasonings including soy sauce, hoisin sauce, sweet bean sauce or paste, and hot bean paste. Fresh green soybeans are cooked and served with soy sauce and sesame oil. Whole dry soybeans are fried and eaten as a snack.

"The nutritious properties of the soybean further explain why it is so popular with the health-conscious Chinese."

Heating soybean milk gives "bean milk sheets (fu pi)." Also mentions "bean curd sticks (fu zu)," "bean curd sheets (bai ye)," and "bean curd noodles (gan si)." In terms of consistency, the three basic types of bean curd are soft, medium, and hard (dou fu gan). "Bean curd is also fermented in rice wine and spices to make a popular seasoning (dou fu ru), which has a "slightly cheeselike flavor."

Nina concludes the introduction: "As most nutritionists will agree, the soybean and its many by-products are the foods of the future." Line drawings show: soybeans, bean curd, bean milk sheets, bean curd sheets, bean curd sticks, and bean curd noodles. Recipes in this soy chapter: Meatball and soybean casserole (with "4 cups dry soybeans, p. 116). Sweet soybean milk (How to make at home; the Chinese equivalent of America’s cup of coffee for breakfast, with 2 cups dry soybeans and 1 cup sugar. Typically accompanied by a sesame flat bread (shao bing) and a fried cruller (you tiao)). Stir-fried soybean sprouts with red-in-snow. Stuffed bean curd rolls (with "8 dried bean curd sheets or bean milk sheets"). Sweet-and-sour fish slices (with "10 dried bean milk sheets"). Eggplant rolls (with "6 dried bean milk sheets"). Buddha’s delight (a well-known vegetarian dish, with "2 ounces bean curd sticks"). Cold tossed bean curd and celery shreds (from Sichuan, with "8 cakes bean curd, about 3 inches square and 1 inch thick"). Red-cooked bean curd. Braised bean curd with black mushrooms in oyster sauce (from Sichuan). Stuffed bean curd (from Canton). Ma po bean curd (from Sichuan). Eight-treasure stir-fried vegetables with meat (with "3 cakes bean curd, about 3 inches square and 1 inch thick"). Northern-style bean curd (p. 129).


One entire chapter is titled "Vegetarian dishes" (p. 279-94). The introduction discusses the Kuantu Temple (a Buddhist-Taoist sanctuary about 1 hour drive from Taipei), and the origin of vegetarian cuisine in China in early Buddhist and Taoist monastery kitchens. Wheat gluten (mian jin) and related preparations such as deep-fried wheat gluten balls (mian jin pao) steamed wheat gluten chunks (kao fu), plus seasonings such as "pickled bean curd (dou fu ru)" are often used. Soy related: Broccoli in mock crabmeat sauce (with "1 cake bean curd," p. 285). Vegetarian lion’s head (with "4 cakes bean curd," p. 287). Mock goose (with "20 bean milk sheets," p. 290-91). Vegetarian eight treasures (with "2 cakes bean curd," p. 291). Wheat gluten (how to make at home from wheat flour, p. 292).


About the author: A photo of Nina Simonds (in Chinese clothing) appears on the inside rear dust jacket. She studied Chinese food and cooking, language and culture, in Taiwan for more than three years (she arrived there at age 19) with Chinese master chefs at the Wei-Chuan school in Taipei, while living with a Chinese family. She subsequently received the Grand Diplôme from La Varenne École de Cuisine in Paris, where she also taught Chinese cooking. "For the past eight years (prior to 1982) she has taught in cooking schools all over the United States and Canada and her articles have appeared in Gourmet and Cuisine magazines and the Boston Globe" (from the inside rear dust jacket). Address: Salem, Massachusetts.


• Summary: One of the best and most authoritative books on Chinese food written by a Westerner, who is a Chinese scholar turned Chinese cook, and who lives in San Francisco. Contains an excellent, long "Glossary of Ingredients" (p. 529-81) with extensive information about Chinese foods (plus their names spelled phonetically in Mandarin and Cantonese) including: Hoisin sauce (Mandarin: hai-hsien-jyang; Cantonese: hoi-seem-jyenug. The characters mean "sea-freshness sauce." She uses a widely distributed brand, Koon Chun, that is jam-like in consistency and on the sweet side). Mock meat (Mandarin: myen-jin; Cantonese: ming-gun. incl. Companion brand Braised Dried Bean Curd, Curried Braised Gluten, Curry Vegetarian Mock
Duck, and Longevity brand Curried Mock Abalone). MSG (“Originally made from dried fermented wheat gluten”). Salted black beans (Mandarin: doe-jrr; Cantonese: dao-see; soy nuggets. This “popular Chinese seasoning is also known as Chinese black beans, salted beans, fermented black beans, and occasionally ginger black beans.” “Shreds of ginger or orange peel or a dash of five-spice powder occasionally added to season the beans in the final soaking stage.” Barbara prefers salted black beans that are seasoned with ginger and she avoids the kind seasoned with five-spice powder. She uses Mee Chun brand and does not wash salted black beans, as is common; it is a practice she has never understood.

A recipe for Hot and sour Hunan chicken (p. 142-43), in the ingredients section titled “Aromatics,” calls for “2 tablespoons Chinese salted black beans (page 561).”

Note: This is the earliest English-language document seen (July 2011) that uses the term “Chinese salted black beans” to refer to soy nuggets. This term is also used in recipes for Garlic-stewed sparerib nuggets (p. 203) and Hunan eggplant with spicy meat sauce (p. 293).

Soyfoods: Introduction, soy sauce (Kikkoman soy sauce {Barbara’s everyday favorite}, thick soy sauce, black soy sauce, mushroom soy sauce; good Chinese brands are Superior and Koon Chun). Tofu (fermented tofu {incl. Pepper Bean Cake with hot chili flakes—[la jiao doufu-ru]}, fresh tofu, pressed tofu.

“Mushroom soy sauce is a flavored soy sauce, something between thin soy sauce and black soy sauce in saltiness. The brand I like best is Pearl River Bridge, which is made specifically with straw mushrooms and is classified in Chinese as black soy sauce owing to a touch of sugar that is included in the mixture,” p. 569).

Note: This is the earliest document seen (June 2011) that uses the term “ginger black beans” to refer to soy nuggets (douchi).

Ms. Tropp (see photo on inside rear dust jacket) studied Chinese language, poetry, and art history at Columbia University, Yale, Princeton, and the University of Taiwan. Her two-year sojourn in Taiwan found her living with remarkable Chinese families. On the rear cover is a nice long quotation from James Beard. Her two-year sojourn in Taiwan found her living with remarkable Chinese families. On the rear cover is a nice long quotation from James Beard.


• Summary: The Los Angeles Chinese Women’s Club has reissued its cookbook, Gourmet Celestial, first published in 1970. Income from sales is used to fund scholarships. The book includes several meatless recipes that are traditionally served during the 24-hour fasting period that runs from midnight of Chinese New Year’s Eve to the sundown of New Year’s day. One of these given here, Chinese meatless dish (Law Hon Jai) includes: “¼ pound dried bean curd stick [bamboo yuba], soaked overnight and cut into 2 inch lengths,... ¼ pound sweet dry bean curd, soaked overnight then halved,... 4 or 5 pieces fried bean curd, quartered,... ½ cup fermented bean curd cake [fermented tofu], ¼ cup red bean curd.” Address: Times staff writer.


• Summary: In the fall of 1974, Thom Leonard made his first batch of barley koji and barley miso using a recipe in Herman Aihara’s new book titled Soybean Diet. The 80-pound batch of miso was aged in a soy sauce keg from Hong Kong. He then made 80-pound batches of chunky wheat miso in the fall of 1975 (he later pickled tofu in it) and of barley miso in early 1976. After moving to Fayetteville, Arkansas, he and Jim Hemminger made larger scale miso equipment and on 15 April 1977 packed their first 35-gallon cedar vat with brown-rice miso. Soon over 1,000 lb were aging in the vats. This miso was sold to and distributed by the Ozark Cooperative Warehouse.

Thom and Richard Kluding founded the first Caucasian-run miso company in North America, Ohio Miso Co. in Monroeville, Ohio. They began production on 13 March 1979. By Jan. 1980 Ohio Miso was making several varieties of miso: brown rice, barley (one or two year), mellow brown rice, mellow red, and black soybean; output was 2,400 lb/ week.

Then in the spring of 1980 Leonard and Kluding split up, largely because of interpersonal problems. In the summer of 1980 Leonard taught miso classes at the macrobiotic Spiral Inn and Moniteau Farm in Missouri. Then in late 1980 he taught 2 classes on making miso, natto, tofu, and tempeh at the Kushi Institute in Boston, Massachusetts, with 30-40 people per class. In 1981 and 1982 he taught 8 similar classes out of his home in Boston, plus four 3-day...
residential workshops on the same subjects. All were sold out every time. In 1983 he plans to travel Ireland to start a miso plant in County Kilkenny. Friends of his own several old buildings. The Irish government will help pay startup costs, covering 45% of the required startup capital plus 25% of the rent for the first 5 years. He hopes to be start in July 1983 and be producing miso by late 1983. He hopes to make 100,000 to 200,000 pounds of mostly barley miso, both mellow barley and 12-24 month barley miso. Thom’s constitution is so yang that he can’t eat much miso—which is also very yang. But this week he enjoyed miso soup twice, which is more than he has had for the past year.

Note: Thom and his wife went to Ireland but they never started a miso plant or commercial miso production there.

Address: Brookline, Massachusetts.


• Summary: Red koji (beni-koji), made my growing Monascus mold on steamed rice, is an important material for manufacturing tofuyo (red soybean cheese). Optimum conditions for producing red koji were investigated. Two kg of steamed rice inoculated with 120 gm of koji starter (tanê-koji, ground in water) was wrapped in a cloth and incubated at 32°C. After 38 hours of incubation, the temperature of the materials was controlled (kept from overheating) by mixing them by hand. When the moisture level in the koji dropped to 30% or less, the koji was sprayed with water to add moisture. By these treatments, the growth of the mold and the formation of red pigment in the koji were markedly enhanced. Optimum incubation time for the koji after inoculation was 150 hours (6½ days). The highest production of enzyme activities and pigment from the koji was obtained when the incubation was 150 hours (6¼ days). The highest production of enzyme activities and pigment from the koji was obtained when the incubation was 150 hours (6¼ days). The highest production of enzyme activities and pigment from the koji was obtained when the incubation was 150 hours (6¼ days).


• Summary: Contents: Foreword by E.J. Da Silva. Preface. 1. Indigenous tempeh and related fermentations: Protein-rich vegetarian meat substitutes. 2. Indigenous fermented foods involving an acid fermentation: Preserving and enhancing organoleptic and nutritional qualities of fresh foods.

3. Indigenous fermented foods in which ethanol is a major product: Types and nutritional significance of primitive wines and beers and related alcoholic foods.


(C) Fermented fish-shrimp sauces and pastes (p. 487-526).

(D) Fish-soy sauce and fish-soy paste, by Ismail (p. 526-30).


5. Mushrooms: Producing single cell (microbial) protein on ligne-cellulosic or other food and agricultural wastes.

6. General papers related to indigenous fermented foods: Contributions of the western world to knowledge of indigenous fermented foods of the orient, the importance of microbial genetics in indigenous food fermentations, new uses for traditional food fermentations, mycotoxin problems in indigenous fermented foods and new methods for mycotoxin analysis.

Less widely known fermented foods include: Idli, dosa/dosa, dhokla (with soy, 131-35), enjera (162), tef/teff (164), wot (165), hopper (173), kishra (175), lombic (179), oji (with soy, 189-98), mahewu (203), gari (208), dahi (249-57), srikhand and lassi (256-57), laban rayeb, laban zeer, yogurt (257-59; cultured soy yogurt is mentioned on p. 616), liban, mast, mass, taw (260), tairu (with soy, 260-65), kishik or kushuk (267), Metchhnikoff (266), trahanas or tarhanas (271-76), rabdi, jalebi (275), kemiss (275), kefir (275-80). Alcoholic beverages and foods: Honey wine, mead, metheglin (305), tej (306), sugar cane wines, basi, bubod, binubudan (307), palm wine or toddy (315-28), pulque (328-
HISTORY OF FERMENTED TOFU     213

Types of tofu: Most is soft tofu (Shui-doufu, like Japanese Momen-dofu) 15 slabs on wood boards 18 x 18 x 4 to 5 inches thick. Pieces are cut with a knife, weighed in a scoop on a hand held lever arm, and put into customer’s bag. (b) Dofu-gan, tan squares 1.5 x 1.5 x 3/8 inches. (c) “Thousand sheets” are very thin (like paper). 10-inch squares called qian zhang. (d) Dofu rolls (dou-fu ? = maki) 3 inches in diameter and 8 inches long make of tofu wrapped in cloth and boiled (illustration). (e) Doufu-ru = fermented tofu in jars. (f) Doufu-fen = soy flour (full fat?) used to make tofu and soymilk. (g) A semi-firm tofu.

Buying: You must present a ration ticket an also pay money. 500 grams of shui-dofu costs 10 cents (i.e., ¥0.10). If you use up your tofu ration tickets, you may go to a separate place and use a grain ration ticket, but it costs more.

Sprouts: Saw 2 baskets (wicker 18 inch diameter, 14 inch deep) sold outdoors next to 5 baskets of mung beans. Lu Dou-Ya = mung sprouts. Huang Dou-Ya = soy sprouts.


1. To make soymilk (dou-jiang): Add 13-15 jin (6.5 to 7.5 kg or liters) of water (cold or hot) to contents of bag, adding a little at first to make a paste. Then, add the rest and mix/beat until contents of bag are smooth and bring to a boil.
2. To make doufu-fa (tofu curds): Proceed as for soymilk using any 3-4 kg of water per bag. Then, add coagulant (what coagulant? No pack of it in the bag) to 0.15 kg of water. Pour boiled milk into coagulant solution and let stand for 5-10 minutes.
3. To make doufu: Wrap tofu curds (#2) in a cloth and press for 20 minutes. (Made in Zhengzhou: Tel. 26644)

This product is widely sold. 1 bag cost ¥0.40.

Soymilk is now one of the hottest subjects in the food field in China. Interest has grown rapidly since 1982 because (1) Vitasoy’s success in Hong Kong (yet Vitasoy still has no plant in China and no joint venture). (2) Japan and Southeast Asia’s soymilk success. (3) Alfa Laval-Kibun and DTD’s competing efforts to sell soymilk plants to China. I predict that there will soon (in 3-10 years) be many modern soymilk plants in China, most run by the Ministry of Light Industry.

One of the new AB-9 Tetra Pak machines sells for about $665,000 in July 1983. It has a capacity of 3,000 liter/hr of milk.

Jiaozi = (Chiao-tsi) = meat dumplings.

Tetra Pak is a family-run business. Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.


• Summary: 6:00 a.m. I walk to the local market. See one stall (a mobile cart) selling gelled tofu curds (doufu-fa) over
which is poured a sweet brown sauce then topped with some diced red chilies and green herbs. Served with deep-fried breadsticks. One other place serves soymilk hot with deep-fried breadsticks. No tofu at all in the market. Some say it is sold only in winter. No other soyfoods seen.

Soymilk terminology: (1) Dou Nai–it sounds more modern than “Dou Jiang.” Implies or connotes no beany flavor, is thicker and has a higher protein content. (2) Dou Ru–(Alfa Laval used this) is harder to pronounce. (3) Dou Ru Fen: Niu Nai Mai Jing. 205 gm. This product consists of a white powder containing 10% cow’s milk powder, 40% soymilk powder (spray-dried traditional soymilk, not soy flour), and 50% (!!) sugar. 1000 tonnes a year are made, starting in 1978 or 1979. Sold to housewives who use it to make breakfast soymilk. Costs RMB 0.78–0.80 = 70-80 cents. Cow’s milk powder is stirred into hot soymilk. The mixture is concentrated and spray dried. Also made in Beijing, but this one is the best quality.

Pure: Soymilk powder is made in Beijing by Beijing Foodstuff Corp. since 1980. Called Doujiang-Fen (Soymilk powder) and also retailed to housewives for breakfast use. It is 50% powdered soymilk and 50% sugar. It is spray dried.

Fresh green soybeans (Maodou = Hairy bean): Mostly eaten by farmers. Also sold in markets. Not packaged or canned. Whole dried soybeans: some canned in China. It is sold in Beijing.

Tofu in Heilongjiang: None is sold during the summer because it spoils easily and people do not like to eat tofu in the summer. A lot is sold in winter.

Soybean use: Of China’s 9 million tonnes produced, one man estimates that 80% of soybeans are crushed. The meal is used mainly for feed, but some for tofu, soy sauce, and textured vegetable protein (TVP).

Main uses for foods made with whole soybeans in approximate order: (1) Tofu and kan-dofu. (2) Soymilk. (3) Soy sauce. (4) Miso = Doujiang. (5) Yuba. (6) Fermented tofu.

Main uses for foods made with defatted soybean meal: (1) Tofu. (2) Soy Sauce. (3) Miso. (4) Soymilk.

Soy nuggets are made y in the south of China. This state farm bureau man estimates that there are 200,000 tofu shops in China, one in every village, but there are no statistics on tofu.

Big tofu factory in Harbin. Ministry of Light Industry people in charge. He does not think as many soybeans will ever be used for soymilk as for tofu.

Many government groups are doing research on soyfoods, such as tofu and shoyu, but no single group.

Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.
Vitasoy is Witanai (pronounced wi-TAH-nai). Hi-C is Yangwan.

For soymilk, Mr. Pan prefers the term douru to dourai.

Danny Wang says the World Bank is helping to finance reclamation of 2 million ha (hectares) of farmland in the three rivers area of Heilongjiang. One-third of this will be planted to soybeans. Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.


• Summary: Soy sauce, miso, and fermented tofu (doufu-ru) are all sold at one type of store, a pickle shop that sells salted foods. I visited one of these named Tien Yuan Jiang Yuen. A color photo shows various types of soy sauce sold in Beijing.

In the market, the sign above the soyfoods section reads Douzhi Shipin. In this section they sell fuzhu (bamboo yuba), Doufu-fen (a type of soy flour made in Beijing), cubes of fried tofu (1 inch on a side, called doubao).

In 1949 the East Asiatic Co. (which is owned by rich Danes) was the leading exporter of soybeans from China. They started exporting soybeans from China in the 1920s. When exporting, they had offices in Dalien (Dairen), Harbin, etc. The company now has about 80,000 employees worldwide. It is the biggest company in Denmark and the biggest foreign trading company in China, except for several Japanese companies such as Marubeni, Nissho Iwai, etc.

June 11, Saturday. Beijing seminar #1 in downstairs room. Talk with Mr. Chen of the Food and Fermentation Research Institute. Mr. Chen says the most popular vegetable oils in China are: 1. Peanut. 2. Soy (not generally refined). 3. Rapeseed.

Two organizations do research on soyfoods in Beijing: (1) His Food and Fermentation Research Institute (under MinLight, the Ministry of Light Industry); three people who work there are Mr. Chen, Mr. Dai Jiakun, and Mrs. Xu Lin. (2) Beijing Municipal Food Research Institute; contact Mr. Dai Xinjun (Dong [East] Zongbu Lane, Beijing).

Four acid tests for the buyer of any soymilk process and equipment: (1) Equipment cost (fixed). (2) Processing cost (including labor, energy, water, etc.). (3) Soymilk flavor. (4) Protein and solids recovery (percentage).

The Chinese name for thin pressed tofu sheets (“1,000 sheets / 1,000 folds”) is Qianzhang or Baiyeh.

The best local markets (which have more variety of produce in the winter) are: Chongwen Vegetable Market and Xidan Vegetable Market (Chinese characters are given for both). The Chinese term for “soyfoods” is dadou shipin (“soybean products”).

There is a new Chinese method (in Shanghai) for continuous pressed tofu sheets.

Commercial soy products made by Mr. Chen’s institute: (1) Formulated soymilk for infant food. (2) Soy protein concentrate. (3) Later a modern soymilk plant will use this to make (1). Plain and sweetened soymilk in glass bottles, plus fruit (citrus = orange flavor) and malt. There are some technical problems with using plastics bags as soymilk containers; they leak and are fairly expensive. Later he will work on a lactic soymilk drink.

Research on soy sauce: Improved method. Low salt, done in factories in Beijing and Shanghai.

Most soy oil in Beijing is not refined. People like the flavor OK, but they do not know the refined flavor. Rapeseed oil is used mostly in South China. In Beijing, mostly peanut and soy oil; peanut is more expensive and has a higher class image. Rapeseed is the cheapest but people don’t like it.

The debate over more meat vs. more protein. Recently Chinese officials have come to understand the problem better. Send him Diet for a Small Planet, by Lappé.

In 3-4 months, Mr. Chen will send me an article about soyfoods in China–Tell Ira Leviton.

I visit a bookstore and buy a pinyin dictionary and a book (published last year in Chinese) about tofu. Visit the Forbidden City and a very famous square in central Beijing. Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.


• Summary: Solvent extracted soybean flakes and meals (moisture content 9.6%) were subjected to 80°C, 90°C, and 100-105°C temperatures for 15 or 20 minutes. The critical temperature for protein denaturation was 80°C. At higher temperatures, solvent-extracted soybean meal was denatured more rapidly than soy flakes. Preparation of the following traditional Chinese soyfoods was described briefly: Soy sprouts (dou ya), soybean jiang (dou jiang), soy nuggets (dou chi), soy sauce (jiang you), soy beverage (dou jiang), tofu (regular and soft, doufu), firm tofu (doufu gan), pressed tofu sheets (doufu yi), vegetarian chicken (su ji), fried tofu

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(you-doufu), fermented tofu (doufu-lu), and yuba (doufu pi). Address: Zhengzhou Grain College, China.


• Summary: This is a review of the Cantonese Chinese 3-star restaurant Siu Lam Kung Restaurant (18 Elizabeth St., south of Canal Street). One exceptional soup is meat broth with straw mushrooms and a side platter of bean curds, green vegetables and pork. A tasty first course is clams in black-bean sauce. Both lobster and cracked crab are delicious with black-bean sauce, or with ginger and scallions. Likewise pork chops with pepper and black-bean sauce. Another masterpiece is crisp cushions of bean curd stuffed with minced shrimp.

Yocca, a leafy vegetable resembling spinach but with a haunting licorice flavor, is generally not on menus, yet it is ordered by Chinese customers. Yocca was served in a winy sauce with garlic and fermented bean cake [fermented tofu]. “Braised bean curd with black mushrooms and Chinese broccoli in oyster sauce” was also flavorful.


• Summary: Three parts of this new edition have been extensively revised and updated: (1) “Tofu Makers in the West” (p. 313-16) has been updated and now includes 310 tofu producers in the Western world (with the name, address, phone number, and contact person for each company), arranged by state or foreign country. This is the only tofu book containing such a directory.

(2) The “Bibliography” (p. 319-324) has been greatly expanded and updated. It now contains 321 publications on tofu, including all known scientific and nutritional journal articles, the 33 books about tofu written in North America since publication of the first edition of The Book of Tofu in 1975, and other key articles and books about tofu from East Asia and Europe, the earliest from Europe dating back to 1613!

(3) An updated listing of “People and Institutions Connected with Tofu” in the U.S. and around the world, including researchers, major tofu manufacturers in Japan, trade associations, publications, equipment dealers, and tofu apprenticeship programs.

The “Glossary” (p. 325-27) has been condensed to make space for the expanded bibliography and back matter. There is a new page about the Soyfoods Center (p. 333). The page “About the Authors” (autobiographical) has been expanded, and the photograph has been updated. “Sending Tofu to the Four Directions” (p. 335) and the inside rear cover have both been updated. Still contains 500 vegetarian recipes—both western and eastern style.

Note: A news release of 17 Aug. 1983 states: “The Book of Tofu, which introduced the Western world to tofu and inspired the founding of more than 200 tofu shops and soy dairies in North America, has sold 340,000 copies to date, making it the world’s best-seller on this popular new ‘protein source of the future.’” Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


• Summary: A comprehensive history of the subject.


• Summary: Contents: Advantages of food fermentation, factors having an adverse effect on the use of fermented foods, nutritional and economic data on some fermented foods, future changes in fermented foods, factors that may lead to growth in the use of fermented foods (scientific interest in fermented foods, prevention of food poisoning, fermentation and increased shelf life, improvement of the physical properties of the product, interest in natural products of plant origin, modification of the substrate, interest in more healthy food, necessity of increased consumption of plant materials as population increases, cultural and religious grounds, and migration of people since World War II). Summary. Contains considerable information on fermented soyfoods. Address: NRRC, Peoria, Illinois.


• Summary: Vegetarian foods containing significant amounts of vitamin B-12 per 100 gm according to a biological assay method using Lactobacillus leichmanii were: tempeh (Indonesia) 4.6 mcg (micrograms), natto fermented soybeans (actually thua-nao, Thailand) 1.5 mcg, and fermented tofu (Singapore, also called Sufu) 1.1 mcg. Flesh-based foods with a high B-12 content included Ka-pi shrimp paste (Thailand) 5.3 mcg, kung-jom fermented shrimp (Thailand) 2.5 mcg, fish sauce, 3 month fermentation (Thailand) 2.4, and fish sauce (Thailand) 1.3 mcg, and fish sauce (Japan) 1.0
fungus, contained a very low amount, 0.7 mcg/100 gm, and tempehs which was transported from Indonesia as rapidly as possible large amounts. “For example, a fresh sample of tempeh measured. However not all tempeh samples contained such soybeans and had the highest B-12 content of any food mcg.

Summary: Discusses: Euvepro in Italy, ASA in Italy, Alpro / Vandemoortele, British Arkady, the confusion of mung beans and soybeans, tofu made from soy protein isolates that doesn’t develop a spongy texture when frozen, regulatory restrictions, Bernard Stopur, tofu burgers, Prolait, Le Bol en Bois, ASA soybean program in England, desire in Eastern Europe for more meat, the many small private businesses in Hungary, Soyana’s excellent products (Daenzer makes 5,000 lb/week of tofu in Switzerland), the Reformhaus chain, Vietnamese tofu shop in Dornach, less refrigeration at the distribution and retail levels in Europe has led to new packaging, soyfoods have started to appear in the big international food trade shows in Europe (e.g. ANUGA). Witte Wonder opened in 1981, now makes 1,000 lb/week of seitan. Cauldron Foods (UK) makes mostly tofu burgers, and has a lot of good technical innovations such as control panels. Cauldron also makes a fermented tofu spread. Dragon & Phoenix (UK) makes several tons of tofu a day. In July Wolfgang Furth-Kuby and Lucas Kelterborn (Germany) published the first issue of a European soyfoods newsletter titled Rundbrief. Paul Jones (UK) has 2 plants and makes 5,000 lb/week of tofu. One man from Cauldron Foods was Paul Jones’ original partner. Full of Beans also makes miso.

Oct. 28. “I have an all morning meeting at ASA’s headquarters in Brussels, Belgium, with Dennis Blankenship, Rita Batens, Roger Leysen, and Michael Martin. It is proposed that I chair the 1984 First European Soyfoods Conference to be held in late September, probably in Amsterdam. ASA agrees to be a sponsor and to help secure another 6 or so sponsors. ASA also agreed to finance the production and mailing of a bi-monthly European Soyfoods Newsletter.” Address: Colrain, Massachusetts.

• Summary: Some information in Chapter 1, Appendix A, and many advertisements have been changed. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

Address: Dep. of Nutrition and Food Hygiene, Inst. of Health, Chinese Academy of Medical Sciences, Beijing, China.

• Summary: How to eat tofuyo (p. 839): In the Gyozon Honzo (Food Herbal) (1832, a book about food and medicine) the physician TOKASHIKI Tsûkan Peichin wrote: Tofuyo has a delicious flavor and is good for the stomach. It makes eating a pleasure and is good for various types of sickness” (Ref. #9; Note: This book contains the earliest direct reference seen to tofuyo. Peichin refers to a high-ranking officer). It seems that tofuyo was consumed by the upper classes during the Ryukyu Ocho period in Okinawa and it was also used as a food for recovering after a sickness, and as a side dish. According to old people in Okinawa, Tofuyo was popular among upper class people in Shuri or Naha, during the Taisho period (1912-1926) and at the beginning of the Showa period (1926+). It was eaten with tea by ladies or with millet brandy (awamori) by men. But it was too for the regular people to afford. The best way to eat tofuyo is to place one cube of it (2-3 cm on a side) on a small dish and eat it with chopsticks or a toothpick a little bit at a time.

Note on the geography and history of the Ryukyu Islands (also called Luchu or Loochoo Islands): This chain of islands extends in a 600-mile long arc southward from the southern tip of Kyushu (Japan’s southernmost main island) down to Taiwan. It includes Okinawa, Sakishima, and the Amami island groups. The population in 1970 was 945,000. The chief town is Naha on Okinawa. History: In 1372
these islands came under the political influence of China. In 1451 they became a tributary to Japan as well as China, and 1609 a Japanese protectorate (part of Satsuma-Han). Thus the islands have long had cultural ties with both Japan and China. During Japan’s Edo period (1600 to 1688) the kingdom of Ryukyu formally belonged to China, but in fact it was more closely tied with the Satsuma Han, a powerful domain in southern Kyushu. Like China and Japan, Ryukyu had its own emperors and dynasties. The imperial palace was on the island of Okinawa, in the southern city of Shuri. Imperial messengers (sakuho-shi) were frequently sent to Okinawa from China and there were cultural exchanges between the two countries. In 1871 the Meiji government in Japan made Ryukyu part of Kagoshima prefecture. In 1872 they made it Ryukyu-Han. After this change, Shôtai (lived 1845-1901) became king of the Ryukyu-Han. In 1879 Ryukyu became an integral part of Japan. Under the Japanese, the Amami group belonged to Kagoshima prefecture and the Okinawa and Sakishima groups constituted Okinawa prefecture. In 1945, after World War II, it was placed under a U.S. military government. In 1966 it received local self-government, and in 1972 was returned to Japan.

History of tofu-yo in Okinawa (p. 839-40). The earliest document seen concerning soybeans in Okinawa appeared in 1534 in the Record of the Messengers to Ryukyu (Shi Ryukyu Roku; Ref. #16). Thereafter soybeans became a widely grown crop. (Ref. #17). The History of Ryukyu by Ryukyu Opu (1713, Ref. #19) noted that it was not clear at the time when and how tofu came to the country. Although this uncertainty still remains, tofu is thought to have arrived in Ryukyu in the mid-1600s. According to the Various Records of the Messengers to Ryukyu written by Osho? (Wang-shu?, Ref. #18) in 1683, tofu was widely available at that time in Okinawan market places. Being produced by many companies. It was an important food not only for the local people, but also for the Chinese imperial messengers (Refs. #20-22). Okinawa’s tofu was a firm tofu, made in the Chinese way by pressing the soymilk out of the okara before cooking it. This method was also traditionally used in Korea and southern Japan (in Kumamoto–Itsugi-mura, Yamaguchi, Ishikawa, and Koichi prefectures). The method was probably introduced to Okinawa by Chinese imperial messengers or by exchange students, although it could have been brought from Japan by Buddhist monks, who served it in their temple cuisine.

Note: For much more detail about the history of tofu-yo in the Ryukyu islands, please see “History of Fermented Tofu” on the Soyinfo Center website. Address: Dep. of Agricultural Chemistry, University of the Ryukyus.

Summary: These recipes were contributed by nine chefs; a brief biography and photo is given for each. Barbara Tropp and Nina Simonds are among them (p. 4). Contains detailed instructions on the preparation of Chinese food, recipes, and sample menus.

The section titled “Pantry (for this volume) includes: On the shelf—Black beans, canned or packaged. Chinese fermented black beans, also known as Chinese salted black beans.” Hoisin sauce (sweet, soybean based). Oils: Oriental sesame oil, a highly aromatic oil, is for garnishing, not cooking. Always buy Chinese or Japanese brands. Sesame paste. Soy sauce: Extracted from fermented soybeans, comes in light and dark. In the refrigerator—Bean curd or tofu.

Soy related recipes: Bean curd salad with peanuts (p. 65). Steamed sea bass with black bean sauce (which includes “1 tablespoon Chinese fermented black beans,” p. 65). Mushroom soy sauce is good to have on hand (p. 71). Crisp chicken strips with black-bean orange sauce (the sauce ingredients include “2 tablespoons Chinese salted black beans,” p. 81).

Diced chicken with fermented black beans (p. 87). Stir-fried spinach with fermented bean curd (with “1 small square fermented bean curd, mashed,” p. 90).


Summary: This book was written for non-Chinese in the maze of Hong Kong’s street markets; it originally appeared in 1980 and 1981 as two volumes, published in Hong Kong. The romanization of names in this book represent the Cantonese pronunciation system of Herklots.

The section on “Seasoning sundries” has entries (p. 3-4) for: Light soy sauce (2 Cc = Chinese characters are given) See yau [Note: See = soy nuggets] or Sang chau. “This is the best grade of sauce. ‘Light’ means it is not thick or viscous and has a delicate or fine flavor.”

Dark soy sauce (2 Cc) Lo chau. “‘Dark’ here means thick and of stronger flavor.” There are various types, each of which has been fermented with different special ingredients such as mushrooms, ginger, etc. Yet they all stain food black.

Fermented black beans (2 Cc). Dau see [soy nuggets]. “These are whole soybeans which have been cooked, salted and fermented.” “These beans are one of the most versatile, convenient, economical and flavourful Oriental seasonings. The Cantonese usually mash them with garlic and stir-fry or braise them with pork, beef, shellfish, fish or vegetables, particularly with green and red vegetables for colour.

“General directions for making black bean sauce are as follows: Use approximately twice as much, by volume, of black beans as garlic. Crush the garlic cloves by smashing them with a single blow of a heavy object (flat side of a cleaver) on a cutting board. Remove the papery husk, then put both beans and garlic in a small bowl and mash together,
either with a spoon or the butt of the cleaver’s handle. Approximately 1 tablespoon of mash will season 1-2 cups of food.

“To cook, add the mash to the hot oil before the ingredients. In a mixture, add the mash just before the last batch of ingredients to be fried, return all the rest to the wok, season with a pinch of sugar and light soy sauce,... Vary the sauce from heavy to light.”

The section titled “Soybean sprouts” (Daai dau nga choi, 4 Cc = large bean sprout vegetable) has an unusual structure. First comes information on soybean sprouts: Appearance, quality, general comments, preparation, cooking. Then a nice color illustration, followed by two recipes using these sprouts. Then come subsections on Bean curd (Dau fu, 2 Cc).

Water bean curd (Seui dau fu, 3 Cc. “This is the most common, and perhaps most versatile, kind of bean curd.” Three recipes."

Wrapped bean curd (Bo bau dau fu, 4 Cc. This type is sold from tubs of water rather than from a wooden board. “Each square has been wrapped in cloth, so pieces have rounded edges and cost 2-3 times more than common fresh dau foo. This is the finest, most delicate curd, and is usually used only for steaming” as in Lo Siu Ping On, a traditional Cantonese dish.

Dry or pressed bean curd (Dau fu gonn, 3 Cc [pressed tofu]. This type is firm and therefore “easily sliced or cut into shreds and stir-fried. Two types exist as illustrated; the larger, 3-inch square white one is plain; the smaller, 2-inch square reddish one is lightly coated with 5-spice powder {ng heung fun, 3 Cc}.” One recipe is given.

Deep-fried bean curd (Dau fu pok, 3 Cc. These are small cubes or squares about 1 inch on a side. Color illustration. One recipe is given). Page 81. Recipe for Mushrooms & ribs with black bean sauce. In the section on Lotus root is a recipe (p. 113). Silkworm cocoon bean curd (canjian doufu, p. 208). Soy-related recipes: Slab bacon with fermented bean curd (Nanru kouru, with “3 cubes fermented bean curd, p. 113). Sweet bean paste sauce (tiendoujiang, with white soup and soy sauce, p. 199). Mrs. Pockmark’s bean curd (mapo doufu, p. 207). Silkworm cocoon bean curd (canjian doufu, p. 208).

There is a section of seven vegetarian recipes (p. 199-205).
The author of this creative book, a woman, was born in British India on 13 Aug. 1933. She first became known as an actress in India, but later found fame as a food writer. She has lived in America for more than 20 years. She presents 21 recipes for bean curd (tofu), 7 for tempeh, and some for yuba and miso. Soy-related recipes include: Aubergine slices with white miso (Japan, p. 4-5). Green beans with soy sauce (Japan, p. 20), Cabbage with miso (Japan, p. 29). Lotus root with soy-sauce dressing (Korea / Japan / Hong Kong, p. 46-47). Yellow pumpkin cooked with soy sauce (Japan, p. 74-75). Fresh soy beans, steamed (China, p. 76, with “fresh green soy beans in their pods”). Yien Koo’s Spinach with fermented bean curd (China, p. 78-79). Pecel (Vegetable salad with spicy peanut sauce, plus tofu and tempeh; Indonesia, p. 87). Tempura (with tofu; Japan, p. 89-92). Soy bean sprouts (how to grow, p. 119). Soy-bean and mung-bean sprouts seasoned with sesame oil (Korea, p. 123-24). Tempeh, Fried tempeh, Fried, pre-seasoned tempeh, Sambal goreng tempeh kering (Sweet and sour tempeh), Tempeh cooked in coconut milk (Indonesia, p. 127-30). Thai fried rice (with red fermented tofu, p. 176).

Chapter 4 (p. 187-221), titled “Soy milk, bean curd, and wheat gluten,” contains the following: Introduction to each ingredient. Soy milk (making your own at home). Making your own bean curd. Udofo (Yudofu, simmering bean curd with seasonings, Japan). Bean curd with watercress (Singapore Chinese). Bean curd with fresh coriander (Korea). Bean curd with watercress (Singapore Chinese). Bean curd with fresh coriander (Korea). Bean curd with watercress (Singapore Chinese).


Summary: This book is about “The New American Diet,” which is an “omnivarian” diet including some fish and meat. Chapter 14, titled “New and future natural foods,” contains a section titled “Soy foods” (p. 162-65) including tofu, tempeh, miso, soy sauce, soy milk, and other soy products (yuba and sufu). The work of William Shurtleff and Aoyagi, and their Soyfoods Center, is mentioned 2-3 times. Toward the back of the book are many soyfoods recipes.

The Prologue tells Rohe’s life story and pioneering work with natural foods. In 1964, at the ripe old age of 27, he didn’t feel good, didn’t look good, and didn’t like it—the result of years of smoking, drinking, eating bad food and “burning the candle at both ends.” “It was time to do something about it. Adelle Davis became my guru and Thom Hamilton—the health foods store owner who sold me [her book] Let’s Eat Right to Keep Fit became my mentor.” Within a few months he was feeling much better. “So in 1965 I bought a small health food store in the Sunset district
foods organically and community-owned business, Sunburst Natural Foods, grew people living communally under spiritual principles on 160 acres of land in the mountains above Santa Barbara. The community-owned business, Sunburst Natural Foods, grew foods organically and flourished. In 1970 they opened a natural foods retail store in Santa Barbara. The community grew to include a second ranch and a total membership of over 200 people. The business came to include manufacturing and wholesaling as well as retailing. There are now five Sunburst Farmer’s Markets, two of them—in Goleta and Ventura—large, complete, natural foods supermarkets. Sunburst also owns and operates a natural foods restaurant, ‘The Farmer and the Fisherman,’ 35 miles north of Santa Barbara along the coastal highway.” Then Norm envisioned a new direction and everything changed. They traded their 6,000 acre coastal ranch for land in northeastern Nevada totaling over 500,000 acres. “It could hardly have been a more radical change. But the soil is rich in minerals and there is abundant water from artesian wells. They are responding strongly to the challenge of, as they say, ‘making the desert bloom as a rose.’”

“Appendix eight: Recommended reading list” (p. 470-78) includes a section titled “Soyfoods.”

This book was Re-published in 1986 as ‘Nature’s Kitchen’ by Garden Way in Brattleboro, Vermont.


491. Product Name: [Tofu, Tofu Pickled in Miso, Tofu Pâté, Terrine with Tofu].

Foreign Name: Tofu, Tofu Mariné, Pâté de Tofu, Terrine de Tofu.

Manufacturer’s Name: Tofu Kuehn.

Manufacturer’s Address: La Tuiliere, 26560 Montfroc, France. Phone: 92 62 02 76.

Date of Introduction: 1983?


How Stored: Refrigerated.

New Product–Documentation: Form filled out by Anthony Marrese. 1989. Nov. The company is run by Yves Kuehn and John Marc. These products were introduced in the “early 1980s.” Production and weights are presently as follows: Tofu (250 gm) 30-50 kg/week. Tofu Pickled in Miso 20 kg/week. Tofu Pâté (150 gm) 10 kg/week. Terrine (150 gm). Anthony writes: “I met this group at an organic fair. It is a small group of 5 or so people making tofu really as a meditation. They produce it in small quantities of 5-10 kg through a mechanical hand grinder, then the paté and pickled tofu are made in a small kitchen.

Leaflet. 1989. In French. Shows labels of the products and briefly outlines Mr. Kuehn’s philosophy that we must
move from an animal-based to a plant-based diet.

Note: Emprésurage is the action of adding a curding agent or coagulant to milk in the process of making cheese. The “présure” is the coagulant.


• Summary: “Tofuyo is a traditional food in Okinawa, and is made from soybean curd with koji, salt, and awamori (distilled liquor).” It was found that the texture of the tofu affects the quality of the tofuyo. The texture is, in turn, affected by the type of coagulant and its concentration, and the pressure under which the curds were pressed to make tofu. The best conditions were as follows: Final concentration of the calcium sulfate coagulant: 20 mM. Final pressure on the curds: 38 gm per square centimeter. Hardness of the curd: 110,000 to 110,000 dynes per square centimeter. Final moisture of the curd: about 76%.

The best quality of Tofuyo was obtained when tofu of hardness 200,000 to 300,000 dynes per square centimeter was gradually dehydrated at room temperature (25°C). Hardness of the finished tofuyo: 14-18 dynes per square centimeter. Address: Dep. of Agricultural Chemistry, University of the Ryukyus.


• Summary: Investigates production of a cheese-like food from soymilk by treatment with a plant protease enzyme. Bromelain is a proteinase / protease obtained from the juice of the pineapple. Stem bromelain was used successfully as a coagulant for soymilk, but the resulting product had a slight bitterness. Address: Dep. of Food and Nutrition, Lab. of Food Chemistry, Tachikawa College of Tokyo, Akishima, Tokyo 196, Japan.


• Summary: “Soymilk entered the modern age in Singapore in 1954, when Yeo Hiap Seng introduced the first commercial bottled soymilk. The company traces its origins to the year 1900 when the patriarch of the Yeo family, Mr. Yang (in the Amoy dialect, his name was pronounced Yeo Keng Lian) purchased a small company named “Hiap Seng” in the city of Chang-chou (Zhang Zhou), Fukien (Fujian) province, China. “Hiap Seng” means “unite to succeed.” Yeo Keng Lian changed the company’s name to reflect his family’s ownership. He worked as a manufacturer and retailer of fermented soybean seasonings: soy sauce (jiang-you), Chinese-style miso (dou-jiang), and fermented tofu (furu). All three products were sold from day one under the “Light House” brand.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the word “furu” to refer to fermented tofu.

By working together, the family did succeed. Their soy sauce, fermented in the traditional Chinese way in wooden vats and earthenware jars, was of superior quality and the business prospered. The original plant was located near the center of Chang-chou. In about 1920 a second plant was established in the eastern part of the city, and in the late 1920s a third plant was set up in the southern part of the city. Each of the three fermented soy products were produced in all three plants; the second and third plants also produced some pickled vegetables.

In 1935, during the Japanese invasion of China, when life was difficult and unsettled in Fukien province, Yeo Keng Lian sent his eldest son, Yeo Thian In, to Singapore to investigate possibilities there. The son founded the Yeo Hiap Seng Sauce Factory at 410 Outram Road, Singapore 3. He was joined shortly by the rest of the family. The company continued to make the same three fermented soy products that it had made since 1900 in China. In 1947 the growing business was moved into larger quarters at 950 Dunearn Road, its present location. The move out of China was a wise one, for in 1949 the three Yeo Hiap Seng plants in Fukien were taken over by the Chinese Communists. By the mid-1940s, Yeo’s quality soy sauce was a common sight in Singapore.

In 1950 YHS decided to diversify into canned products, such as chicken curry, fish, and meat. Then in 1954 they launched their first soymilk. Called Beavint, it was subsequently renamed Yeo’s Soybean Drink. A rather sweet soymilk sold like a soft drink in sterilized bottles, it was marketed in both Singapore and Malaysia, where it was the first product of its type. (Vitasoy was first sold like a soft drink in sterilized bottles in Hong Kong in 1953.) In 1955 the company changed its structure to that of a “Limited” (Ltd.) company. In 1958-59 YHS expanded its soft drink line by bottling favorite traditional Chinese beverages, such as chrysanthemum teas and herb teas. In 1962 YHS began its first export sales to Hong Kong. In 1967 YHS soymilk and teas were first sold in UHT (Ultra High Temperature) aseptic Tetra Pak cartons (tetrahedral/pyramid shaped; 285 ml).

“YHS was the world’s first company to package soymilk in aseptic Tetra Pak cartons, and the first to use Tetra Pak for any beverage in Singapore. (Vitasoy in Hong Kong did not start using Tetra Pak until 1976). Shortly after introducing sweetened soymilk in the tetrahedral pack,
YHS launched enriched Vitabean in the same carton. It was fortified with half of the adult Minimum Daily Requirement of most essential vitamins. Sterilization in bottles would have destroyed most of the added vitamins, but the UHT process did not. In 1974 packaging was changed to Tetra Brik (250 ml), but bottling continued. During the late 1970’s YHS changed its soymilk brand name to Yeo’s. By 1976 Yeo Hiap Seng’s soymilk production had climbed to 50 million bottles and cartons a year, and by 1980 to 75 million (250,000 a day), prompting the company to build a new plant to double its capacity. In 1983 YHS had the biggest share of the Singapore soymilk market (Alan Yeo, personal communication, 1982, 1983).

“Yeo Hiap Seng pioneered soymilk throughout Southeast Asia. In 1959 they opened their first soymilk plant at Kuala Lumpur in Malaysia. By 1984 they had four soymilk plants there at Kuala Lumpur, Jahore Baru, Prat, and Kuching. Malaysia, with its 14 million people, was a bigger market than Singapore, with its 2.4 million people. By 1984 YHS had the lion’s share of the Malaysian soymilk market. During the 1970’s, YHS started exporting soymilk to Hong Kong (where they got a small share of the market). In 1979 they began exporting canned soymilk to the USA, where they had offices and a warehouse in San Jose, California. In early 1983 they introduced a low-sugar soymilk to the US. Sales, however, were slow. YHS was not interested in the China market, since they thought that it would be too difficult to get profits out in hard currency. They were franchising their soymilk process and technology in Indonesia, where the product is being marketed under the YHS name. They plan to share in the promotion, too.

Starting in 1974 Yeo Hiap Seng began a new phase of its expansion and diversification by acquiring the Singapore franchises for Pepsi-Cola and Mirinda. These were followed by franchises for Schweppes in 1985 and 7-Up in 1986. In 1985 the company acquired distribution rights for Budweiser beer and in 1987 they branched out into prawn farming.

“The 1981 Annual Report of Yeo Hiap Seng Ltd. shows that this publicly held company was run by Yeo Thian In (Chairman) and Alan Yeo Chee Yeow (Managing Director). From 1977 to 1981, sales of all products grew from $39.5 to $95.8 million and pre-tax profits from $7.1 to $11.5 million. Their Soft Drinks Division, one of the largest in Singapore, Malaysia, and Hong Kong, provided the main thrust of company growth.” Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


• Summary: “The Seafood King is off to one side of Chinatown, and so unpromising on the outside and threadbare-basic within that one would tend to pass it by. That would be a mistake.” It has enough fine dishes to attract a steady stream of Chinese.

“When a Chinese friend took me there we had wonderful things like swamp cabbage with fermented bean curd, which sounds terrible but was not...” Address: Times staff writer.


Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “fetid tofu” to refer to stinky tofu.

In 1982 Taiwan imported 1,150,433 tons of soybeans from the USA, and grew 11,942 tons of soybeans in Taiwan. 80% of the soybeans are crushed to make soybean oil and meal, and the remaining 20% are made into versatile soybean foods. In 1983 two new brands of instant soy milk powder appeared on the market in Taiwan. More than 1,400 small tofu plants are located throughout Taiwan. They make and sell their products on the same day. Only two large, modern plants produce packaged and refrigerated tofu. A continuous film-forming method for making yuba was developed by FIRD in 1977. Address: Food Technologist, Food Industry Research and Development Inst. (FIRD), P.O. Box 246, Hsinchu, Taiwan 300.


(2) Oriental fermented soybean foods (gives food name, local names, microorganisms used, substrate, nature of product): Soy sauce (local names: chiang-yu, shoyu, toyo,


(4) Soybean solids and proteins in soybean soak water as affected by soaking conditions (temperature vs. time; Lowry protein / Lowry's protein). (5) Ratio of protein to oil content of tofu and soy milk as affected by protein content of soybeans (for different soybean varieties; the highest ratios come from the varieties Wase-Kogane, Vinton, Toysuzu, and Coles).


• Summary: The first soy deli cases went into Raley’s supers in Reno, Nevada, and Sacramento, California, on 16-17 May 1983. Raley’s has now dropped the coolers, but integrated the soyfoods in with their other products in the natural foods section of the store. Safeway is keeping the coolers. A new area of interest is high-volume natural foods stores and co-ops. In March the Pugent Consumers Co-op in Seattle, Washington, and the Arcata Co-op in Arcata, California, each took a cooler.

Quong Hop’s fermented tofu now retails for $1.75 per pint (16 oz.).

Starting about a year ago, the California state Board of Health required Quong Hop to ship and sell all of its fermented tofu refrigerated. This ruling applies to any fermented tofu made in the USA because the manufacturing process does not conform to canneroy standards which are designed to prevent botulism; under extreme conditions botulism spores grew out on furu. Yet imported fermented tofu is not under this regulation because, it is believed, that its overall medium of salt and alcohol acts to prevent botulism.

Miller estimates that 500,000 lb/year is imported. The imported product retails on average for $1.30/lb. Address: V.P. Marketing & Personnel, Quong Hop & Co., 161 Beacon St., South San Francisco, California 94080. Phone: 415-873-4444 or 761-2022.


• Summary: Includes a brief introduction to tempeh, fermented tofu, miso, natto, and soy sauce.


• Summary: Contents: Brief biography of Leviton and introduction. Deep-fried and grilled tofu treats: age, atsuage, ganmo, yaki-dofu, doufu-gan. Tofu haute cuisine (at 280-year-old Sasa-no-Yuki in Tokyo, dried-frozen tofu, wine-fermented tofu). Delights of soy milk and yuba (incl. Yuba Han). Natto, miso, and savory soy condiments (incl. Hamanatto or “savory soy nuggets,” thua nang from Thailand, and natto miso). And still more: Cooked soybeans with wakame, “soy sprouts packed in a sausagelike clear tube, green soybeans in the pods, kinako powder (a flour made from dry roasted soybeans, used as a basis for confections or nut butters), freeze-dried instant miso soup powder, instant silken tofu powder (just add water and stir), and dry meat sauces for tofu.” Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.


Address: Editorial Asst., The Hawaii Herald, 917 Kokea St., Honolulu, Hawaii 96817. Phone: 845-2255.


• Summary: This interview, conducted during a visit by Mrs. Torii to Soyfoods Center in Lafayette, California, discusses: Marukin Shokuhin Kogyo in Kumamoto city, Japan, Mr. Goro Kanasugi, the recent start of production of tempeh starter in Japan, tempeh made by Takashin / Takato, René Breuls, sales outlets for tempeh in Japan, Marusai-Ai in Okazaki, update on Torigoe, soybeans in Indonesia, symposium at Tsukuba (Japan) on tempeh and natto, Japan Tempeh Research Society (Tempe Kenkyukai, Korin Shuppan KK, Iriya 1-27-4, Taito-ku, Tokyo), Okinawa fermented tofu (tofuya), Yamagata no Shojin Bushi (dried tofu that is shaved like katsuobushi). Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

**Summary:** Contents: Traditional soybean foods. Modern soybean protein food. Meat extenders and analogs. Discussion. Figure 1 shows that traditional soybean foods include tough bean curd (which can made into fermented bean curd (fu-ru), sauce bean curd, fried bean curd, or vegetable chicken), tender bean curd (to-fu), or bean curd sheet (fu-zu [yuba]). Address: Dalian Oil Industry General Factory, Liaoning.


**Summary:** Special attention is given to the chemistry of soy proteins and gelation reactions involving them for the production of tofu, sufu, cheese analogs, and yogurt-type products. Address: 1. Dep. of Food Science & Human Nutrition, Univ. of Florida, Gainesville, FL 32611; 2. Dep. of Food Science & Nutrition, Univ. of Minnesota, St. Paul, MN 55108.


**Summary:** Urizun, a restaurant in Naha (Asato 388-5), the capital of Okinawa Prefecture, is a “rare combination of superb food and ambiance.” It was started 12 years ago by Tsuchiya Saneyuki, because of his passion for awamori, “the Okinawan liquor distilled from Thai rice and aged like whiskey.” Its flavor resembles that of shochu, which is distilled from potatoes in southern Kyushu.

Urizun serves Tofuyo ($1.30), Okinawa-style fermented tofu with a sharp taste. Another popular dish has a dressing of miso and vinegar. Another Okinawan standard is a “creamy white tofu made of peanuts.”

Note: The colorful paper wrapper for Urizun’s tofuyo looks like this. The text (in Japanese) on the label reads like this (see next two pages).


**Summary:** Contents: Introduction. Part 1. General information: 1. Characteristic traits: Agronomic and other biological characteristics, physical properties, chemical properties, soybean protein, properties of soybeans as food material. 2. Current ways of using and processing soybeans: Throughout the world, traditional ways of using and processing, new soybean food products. 3. Tofu and other nonfermented soybean food products: Tofu, deep-fried tofu, dried-frozen tofu, soy milk, yuba, roasted soy flour (kinako), soybean sprouts. 4. Miso and other fermented soybean products: Miso, natto, Hama-natto (tera-nattô), soy sauce, sufu, tempeh. 5. Other ways of eating soybeans—Simple traditional Japanese foods: Parched soybeans, boiled soybeans (budo-mame; hitasahi mame), beaten and mashed [or ground] soybeans (go, or (from edamamé) zunda or jinda), molded soybean mash (jinta-dôfu), molded mashed soybeans and rice flour (shitogi), soybean soybean-mash paste. 6. New soybean protein products.

Note 1. This is the earliest document seen (Nov. 2008) that mentions zunda. The text (p. 84) reads: “When fresh green soybeans (edamame) are used in cooking, they are boiled for from ten to twenty minutes; ground; and flavored with salt, sugar, and soy sauce. The resulting dish is called zunda or jinda.”

Note 2. Zunda is a healthy and tasty snack or treat made from mashed edamamé. It is sweet, rich in protein, high in fiber and emerald green. It is said to have originated hundreds of years ago in Japan in Miyagi prefecture. In and around Sendai (capital of Miyagi prefecture) one can find many shops and booths that sell zunda cakes, zunda mochi treats, and zunda shakes, all made from edamamé (green vegetable soybeans). One well-known company in Japan that markets delicious zunda products is Zunda Saryo.


Bibliography.

In the chapter on tofu, pages 43-44 discuss okara or unohana (the residue remaining after soy milk production); a photo shows it in a glass bowl. “Though it formerly appeared on many Japanese tables seasoned and cooked with vegetables, today it is most often fed to animals. As the number of animals raised in urban and suburban areas decreases, however, tofu manufacturers are finding it harder to dispose of residue.”

Page 99 notes of tofu: “At a certain temple in Kyoto is a plaque bearing the following inscription, which, while comparing this food to religious faith, clearly shows the esteem in which the Japanese people hold tofu. ‘Religious faith should be like tofu: it is good under any circumstances. It is good boiled, grilled, or fried. Raw, chilled, served with soy sauce and other seasonings, it is good with steamed rice. Simmered in hot water and flavored, it is good with sake. Because it is soft, old people and sick people welcome it, but children and young people like it too. Men like it, women like it; poor and rich both like it. Though common, it has elegance enough to find a place in the upper class. ‘It cuts clean and well for use in clear broths. It is good in the meatless diets of religious training. It can be crushed for use in miso soup. It is used all the time and in all seasons. It is inexpensive yet numbered among the delicious treats.”

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It is welcomed everywhere, in mountains as well as in big cities. It is well received at dinners for dignitaries and guests yet is convenient enough for college students who do their own cooking. Women especially should be like tofu. The mature and cultivated person should be tender, yet firm, like tofu. Though apparently tasteless, it is delicious. Though apparently ordinary, it is extraordinary.”

Other ways of eating soybeans (p. 83-84): (1) Parched—“Parched gently in unglazed ceramic dishes made for the purpose,” then tossed by people at Sestubun in February around their houses as they chant “Demon out! Good luck in!” “Then they pick up the beans and eat them. “Parched soybeans are included in some varieties of mochi (glutinous rice cake) and in okoshi a confection made of puffed rice bound together with sugar syrup. In the past they were eaten with salt, miso, or soy sauce.”

Note: In the USA, parched soybeans are called “dry roasted soynuts.”


Japan once produced a million tonnes (metric tons) of soybeans annually. This figure decreased dramatically during World War II. After the war, as soybean imports from the United States steadily increased, Japan’s domestic crop gradually fell to the level of no more than 100,000 tonnes. In 1977 it was 111,000 tonnes, yet by 1982 it had jumped to 226,000 tonnes as rice acreage was reduced.


Note: Surprisingly, edamamé, one of the most popular soyfoods in Japan, is mentioned only once, in passing (p. 84) in this book.

Photos on the rear cover show Tokuji Watanabe and Asako Kishi. A brief biography of each is given.

Tokuji Watanabe: Born in 1917 in Tokyo, he graduated from the Faculty of Agriculture of Tokyo University in 1941, with Doctor of Agriculture. In 1945 he entered the National Food Research Institute (NFRI), of which he became director with Doctor of Agriculture. In 1945 he entered the National Food Research Institute (NFRI), of which he became director in 1971. In 1977 he resigned that position and became a professor at the Kyoritsu Women's University, where he now teaches. Address: 1. D. Agr., Kyoritsu Women’s Univ., Tokyo.


**Summary:** Red rice koji (beni-koji), prepared by growing *Monascus* on steamed rice, is an important material used in making red fermented tofu (Tofuyo), which has long been manufactured in Okinawa. The ripening of this food is greatly affected by the quality of the koji, and its protease is thought to be the key enzyme. Although fungal proteases have been studied in depth, information on the enzymes produced by the *Monascus* mold has previously been very limited. Address: Dep. of Agricultural Chemistry, Univ. of the Ryukyus, Nishihara, Okinawa 903-01, Japan.


**Summary:** “Some might say that David Mintz, the Brooklyn man who invented the nondairy frozen tofu dessert known as Tofutti, is obsessed with tofu.”

The founder of Tofu-Time Inc., Mr. Mintz dreams of tofu. “He spends hours in the kitchen concocting Tofutti flavors and recipes with the product made from fermented soybean curd such as tofu beef stroganoff and tofu brownies.

He married last year and his wedding cake was made of tofu.

And now, just in time for the Jewish New Year (Rosh Hashanah), Mr. Mintz has developed three special nondairy recipes: Tofu matzoh balls, Tofu noodle pudding (recipe given, calling for 1 pound tofu), and Tofu honey cake.

Note: Neither Tofutti nor any of the other dishes mentioned above is made with “fermented soybean curd” [fermented tofu]. The stroganoff and brownies are made with regular tofu—which is not fermented. The cake probably had icing / frosting, including layers, made of sweetened, blended tofu.


“It is our [American Soybean Association’s] strong intention that marketing and consumption of soy protein should not in any way deter the expansion of the production and sale of as much animal protein as the world can be expected to produce in the years ahead. Soy protein foods are being intentionally brought to the market to complement and not necessarily to replace animal protein products.”

“Taiwan imported 1.41 million tonnes (metric tons) of soybeans in 1983 and used about 250,000 tonnes as soyfoods for direct human consumption, which made Taiwan one of the highest in per capita consumption of soyfoods (13.2 kg or 29 lb) in the world. In the past 10 years (1974-1983), the consumption of traditional soyfoods showed an average increase of 3% per year as compared to 12% and 8.1% for poultry and soy oil, respectively. The market for packaged soymilk, soy pudding and tofu has also been expanding rapidly in recent years in Taiwan.” Table 7 shows the production of soymilk in Taiwan, which grew from 103,600 tonnes in 1974 to 210,000 tonnes in 1983, for an average growth rate of 8.2% a year.

China produces about 9 million tonnes of soybeans a year, and about half of these are consumed as soyfoods, giving a per capita consumption of 4.5 kg of soyfoods.

“An improvement in the general economy and soyfood technology and equipment will bring a sharp increase in soymilk demand and more soyfoods consumption.”

In South Korea soymilk consumption has increased more than seven-fold in the last 4 years. Currently about 10,000 tonnes of soybeans are used to make 70,000 tonnes of soymilk. “It is projected that soymilk production in Korea will double in 1984 as compared to the previous year.”

Indonesia continues to be Southeast Asia’s largest consumer of soybeans as food. In 1982/83 soybean consumption was 6.7 kg per capita. Indonesia consumes...
about 1 million tonnes of soybeans annually; 60-65% of them in the form of tofu and 35 to 40% as tempeh.

Malaysia consumes only about 30,000 tonnes of soybeans per year as food. In Singapore, more than 75% of the population of 2.5 million are Chinese. Therefore tofu, soysauce, and soymilk are the predominant traditional soyfoods consumed.

Thailand consumes about 40,000 tonnes of soybeans a year as food, mainly in the form of tofu. The Philippines uses only 5,000 tonnes of soybeans annually for food, mainly as tofu.

To summarize (Table 6), annual per capita consumption of soybeans in various East Asian countries, in descending order of the amount consumed, is as follows: Taiwan 13.2 kg (population 19 million); Japan 8.3 kg (population 120 million); South Korea 7.5 kg (population 50 million); Indonesia 6.7 kg (population 150 million); Singapore 6.25 kg (population 2.4 million); China 4.5 kg (population 1,000 million); Malaysia 2.1 kg (population 14 million); Thailand 0.8 kg (population 50 million); Philippines 0.3 kg (population 15 million). Address: Director, American Soybean Assoc., Room 603, Kwang-Wu Building, No. 386, Tun Hua South Road, Taipei, Taiwan.


• Summary: Mrs. Torii thinks that tempeh will spread and become popular in Japan. It is now rapidly growing in popularity.

Mr. Kanasugi’s restaurant Mame-no-ko opened in March 1976. He makes the tempeh in a walled-off room in his natto factory.

Takashin tempeh is served as tempeh cutlets at Alicia’s in Shimokitazawa, where it is a popular entree.

Mr. Kanasugi’s method makes good, firm, tasty tempeh, with no dewatering. Prof. Watanabe and Mrs. Torii have both visited him and both praised the method. His tempeh miso is very delicious. She gives the recipe. Like Namé Miso it is good on sliced cucumber or with ginger.

Mrs. Torii (whose mother is Okinawan) has found Okinawan fermented tofu (tofuyo) sold in Tokyo; she includes a label: Tofu maker: Mr. Y. Yamada. K.K. Maruyama (also known as Okinawa Dento Shokuhin-jigyo Kyôdo Kumiai). Eight pieces in a glass jar retailed for ¥2,000. She found this product sold at two department stores in Tokyo: (1) Seibu Department Store, in Yûrakucho. (2) Matsukakaya, in Ginza. 2-10-26 Matsuo, Naha-shi, Okinawa-ken 900, Japan. Phone: (0988) 63-0236.

Mrs. Torii says tofuyo is like Chinese-style fermented tofu (doufu-ru) except milder and more expensive. She finds it to be delicious. It is sold in a plastic bag inside a book-sized box. It is made by Urizun, a restaurant in Naha, Okinawa. Molded tofu is immersed in a brining liquor of Ryukyu Awamori, which is clear shochu spirits.

Note: Mrs. Torii brought a small sample of tofuyo to Soyfoods Center in 1984 during one of her many visits. Shurtleff and Aoyagi both tasted it straight (as is) and found it the most delicious fermented tofu they have ever tasted. It would make a delicious spread on crackers. Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.


• Summary: Page 14: “The monotony of their starch diet was lightened only by bits of tiny salt-dried fish, pickles, fermented bean curd, and fermented black beans, the kind of strong tasting condiments that in small amounts could go a long way on rice or in gruel.”

Page 105: The peasants used soy sauce.


166.

Summary: Page 28: Basic seasonings include “nam yee (fermented red beancurd)...” This same seasoning is called for in recipes on pages 54 and 166 (“1 heaped teaspoon fermented red beancurd (nam yee))."


Summary: Introduction. Historical aspects of soy sauce and miso. General description of fermented vegetable protein foods: Soy sauce (varieties, manufacturing, flavor components and quality evaluation), miso, natto, sufu (fermented product of tofu), fermented soy milk. Microbiology, biochemistry and nutrition: Role of koji as enzyme source (unique sources of enzymes, peptidases in koji, role of proteinases and peptidases in koji during protein digestion, role of glutaminase in koji in formation of glutamic acid during protein digestion), effect of heat treatment of soybean proteins on their digestibility and nutritive value (enzyme digestibility and yield of soy sauce, enzyme digestibility and nutritive value of protein), basic mechanisms for protein coagulation, microorganisms during brine fermentation in soy sauce and miso (change of microflora during brine fermentation, properties of P. halophilus, properties of S. rouxii, properties of Torulopsis species), nutritive value, safety and anticarcinogenicity of fermented foods. Future of traditional vegetable protein foods made through fermentation. References. Address: Food Science Research Lab., Kikkoman Corp., Noda-shi, Chiba-ken, Japan.


Summary: An illustration on the cover shows an American cowboy-like man, wearing a cowboy hat and cowboy boots, smoking a cigarette, and carrying a briefcase on which is written ASA. He appears to be emerging from a garbage can labeled “soya” and from his briefcase are flying several cartons of soymilk. The article begins: “Two soy products, milk and tofu, were at the center of a conference organized in September 1984 at Amsterdam [Netherlands] by the American Soybean Association (ASA).”

Gives data on the chemical composition and nutritive value of soy beverages, soymilks, and tofu. Discusses the products recently introduced in Europe. Consumption of soy products in the E.E.C., principally as soy protein concentrates or isolates, has never exceeded 40,000 tonnes/year. Consumption of traditional East Asian soyfoods such as tempeh, miso, sufu, and soy sauce, is still low in Europe, but consumption of tofu and soymilk is growing significantly. Nutritional composition of cow’s milk and soymilk are compared, and various commercial soy products are discussed.

Soy ice creams (including Ice Bean and Tofutti) are discussed in detail on page 19, col. 1. The pioneer of these soy ice creams (ces ice cream au soja), named Ice Bean, was developed by Farm Foods in Tennessee. Today there are a dozen other brands of tofu ice cream (glaces au tofu). One of these ice creams (ces crèmes glacées), Tofutti, made by the company Tofuyo Time and presented at SIAL in 1984, took the first place last fall on the hit parade of dairy products from the United States.” Note: This is the earliest French-language document seen (March 2007) that mentions soy ice cream which it calls ice cream au soja, or glaces au tofu, or crèmes glacées.

Photos show the following products, each in a Tetra Brik carton: Nestle Bonus Soya Bean Milk, Plamil Soya Milk Concentrated, Morinaga Ever-Fresh Silken Tofu, Yeo’s Soya Bean Drink, Alpro Soya Drink. Address: France.


Summary: A person from NHK went to Okinawa on 19 Feb. 1985 and visited the market located in Makishi, near the center of Naha city. It was on the last day of the year, the day before New Year’s day (o-misoka), as celebrated according to the ancient lunar calendar. The market was very crowded since many Okinawans still use the lunar calendar.

Cakes of Okinawan tofu are large and very firm. Tofu is called rikuni agatta o-tofu, which means “tofu landed on a shore.”

There are about 300 shops in the market but only one shop, Saburô-ya, that sells tofuyo and only about 10% of the customers buy tofuyo. It is sold in a box. Its color is a pretty red. Red koji (aka-koji, beni-koji) is used to make it. It is very difficult and time consuming to make at home. Tofuyo is not the most popular food in Okinawa among regular people. In the old days, the royal family treasured it as a special delicacy (chimmi) that was largely reserved for them. During the Okinawa dynasty, the royal family lived in the city Shuri, which is today a district in the highlands of Naha, at the southern part of Okinawa island. It was formerly a separate city unto itself and the royal capital of the Ryukyu Kingdom, the site of Shuri Castle. It is believed that the idea for tofuyo came from Chinese fermented tofu. It is difficult to make good tofuyo, and the ageing process takes 3-4 months. Today there are very few people who can still make tofuyo—even in Shuri.

517. Byrne, Maureen. 1985. The future for soyfoods. The first European Soyfoods Workshop was held in Amsterdam by the American Soybean Association, and papers covered subjects from marketing to microbiological standards. Food Manufacture (London) 60(3):49, 51, 53. March.

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**Summary:** Contains an interesting full-page table in which Oriental soyfoods are classified into two types: Non-fermented and fermented. The non-fermented soyfoods are: Fresh green soybeans, soybean sprouts, soynuts, soymilk, soy flour, soy protein-lipid film (yuba, tou-fu-pi), soybean curd (tofu). For each food is given the local names, description, and uses.

The fermented soyfoods are: Soy sauce, miso, tempeh, natto, fermented tofu, and soy nuggets. For each fermented soyfood is given the local names, organisms used, description, and uses.

Soy sauce includes chiang-yu from China, shoyu from Japan, ketjap from Indonesia, kanjang from Korea, toyo and see-ieu from Southeast Asia.

Soy nuggets include tau-shih from China, tao-si from the Philippines, tau-cho from Malaysia, tauco from Indonesia, and Hamanatto from Japan.

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**Summary:** Tofuyo. Even if you can imagine, from its name, that it is a food made from tofu, very few people know what tofuyo is. It tastes like a cheese and there is a similar product in China named *funyu* [fermented tofu]. It is a special delicacy in Okinawa, made from tofu which is fermented in red rice koji and awamori (millet brandy). However tofu made in Okinawa is firmer (it contains less water) than regular tofu (*momen-goshi*) made in Japan. And each cake of tofu is large, weighing about 900 gm. Also the method of selling the tofu is a little different; it is not immersed in water but a large piece (containing about 5 cakes) is placed on a wooden cutting board and covered with a kitchen cloth (*fukin*). The tofu seller cuts each cake of tofu according to the customer’s desire.

Tofu is essential, as is pork, in the diet and food culture of Okinawans. The most popular dish prepared at home in Okinawa is *chanpurû* [*champuru*] which means “something mixed.” It is made from tofu and seasonal vegetables stirred (or sautéed) together, often with a little meat or fish. Tofuyo, by contrast, is a delicacy most suited for drinking with saké.

Photos show: (1) The inside of a Okinawan shop that makes the island’s most popular distilled alcoholic beverage, awamori (millet brandy), in large earthenware vats. There are ten or more old makers of awamori in Naha city (formerly named Shuri). (2) The process for fermenting rice. (3) Freshly made tofu; it is carried to the store in a wooden frame. (4) Wooden presses with heavy weights on top. Soymilk curds are being pressed. (5) To make tofuyo, soak rice koji in awamori for about 10 days. After it becomes soft, grind it in a suribachi. If you have red koji (*beni-koji*), put it in too, and season with salt and sugar. Cut firm tofu into cubes about 3 cm on a side. Sprinkle salt over them. Dry them on a flat woven-bamboo tray in a shady place. When the tofu becomes yellowish, wash them in awamori 2-3 times. Place them in a jar of the seasoned sweet koji and cover. Place the jar in a refrigerator and allow to ferment for 3-6 months. (6) Tofuyo in the jar in which it is ripening. (7) Kôsetsu Shijo (huge indoor market) near Heiwa-dori in Naha city, Okinawa. It is regarded as “the kitchen of Okinawa.” (8) In Okinawa, all parts of slaughtered pigs (intestines, ears, legs, etc.) are sold as food in Kôsetsu market; nothing is wasted. (8) There are tofu shops in Kôsetsu market. They cut tofu into one cake (*cho*) pieces at the request of customers. (9) For more information contact Naha-shi Kankô Kyôkai (Tourist’s Bureau), Phone: 0988-68-4887. Senzaki 1-1, Naha city 900, Okinawa.

Note: The NHK TV broadcast on tofuyo was on Friday 8 March 1985.


**Summary:** Four factors contribute to the acceptance of a novel food or beverage: color, aroma, flavor, and texture. The important basic role of food structure and texture, and ways of obtaining unique and inviting textures are discussed. These concepts are applied to the various types of tofu, dried-frozen tofu, and fermented tofu. For example, the use of GDL as a coagulant yields very soft tofu with a silken texture. Deep-frying yields a porous, elastic texture. Freezing creates a sponge-like texture.


20 to (hopefully) cover expenses (postage, etc.). You are at that time when I’m a little more free. I’m also sending you and the tapes to you by the end of September, and write more return the also look forward to hearing whatever tapes you send. I’ll your good letters. They are very, very interesting to me. I conference, the symposium brochures, the clippings, and things that you have sent me, the letters about the “Above all I want to thank you for all of the wonderful be brief.

Already this summer we have keyed in 7,000 cards into computerizing our Soyfoods Center library card catalog. Thank you for tempeh materials. Letter to Yasuko Torii, Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan, Aug. 1. 1 p. Typed, without signature (carbon copy).


• Summary: Discusses the basic steps in making fermented tofu, gives a nutritional analysis of red sufu, white sufu, zao sufu (made with fermented rice mash), and chau sufu (a type with a strong smell). Protein content ranges from 11.7 to 14.6%. Gives the amino acid content of red sufu and chau sufu. Vitamin B-12 is highest in strong smelling sufu (1.9 to 9.8 micrograms/100 gm), and 0.42 to 0.78 in red sufu. Address: Inst. of Health, China National Center for Preventive Medicine.


• Summary: “Dear Torii-san. We are right in the middle of computerizing our Soyfoods Center library card catalog. Already this summer we have keyed in 7,000 cards into the computer. A very talented Stanford student is doing the actual data entry and I am preparing and then proofing every card as it is printed out. It keeps me working 12 hours a day, 7 days a week just to keep up with him. So, this will have to be brief.

“Above all I want to thank you for all of the wonderful things that you have sent me, the letters about the conference, the symposium brochures, the clippings, and your good letters. They are very, very interesting to me. I also look forward to hearing whatever tapes you send. I’ll return the Tofuyo [Okinawan fermented tofu] video cassette and the tapes to you by the end of September, and write more at that time when I’m a little more free. I’m also sending you $20 to (hopefully) cover expenses (postage, etc.).* You are such a kichinto-shita hito! [accurate, precise, punctual, neat and tidy person]. Both Akiko and I greatly appreciate this! Sincerely,...

“* To make it as easy as possible for you (though it doesn’t seem as much like a real gift or money), we are deducting the $20 from your invoice. Akiko said if we sent you a $20 bill it would at be mendokusai [a nuisance] to go to the bank to cash it. I hope that’s okay.” Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


• Summary: In this Mycological Society of America Annual Lecture, presented on 7 Aug. 1984 at Colorado State University (Fort Collins, Colorado), Dr. Hesseltine gives a nice history of the research conducted by him and others at the Northern Regional Research Center (NRRC) on Asian soybean fermentations, including fermented tofu (Frank Meyer, early USDA plant explorer, in a letter dated 21 Nov. 1916, states: “Parcel No. 125c contains first quality Chinese soybean cheese: please taste a little on the point of a knife; it is extremely appetizing.”), sufu, shoyu, miso, tempeh, Chinese black beans (soy nuggets), natto, and “the use of lactic acid bacteria to produce a yogurt product from soybeans.” He also studied non-fermented tofu.

Dr. Hesseltine pays a nice tribute to the work of Dr. A.K. Smith of the NRRC (p. 506-07). After his trip to East Asia shortly after World War II, Dr. Smith (a protein chemist) made great efforts to promote cooperation between the USDA, particularly the NRRC, and Japan in conducting research to understand how our exported soybeans were used for food. He had the foresight to recognize the importance of studying soybeans used in such huge quantities for processing into human food. Dr. Smith was instrumental in arranging for two Japanese scientists (Dr. Tokuji Watanabe and Dr. Kazuo Shibasaki) to come to the NRRC to do research on tofu and miso. “This really began a new era of research on use of Oriental methods to produce foods from soybeans” (p. 507).

“My first real involvement in fermentation of soybeans was the arrival [in Oct. 1958] of Professor K. Shibasaki of Tohoku University to study the miso fermentation. He was sponsored by the American Soybean Association and USDA’s Foreign Agricultural Service. When he arrived, I was told that since I was curator of the mold collection and since the Aspergillus oryzae strains used in the miso process were in my charge, I would be the person he would work with. I had no background and no interest in soybean fermentations, but this was a fortuitous happening because it acquainted me with Oriental food fermentations. All my background was in conventional liquid agitated pure culture fermentation. The miso fermentation introduced me to two new concepts in fermentation: (1) solid state fermentation, and (2) use of mixed pure culture inoculum” (p. 510).
“Probably my interest in fermented foods would have abated had it not been for the acceptance of Mr. Ko Swan Djien of Indonesia, who came to us in 1960 for practical training. In my first discussion with him, we talked about the kind of work he would do. Since I knew that a fermentation was conducted in Indonesia using soybeans and reportedly the fermentation organism was a species of Rhizopus, I asked him if he was familiar with the product; his answer was yes, that he often ate it, but he knew nothing about how the fermentation was conducted. It was decided that during his 6 months at Peoria this might be an interesting subject to study, especially since he could obtain samples of the tempeh cake from his wife, who was in Java and could tell good tempeh from bad. Dried samples were quickly obtained; from these cakes, four species of Rhizopus were isolated” (p. 514-15). Eventually many strains of Rhizopus were isolated and investigations showed that Rhizopus oligosporus strain NRRL 2710 produced especially good tempeh.


*Summary:* “I want to help you on this subject heartily. I will answer your questions and send you some good documents,” Address: PhD, Assoc. Prof. of Agricultural Chemistry, Dep. of Agricultural Chemistry, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-01, Japan. Phone: 09889-2221.


*Summary:* Wm. Shurtleff made an appointment with Stanley Lee to have lunch together in South San Francisco and talk about the history Quong Hop’s fermented tofu.

The product, first made in 1906 in San Francisco, had always had a Cantonese Chinese name (“Fu-Yu”) and an English name (“Bean Cake”). The English name was used mostly because of health inspectors and because of the Bureau of Alcohol, Tobacco and Firearms—especially during the Prohibition era (1920-1933) in the USA. There was no tax on the product until Prohibition went into effect.

There have always been inexpensive imports with which Quong Hop has had to compete, except during World War II. Today these were made mostly in Hong Kong (#1), China, and Taiwan (#3). The U.S. market is composed of about 90% imports and 10% Quong Hop—now the only manufacturer in the USA. The red label (regular, with no chili flakes added), is used mostly by restaurants and served mostly with beef. In about 1948 the Caucasian chef at a big Statler hotel in Boston started to use it as a seasoning in spaghetti sauce. Many types of fermented tofu use no alcohol; they just add lots of salt.

Another company on Sacramento St. in San Francisco may have made fermented tofu as early as 1904. Wo Chong also started making fermented tofu on Jackson St. in San Francisco.

From the early days until 1941 it could be packaged in two ways: (1) Pack in a can 4-5 inches tall, or (2) Pack in a cylinder 3 inches in diameter, pour in thesolution, then seal the mouth with tough paper and paste. Glass pint jars came later, when World War II started and metal was rationed.

The company name, “Quong Hop,” was the name of an old, famous company in Guangdong province not far from Canton. Stanley is the grandson of Quong Hop’s founder. Address: Owner, Quong Hop & Co., 161 Beacon St., South San Francisco, California 94080. Phone: 415-873-4444 or 761-2022.


*Summary:* A comprehensive history of the subject.


Note: As of Aug. 2004 this chapter can be viewed free of charge by going to the Soynfo Center website (www.soyninfocenter.com) and searching for: History fermented tofu. Address: Lafayette, California. Phone: 415-283-2991.


*Summary:* “I think the origin of fermented tofu in China is very uncertain. I believe the time of origin of doufu-ru is later than the Pen-ts’ao Kang-mu compiled by Li Shih-chen (1578-1597; Ming dynasty). The ‘nyu-fu’ in that book is not fermented tofu, but rather cow’s milk protein coagulated with acetic acid. Therefore, I think Yamazaki’s Nyu-fu (in the ‘Gyoku Hen’) is also a dairy product. Yamazaki’s Nyu-fu in my article was cited from Ohta’s article (Nippon Jozo Kyokai Zasshi, 1965, July and August).” Address: Dep. of Agricultural Chemistry, Univ. of the Ryukyus, 1 Senbaru,
Nishihara-cho, Okinawa 903-01, Japan. Phone: 09889-2221.


• Summary: The author gives good, brief introductions to the fermented soy foods tempeh, miso, miso pickles, shoyu, tamari, sifu, natto, soy idli, and hamanatto. Related foods that are also discussed include koji, amazake (amasake), and ontjom. See especially chapter VII: The fermentation of legumes (p. 73-78). Part IV (p. 153-216) is a dictionary of fermented foods and beverages, in which they are listed alphabetically; basic information and references for each are given. Instructions are given for preparing many of these foods on a home scale, and for some foods (such as tempeh) even recipes are given (fried tempeh, tempeh goreng). The book contains many beautiful illustrations and an excellent bibliography. The author acknowledges his extensive use of the material in Handbook of Indigenous Fermented Foods (1983) edited by K.H. Steinkraus. Address: Ingénieur agronome de formation, France.


• Summary: On the cover, below the title we read: “An illustrated course in contemporary Chinese cuisine.” A gorgeous book, packed with superb color photos on glossy paper. One chapter (p. 98-115), titled “Bean curd and eggs,” contains many tofu recipes. Other tofu recipes are scattered throughout the book.

The section titled “Soy beans and bean-based products” (p. 26) gives brief definitions of: Bean curd [tofu], bean curd cheese [fermented tofu], bean curd skin [yuba], salted black beans [soy nuggets] (“Cooked, salted and fermented whole soy beans. Mash them with other ingredients or mix into dishes for color” and rich, earthy, piquant flavor), Sichuan chili paste (yellow soy bean paste mixed with dried chilies and their seeds, sugar, and garlic), soy bean paste (crushed soy beans mixed with sugar, salt, and chili), sweet bean paste (made from cooked, puréed, sweetened red beans [azuki]), and yellow bean paste (made of fermented, salted puréed yellow [soy] beans with salt, flour and water). Also contains recipes for: Bean-curd cheese [fermented tofu], p. 88, 89. Bean curd skin [yuba] (p. 200, with color photo of “dried bean curd skin” on p. 18).

Recipes and photos for “salted black beans” [soy nuggets] or black bean sauce are: Steamed scallops with black bean sauce (p. 132, 138). Quick-fried crab in black bean sauce (p. 144). Cantonese steamed spareribs with black beans (p. 186, 188). Sliced beef in black bean and chili sauce (p. 201). Ho-fen noodles with beef in black bean sauce (p. 270, 273). Soy sauce is used in recipes throughout the book.

A color photo on the rear dust jacket cover shows Kenneth Lo. His biography, on the inside rear dust jacket, states that he is acknowledged the world over as an authority on Chinese food, and is a graduate of both Peking and Cambridge universities. He is also the founder of one of London’s best-known Chinese restaurants.


• Summary: “From the National Public Television Series “Yan Can Cook,” now in its sixth season since 1978. One of the show’s sponsors is Kikkoman. The recipes in this book are divided by geographical region. “The best way to grasp the diversity of China’s cuisine is to consider the land as divided into four major culinary regions [north, south, east, and west], each boasting its own cultural identity. Contents: Introduction. Canton. Szechuan and Hunan. Peking. Shanghai. Nouvelle cuisine. Contains at least 10 recipes for tofu (the term now preferred by the author to “bean curd,” though he uses both), plus a recipe for “Black Bean Sauce” (p. 32). “Red fermented bean curd” is mentioned on page 10 (no. 48 in list) and in a recipe on p. 38.

On page 79 is a description of the many uses of the soybean, including dark/thick and light/thin soy sauce, tofu (fresh bean curd), deep-fried bean curd, dried bean curd sheets or sticks (yuba), and fermented bean curd [fermented tofu] in red and white versions.

“Dark soy sauce has a heavier consistency and is somewhat sweeter. Its dark color imparts a reddish-brown hue to the foods cooked in it, so it is used in ‘red-cooked’ dishes. Light soy is an all-purpose soy sauce often used in marinades and in stir-fry dishes.” Address: Yan Can & Company, Inc., P.O. Box 4755, Foster City, California 94404.

532. Rocheman, Marc. 1986. Les aliments fermentées derivés
du soja [Fermented foods derived from soya]. Biofutur No. 43. p. 34-42. Feb. [8 ref. Fre]

• Summary: Gives the composition and nutritive value of various soy products: tofu, fermented tofu (sufu), miso, natto, shoyu, and tempeh. Describes the possibilities for use of koji, as a source of proteases and peptidases, in the production of these fermented foods.


• Summary: Shows how soya makes most efficient use of the earth’s ability to produce protein. Address: Granja Tierra Nueva, Aldea San Luis, La Azulita, C.P. 5102, Estado Merida, Venezuela.


• Summary: This interview was conducted during a visit by Mrs. Torii to Soyfoods Center in Lafayette, California. She brings tofuyo made in Okinawa. Dr. Masaaki Yasuda in Okinawa says this is the “real thing.” made my a good company that uses awamori. It is very expensive: 2,500 yen for a small container. It does not have a sharp flavor; it reminds Akiko of sea urchin (uni). She says it is a “delicacy” (chinmi).

The other maker is Urizun, which is also a restaurant; they are bigger and more modern, and they use raw alcohol instead of awamori.

The small number of makers of this traditional food belong to a trade association (kyodo kumiai) named Okinawa Dento Shokuhin Jigyo Kyodo Kumiai, located in Naha, the capital of Okinawa. It is now widely available via the yoi shokuhin o tsukuru kai (the society for making good foods). They are very strict about quality, and starting 5-6 years ago they have had a corner in Matsuzakaya and Sogo department stores.

Tofuyo is eaten a tiny bit at a time on the point of a sort of toothpick (yôji, or with chopsticks) while people are drinking saké and eating.

Mrs. Torii’s parents were born in Okinawa Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.


• Summary: “Products such as soy sauce, soy paste (Tao-Jeow), fermented soybean curd [Sufu] and Thua-nao constitute the major traditional fermented foods [of Thailand]. The first three are common throughout the country. Thua-nao is popular in northern Thailand.” Flowcharts and details are given concerning the production of each of these products. Address: Dep. of Food Science & Technology, Kasetsart Univ., Bangkok, Thailand.


• Summary: In the section titled “Fermented foods from different raw materials,” the subsection on Legumes states that “Soybean meal, left after extraction of oil, can be used for producing a variety of foodstuffs,” including soy yogurt, soy-cheese (tofu, apparently fermented–based on chapter title), and tempeh.

Concerning “Soy-cheese: Cheese produced from soybeans has cream white colour, delicate flavour, pleasant taste and texture. It is a low-cost high quality protein, free from cholesterol and with minimum amount of saturated fats.” Address: Food Technology and Fermentation Div., PCSIR Laboratories, Lahore, Pakistan.


• Summary: Under “Oilseeds, Soy products,” the author discusses soymilk, soybean curds (tofu; soft tofu is popular in south China and hard tofu in North China), fried bean curd, smoked bean curd, “stink” flavoured bean curd, soymilk skin sheet [yuba], dried soymilk skin sticks [bamboo yuba], fermented bean curd or soy cheese, and soybean powder.

Under “Condiments,” soy sauce is discussed. Note: This is the earliest English-language document seen (Oct. 2008) that uses the term “soy milk skin” or “soy milk skin sheet” to refer to yuba, or that uses the term “dried soy milk skin sticks” to refer to bamboo yuba. “These products form an important part in a vegetarian’s diet and are used in conjunction with other ingredients to prepare imitation meat and fish like products for vegetarian dishes” (p. 194).

“Soy milk is a very popular breakfast beverage. In order to supplement milk supplies and also meet the special needs of those who, for some reason cannot drink milk, processing
factories have been set up with relatively large-scale production capacities for soymilk. With the same distribution pattern as milk, soymilk is supplied to various catering departments, schools, kindergartens, nurseries and families. The process employed for soymilk ensures destruction of trypsin inhibitor and effective deodorization to reduce the unpleasant bean-taste...

“Fermented bean curd or soy cheese can be produced by the fermentation of bean curd. The fermented bean curd may differ in shape (square bits, cubes), colour (white, red), flavor and smell; the products can also be steeped in seasoned rice wine or preserved with drags of rice wine. Sometimes they contain added pepper, rose leaves or shrimp spawn. The traditional production procedure is very subtle. The aging process requires high levels of skill and experience. The product is liable to break down and careful handling is needed. Presently, a new type of fermented bean curd in the form of paste which is more amenable to handling and packaging, and consuming has appeared on the market. However, this product does not conform to Chinese traditional eating habit and is, therefore, now [not?] widely accepted, either for nutritional value or flavour. Soy cheese has a great potential for development...

“In several baby food recipes, soybean constitutes an important source of protein. The well known milk substitute 5410 formulated during the 1950s contained soybean powder as the main ingredient. Formula 5410 has proved to be a success in terms of its nutritional value. It has become the basic recipe for many milk substitutes. Some factories use spray drying process to produce instant blended milk powder consisting of soymilk, milk and other ingredients; they have gained some technological and financial benefits. In recent years, there has been a continuous flow of such products into the market.

“Based on previous research efforts, and in conformity with China’s present situation, work is being done to develop an oil-containing concentrated soy protein. The techniques involved have certain positive characteristics. The end product can be a liquid for direct use as a food ingredient or a spray-dried powder for the formulation of dry-mixes.”

Address: Research Inst. of Light Industry, Beijing, People’s Republic of China.


• Summary: “I’ve been working for the last 4 years making tofu, seitan, and tempeh, in a craftsman way, in the North of Spain, in the Basque country. Unfortunately in all of Spain we are only two people making those kind of products, even if slowly, slowly, people are asking us more and more for them every day. I have graduated in biology, and so have a background in what I am doing. I’ve really found myself useful for the rest of the world, and enjoy my life and work... I’d like to ask if there is any possibility of working for a short time (a summer or a month) is a place where I could learn how to make miso, tamari, natto, sufu, and soynuts.”

Address: Zuaitzo, Correria, 39–01001 Vitoria-Gasteiz, Spain. Phone: 945/28 86 30.


• Summary: Soybeans and their products are discussed briefly, including their composition, manufacture, and uses. Products mentioned are green vegetable soybeans (unrefi Sojabohnen), whole dry soybeans, soy protein, soy oil, lecithin, defatted soy flour, soy protein concentrate, soy nuts, soy sprouts, soymilk (Sojamilch), tofu (Sojaquark), soy sauce (Sojasosse), and fermented tofu (Sojabohnen-Käse, sufu). The application of German dairy product laws to soyfoods is discussed. Address: Chemiedirektor a. D., Beratender Lebensmittelchemiker, Robert-Steiger-Str. 110, 8909 Krumbach, Germany.


• Summary: A pioneering symposium featuring tempeh and natto. About 70% of the book is in English and 30% in Japanese. A number of chapters are in Japanese with no English translations. Contains many typographical errors in the English sections.

Those interested in the early history of natto and other East-Asian fermented foods will find the discussion (in Japanese) on pages 174-78 to be very interesting. Address: Tsukuba, Japan.


• Summary: Data are presented for 133 legumes and legume products. Of these, only 53 were included in USDA Agriculture Handbook No. 8, published in 1963. The following soy-based foods are included: Simulated meat products (bacon, meat extender, and sausage), raw soybeans, cooked boiled soybeans, roasted soybeans, dry-roasted soybeans, soybean products: miso, natto, tempeh, full-fat soy flour (raw, and roasted), defatted soy flour, low-fat soy flour, defatted raw soy meal, fluid soy milk, soy protein concentrate, soy protein isolate, soy sauce (shoyu, tamari,
and HVP), raw tofu (firm {p. 147}, regular, dried-frozen/ koyadofu, and fried) [Note 1. Tofu is called “tofu” and at “Soybean curd” it says, see “tofu.” Note 2. Footnote 2 states that the calcium content of tofu curded with calcium sulfate is 683 mg/100 gm, compared with 205 mg/100 gm for tofu curded with nigari. As of May 1997 Soyfoods Center believes that both these values are far too high; the two figures should be about 159 mg/100 gm (range 128-168) and 45 mg/100 gm respectively], okara, salted and fermented tofu (fuyu).

For each food the following information and number of values are given: Vertically: Proximate (7 values), Minerals (9), Vitamins (9), Lipids (Fatty Acids [Saturated (9), Monounsaturated (5), Polyunsaturated (7)]), Cholesterol, Phytosterols), Amino acids (18). Horizontally: Amount in 100 gm edible portion (mean, standard error, number of samples), amount in edible portion of common measures of food (e.g. ½ cup or 1 cup), amount in edible portion of 1 lb of food as purchased.

Minerals include calcium, iron, magnesium, phosphorous, potassium, sodium, zinc, copper, and manganese (not aluminum).

Vitamins include ascorbic acid, thiamin, riboflavin, niacin, pantothenic acid, vitamin B-6, folacin, vitamin B-12, vitamin A.

Amino acids include tryptophan, threonine, isoleucine, leucine, lysine, methionine, cystine, phenylalanine, tyrosine, valine, arginine, histidine, alanine, aspartic acid, glutamic acid, glycine, proline, and serine.

For Adzuki beans (raw, cooked boiled, canned sweetened, and Yokan {yōkan–sugar-sweetened confection}) see p. 24-27.


Address: USDA Human Nutrition Information Service.


• Summary: A general review, including many fermented foods not containing soy. Address: Dep. of Agriculture, Tokyo Univ. of Agriculture.

544. Product Name: Creamy Miso Dressing [Sesame, Mustard, or Vinaigrette].

Manufacturer’s Name: Simply Natural, Inc.

Manufacturer’s Address: P.O. Box 295 (Evelyn and Gershel Avenues), Norma, NJ 08347.

Date of Introduction: 1986. December.

Ingredients: Sesame: Organic light miso, unrefined sunflower oil, filtered water, apple cider vinegar, barley malt, toasted sesame oil.

Wt/Vol., Packaging, Price: 12 oz jar.

How Stored: Shelf stable; refrigerate after opening.

Nutrition: Sesame, Per ounce: Calories 86, fat 1.5 gm, sodium 136 mg.


• Summary: This is a survey of the major species of mucorales which are useful in applied microbiology. Taxonomically, they are classified in the sub-division Zygomycota of the division Eumycota. Names of the genera include Absidia, Mucor, and Rhizopus. They are included in the Phycomycetes in older textbooks. “So far as I know, the first investigation of Mucorales from Asia was made by a French mycologist, Calmette, who first described an interesting species, Amylomyces rouxii, in 1882... His isolates came from the Chinese yeast. This species has been called Mucor rouxii in most textbooks so far.” Two years later, in 1884, Eijkman considered this fungus to be a species of Mucor, but used a trinomial name, Mucor amylomyces rouxii. “Then many other important species of Mucor have been published including, M. javanicus, M. pratini, etc. In the case of Rhizopus, the first species from Asia is Rhizopus japonicus so far which was isolated by Vuillemin in 1902. In Japan, studies of the mucoraceous fungi started by Saito in 1904.
After that, Hanzawa reported a taxonomic study of *Rhizopus* in 1912 and 1914 describing twelve species. Hanzawa’s work was continued by many mycologists.” Address: Dep. of Biological Science, Univ. of Tsukuba, Japan.

   • **Summary:** Tofuyo is a fermented tofu product made in Okinawa. Address: Dep. of Agricultural Chemistry, Univ. of the Ryukyus, Nishihara-cho, Okinawa 903-01, Japan.

   • **Summary:** Tyramine was assayed by high pressure liquid chromatography (HPLC) in 9 common Chinese foods including soy sauce, fermented soybean, fermented bean curd, red fermented bean curd, chili soybean paste, soybean paste, and preserved vegetables. Contents were highest in fermented soybean and fermented bean curd. Results are discussed in terms of hypertensive risk for patients taking monoamine oxidase inhibitors.

   Note: *Webster’s Dictionary* defines tyramine (derived from tyrosine + amine) as “a phenolic amine C₇H₈NO that has a sympathomimetic action and is derived from tyrosine.” It defines sympathomimetic as “simulating sympathetic nervous action in physiological effect.” Address: Dep. of Psychiatry, Chinese Univ. of Hong Kong, Shatin, N.T., Hong Kong.

   • **Summary:** Published in 1981 in *Advances in Biotechnology* 2:511-16. Contents: Introduction. Varieties of traditional Chinese fermented foods and beverages: Soy products include: Soy sauce (4-6 month fermentation), soy sauce by Gun-tou method (no wheat is used, 1 year fermentation, new batch concentrated for 1-2 months under the sun), soy paste, sufu, red sufu (with qu = chu = Chinese-style koji added), tou-si (made from black soybeans and salt, fermented with *Aspergillus oryzae* for 10-12 days). There are also many white spirit fermentations. “Wine was made in China as far back as 4,000 years, and white spirits made their appearance in the 13th century. Li-shi-zheng of the Ming Dynasty gave a description of the distillation process in detail in his famous Ben-Chao-Gong-Mu. Nowadays the alcohol content ranges from 40-65%.

   In 1970 the San-jia Starch Factory in I-Chang, Hupeh, used liquid proteinase for a new soy sauce process using the waste water from starch processing, thus simplifying the ordinary soy sauce process. But this product was inferior in color, taste, and flavor to regular soy sauce made by a solid substrate fermentation. In 1976 and 1979 the Experimental Plant of the Shanghai Grain and Oil Industry Co., by selecting mutant strains of *Aspergillus oryzae* having high proteinase potency, was able to get an improved soy sauce (though still not as flavorful as regular soy sauce) using the liquid proteinase process. A flowchart is shown. Address: Dep. of Microbiology, Shanghai Inst. of Plant Physiology, Academia Sinica, Shanghai, China.

   • **Summary:** Written by The Soybean Committee (Dr. Florendo C. Quebral, a plant pathologist at UPLB, chairman), this work focuses on recent technologies for soybean production. A foreword by Ramon V. Valmayor, Executive Director of PCARRD, notes: “The importance of soybean has been stressed continuously. To encourage its widespread production, the Ministry of Agriculture and Food (MAF) launched the Soybean Production Program in Mindanao. Likewise, PCARRD initiated and coordinated the implementation of Soybean Pilot Production Project in 1983 to demonstrate the feasibility of growing soybean profitably in Luzon.”


   Table 1 shows soybean production in the Philippines from 1974 to 1985. Area in hectares grew from 2,780 ha in 1974 to a peak of 11,250 ha in 1976 and was 8,479 ha in 1985. Production grew from 2,214 tonnes in 1974 to a peak of 11,466 tonnes in 1982 and was 8,430 tonnes in 1985. Yield grew from 0.80 tonnes/ha in 1974 to a peak of 1.05 in 1982 and was 0.99 in 1985. Local production does not begin to supply local demand. In 1984 380,691 tonnes of soybeans and products were imported. Most of the imports were soybean meal.

   Table 2 shows imports and exports of tausi (salted, fermented soybeans), oil cake (huge imports), soy sauce (large exports), soy oil (refined; large imports), soybean paste, taho (soymilk curds, often sold topped with a little brown sugar), bean cheese (tokwa [tofu]), hypoallergenic soy food, crude soy oil. Page 50 shows all current uses of soybeans in the Philippines, and p. 51 gives the nutritional

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composition of Philippine soyfoods. Note the terms Geerligs cheese (Tahu; 92.7% moisture and 2.9% protein), Soybean curd (Tahuri; 61.3% moisture and 11.4% protein), Fermented soybean cheese (Taosi; 51.5% moisture and 13.8% protein), and Soybean cheese (Tokwa; 77.0% moisture and 12.9% protein).

Recipes are given for preparing soy sauce, miso, tahu (soymilk curds), tokwa (soybean cheese, or firm tofu), taos-si (salted, fermented soybeans), soybean milk, and soybean coffee. Descriptions are given for sufu, tempeh, soy flour and grits, soy protein concentrates and isolates.

Note: In the section on nutritional composition, two words are incorrectly defined. The term “Tahuri” actually refers to tofu in brine, and “tausi” refers to salted, fermented soybeans. Address: PCARR.


・ Summary: An excellent, very balanced, concise and readable history of the People’s Republic of China.

Chapter 7, “The Cultural Revolution in retreat: 1969-1976” contains a section titled “Persisting radical influence” where we read (p. 228): In “March and April 1975, both Zhang Chunqiao and Yao Wenyuan of the Shanghai Group published attacks on Deng’s approach. Zhang warned against the bourgeoisie who assured China’s youth that material incentives ‘like “stinky” bean curd, smells awful but tastes good.’ Yao, too, decried material incentives.”

Near the front is an excellent two-page map of China, with each province and its capital labeled (in Wade-Giles romanization), plus major rivers, railroads, and the Great Wall. Address: Assoc. Prof. of History, Univ. of Southern Maine.


・ Summary: Three pioneers of the taxonomy of molds used in fermented foods were Drs. R. Nakazawa, K. Saito, and C. Thom. Fermentations can be classified as Homofermentations (only one species of microorganism is necessary to produce the product; e.g. natto, onchom, tempeh, fermented tofu), Heterofermentations (more than one is required; e.g. Chinese yeast, or ragi), Homomultifermentations (two or more strains of the same species are used together; e.g. miso, shoyu, soy yogurt).

Tables show: (1) Representative strains of cultures in Oriental food fermentations: Miso—Aspergillus oryzae,


・ Summary: The following fermented soyfoods are discussed: Miso, shoyu, natto, hanamatto, sufu, tamari, ontjom, tempeh. Address: USDA/NRRC, 1815 N. University St., Peoria, Illinois 61604.


・ Summary: This book “is an attempt to present Chinese food as the Chinese view it.” It is not a cookbook, but rather the kind of book that Marco Polo would have found very useful as he first encountered the food of China.

Page 6: The term ‘putrid’ embraces, “among other things, cheese (which most Chinese abominate as an inedible Western curiosity) and ‘stinky’ bean curd, a Ningpo specialty which some Chinese love it and many others do not.”

Page 15. “Another Ningpo specialty, specialty, which appeals to a much more limited circle of Chinese and almost no Westerners at all, is Stinky Bean Curd. This is fermented bean curd which smells rather like a stout cheese which has gone off. When cooked it disperses a strong odor in all directions and to considerable distance.”

Chapter 9, titled “Meat,” begins by discussing the meat radical (rou). It then notes (p. 68): “There is one interesting case in which the entire meat character is used as the radical, and applied to something which is not meat at all, although it is a principal source of protein for the poorer Chinese: dou fu.” It is used less frequently in terms like dou fu yi ‘bean curd skin’ [yuba]. The term “bean curd” appears on 13 pages in this book.

The character su means “plain,” as in the word suatsai “vegetarian” (p. 92). The English word “vegetarian” appears on 6 pages in this book.

Three chapters near the end of the book are very interesting and useful. Each is a long table having four columns: Chinese character(s), Mandarin, English, and Cantonese—but in a different order for each chapter. The three chapters are: (1) “Mandarin glossary” (p. 173+), sorted alphabetically by the romanized Mandarin word. For example: 1 Cc, fu, curved, fu; or 1 Cc (Chinese character), nau, brains, nou; or 1 Cc, mau, hairy, mou. 2 Cc, ru fu, fermented bean curd, yu fu (p. 189, 243). (2) “English glossary” (p. 197+). (3) Cantonese glossary (p. 221-45).

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“The author, a linguistic anthropologist, was educated at Choate, Harvard, West Point, Heidelberg and Georgetown. He has spent a fourth of his life overseas as an Army officer, traveler, and researcher. For the last twelve years he has been the director of International Programs for The California State University, one of the world’s largest university systems.” A color photo on the rear cover shows the author. Address: California.


• Summary: Man sei! means “Long live Korea.” In this autobiographical sketch, the author describes what it was like growing up in occupied Korea under Japanese rule. “Peter was born in Hawaii in 1906, but grew up in Seoul, Korea, where his father, the Reverend Soon Hyun, was one of the leaders of the Korean independence movement struggling against Japanese colonial rule. In Seoul, at age 12, he took part in the nonviolent March First (1919) uprising for independence and freedom; a year later, he and his family escaped to join his father in Shanghai. There, his father and other patriots, established the Korean Provisional Government in Exile. When Peter was age 17 the family moved to Hawaii.

Page 142: He is discussing his life (at age 15) of hunger, poverty and cold in Nanking, China. “Whenever Umma sent me a little money, I would go to the store and buy a jar of poverty and cold in Nanking, China. "Whenever Umma sent..."

"That was how I survived."

On the rear dust jacket is a photo of Peter Hyun and a brief biography. A longer biography on the next to last page, under “About the author.” Address: Oxnard, California.


A discussion of the author and her works appears on the half-title page at the front of the book. Address: 19 Leamington Terrace, Edinburgh EH10 4JP, Scotland.


• Summary: Chapter 3 (p. 57-84), titled “Meat without bones”–Tofu,” contains 3 preparatory techniques and 16 recipes. Chapter 4 (p. 85-98), titled “More meat without bones”–Pressed tofu,” contains two basic recipes for pressed and spiced pressed tofu plus 9 additional recipes. “The highly odiferous ‘stinking’ tofu (chou doufu) is made by fermenting tofu or pressed tofu, or allowing it to grow moldy, then deep-frying it. Usually eaten with a hot sauce, this is available at movable carts...” (p. 58).

“the dense cakes are fermented to become tofu ‘cheese’ (see Chapter 1) as well as ‘stinking’ tofu...”

Chapter 5 (p. 99-126) titled “‘Duck,’ ‘chicken,’ and other specialties,” first discusses the basic ingredients in making these traditional meatlike products (Bean curd sheet [pressed tofu sheets], bean curd skin [yuba], and bean curd sheet noodles), then gives numerous recipes, many containing soy. Chapters on fried gluten, soups, and fruit and nut desserts follow. Soy sauce, “green soybeans” [green vegetable soybeans], soymilk, soy sprouts, and soy-pickled cucumbers are also mentioned.

The author, a graduate of Northwestern University, lived
in East Asia for over 10 years, first as a student at National Taiwan Univ. in the Graduate Inst. of Chinese Literature, and later as a translator of short stories, poetry, and novels. "A long-standing interest in the cuisines of the region, especially vegetarian, has taken him into home, restaurant, and temple kitchens. He has studied privately with instructors from the area’s well-known cooking schools, including Wei-Chuan and Pei Mei’s, besides being tutored in special techniques by tofu makers and manufacturers of other Chinese specialty food items."


• **Summary:** Contents: Introduction. Method of preparation. Biochemical changes and composition. Nutritional quality. Toxicology. Conclusions. Address: Dean and Prof., College of Agriculture, National Taiwan Univ., Taipei, Taiwan.


• **Summary:** Discusses the early history of numerous types of chu [ch’u] (similar to koji, with a substrate of wheat, barley, millet, and/or rice), chiang [jiang] (salted sauce), shi or tou-shi (fermented beans) [soy nuggets], chiang-yu, tou-yu and shi-tche (the liquid from shi [soy nugget sauce]; “It is a very dark but clear liquid and was the most popular seasoning in the sixth century”), tou-fu-ru (fermented tofu or sufu), Lapa-tou (Mucor fermented beans), Mei-tou-tcha (Meitauza, fermented okara), tsu (vinegar), yan-tsai (salted vegetables).

The three main sources of early information on fermented soyfoods are: (1) *Shii chi* [pinyin: Shiji by Sima Qian] (90 B.C., historical record). (2) *Ch’i-min yao-shu* [pinyin: Qimin yaoshu, by Jia Sixie, AD 544, “Important arts for the people’s welfare”] (+6th century agricultural encyclopedia). (3) *Pen-ts’ao kang-mu* [pinyin: Bencao gangmu, by Li Shizhen, AD 1596, “The great pharmacopoeia”] (16th century botanical encyclopedia).

Concerning shi or tou-shi [soy nuggets]: The first written record “appeared in the *Shii-chi* (the historical records) written by Szuma Chien in the second century B.C., which stated that shi as sold next to salt, indicating shi was already a popular food seasoning.” In the *Qimin yaoshu* (6th century AD) the method of preparing shi is described in detail. Temperature is said to be the most important factor in making shi, and June was found to be the best month for preparing this fermented seasoning. A detailed description of the process is given.

The *Bencao gangmu* (16th century AD) described many types of shi made at different localities, and give the medicinal use of each.

“In more recent times, shi can be classified into three general types.” (1) *Aspergillus oryzae* mold type, which is the traditional type, also known as tou-shi, and is the most common type, prepared as described above, but using pure cultures of *Aspergillus oryzae*. Today the fermentation is carried out at 25ºC in wooden barrels. “In some areas, the washed, molded beans are mixed with 16-18% salt and fermented at 35ºC for 30 days.” (2) *Mucor* mold type, which is usually made in Szechuan in wooden trays. The process is described. The mold is *Mucor racemosus* Fresenius. (3) *Bacillus* bacteria type, called shui-tou-shi [pinyin: shu-shi-dou-chi], is probably the same product as natto in Japan [except that it is salted]. To make shui-tou-shi: Clean, soak, and boil soybeans until soft. Place in a cloth bag and cover with straw [an excellent natural source of *B. subtilis*]. After incubation for 1-2 days at 25-30ºC the soybeans will be covered with viscous substances. The quality of the product is ascertained by the stickiness of the beans. Mix the sticky soybeans with minced ginger and salt, then pack tightly into jars, and age for one week. They are now ready to consume.

“The organism responsible for this fermentation has been identified as *Bacillus* species.

Note: Is the third type salted? If it is, it would seem to be an intermediate form between tou-shi (soy nuggets, salted) and natto (unsalted). If it is not, it would seem to be Chinese natto. Address: 1. USDA/NRRC, 1815 N. University St., Peoria, Illinois 61604; 2. Inst. of Microbiology, Academia Sinica, Beijing, China.


• **Summary:** The section titled “Fermented Legume Products” defines chao (Vietnamese fermented tofu), chiang-chu (Chinese koji), ch’ou-toufu and ch’ou-tou-fu-ru (fermented tofu), Damsuejang and doenjang (Korean miso), furu, sufu, hon-fan or red sufu (fermented tofu), in-shi (“Fermented black soybeans from China” [soy nuggets]), in-yu (Type of Chinese soy sauce made from black soybeans), kanjang (Korean soy sauce), kinema [sic, kinema], ketjap or kecap (Indonesian soy sauce from black soybeans), meitauza or mei-tou-cha (fermented okara), meju (maiju or maeju; Korean soybean koji), natto, oncom (onchom or oncom), see-iu (see-iuw; Thai soy sauce made from whole soybeans); soy sauce, soybean paste, tahuari (tahuli; Filipingo fermented tofu. See sufu), tao-chiao (tao-jiao; Thai miso), taohu-yi (Fermented tofu from Thailand. See sufu), taokoan, tempe (many types), thua-kab (dry thua-nao), thua-merk (wet and cooked thua-nao), thua-nao (Thai natto), tounfu (see sufu), toufu-ru (fermented tofu), tse-fan (tsui-fan, chee fan;
fermented tofu).

Note 1. This is the earliest English-language document seen (July 2011) that contains the term “Fermented black soybeans” or “Fermented black soybeans from China,” or that uses these terms to refer to in-shi.

Under “Fermented Cereal-Legume Products” we find: chiang, chiang-yu (chau-yu, Chinese soy sauce), fermented soybeans (soy nuggets), hamanatto, kochujang (kochu chang), miso, shoyu, tamari, taotjo (tao-tjo, tao dji; Fermented soybeans from Indonesia or Thailand [No! Tao-tjo is Indonesian-style miso and tao dji is Indonesian soy nuggets]), tao-tjung or tou-chiang (chiang), tao-yu (tou-yu; Chinese soy sauce), tauco (taocho, taoco, taicho; Indonesian miso), tou-pan-chiang (Chinese fava bean miso), tou-shi (toushih; Chinese soy nuggets), toyo (Filipino soy sauce).

Note 2. This is the earliest English-language document seen (March 2009) that uses the word “taocho” to refer to Indonesian-style miso.

Fermented Vegetable Products include: Chiang-tsai (chiang-tsay; Vegetables in China pickled in chiang or soy sauce or tien-mien-chiang), miso-zuke. Address: USDA/NRRC, 1815 N. University St., Peoria, Illinois 61604.

561. Irish Times (Dublin). 1987. Plenty of products on the boil. Feb. 17. p. 17. • Summary: “The Food Technology Business Unit in the Food Centre at Raheen is a place where people can come and try out their food ideas, while at the same time receiving basic business training.” About 20 people are presently working on projects.

Lin Thakker, who trained as a nurse in England before coming to Limerick with her husband six years ago, is supplying the public in Limerick with foods she ate growing up in Japan. “Her first product was tofu, a fermented bean curd [sic], which has a mild flavor and which can be used instead of cheese.” She first had the idea when she saw the high price of imported tofu. Now she also makes fresh soya milk, vegetarian pizzas and vegetarian burgers.” She sells all of these to hotels and fastfood outlets as well as to wholefood shops.

Note: Tofu is also occasionally called “soybean curd.” It is not fermented, and is very different from “fermented tofu,” which is rarely found in Japan.


This book is well written (though largely a repetition of previous works) in the area of modern soy protein products. It is weak and poorly researched in the area of “Oriental Soy Food Products,” which comprises only 1 chapter (22 pages) of the total, making the book unbalanced. The author of this chapter seems to be almost completely unaware of the many major developments in the Western world during the past 10 years.

Note the following Korean soyfood terms: Fresh soybean = Put Kong. Toasted soy powder = Kong Ka Ru. Soy sprouts = Kong Na Moal. Soymilk = Kong Kook or Doo Yoo. Yuba (Soymilk film) = no name. Tofu (Soy curd) = Doo Bu. Tempeh (Fermented Whole Soybeans) = no name. Natto = Chung Kook Jang. Soy sauce = Kan Jang. Miso (Soy Paste) = Doen Jang. Fermented tofu (Fermented Soy Curd) = no name. Fermented okara (fermented soy pulp) = no name. Note: This is the earliest English-language document seen (Dec. 2005) that uses the term “Toasted soy powder” to refer to roasted soy flour. Address: 1. Prof., Food Science Dep., Univ. of Arkansas, Fayetteville, AR; 2. Principal Research Scientist, Div. of Biological Science & Engineering, Korea Advanced Inst. of Science and Technology, Seoul, South Korea.

563. Howe, Joyce. 1987. In Mah’s kitchen in Queens, the Cantonese food was genuine. New York Times. Oct. 14. p. C6. • Summary: Yu Kin Seid is the mother of Joyce Howe, the writer. Her mother (Mah) made delicious, authentic Cantonese meals; “dinners of four or five dishes eaten with rice, the menus including pepper steak, steamed sea bass with ginger and scallions, string beans with fermented bean curd and pork...."
Recipes include: Pepper steak (with 3 tablespoons fermented black beans). Lobster Cantonese (with 4 tablespoons fermented black beans).


• Summary: This is a review of the Chinese restaurant Lotus King (30 Mill Road, Eastchester). Among the recommended dishes are: “Sautéed pompano in bean paste and bean curd sauce.” Also good is the house soup, full of seafood and bean curd [tofu]. And “Sautéed spinach, embellished with a bit of fermented bean curd, a lovely touch.”


Manufacturer’s Name: Full of Beans Soyfoods.

Manufacturer’s Address: Castle Precincts, Castle Ditch Lane, Lewes, East Sussex, BN7 1XH, England.

Date of Introduction: 1987.


Chapter 9, “Traditional fermented food products, has a section on koji and a long section on soybean foods that discusses: Shoyu, miso, natto (incl. itohiki-natto, yukiwari-natto, and hama-natto / hamanatto; called tu su by the Chinese and tao-si by the Filipinos), sufu, meitauza, and tempé [tempeh].

Tables show: (9.1) Some fermented foods of fungal origin. For each food is given: Product name, geography, substrate, microorganisms, nature of product, and product use. Soy-related products include: Chee fan, Chinese yeast, Hamanatto, kecap, kinema, ketjap, meitauza, mejju, miso (incl. chiang, jang, doenjang, taucu, tao chieo), natto, soybean milk, soy sauce (incl. chiang-yu, shoyu, toyo, kanjang, kecap, see-ieu), sufu (tahuri, tao-kaan, tao-ju-yi), tao-si, taojo, taocho and tempéh. Address: Dep. of Food Science, Agric. Exp. Station, Univ. of Georgia, Experiment, GA 30212.


• Summary: The author classifies fermented foods into 9 groups: Beverages, Cereal products, dairy products, fish products, fruit and vegetable products, legumes, meat products, starch crop products, and miscellaneous products. Fermented legume products are particularly important in the diets of East Asia, Southeast Asia, and the Indian subcontinent. He has sections on many fermented soyfoods: Dawadawa, hama-natto, kenima [sic, kinema], miso, natto, tempe (incl. tempeh, tempe bongkrek, tempe gembus [okara tempeh], tempe lamtoro, tempe mata kedele), and sufu (incl. teou-fu-ru). He lists major areas consumed, related terms, how consumed, types, how produced, microbiology and biochemistry, and a few key references. His research began in Ghana with dawadawa made from the African locust bean. Address: National College Prof. of Food Technology, Dep. of Food Science & Technology, Univ. of Reading, Reading, Berkshire, UK.


• Summary: The section on soybeans (p. 14-16) discusses soya oil, lecithin, soybean meal, soy protein concentrates, soya bread, low-fat soy flour, Sojamar (Soya meat), TVP, soya milk, tofu, soy sauce (shoyu, tamari), miso, tempeh, sufu (fermented tofu), natto, and soy sprouts. Address: Institut fuer Pflanzenbau und Pflanzenzuechtung I, Giessen, Germany.


• Summary: Contains entries for: fermentation, fermented foods, fermenter (fermentor), miso, natto, nitrogen fixation (dinitrogen fixation), ogi, oncom, shoyu (see Soy sauce), soy paste (see Miso), soy sauce (shoyu), sufu, tempeh, tofu (an intermediate in Sufu production).


571. Amoy Industries (International) Ltd. 1987? Amoy: We bring the tastes of China to the world. Hong Kong. 16 p. Undated. 28 cm. Catalog. [Eng]

• Summary: This attractive color brochure, with a globe and carved ivory dragon ball on the cover, presents Amoy and its products. The company began as one small factory in the southern Chinese port of Amoy, making only soya sauce. An old photo shows that factory, with many earthenware crocks of soy sauce fermenting outdoors. “Amoy is now one of the largest manufacturers of exportable oriental food in Hong Kong.” Amoy has an affiliation with Pillsbury including Burger King and Haagen-Dazs.

Color photos (p. 6-7) show four of Amoy’s soy sauce products (Gold label lo chau; Silver label lo chau; Gold label sang chau; and Silver label sang chau), and of many traditional Chinese earthenware soy sauce fermentation crocks. Photos also show Amoy black bean sauce, Yellow bean sauce, fermented tofu. Plus non-soy Royal Dragon wonton, spring roll, shaomai, and dimsum combination. Address: 11-15 Dai Fu Street, Tai Po Industrial Estate, Tai Po, Hong Kong. Phone: 651-6633.


• Summary: Highest yields of protease and lipase were found after 60 hours incubation at 97% relative humidity and 25°C. Highest yield of alpha- amylase was observed after 48 hours incubation at 96-97% relative humidity and 30°C, and the highest amount of alpha-galactosidase was observed at 35°C and 96 relative humidity after 60 hours of growth. Results suggest that temperature and humidity should be controlled at 25-30°C and around 97%, respectively, during the commercial preparation of sufu pehtze. Address: Graduate Inst. of Food Science & Technology, National Taiwan Univ., Taipei, Taiwan.


Plus 16 pages of color plates showing recipes. 21 x 30 cm. [Slv]

• Summary: Features 300 recipes that use soybeans and soyfoods. Contents: Introduction: In the beginning there was the soybean, almost anything can be made from soya (a diagram shows many food and non-food products), soya is concentrated, soybeans in cuisine, how to use these recipes. Whole soybeans (p. 17): Recipes for coffee, different kinds of spreads, salads, soups, green soybeans with rice, dips with whole soybeans, soybeans with mushrooms, patties, soybean roast, sausages made of whole soybeans, stuffed duck, stuffed trout.

Soybean flake and textured proteins (p. 40): Spread, party balls, filled bread, soups, pancakes, Australian pie, Buckwheat with flakes, flakes in mushroomy sauce, baked potatoes, stuffed cabbage leaves, chilled stuffed tomatoes, stuffed roasted peppers, stuffed eggplant.

Soymilk and dairylike products (p. 74): Various spreads, soups and salads with herbs, pancakes, baked potatoes, baked noodles, soy pudding, soy milk ice cream, avocado milk. Soy flour and semolina (p. 111): Soy noodles, pasta, pancakes, fish balls, soy bread.

Soy sprouts (p. 122): Soups, salads, sprouts with potatoes, chicken with sprouts and wine, pork with sprouts. Soy sauce and other forms of fermented soybeans (p. 128): Chart showing fermented soy products (incl. miso, tempeh, sufu, natto), salads, soups, chicken with sprouts and soy sauce, meat with fermented black soybeans, roast cutlets, Hoisin dip.


• Summary: In this letter to the editor, the writer is concerned about two issues raised in the article titled “Soy Cheese Market” (Soya Newsletter, Jan/Feb. 1988). He wonders to what extent the present success of soy cheese in the natural foods marketplace is based on consumers’ lack of awareness that casein is a dairy product. His own informal survey, conducted shortly after Soya Kaas was first introduced and already finding widespread acceptance, found very few consumers who knew that casein is derived from milk. “In fact, over 90% thought Soya Kaas was strictly vegetarian, containing no milk-derived ingredients.”

He is also shocked that Simply Natural has patented a product (named Soy-alite) made by fermenting fresh tofu in miso and discovered by accident. This process “is well known and practiced by thousands of people all over the United States, and has been since the late 1970’s. I first learned of ‘miso-pickled tofu’ (as we called it) in 1978, while manager at Erewhon Natural Foods retail store in Boston [Massachusetts]. One of our employees had learned the process while studying with Noburo Muramoto, a teacher of Oriental food-crafting in Escondido, California. Her miso-
pickled tofu was a big hit among the Erewhon staff, and we began selling it ready-to-eat in the store and published the recipe in our weekly consumer newsletter. Soon after, miso-pickled tofu became a favorite dish among Boston’s diverse natural foods community, and found a place in the menus of local natural foods restaurants.” Address: Director, Mitoku USA Inc., New York.


• Summary: A pocket book edition of The Book of Tofu. Contains 300 recipes. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


• Summary: “Ong chai (water spinach, empty heart): Distinguished by its crunchy hollow stems and soft pointy leaves, it tastes like mild spinach and is often served Cantonese-style stir-fried with garlic (and sometimes fermented bean curd).”

Recipes include: Madhur Jaffrey’s bean curd with Chinese parsley (which calls for “½ pound medium-firm bean curd, cut into 3/4-inch cubes” and “1 tablespoon Chinese thin soy sauce”).


• Summary: Describes fermented tofu, its preparation, and four different types. Address: Granja Tierra Nueva, Aldea San Luis, La Azulita, C.P. 5102, Estado Merida, Venezuela.


• Summary: The following soybean products are described briefly: soymilk, bean curd, tofu, tempeh, natto, sufu, miso, shoyu, and yuba. Protein yields are given for a range of plant crops versus milk and beef, e.g. soybeans 3500 kg/ha/annum versus 75 kg/ha/annum for beef. Recipes are included for miso cream cheese dip and deep fried tofu and miso soup. The marked rise in consumption of soybean products in the USA in recent years is noted. Address: Dep. of Applied Sciences, Leeds Polytechnic, Leeds LS1 3HE, England.


• Summary: Contents: Preface. Acknowledgments.


Soybeans and soyfoods are mentioned as follows: North China is the native home of the soybean (p. 3). Soybeans seem to have been introduced to China in about 1000 B.C., but they were not popularized until the early Eastern Chou period (Ho 1975). Called, shu, they “seem to have come from the Jung people, northern and northeastern neighbors of the Chinese, who may have been Tungusic or Altaic, and were perhaps related to or descended from the Hunghs.” Domesticated soybeans are descended from wild soybeans (p. 29).

Fan Sheng-chih wrote an agricultural manual in the first century B.C.; it survives in extensive fragments quoted in later agricultural works. This manual mentions the “Nine Staples”: wheat, barley, millet, glutinous millet, spiked millet, soybeans, rice, hemp, and small beans (Vigna spp.) (p. 50).

The art of fermenting soybeans was probably introduced sometime in the late Chou period, or perhaps even as late as the very early Han. Thereafter, Han texts devote much space to salt-preserved soybeans, called tou shih (or shih), the tausi of modern Cantonese cooking. Chiang, fermented sauce, was made from beans, but also from meat and elm products (p. 51).

During the late Southern Sung, Wu Tzu-mu coined the famous phrase: “the things that people cannot do without every day are firewood, rice, oil, salt, soybean sauce, vinegar, and tea” (Freeman 1977, p. 151). By the Sung, chiang had come to refer unequivocally to soy sauce; as late as the T’ang, it would probably have been understood, at least in literary contexts, to refer to a variety of fermented foods (p. 82).

Bean curd or tou fu (Japanese tofu) was first mentioned in the early Sung; its invention was attributed to Liu An of the Han Dynasty, “but this is preposterous.” In fact, tofu “was invented in the late T’ang or early Sung—possibly by Taoists and/or people from the Huainan region, who then ascribed it, out of a sort of respect, to Liu An, the Taoist prince of Huainan (B.W.-C. Young, pers comm). Buddhists quickly took over the food as a good substitute for meat and for dairy foods…”

Soybean curd is also fermented; the firm tofu cubes are packed in brine and sold. “They constitute the Chinese equivalent of a cheese and are apt to be overpowering, reminiscent of strong German hand cheese [Handkäse, a German regional sour milk cheese]. They are graphically
known as ch’ou tou fu (stinking bean curd). Only the very stoutest of heart eat them and then only in small quantities.”

Also discusses: Vegetarian cooking (p. 66, 86, 118, 150, 196, 204, 249). Vegetarianism came to China with Buddhism during the T’ang dynasty. Fish farming (p. 103, 129). Note: Eugene Newton Anderson was born in 1941. Address: Dep. of Anthropology, Univ. of California, Riverside, CA 92521.


Soybean sauces, condiments and pastes (p. 195-211): Salted and fermented black beans with recipes for “Roast chicken with black beans stuffed under the skin,” and “Soft-shell crabs with ginger, lemon, and black beans” (“Fermented black beans, often flavored with bits of ginger and sometimes orange peel, are usually sold in 8-ounce plastic bags.”) Acceptable brands: Mee Chun or Koon Chun Sauce Factory. “Earther and probably more classic are the Yang Jiang Preserved Beans (with ginger) from Kwangtung, China), bean sauce (other names: Yellow bean sauce, brown beans sauce, bean paste, Jiang; two types are with the beans whole or ground), hot bean sauce / paste with recipe, hoisin sauce, sweet bean sauce (made with soybeans [probably tian mian jiang, p. 202], Taiwan), soy sauce (Chinese, Japanese, tamari; Highly recommended light soy sauce: Pearl River Bridge. Highly recommended dark: Pearl River Bridge Mushroom Soy, flavored with straw mushrooms), Java’s ketjap and other soy sauces miso with recipe, yellow miso (Shinshu miso), white miso (shiro miso, Kyoto shiro miso, sweet white miso), red miso (aka miso), Hatcho miso [soybean miso], barley miso (mugi miso), fermented bean curd (white or red; also called preserved bean curd, wet bean curd, bean cheese, dou-fu ru or fū-ru {Mandarin}, fū yu {Cantonese}) with two recipes.

“Red fermented bean curd” is described on pages 210 (also called “red bean cheese”), 211, and 283 (together with “red rice”).

Concerning ketjap (p. 206): Tomato ketchup, although it may seem to be of Asian origin, may or may not come from a family of Asian pickled products. But the word “ketchup” is clearly of Asian origin. [Note: The modern Indonesian word for soy sauce is kecap / ketjap / kechup.] “It comes from the Malay kechap, which apparently derives from the kôe-chiap of a southern Chinese dialect (Amoy); both of these refer to the kind of briny liquid preserves that include fish and soy sauces.” Throughout most of Southeast Asia, fish sauces are the standard condiment, in Indonesia (incl. Java) soy sauce is more widely used. Sweet Indonesian soy sauce (ketjap manis), which is very widely used, is traditionally sweetened with palm syrup and seasoned with garlic, star anise, salam leaves, and galangal.

Also discusses: Seaweed (p. 165-70): Kelp (Laminaria), laver (Porphyra), wakame, dashi, hair vegetable / black moss / hairlike vegetable (China; Gracilaria verrucosa), agar-agar. Monosodium glutamate (p. 247)

Bruce Cost was born in 1945. A photo and brief biography appears on the inside rear dust jacket. Address: [San Francisco, California].


• Summary: Describes examples of successful transfer of new technology, especially with Oriental fermented foods, such as tempeh, miso, and sufu. Address: 5407 Isabell, Peoria, Illinois 61614.


• Summary: The vitamin B-12 content of tempeh made in Indonesia was found to be 4.6 micrograms (mcg) per 100 gm fresh weight, much higher than any other vegetarian food tested. But this was based on one sample transported slowly from Indonesia to Japan and its smell was no good when the value was measured. A sample brought quickly from Indonesia with good smell contained 0.7 mcg/100 gm. A sample prepared in Japan with tempeh from Indonesia contained only 0.05 mcg. And tempeh prepared in Japan with Rhizopus oligosporus NRRL 2710 contained 0.03 to 0.06 mcg/100 gm. Other vegetarian foods containing significant amounts of vitamin B-12 were thua-nao (Thailand) 1.5 mcg and fermented tofu (Singapore, also called Sufu) 1.1 mcg. Flesh-based foods with a high B-12 content included Ka-pi shrimp paste (Thailand) 5.3 mcg, fermented shrimp (Thailand) 2.5 mcg, and fish sauce, 3 month fermentation (Thailand) 2.4 mcg. The vitamin B-12 in vegetarian foods is produced by the fermentation process and it increases during fermentation. Flesh foods contain their own B-12. The daily requirement of vitamin B-12 for adults is estimated to be 3 mcg.

Bacteria that produced vitamin B-12 in tempeh were isolated and identified. The most prolific producer was Klebsiella pneumoniae, which had a maximum relative B-12 productivity of 1350. All prolific producers were members of the genus Klebsiella but some Bacillus species also produced B-12. The author suggests that intraspecific cell fusion techniques might be used to transfer this ability.

• Summary: Contents: Abstract. Introduction. Variables in manufacturing tofu: Soybean variable, processing variable, maceration and extraction (soaking and grinding) stages, filtration and heating stages, coagulation stages, types and concentration of coagulants used in tofu manufacturing. Tofu products.


(2) Chinese fermented soy food products. Five columns (same as table 1) The soy foods are: Fermented whole soybeans (tou-shih). Soy sauce (chiang-yu). Soy paste (chiang). Fermented tofu (so-fu [sic]). Actinomucor or Mucor molds are used. Description: Creamy cheese, mild flavor, salty. Uses: Relish, also cooked with meat or vegetable.

(3) 1987 consumption of soybeans as foods in Asian countries. The results are presented here in descending order of per capita consumption: Per capita soybean consumption, country (population), total soybean consumption in 1,000 tonnes. 13.3 kg/capita, Taiwan (19.6 million), 260,000 tonnes. 9.3 kg/capita, Japan (122.2 million), 1,141,000 tonnes. 9.0 kg/capita, Indonesia (175 million), 1,575,000 tonnes. 7.8 kg/capita, South Korea (42.1 million), 330,000 tonnes. 7.7 kg/capita, Singapore (2.6 million), 20,000 tonnes. 6.9 kg/capita, China (1.062 million), 7,325,000 tonnes. 3.4 kg/capita, Malaysia (55 million), 55,000 tonnes. 2.2 kg/capita, Thailand (53.6 million), 118,000 tonnes. 0.3 kg/capita, Philippines (61.5 million), 18,000 tonnes. (4) Nutritional composition of traditional nonfermented foods: Fresh green soybeans, toasted soy powder, soy sprouts–raw, soy milk, soy milk film / yuba, tofu (Source: Food Composition Table for Use in East Asia, 1978).


• Summary: Page 74: “Chinese white cheese: (Chin.) Tofu marinated and fermented in rice wine; taste and texture of Camembert cheese. Used as flavoring for noodles or vegetables, or served as a condiment.”


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Concerning the preparation of sufu (p. 21): “... the cubes of tofu are drained and heated for about 15 minutes at 100°C to sterilize them. The sterilized cubes are cooled, placed on trays, and inoculated with one of the following fungi: Actinomucor elegans, Mucor liensalis, or Rhizopus chinensis var. chungyen, depending on the type of ‘cheese’ to be produced. They are then incubated at 12-20°C for three to seven days. At that stage, the cubes become covered with a white mycelium and are known as pehitzu [pehize]. “In the final stages, the cubes of pehitzu are transferred to ageing tanks, where they are immersed in a mixture of rice wine and salt, 2-5% sodium chloride, for forty to sixty days. The alcohol content of this ‘dip’ (approximately 10 percent) is much higher than that normally obtained by anaerobic fermentation using osmophilic [osmophilic] yeasts. The final product, after completing the ageing period, is soft and pale yellow, with a pleasant taste and aroma. It is often served with sesame oil. More pungent cheeses are prepared by related processes, by adding other components to the final brine solution. These may include red rice koji, fermented rice mash, anise or pepper. An outline of a preparation from Thailand, using red rice koji to give a red sufu is shown in Figure 3” (a flow sheet, p. 22; Source: Narudom Boon-Long. 1983. “Traditional fermented food products.” United Nations University (UNU) Workshop Paper, CFTRI, Mysore, India).

The peanut from Peru (p. 36+).


• Summary: Contents: Introduction: Fermented legume products. A table lists about 85 products with the vernacular name, legume from which it is made, country, and microorganism(s) used. Products made from soybeans include: Miso (bean paste), Shoyu (soy sauce), Sufu (Chinese cheese), Ontjom (Oncom), Hamanatto, Idli (with and without soy), Natto, and Tempeh. Address: Human Nutrition Information Service, USDA, Hyattsville, Maryland (and NRRC, Peoria, Illinois).


• Summary: Discusses the phytoestrogen content of soybeans, defatted soy meal, hard tofu, soft tofu, dry spiced tofu, soy milk skin (p. 189) / soy milk film (p. 188) [yuba], soy milk, soy sauce, hot soy paste, sweet soy paste [miso?], fermented tofu, soy sprouts (homemade), soy sprouts (grocery),erty, genistein, formononetin, coumestrol. Address: Natural Toxins Research Center, Food and Drug Administration, 4298 Elysian Fields Ave., New Orleans, Louisiana 70122.


• Summary: When he was a small boy in Chicago, Illinois, the writer’s mother began what became a repeated chant: we must return one day to the village of our ancestors (gu
Dr. Charles Thom, wrote the first authoritative treatment of oriental fermented foods in the West was written by her. It remains an accurate account of these fermentation processes. Dr. Church also conducted laboratory experiments on soy fermentations and collaborated with Japanese workers, especially Professor K. Oshima; Hokkaido Imperial University, Sapporo, Japan...

“Dr. Church was born in Providence, Rhode Island, on March 13, 1899. She received an A.B. in 1912, an A.M. in 1914, and a Ph.D. in 1918, all from Brown University. One of her most important contributions was the USDA Department Bulletin 1152 entitled, ‘Soy and Related Fermentations,’ published in 1923. At that time there was interest in establishing soybean production in the United States because soybeans were being imported into the U.S. from the Orient. This publication had many photographs of the industrial processes of making koji and soy sauce in Japan. Research in soy sauce production began in 1918 and continued for several years. Soy sauce, miso, molded [fermented] tofu, and natto were also described...

“Dr. Church’s research dealt extensively with koji, and it is surprising that she knew even then that tane koji (koji inoculum) consisted of several selected mold strains of Aspergillus oryzae. The fact that yellow-green Aspergillus strains were employed in these fermentations undoubtedly led both Thom and Church to publish the taxonomic relationships of this group of molds in 1921. Her research on koji was a likely catalyst for her study of industrial enzymes...

“In 1938-1939, Dr. Church served as an indexer and abstractor for Biological Abstracts. Upon her retirement, presumably in 1939, she moved to Lyndon, Vermont.” A large photo shows Dr. Church. Address: 5407 Isabell, Peoria, Illinois 61614.


• Summary: Various soy products (silken tofu, tofu, tempeh, natto, different types of miso, sufu, and soy flour) were fed to 242 women. Blood levels of iron were then compared. Silken tofu, tempeh, natto, and the misos showed better iron absorption than tofu and sufu. The authors speculated that because tofu is higher in calcium, it might be this calcium that is inhibiting iron absorption. Silken tofu, coagulated with GDL, has a much lower calcium content than silken tofu. Address: MRC Iron and Red Cell Metabolism Unit, Dep. of Medicine, Univ. of Witwatersrand, Johannesburg; Div. of Food Science and Technology, CSIR, Pretoria; and the Dep. of Medicine, Univ. of Natal, Durban, South Africa.


• Summary: On page 404 is a flow chart for making tofuyo from whole soybeans. The article contains 3 tables and 4 figures; two of the latter are graphs and one is a photo. Address: Dep. of Agricultural Chemistry, College of Agriculture, Univ. of the Ryukyus, Nishihara-cho, Okinawa-ken 903-01.


595. MT Plate. 1990. July. New soyfoods restaurant or deli. 641 N. Palm Dr. (P.O. Box 3243), Palm Springs, CA 92263-3243.

• Summary: Letter from Tanya Malch. 1990. Sept. 11. This restaurant opened on 17 July 1990 with completely vegetarian (except rennetless cheeses) lunch and dinner menus consisting of Pasta, Pizza, and Pacific Rim foods. The dinner menu represents 8 countries. They have a young,
full-time French chef who adds style and presentation and is doing great things with the tempeh. They make their own tempeh, presently for use at the restaurant only, and lite-soy-millet. For lunch they serve tempeh burgers, tacos, Tempehting Garden Salad, and a wonderful tempeh paté on a bed of greens with basmati rice. For dinner, appetizers include (from Thailand) Thai Stix, which are skewers of tempeh to dip in a south seas peanut sauce, and (from Japan) aged tofu. Entrees include Tempeh Scallopini with Shallot and Shiitake-Sake Sauce. Everyone loves the tempeh. “We have tempeh addicts who never knew the word before we opened.” Her partner is Mona.

Menu. 1990. 8.5 by 11 inches. 1 page, two sided. Black on yellow.

Talk with Tanya. 1991. March 7. She tells how tennis star Martina Navratilova came repeatedly to her restaurant before and during the local Virginia Slims tennis tournament and loved the tempeh, then after winning the tournament, Martina stopped her press conference to talk about what a great food tempeh is! (see separate record). Tanya uses about 48 cups of soybeans a week to make tempeh. She mixes 3 parts of soybeans with 1 part millet and makes only soy & millet tempeh—her favorite. She feels that fresh tempeh is far superior to its refrigerated or frozen counterpart. She also teaches a cooking class on tempeh.

M.T. Plate then moved to 43 North Pacific Coast Hwy #201, Redondo Beach, California 90277. This restaurant was on the second floor of a building. Then the rent tripled and investors balked. So Tanya closed it in mid-1993. Now she wants to make tempeh. Address: Palm Springs, California. Phone: 619-323-9686.


• Summary: This article appears is the section of the magazine titled “The Taste of Japan.” Contents: Introduction. The transformation to tofu, The birth of tofu. The popularization of tofu. Transformation of tofu [by further processing]. Tofu dressed up. Tofu coming to Japan from overseas.

Fermented tofu is common in China, but rare in Japan. “Fermented tofu, furu in Chinese, can be regarded as a cheese made from tofu.” In Japan, fermented tofu is found only “in Okinawa prefecture, which because of its proximity to China, developed a unique culture under Chinese influence. “The Japanese word for fermented tofu is ‘tôfuyo’ [tofuyo].

Some dishes are made from the byproducts of tofu manufacture. “One byproduct from which dishes are made is okara, the dregs extracted from tônyû” [soymilk].


• Summary: “In Jan. 1848 gold was discovered in California. By 1850 there were still only a few hundred Chinese in California. Then in 1852 the Chinese joined the Gold Rush. They called California the ‘Golden Mountain.’ By 1852 there were 20-25,000 Chinese in the golden state, and by 1860 there were 30-50,000. The 1880 census found 75,132 Chinese in California, comprising 8.6% of the state’s population.

“These Chinese immigrants, mostly young men from Kwangtung province in southern China, and more specifically from the area around Canton, almost certainly brought soybeans with them to America, and they probably made tofu (which they called daûfu, dow-foo, or doufu) using those soybeans. But, until now, no one has been able to prove the existence of any Chinese manufacturers of tofu or other soyfoods in America before 1899. During this year Walter C. Blasdale, an instructor in chemistry at the University of California, Berkeley, reported in the USDA Office of Experiment Stations, Bulletin No. 68 that Chinese in San Francisco were making ‘bean cheese,’ both fresh and fried, as well as fresh curds.

“After years of searching, William Shurtleff, Director of the Soyfoods Center in Lafayette, California, has discovered a tofu manufacturer in San Francisco, California, in 1878. According to the Wells Fargo and Co. Directory of Chinese Business Houses, published in San Francisco in 1878, Wo Sing & Co. was making fermented tofu and regular (non-fermented) tofu at 708½ Dupont St. in San Francisco. The name of the company and its products were written in both Chinese and English. Tofu was translated as ‘Bean Cakes.’ This was the earliest known tofu shop in the western world (as of Oct. 1990).

“In the same Wells Fargo directory published in 1882, a second Chinese tofu manufacturer appeared. Sam Sing was making fermented and regular tofu at 615 Dupont St., basement, in San Francisco. Wo Sing was still in business at the address given above.

“The earliest known Japanese-run tofu manufacturer in America was Hirata Co. in Sacramento, California. They began making tofu in 1895. The oldest existing tofu maker in America today is Quong Hop & Co. of South San Francisco. Founded and still run by the same Chinese-American family, they began making tofu in 1906 in San Francisco.

“The two oldest existing Japanese-American tofu companies are probably House Foods & Yamauchi Inc. of Los Angeles and Aala Tofu Co. of Honolulu. Both trace their origins back to 1923 in Hawaii...

“The first five Caucasian-run tofu companies in the western world were all run by Seventh-day Adventists in America. In Nov. 1929, T.A. Van Gundy of La Sierra Industries in Arlington, California (near Riverside), introduced his La Sierra Soya Cheese...
The sixth Caucasian-run tofu company in America, and the first of the new wave of Caucasian tofu makers, was the Welcome Home Bakery and Tofu Shop in Corvallis, Oregon, founded by Alec Evans. In March 1975 he started making ‘Tofu.’

“The earliest document seen (Oct. 1990), written by an American, that mentions tofu appeared in 1770 when the famous Benjamin Franklin wrote a letter on Jan. 11 from London to John Bartram in Philadelphia...

“The Soyfoods Center would like to offer a $100 reward to anyone who can find a tofu manufacturer in North America or Europe before 1878.”

Reprinted in Soya International (July/Sept. p. 3).

Address: Lafayette, California, 94549.

ISBN for each). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

Statistical information is taken, without permission or adequate citation, from books published by the Soyfoods Center in California. The statistics and dates given for the European, American, and Asian markets are taken almost completely from Soyfoods Center books. In some cases where the author relied on these books published more than 2 years ago, the information is presented as if it were current, whereas it is actually out of date and no longer correct. DACOSTA’S book, which might be called a “review of the literature,” contains little or no new information. However his bibliography, based largely on a search of the CDIUPA database, with some original references, is quite good.

APRIA stands for Association pour la Promotion Industrie Agricole. APRIA administers CDIUPA. Address: Conseiller d’Entreprises, France: 47, rue Guersant–7015 Paris, France.


• Summary: Contains many new advertisements, plus changes on the copyright page, on page 14 (Soyfoods Association in now located at Bar Harbor, Maine), and rear cover of both paperback and hardcover editions (new ISBN for each). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


• Summary: Compares the quality and nutritive value of...
cow’s milk and soymilk, and discusses criteria for evaluating the chemical, microbiological, and organoleptic quality of tofu, okara, miso, tempeh, sufu, and other soyfoods. Address: Bundesanstalt Milchforschung, Inst. Mikrobiologie, Kiel, Germany.


List of species of plant families

Acknowledgements. Botanical listings: Alphabetical listings


The main information on soybeans is found on pages 91 (Botanical listings for Glycine max and Glycine tabacina), p. 219 (Aspergillus oryzae culture), p. 221 (Actinomucor elegans culture for fermented tofu or sufu, and Rhizopus cultures for tempeh), p. 224 (Bacillus subtilis culture for natto), p. 482-83 (for “field soybeans,” lists 5 black-skinned cultivars, and 7 yellow-skinned cultivars; plus 11 “vegetable soybeans”–Agate, Butterbeans, Envy, Extra Early, Fiskeby V, Hahto, Hakucu Early, Kanrich, Okuhara Early Green, Prize, and White Lion), p. 485-87 (sprouting seeds including soybean sprouts with directions for sprouting), and p. 500 (Soyfood cultures).

Additional information on food uses of soybeans is found throughout the book. Tofu: p. 9 (In Indonesia, a salt derived from the fruit of Rhus javanica (Nurude, Mu-yen) is used to coagulate tofu), p. 61 (In Japan the seeds of Cannabis sativa, called asanomi, are used in deep-fried tofu burgers (ganmodoki)), p. 76 (A vegetable curd similar to soybean tofu can be made from the seeds of the bottle gourd or calabash (Lagenaria siceraria)), p. 92 (The seeds of the Bonavista bean or hyacinth bean (Lablab purpureus) can be prepared as tofu), p. 127 (The seeds of okra, gumbo, or lady’s finger (Abelmoschus esculentus) can be made into tofu or tempeh). Kecap (Indonesian soy sauce): p. 9 (In Indonesia, the plant tuberose (Polianthes tuberosa) is added to the substrate in making kecap), p. 191 (In Indonesia, fresh leaves of kaffir lime, also called ichang lime, makrut, or djeruk purut (Citrus hystrix) are used to flavor kecap). Miso: The following can be used as a substrate for miso–p. 88 (Peanuts), p. 94 (seeds of the velvet bean, also called cowwage, benguk (Mucuna pruriens)), p. 155 (barley (Hordeum vulgare)), p. 156 (proso millet (Panicum miliaceum)). Address: 1870 Sunrise Dr., Vista, California 92084. Phone: (619) 726-0990.


• Summary: The UJNR (United States–Japan Cooperative Program on Natural Resources) was established in May 1964. There were 7 original panels, one of which was Toxic Microorganisms. The initial emphasis was on botulism, soon followed by aflatoxins. The Panel consisted of 7 Japanese and 7 Americans; they comprised a mix a people who were experts on fungal mycotoxins and bacterial toxins. The Panel conducted many activities including joint panel meetings and study tours, exchange of mutual interest items, publication of 6 books, symposia, development of regulations, and interaction with other societies.

The 1966 study tours in Japan were longer than usual because of the review of 4 projects supported by the USA involving the use of soybeans in foods. These 1966 tours included visits to the following Japanese organizations working with soybeans: (1) Universities: Nagoya Univ. (Mycotoxins and soybean fermentations), Tohoku Univ., Faculty of Agriculture (Miso fermentation), Kyoto Univ. (Fermented soybean foods), and Tokyo Univ. of Education (Soybean cheese). (2) Japanese government laboratories: Noda Institute of Research, Chiba (Shoyu fermentation), Institute for fermentation, Osaka (Culture collection and fermentation in General).

(3) Trade association laboratories (each in Tokyo):

Talk with Dr. Walter Wolf of Peoria, Illinois. 2000. Aug. 14. He was on the UJNR Protein Panel, which met for about 10-12 years, on alternating years in Japan and the USA. Thus he went to Japan 5-6 times—the last time being in about 1988. The purpose of the panel was exchange of information about protein. They met with their counterparts at the NFRI (National Food Research Institute, Tsukuba). At a typical meeting there would be formal presentations by members of both teams, followed by a field trip to numerous facilities. Address: NRRC, Peoria, Illinois.


• Summary: Jim Miller of Quong Hop & Co. noted in a SoyaScan interview in April 1984 that the government now required fermented tofu to be sold refrigerated. The regulation was apparently fairly new at that time. This regulation still applies, but apparently only in the state of California and only on products made in California. The law is a state law, and it is applicable since it is stricter than the federal law. Thus in California, Quong Hop & Co., the only manufacturer of fermented tofu in the USA, must make this product under canning regulations and print on the label: “Perishable—Keep refrigerated.” Of course, the product has never been refrigerated in Asia and there is no reason for it to be refrigerated here since it is made under more sanitary conditions.

There continues to be a glut of imported brands of fermented tofu, mostly made in Hong Kong, Taiwan, and mainland China. Ben feels they are of inferior quality and are often detained by customs officials. But these products, because they are not made in California, need not be refrigerated in retail stores. The law is inconsistent on this point and Quong Hop has spent considerable money and time trying to rectify this injustice, but the state health regulators are unwilling to respond or change the law. Thus, it is an ongoing problem and handicap for Quong Hop.

The market for this product, which is consumed mostly by Asian Americans from the countries that import it, is at least $2-3 million a year retail. Address: V.P. Marketing & Personnel, Quong Hop & Co., 161 Beacon St., South San Francisco, California 94080. Phone: 415-873-4444.


• Summary: Craig and Greg Sams were both born in America. Their mother is from Nebraska and their father from Pittsburgh, Pennsylvania. Greg is 4 years younger than Craig. During the 1950s and 1960s the family went to England periodically, largely because Craig’s father worked in England as a historian for the U.S. Air Force. In 1965 Craig took a year off from college, traveled around the Indian subcontinent, and got hepatitis. Upon returning to the Univ. of Pennsylvania in Philadelphia for his final year, he fell in with 3 followers of macrobiotics and got interested in macrobiotics. In about Feb. or March of 1966 he went to the Paradox, a macrobiotic restaurant in New York and decided that he wanted to start a similar restaurant in London. In late 1966 Craig’s brother, Greg, fell out of a tree in Berkeley, was paralyzed from the waist down and was confined to a wheelchair—as he still is.

In Feb. 1967 Craig started a restaurant named the Macro at 10-A Airlie Gardens, Holland Park, London. Yoko Ono, John Lennon’s wife, was one of the first regulars. She was the first person Craig met in London who was aware of macrobiotics; she had learned about it in Japan. But Craig had to close Macro after 2 months because of zoning problems. In mid-1967 Greg joined Craig in London and in Dec. 1967 they opened a new macrobiotic / natural foods restaurant named Seed at 136a Westbourne Terrace, W.2, London—a few minutes walk from Paddington Station. Soyfoods were a part of the menu. They got Kikkoman shoyu, shiro-miso, and Hatcho miso from a Japanese import company named Mikado-ya, which was run by Japanese in southeast London out of the basement of a house and supplied Japanese embassies in Europe and Africa. At that time Craig thinks there were no Japanese restaurants or retail stores in London. Seed soon started to import Hatcho and barley (mugi) miso from Muso in Japan. Seed never used any of Lima’s soyfood products. Seed also used fermented tofu; they mixed it with tahini, spread it on bread, and called it a Rarebit—an alternative Welsh Rarebit, which is cheese on toast. Seed purchased fresh tofu and [mung] bean sprouts from a Chinese company named Lung Kee on Fermoy Road, Paddington, London, right on the banks of the canal. It was run by one Chinese man who employed about 15 West Indian / Jamaican women who made the foods. Bean sprouts accounted for most of Lung Kee’s business. Craig has no idea when Lung Kee started making tofu. In addition to its mainstay, brown rice, Seed served the tofu diced in miso soups, or sautéed with vegetables such as nitsuke carrots, etc., or as a dessert with tofu and apple concentrate whipped with fruit to a thick creamy consistency and chilled. The restaurant did well. It was soon famous for its “groovy vibes” and its free meal of brown rice, veggies, and green tea for those who could not afford to pay. Although the Sams brothers were not “proponents of the brown rice and marijuana regimen” (as Kotzsch had implied in 1985, p. 221), Seed was a favorite hangout for a host of ‘60s
counterculture celebrities such as The Beatles, The Rolling Stones, Yoko Ono, and others. Americans such as Bill Tara, Peggy Taylor, Eric Ume, and Paul Petrofsky also worked there. Then people began to ask the Sams if they could buy staple foods from the restaurant. So food was soon packaged and sold over the restaurant counter.

In about March 1969, to meet the growing consumer demand, the Sams brothers opened Ceres, a natural foods / macrobiotic retail store, at 8-A All Saints Road, 2 books from and parallel to Portobello Road. Ceres also did extremely well, with Greg and various managers handling the main responsibility while Craig focused on the restaurant. Soyfoods retailed by Ceres included Hatcho and mugi miso, tamari, fermented tofu, and fresh tofu sold in trays immersed in water. Eventually Bill Tara and Peter Bradford took over management of Ceres. Soon other people began to open restaurants and natural foods / macrobiotic stores like Ceres in college towns in England: Infinity Foods in Brighton (at Sussex University; Peter Deadman, Robin Bines, Simon Bailey were involved), Arjuna in Cambridge, Harvest in Bath, and On the Eighth Day in Manchester. In 1970 the Sams developed a large mobile tent macrobiotic restaurant and made a lot of money by taking it to various big rock festivals.

In Aug. 1970 Harmony Foods was established as a natural foods / macrobiotic import, product development, and distribution company. The money from the mobile restaurant was used to rent a building at No. 10 St. Luke’s Road in London (only about 300 yards from the Ceres shop), and to import enough products to start a line / range of products under the Harmony Brand (the logo was a yin / yang sign). They stored and packed these in basement at Harmony Foods. Starting in 1969, the first imports for the restaurant and for Ceres had come from Muso in Japan, and from a macrobiotic society in Vietnam where rice was red and green tea. In 1970 they started to import 4-5 tons of organically-grown brown rice from The Camargue in the south of France. Grown by the same man who grew brown rice for Lima Foods, it became the company’s main product. Harmony Foods started out with about 20 customers–16 conventional health food shops and 4 of the new wave of natural foods stores (which the natural foods stores called “grain shops”). Wholefood of Baker Street was the pioneer “organic shop” that started in the 1950s. They were part of the Soil Association, so organic growers used it as an outlet for the first organically grown produce retailed in England. They soon became an important outlet for Harmony Foods as well. In addition a man named Ivan Seruya would collect food (mostly produce) from the organic growers and deliver it to restaurants like Seed and Manna in London. One other product that was grown organically was Pimhill Flour.

Harmony Foods was a pioneer in developing new organic growers (such as Stewart Patterson who farmed wheat with horses) and in putting organically grown foods into retail outlets.

By Aug. 1970 Harmony Foods was distributing soyfoods, including Hatcho miso, mugi (barley) miso, and tamari from Muso in Japan—imported in wooden kegs and packed in glass jars. These were the first miso and shoyu products available at retail outlets in England.

In Jan. 1971 Harmony Foods outgrew its building on St. Luke’s Rd. and moved into a larger warehouse at 191 Latimer Road (Maidenhead), a former cosmetics factory. Just before the move, Bill Tara informed the Sams that he was in London to set up Erewhon Europe to compete with Harmony. The restaurant, Seed, was sold in the spring of 1971 and reopened as The Magic Carpet. In 1971 Ceres was renamed Ceres Grain Shop and relocated at 269 A Portobello Rd.

In mid-1972 the shop next to Ceres closed. The Sams took it over and made it into Ceres Bakery. It transformed large amounts of wheat, organically grown in England, into unique and delicious naturally leavened breads. The enzymes in the freshly-milled flour helped to leaven the bread.

When they closed down Seed, the restaurant on All Saints Road, there was still a demand for simple macrobiotic food, so in about Feb/March 1971 they opened Green Genes, a sort of macrobiotic workingman’s café on a much smaller scale. Each person picked up her or her food from a counter; there was no table service. It was open for lunch only whereas Seed had been open only in the evenings.

In 1972 they began to publish a magazine titled Seed: The Journal of Organic Living. Bill Tara and Peter Bradford helped with it occasionally. It continued for 6 years. That same year, above Ceres Bakery, started Ceres Bookstore, which only lasted for 1½ years.

Meanwhile Bill Tara and Peter Bradford had expanded and transformed Ceres Grain Shop, but in a way that led to extensive shoplifting, so it was scaled back to near its original size and finally sold in 1979 to Jack Weller. By that year all efforts and resources were focused on Harmony Foods, the wholesale business. Peanut butter (non-organic), the first product manufactured by Harmony, was now in two of the leading supermarket chains, Safeway and Waitrose.


• Summary: The iron in soy products comes in a form that is difficult for the body to use. However a new study shows that the iron in some soyfoods is more readily absorbed by the body than the iron in others—although the mechanism is not yet clear.

South African researchers divided 242 women into seven groups and fed each one a different type of soyfood: regular tofu, silken tofu, miso, tempeh (fermented), natto (fermented whole soybeans), fermented tofu (occasionally
called sufu), and soy flour.

Each meal contained 3-4 mg of iron and the meals were consumed daily for two weeks. Then the researchers checked the iron levels in the women’s blood.

Significant differences were found. “The women who ate silken tofu, tempeh, natto or miso had much higher iron levels than the women who ate regular tofu, fermented tofu, or soy flour.”


• Summary: About the authors: Binh Duong was born in Vietnam in Nha Trang, on a beautiful bay on the country’s south central coast. He was raised in Da-Lat in the mountains; his father was an engineer. In 1975, near the end of the Vietnam war, he fled to the USA, where he became a well-known chef. He and Marcia Kiesel met in 1998 in the test kitchens of Food & Wine magazine.

“There is a certain finesse, a certain quality to Vietnamese cooking that sets it apart from other types of oriental food: Clean, clear sauces; a minimum of fat; an abundance of vegetables; and very distinctive flavors” (p. xi, from the Foreword, by Jacques Pépin).

The best place to eat for most people in Vietnam, especially if one does not have much extra money, is at “the food stalls in the open-air market. The atmosphere is convivial; the food as pure and fresh as it can be made.”

“There are only a few basic ingredients in Vietnamese cooking, but they are vital ones: nuoc mam, or fish sauce, lemongrass, a handful of unusual herbs, rice paper, and rice flour” (p. xvi-vii).

The chapter on “Key ingredients” (p. 10-29) includes:
(1) Bean curd, dried (tau hu ky [yuba]); it comes in thin sheets or rolled “bean sticks.” Sold in plastic packets or colorful paper packages. Can be fried until crisp or softened in water then simmered or sauteed. (2) Bean curd, fresh (dau khouon): Japanese name: Tofu. (3) Bean curd, fried (dau khouon chien): Cubes of fried tofu, especially delicious filled then simmered in a flavorful stew. Sold 10 cubes in a 2-oz pack. (4) Bean curd, red (chao): “A spicy wine-fermented tofu that imparts a reddish-brown luster and rich flavor to marinades.” Better quality products are sold in glass jars or small crocks. (5) Hoisin sauce (Tuong ngot): From China, hoisin is made from soybeans, garlic, sugar, and spices. (6) Vietnamese bean sauce (Tuong cu da). Made from soybeans, cooked rice, and water. (7) Soy sauce (xi dau): Used quite a bit in Vietnam, especially by Vegetarian Buddhists who do not eat fish sauce. “Japanese soy sauces are light, pleasant and well suited to Vietnamese cooking.”

Dipping sauces and condiments: Soy vinaigrette (Nuoc xi dau giam, with “3 tablespoons soy sauce,” p. 51). Rich bean sauce (Nuoc tuong ngot, with “1 heaping tablespoon pure Vietnamese bean sauce or Chinese bean paste,” p. 54).

Soy related recipes: Garlic chive and tofu soup (Canh dau khouon, with three 3-ounce tofu cakes, cut into 2-inch pieces, p. 91. “Tofu, highly prized even by nonvegetarians because it is so nutritious, picks up the flavors it is cooked with and takes on a smooth and unusual texture that is quite pleasant”). Fried tofu stuffed with pork and mushrooms (Dau khouon don thit, with two “2-ounce packages fried bean curd, p. 242-43).


“Chinese cheese sufu—This important Chinese food is made by the fermentation of tofu with Actinomucor elegans (Eidam) C R Benj & Hesselt, or with Mucor species, especially M. dispersus Hagem in home processes. Actinomucor elegans was the mould used in all the commercial preparations investigated by Wai (1964). However, in his paper Wai called it R. chinensis var. chungyuen but later Chang & Wai (1967) corrected the identification.

“Actinomucor appears to be a monotypic genus intermediate between Rhizopus and Mucor.”

An illustration (line drawing) shows Actinomucor elegans. Sporangia, columnellae and sporangiophore (from Zycha and Ziepmann, 1969).

The amylo process is used in the saccharification of cereal flour mashes in the production of sugar to be converted into ethanol (ethyl alcohol). The process involves
soaking the grain for several hours in water followed by
cooking to solubilize the starch. The acidified mash is cooled
to 38-40°C, then inoculated with a mucoraceous mold such as
Mucor rouxii, Rhizopus japonicus, R. tonkinensis, R.
delemar, or R. boulard. Air is blown through the mash for
24 hours at 38°C, then the mash is cooled to below 33°C
and inoculated with yeast. The molds produce saccharifying
enzymes as well as some alcohol. According to Schipper
are synonyms of Rhizopus oryzae. Address: NRRC, Peoria,
Illinois.

by Jan Smith. Index. 24 cm. [44 ref]

- Summary: The most complete book of its type seen to date
(May 2010), with many helpful cross references (sometimes
flawed). Soyfoods are mentioned throughout. Unfortunately,
for Chinese foods, the author does not distinguish between
Mandarin and Cantonese, or between pinyin (newer) and
Wade-Giles (older) styles of romanization. For some of the
“Also known as” it is not clear to which of several previous
entries this refers (see “Soybean”).

Ame (ah meh, Japan): A sweet jelly made from millet.

Azuki bean (Phaseolus angularis). Native to China;
used in China since the Han Dynasty (206 BC–AD 220): An
[or anko] (Japan): A sweetened paste of ground azuki beans
available in smooth (koshi-an) and crunchy [chunky] (tsubu-
an or tsushubi-an). Sarashi-an: A flour of ground azuki beans.
Also known as hong dow (China), dried red beans, red beans
[adzuki beans, aduki beans]. See also: Red bean paste, sweet.

Bean curd: Also known as dou-fu, dow foo (China);
tahu (Indonesia), momen tofu, tofu (Japan); ta hu, ta hua
(Malaysia); tahure (Philippines); tauh kau (Thailand); dau
hu, dau hu chung (Vietnam); bean custard, soybean cake.
Illust of: Fried bean curd, pressed bean curd. Almond bean
curd (non-soy). Bean curd “brains”: Also known as doufu
nao (China); taho (Philippines). “Cotton” bean curd: Also
known as momen tofu (Japan). Freeze-dried bean curd: Also
known as char doufu, doufu pok (China); agedofu,atsu-
age, nama-age (Japan); tauhu tod (Thailand), dau hu chien
(Vietnam). Fried bean curd pouches: Also known as aburage,
usaj (Japan). Gan modoki. Grilled bean curd: Also known
as doufu kan [sic]; gone (China); yakidofu (Japan). Instant
bean curd. Okara. Pressed bean curd: Also known as doufu
kan (China), taukwa, tauhu kuning (pressed yellow bean
curd) (Indonesia, Malaysia); tokwa (Philippines); tauhu
leong (Thailand); dau hu ki (Vietnam). Silk bean curd: Also
know as kinugoshi tofu (Japan), shui doufu (China), taho
(Philippines). Contains a recipe for homemade “Bean Curd”
plus 3 recipes.

Bean curd by-products: Bean curd skin [yuba], bean
curd sticks: Also known as fu jook pin, gee jook (China),
yuba (Japan), forng ta ohu [tauhu] (Thailand); rolled bean
curd, second bamboo.

Fermented bean curd: Also known as foo yu, fu-ru,
narm yu (China), tahoe, tahu (Indonesia, Malaysia), tausi
(Philippines), bean curd cheese, Chinese cheese, pickled
bean curd, red bean curd, soybean cheese.

Moldy bean curd. Bean curd cheese: See bean curd by-
products (fermented).

Bean pastes and sauces: Shih and jiang from China:
(1) Bean sauce (jiang) also known as taucheo or tau sa
(Malaysia, Nonya and Singapore cooking), mien see [mian
shi] (China), taoco [Pron. = tao-cho] (Indonesia), tuong
ot (Vietnam), bean paste, brown bean sauce, yellow bean
sauce. (2) Black bean sauce (a recent addition to the family
of Chinese sauces. A major ingredient is pureéd fer-
mented black beans with a hint of garlic and star anise. It
tastes best when freshly made). (3) Chili bean paste (in addition
to chopped dried chilies, it sometimes contains fermented black
beans): Also known as lat chu jeung, as lat chu jeung yau
(Garlic) (China); kochujang (Korea); bean paste with chili;
hot bean paste; Sichuan hot bean paste. (4) Dhwen-Jang
(Korea). See also miso. (5) Hoisin sauce (China): A sweet,
thick, reddish brown sauce. One ingredient is fer-
mentd soybean paste. Not to be confused with the Chinese barbecue
sauce called sha cha jang. Also known as hoi sin cheung
(China); barbecue sauce. (5) Soybean paste. Also known as
mean see jiang (China). (6) Sweet bean paste. In this context
it is not the sweet bean paste made from azuki beans, but
rather a sweet, thick, dark brown sauce made of ground
fermented soybeans and sugar. Its salty-sweet flavor is used
in marinades and roast meats. Also known as tim mean jiang
(China).

Bean sprout: Mung bean sprouts, silver sprouts (mung
bean sprouts with the roots and seed pods removed), soybean
sprouts. Also known as: Daai dau nga choy (soybean sprout),
ngunn nga choy (silver sprouts), nga choy, sai dau nga choy
(mung bean sprout) (China); tauge (Indonesia); moyashi
(Japan); kakac ijo, kakac djong, kakac padi (Malaysia);
togue (Philippines); taun gawk (Thailand); gia (Vietnam);
bean shoots.

Beijing duck sauce (recipe with ½ cup sweet bean
paste). Vietnamese-style Beijing duck sauce (with ½ cup
sweet soy sauce–kecap manis).

Black bean: See Fermented black bean. Black bean
sauce: See Bean pastes and sauces. Fermented black bean
sauce. Black soybean: See soybean.

Broad bean paste. Broad bean sauce: “The best is made
in Pixian, a city in Sichuan province, where it is used instead
of soybean-based seasoning sauces.”

Brown bean sauce: See Bean pastes and sauces.

Che hau sauce (Che how, China): See Bean pastes and
sauces (Hoisin). Chick-pea.

China: Has the “oldest and most well-documented
cuisine in the world.” Chinese cheese: See Bean curd by-
products (fermented). Chinese hot bean paste: See Bean
pastes and sauces.


Edamame (e dah ma meh, Japan): See soy bean.

Fermented bean curd: See Bean curd by-products. Fermented bean curd cake. See Bean curd by-products; tempe.

Fermented black beans (Shih, China). With recipe for “Fermented black bean sauce” (p. 106). Also known as dau see (China), black beans, dried black beans, preserved back beans.

Fermented red rice. Flours and thickeners: Kuzu (Japan). Mung bean flour. Soy flour (incl. kinako). Foo yu (Fu you, China). See Bean curd by-products (fermented). Forng Tao Hu (Fong tao huu, Thailand). See Bean curd by-products, bean curd sticks. Fu jook pin (Fu juk pin, China): See bean-curd by-products, bean curd skin. Fu-ru (Fu yue). See Jook (Ji Juk, China): Bean curd sticks.

Gluten: Kau fu, kohana fu, matsutake fu, mein jin pau, nama fu, su tang, yaki fu. Also known as: Kau fu, mianjin, mein jin pau, su tang (China), kohana fu, yaki fu (Japan).

Gochujang (Korea). See also: Chili paste, chili sauce. Korean barbecue sauce.


Japan: “Japanese cooks revel in the artistry of their craft. The Japanese love of nature is a challenge to present each ingredient as reminder of its origins: to bring nature to the table...” Regional cuisines are not of great importance in Japan; cooking methods (incl. Dengaku), salting (incl. Teriyaki), cutting and slicing techniques.


Kochujang (go-choo jang, Korea): See Bean pastes and sauces; chili pastes.


Light soy sauce: See Soy sauce.

Lu soy (lo shui, China): See soy sauce.

Maltose: Made by fermenting germinated grains of barley. When used to glaze foods, may have soy sauce and red food coloring added. Also known as: Malt sugar, [barley malt syrup].

“Ma-po” dofu [Mabo-dofu]: See beef.

Mean see jiang [mian shi jiang] (min see jiang, China): See Bean pastes and sauces.

Mein jin pau [mien jin pau] (China): See Gluten.

Mien see jiang [mien shi jiang] (min see jiang, China): See Bean pastes and sauces.

Miso (Japan): (1) Hatcho-miso. (2) Inaka miso or Sendai miso. Also known as Red miso. (3) Shinshu miso. (4) Shiro miso.

Mochi. Monosodium glutamate. Also known as: Mei jing (China); aji-no-moto (Japan); servuk perasa (Malaysia); ve tsin (Vietnam), M.S.G., taste essence, taste powder.

Moyashi (Japan): See Bean sprout.

Mung bean. Also known as moong ke dal (India); kacang djong, kacang edjo [hijau, katjang idjo] (Indonesia); kacang hiau (Malaysia); tau ngok (Thailand); dau xanh (Vietnam); green gram.

Nama-age (nah-mah ah-geh, Japan): See Bean curd, deep fried.


Noodles: (1) Bean curd noodles (China). Also known as Soy noodles, soy vermicelli.

Oils and fats: Soybean oil. (2) Bean curd skin noodles (China) [yuba noodles].

Peanut (with many foreign names and recipes).

Preserved black beans: See Fermented black beans. Pressed bean curd: See Bean curd (pressed).

Red bean paste, sweet: “An important ingredient in Chinese and Japanese cooking, sweet red bean paste is made by boiling the red azuki bean and mashing it to a paste with lard or oil, then cooking it until it is fairly dry or thick. In Japan, red bean paste is made in two textures: the smooth purée is koshi-an and the chunky version, with the beans only partly crushed, is tsusushi-an. It is a filling for cakes and sweet buns, and is used in several desserts.” Also known as hong dow sar (China), an (Japan). Contains a recipe for Sweet red bean paste.

Red rice: See Fermented red rice.
Rice: Many type of glutinous and non-glutinous.
Rolled bean curd: See Bean curd sticks [dried yuba].
Seaweed: Many different types. Seaweed gelatin or Seaweed jelly: See agar agar.
Sendai miso (Japan): See miso.
Sesame seed: Black sesame seed, sesame oil, sesame paste, white sesame seed.

Soy sauce: “An ancient seasoning, first used in China more than 3,000 years ago. Known in its original form as shih, it was a thin salty liquid in which floated fragments of fermented soybeans.” “Soy sauce is to Chinese and Japanese cooking what the pungent, salty mushroom soy. (2) Light soy sauce: Thinner, saltier, and koikuchi shoyu, tamari (Japan), kecap pekat (Malaysia); or nuoc mam is to Thailand and Vietnam respectively.” (1)

• History of fermented tofu: See p. 329-73. Chap. 11. 

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4. Fermented salty liquid condiments made from soybeans and cereals: A. Japanese shoyu (Manufacture of koikuchi and usukuchi shoyu, manufacture of tamari shoyu). B. Soy sauce produced in east and southeast Asian countries other than Japan (Korea, Taiwan, Hong Kong, Singapore, Malaysia, Indonesia, Thailand, People’s Republic of China {the process, acid hydrolysis illegal until recently}, chijhi or whole soybean soy sauce still made in the basins of the Zhujiang {Pearl} River and the Huanghe {Yellow} River).


6. Conclusion.


Concerning \textit{shuidouchi}: Boiled soybeans are inoculated with \textit{Bacillus subtilis} and incubated at high humidity and at 30-40ºC. This preference for a high temperature may be why \textit{Chi-min yao-shu} (6th century China) recommended that, when making douchi [soy nuggets], the temperature during incubation be kept rather low. In Shandong, China, salted soy nuggets are made as follows: Clean, soak, and boil soybeans until soft. Place in a cloth bag and cover with straw, which is the best natural source of \textit{B. subtilis}. After incubation for 1-2 days at 25-30ºC the soybeans will be covered with viscous substances. Mix the sticky soybeans with minced ginger and salt, then pack tightly into jars, and age for one week. They are now ready to consume (See references 5 and 6). Address: Research Div., Kikkoman Corp., Noda City, Chiba prefecture, Japan.


- **Summary:** In 10-15 years NASA (the North American Space Administration, funded by the U.S. federal government) is planning to launch a lunar module, which will be composed of various modular living capsules roughly 48 feet long and 14 feet in diameter. These will be assembled on the surface of the moon, and the structure will be inhabited by 8-15 people at a time. As with a space station, different groups of people will come and go from the module.

Inside this module NASA plans to grow soybean plants hydroponically. They will then harvest the beans, save some of them for planting the next crop, and consume the rest as food in forms such as green vegetable soybeans, soy sprouts, tofu, and fermented tofu used like a cheese spread. Tom is developing these food uses. One key consideration is that the residents of the module are expected to want something to do, such as processing and cooking foods. The program's headquarters are at NASA-Ames in Sunnyvale; ask for the Education Desk. Address: Food and AgroSystems, P.O. Box 62185, Sunnyvale, California 94088. Phone: 408-245-8450.


- **Summary:** Mr. Eng is the son of Bing-sun Eng, who (with a partner, Tao-yee Kok) founded Fong-On tofu company in New York City on 29 June 1933. The story of the discovery of fermented tofu was well known among tofu makers from southern China. When he was a boy, Mr. Eng heard this story from Mr. Law (or Lo), a 70-year-old Chinese seaman (from Xinhui) who taught his father how to make tofu and who jumped ship to work in restaurants in New York City. The seaman's brothers are still making tofu in Xinhui, and his great-grandson still lives in New York City. According to this story, fermented tofu was invented by a 9 year old beggar boy from the Sun-Wei (pinyin: Xinhui. The Chinese characters are new + meeting or group) district of Kwangtung province, China, not too far from Toisan (or Hoisan in his dialect; Pinyin: Taishan. Chinese characters: platform + mountain). One day this boy went to a tofu shop and begged for some tofu. The owner's wife
gave him 2 pieces. He went back to his little hut, ate one piece, and saved the other in his rice bowl to eat the next day. But the next day the tofu had mold on it, so he put salt on it. To further preserve it, he went to a temple where the worshippers were making offerings of rice wine by sprinkling the wine. He gathered some banana leaves and laid them on the ground to catch the rice wine. Then he collected this rice wine and poured it over his tofu in the bowl.

All of the companies that make fermented tofu and all of the Jiang Gardens in Kwangtung province have an altar dedicated to this little beggar boy—who married a widow and died at age 33 from tuberculosis in China. On the 1st and 15th day of each month, a cup of tea was placed on the altar in remembrance of the little beggar boy. In the 1930s, these altars were said to have existed for 10-15 generations (200-350 years). On each altar is a plaque (to honor him) on which is written “Six Original Great King” (Lu-Oh Tai-Wang), because he invented six important Chinese foods. Mr. Eng does not know when the beggar boy lived, and he has never seen the story written down.

This same little boy is said to have invented a number of other important Chinese foods, such as duck sauce (ssu-mai jiang; Chinese characters: 8 + treasure + thick sauce). He found a molded food that had been discarded in the market, then preserved it in a salt solution and sweetened it with boiled sweet potatoes. He must have put 8 ingredients in it; when he ate it, it cured his bloated stomach in 7 days), 1000-year-old eggs (he salvaged them from a farmhouse where there was a fire), and fermented sweet bean sauce (tao-jiung, a lumpy soft paste made from roasted soybeans and rice, with a little whiskey).

Mr. Eng also feels that Lord Liu An of Huai-Nan was not the one who invented tofu; it was his cook! A high official in China would never go to the kitchen, lest he loose face.

Update: On 19 July 1994 Mr. Wun Eng sent to William Shurtleff at Soyfoods Center an illustration (line drawing) of a vertical wooden plaque on an altar inscribed with 6 Chinese characters, set behind a pot of incense, in front of which is a cup of tea. The characters mean: “Inventor of Six. Great King. Spirit Place.” He wrote: “The above is what my father had in the store on the first and fifteenth day of each month. I light the incense, change the tea in the cup, and kow-tow (bow) 3 times.” Address: 180 Park Row, Apt. 4B, New York City, NY 10038. Phone: 212-267-6972.


• Summary: Taipei is the capital of Taiwan. Behind the city’s main streets are small alleys that here and there. “Its worth wandering around these back lanes, following your nose... to the appalling stench of chou tofu, or stinking bean curd, which is sold by private vendors. Chou tofu is culinarily remarkable in that it is not only awful-tasting but also smells repulsive from 100 feet away.”


[17 ref. Jap; eng]

• Summary: Tofuyo is a unique type of fermented tofu made in Okinawa Prefecture, Japan. It is made from partially dehydrated tofu cubes fermented in moromi (mash) of red rice koji, salt and awamori (distilled liquor). The quality of the finished product is always affected by the quality of the tofu cubes, which are always dehydrated at room temperature. Microorganisms (mainly bacteria) which grow on the surface of the cubes are thought to play an important role in the process. These bacteria were screened to find what species and strains / varieties produced high proteinase enzyme activity. Bacillus TYO-67 was found to have by far the greatest enzyme activity. After tofu cubes were inoculated with this strain, changes in the protein and nitrogen composition of the cubes during dehydration at room temperature were measured. Cubes which were un inoculated were used as a control. The pure protein content of the inoculated cubes was lower than that of those which were not inoculated; thus, the former were considered more digested / hydrolyzed than the latter. The values of water soluble nitrogen, 4% trichloracetate soluble nitrogen, and 75% ethyl alcohol soluble nitrogen to total nitrogen and free amino acids of the cubes all increased during dehydration, and the increases in the inoculated cubes were greater than in those which were not inoculated. The ripening time of the inoculated cubes was shorter than that of the cubes which were not inoculated. Therefore, we can say that dehydration of tofu cubes at room temperature is a sort of “prefermentation” by bacteria in the process of making tofuyo.

Tables show: (1) Proteinase activity of various bacteria isolated from the surface of tofu cubes. (2) Changes of free amino acids composition of tofu cubes which were either inoculated or not inoculated with Bacillus TYO-67.

Figures (graphs) show: (1) Changes is moisture content and pH of tofu cubes during dehydration for 60 hours. The moisture decreased and the pH increased. (2) Changes in the pure protein content of inoculated and un inoculated tofu cubes during dehydration. Both decreased but that of the inoculated cubes decreased slightly faster. (3) Changes in the content of water soluble nitrogen, 4% trichlor acetic acid soluble nitrogen, and ethyl alcohol soluble nitrogen of
inoculated and noninoculated tofu cubes during dehydration. All increased but that of the inoculated cubes increased faster. (4) Changes in the hardness of tofuyo during a ripening period of 150 days. That made from inoculated tofu cubes decreased faster than that made from uninoculated cubes. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.


• Summary: Contents: Soybean producing areas in South Viet Nam: Dong Nai Province (this area in southern South Viet Nam supplies 25% of the nation’s soybeans), Mekong River delta. Technical aspects of soybean production (in each of the two regions mentioned above): Land preparation, fertilizer use, varieties, weeds, pests and diseases, cropping patterns, mixed cropping with maize, soybean before tobacco, economic efficiency. Soybean utilization in Viet Nam: Utilization as food (80% of the crop is used to produce soybean curd, fermented soybean curd, soybean milk, soybean meal and small quantities of soybean oil), utilization for soybean glue, utilization as stock feed, utilization as fertilizer. Policies necessary for the development of soybean production in South Viet Nam: Government’s role in soybean production. Production constraints. Research activities conducted to date by U.A.F. Concluding remarks. Future research activities of the U.A.F.


The soybean, also know locally as “utao,” has become an increasingly important economic crop in the Philippines. Yet in 1987 (the latest year for which figures are given) only 5,698 tonnes (metric tons) were harvested from 6,490 hectares, having a value of 45,169,000 pesos. This represented only 0.02% of the total Philippine quantity of agricultural production, and only 0.05% of total farm area and value. Philippine soybean production peaked at 11,466 tonnes in 1982. Most of the country’s soybeans are grown in the southern Mindanao region (72.1%), followed by northern Mindanao (10.0%) and central Mindanao (9.4%). Imports of soybeans and products have steadily increased since Philippine farmers do not produce enough soybeans to meet local demands; the value (FOB US$) rising from $61,989,000 in 1980 to $127,981,000 in 1988. The main imports are soybean meal (accounting for 86.87% of total import value), refined soybean oil (5.19%), soybeans
(4.18%), and crude soybean oil (223%). Before March 1986 the National Food Authority (NFA) had the sole authority to import soybeans, but with the introduction of the trade liberalization program, importation has reverted to private firms. In 1989 the country’s major sources of imported soybeans were China (which supplied 42% of total imports), Brazil (34%), and the USA (15%). Exports, which are negligible, have grown from $136,000 to 1,123,000 during the same period. The main exports are soy sauce (accounting for 91.03% of total value), salted and fermented soybeans (tausi, 3.34%), and soybeans (2.65%).

Table 7 lists and describes “Soybean-based food products popularly used in the Philippines.” Fermented products include soy sauce, salted and fermented soybean (tausi), tempe (tempeh), soybean paste (miso), and soybean curd (fermented tofu cubes; a soft cheese-type product with a salty but mild flavor, eaten as a relish or cooked with meat and vegetables). Non-fermented products include soybean sprouts (toge), soybean cheese (tokwa [tofu]), curd, soybean milk, and roasted soybean (soy coffee).

“In terms of food usage, Filipinos, unlike other Asians, have not developed a taste for soya-based products... Most of the soy products available in the market are either made at home or in family-operated shops.

“It is interesting to note from the report of Co (1987) that small scale food processors engaged in manufacture of taho and tokwa preferred locally grown beans to imported ones. They claimed that local soybeans have a distinctive ‘fresh’ quality which imparts a finer and smoother texture to their finished products providing a longer shelf life than that produced from imported beans.

“Recently, several developments in the local economy have signaled a revival of interest in the use of soybean as food. In 1980 Nestle Philippines Incorporated began commercial production of powdered soymilk products and later a baby soya-cereal food formulation and a soya-based meat extender which is produced primarily for export to other Asian countries. Today Nestle Philippines, in co-operation with the Land Bank of the Philippines, the Regional Offices of the Department of Agriculture and PCARRD is encouraging local production of soybean and had adopted a no importation policy.

“Some years ago, the use of TVP also gained a permanent foothold in the local processing industry. It is used in the manufacture of ground meat products and as a meat extender. Almost all TVP used in the country is imported except for the locally manufactured full-fat TVP which is being produced by the Vitarich Corporation, one of the biggest feed millers in the country. The company has built a full-fat soya processing plant capable of utilizing 900 MT [metric tons] of soybean per month. Unfortunately, all its raw soybean requirements are imported from the U.S. and China.

“Soybean flour, protein concentrate and protein isolates are the newest soya-based products and are now used extensively in the country for the formulation of meat emulsion products. All raw materials are imported and there is no local manufacturing capability at present.”

“Programmes: As early as the 1970s, the government tried to involve itself to some degree in boosting national soybean output, despite the low priority it accorded to soybean in general. It was an involvement borne out of an urgent need to meet the growing requirements of the local feed milling and livestock industry, rather than of a need to address the high incidence of malnutrition among Filipinos. Accordingly, the government launched a number of programmes to improve soybean production, most of which failed to achieve their goals. At present, only the PCARRD-coordinated Soybean Pilot Production Programme continues to function. This programme was initiated in late 1983.”


“Utilization as food: In Viet Nam 80% of the soybean crop is used to produce soybean curd, fermented soybean curd, soybean milk, soybean meal and small quantities of soybean oil. Although many factories in Ho Chi Minh City produce sesame, groundnut and coconut oils, soybean oil remains uncommon.”

Address: Univ. of Agricultural Forestry of South Viet Nam (UAF), Ho Chi Minh Coty, South Viet Nam.


• Summary: Pascal saw and ate tofu for the first time in May 1980 when he was living in India, while visiting some
friends in Poona (Maharashtra). He bought 1 pound of tofu at a tofu shop but he is not sure if they were making the tofu in a back room of the shop or at some other place. “I suppose this tofu manufacturing plant in Poona was an offshoot of the Rajneesh Ashram, which was very active at that time and place.” Pascal lived in Goa, south of Bombay, from 1976-1980; there he baked bread leavened with palm wine. He learned most of what he knows about soyfoods while living and working, mostly in health food stores or health farms (see attached resume), in the Catskill Mountains area of New York from 1981 to 1987. There he learned to make tofu for his personal use (not for sale) by adding lemon juice to hot soymilk then pressing it in a cloth. During two other trips to India in 1982-83 and 1986 he found and bought chunks of a dry soy protein product resembling TVP which must be cooked in water. He found this soy protein product very interesting for a country like India which has such a shortage of protein, however the price was high—about 10 rupees/kg compared with 2½ rupees/kg for wheat.

In Jan. 1988 he and his family moved to Martinique. “I was compelled to make tofu for myself and my family because there was no other vegetable protein available in Martinique, except for this chunky TVP. I was still using lemon juice instead of nigari and making 2 pounds of tofu at a time. Then in 1991, as I started to import Japanese food products from France (umeboshi, seaweeds, amasaké, etc.), I ordered a small booklet on making tofu using nigari. Plus I had an excellent book (Les Aliments Fermentés Traditionnels, by Claude Aubert [1985]) in which I found recipes and nutritional details on many foods like tofu, okara, sufu, tempeh, amasaké, and, in general, all the foods subjected to lactic acid fermentation. In Martinique he has been making an average of 12 to 20 pounds of tofu every week since Oct. 1991 when he moved with his family to mountainous Morne Vert. Occasionally he makes larger amounts for a health food store that sells it or when he caters to people he knows. He is an interesting person with a lot of good ideas,” but he tends to be hard to work with as a partner.

Concerning seitan: “I first started to make seitan in a back room of the shop but he is not sure if they were making the tofu in a back room of the shop or at some other place. “I suppose this tofu manufacturing plant in Poona was an offshoot of the Rajneesh Ashram, which was very active at that time and place.” Pascal lived in Goa, south of Bombay, from 1976-1980; there he baked bread leavened with palm wine. He learned most of what he knows about soyfoods while living and working, mostly in health food stores or health farms (see attached resume), in the Catskill Mountains area of New York from 1981 to 1987. There he learned to make tofu for his personal use (not for sale) by adding lemon juice to hot soymilk then pressing it in a cloth. During two other trips to India in 1982-83 and 1986 he found and bought chunks of a dry soy protein product resembling TVP which must be cooked in water. He found this soy protein product very interesting for a country like India which has such a shortage of protein, however the price was high—about 10 rupees/kg compared with 2½ rupees/kg for wheat.

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The water he uses to make his tofu comes straight from a spring a mile up in a beautiful mahogany forest. He also makes sprouts—mostly alfalfa, mung bean, and clover, but sometimes wheat grass. He uses most of the tofu he makes to produce second generation products such as tofu mayonnaise, hot squash pies with miso-tofu topping, tofu & cocoa (or carob) sweet pie, tofu salad, spring rolls (Nems).

“I know of two vegetarian restaurants in town (Fort-de-France) that make their own tofu and serve it to customers, but no one in Martinique uses tofu as extensively as I do, thanks to my 7 years’ stay in the Catskill Mountains. In fact, it takes a long time to get people used to tofu in an island where Creole culinary habits are still well-established.”

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Martinique under the same circumstances as tofu—lack of vegetable proteins other than beans. Not having ready-made gluten, I first made it by washing white-flour wheat dough. That was a very long and messy process but was well worth it. Then I found wheat gluten in the Tama catalogue—the company I mentioned that specializes in Japanese products. That’s when I started to sell seitan—though there is not much demand for it. I learned to make seitan while living in the Catskill mountains of New York from a macrobiotic British girl friend who also taught me how to make amazake.

Update of April 27, 1993. “Since my family sent me tempah starter (thanks for giving them the address), I have started small-scale production.”

Update of July 17, 1993. “I first made amazaké, in Martinique, in 1992. Even though I gave samples to quite a few people, nobody has seemed to be interested in this product, or to realize the versatility of it! So, I keep ordering it from Tama, packed in glass jars, and make my own once in a while, using ‘Cold Mountain’ starter. I’ve been a bit disappointed by this non-reaction. Amasaké being one of my favorite sweeteners, which I value more than any breakfast or desert cereal. My youngest daughter ate it as a first ‘solid’ food when she was only 5 months old, along with bananas.”

“If you allow me a personal remark about my work in Martinique, I find it extremely ungratifying. The public here is highly suspicious of anything new and foreign. My little business doesn’t allow me to assume my financial obligations, and I sometimes consider going back to the U.S. But I still want to try harder, at least for a few months.”

Note: This is the earliest English-language document seen (Oct. 2010) that uses the term “amasaké” to refer to amazake. Address: “Caplet,” 97226 Morne Vert, Martinique, French West Indies 0033. Phone: 596 55-56-57.


• Summary: Tofuyo is an excellent type of fermented tofu made in Okinawa Prefecture, Japan. Crude protein and crude fat contents of tofuyo decreased during ripening, but is reducing sugars increased. The sodium chloride (NaCl) content of the product remained almost constant at about 3%. “Digestion of soybean protein was examined by slab polyacrylamide gel electrophoresis. Some polypeptide bands of soybean globulin, such as α-1, α-2, beta-subunits in beta-conglycinin,” an acidic subunit in glycinin in the water-insoluble fraction of tofuyo disappeared after 3-months ripening, but that of the basic subunit in glycinin remained.

The main constituent of the body of tofuyo was found to be the basic subunit in glycinin and other polypeptides (whose weight in kilodaltons is given).

“The ratio of water soluble nitrogen to total nitrogen (called protein solubility ratio, or ripening ratio) reached 36.3% after 3 months of ripening. ”The ratio of trichloracetic acid soluble nitrogen to total nitrogen reached 35.0% after 3 months of ripening.

A table shows: Changes in the chemical composition of raw tofu, dehydrated tofu, tofuyo. and moromi (mash) prepared by Monascus fungus during ripening periods of 0-5 months.

Figures (graphs) show: (1) Changes in ethyl alcohol concentration pH, activities of various enzymes (α-amylase, glucosamylase, proteinase) in the moromi mash during ripening periods of 0-5 months. (2) Changes in pure protein content of tofuyo during ripening periods of 0-5 months; it decreased. (3) Changes in protein solubility ratio of tofuyo during ripening periods of 0-5 months. (6) Changes in the ratio of trichloracetic acid-soluble nitrogen to the total nitrogen during ripening periods of 0-5 months. These nitrogen contents are shown on an oven dried basis. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-01.


• Summary: A section titled “Soya Cheeses” by C.W. Hesseltine has the following contents: Introduction. Importance worldwide. Sufu (Chinese cheese): Introduction, preparation of curd, fermentation of curd, processing and aging, microorganisms, composition, enzymes involved, culinary use and preservation. Tofu: Introduction, process for making tofu, soya bean varieties and tofu consumption, microbiological safety of tofu, hydration, coagulation conditions, types and use of tofu. Other soya bean cheese-like products.


• Summary: An excellent review of the literature. Contents: Introduction. Mold-modified indigenous fermented foods: Miso, shoyu (soy sauce), hamanatto, sufu, fermented rice (sierra rice), tapé (lao-chao), ang-kak, ogi, tempeh, onjom (oncom, lontjom), bongkrek (tempeh bongkrek), kenima. Processing developments in legume tempeh manufacture: Traditional tempeh fermentation, industrial production of tempeh, methods of preparation (cleaning, dehulling, hydration and acid fermentation, partial cooking, draining, cooling, and surface drying, inoculation, fermentation containers, incubation, harvesting, storage,


Concerning fermented tofu (Chapter 7): Fermented tofu may be named after the region where it is made. Some famous products in China include: (1) Shaoxing furu. Famous for its rice wine, Shaoxing is a city in northeastern Zhejiang, a coastal province in central eastern China. (2) GuiLin furu. Guilin is a city in the northeastern of the Guangxi Zhuang Autonomous Region of far southern China. (3) Kedong furu. Kedong is a county in Heilongjiang province in northeastern China. (4) Jiajiang furu. Jiajiang is a county in Sichuan Province, southwest China. (5) Tangchang doufu-ru. Tangchang is a town in Sichuan province.


• Summary: This book is filled with photos and commemorative stories about the research discoveries and breakthroughs in the field of crop utilization at the four regional USDA’s Agricultural Research Service (ARS) labs during the 50 years since they were established.


The most important work of the Northern regional laboratory in Peoria was the development of penicillin starting in June 1941. A brief chronology: 1941 Dec.–Andrew J. Moyer, a chemist at the Northern lab, developed the basis for the industrial process–deep vat fermentation. 1942 March–Only enough penicillin is available to treat a single case. 1942 Dec. 31–Seventeen U.S. pharmaceutical companies are working on penicillin. 1944 June 6–Thanks to the combined efforts of many people, enough penicillin is available in quantity by D-Day (invasion of Normandy,
France) to treat wounded allied soldiers. Penicillin was the world’s first commercial antibiotic. By the 1950s, hundreds of antibiotics were on the market. Address: Director (retired), Information Staff, USDA Agricultural Research Service (ARS).


**Summary:** Contents: (1) Introduction. (2) Production: Status, major growing seasons and cropping systems, constraints, resolving constraints. (3) Processing, utilization and marketing: Status, supply and demand, exportation of soybean products, constraints, resolving constraints.


Tables: (1) List of soybean-based food products popularly used in the Philippines. (2) Volume and value of soybean imports, 1980-90.

Soybean production increased from about 9,800 tonnes (metric tons) in 1980 to a peak of 11,466 tonnes in 1982, then decreased to 5,614 tonnes in 1990. Area planted to soybeans increased from about 10,000 ha in 1980 to a peak of about 11,00 ha in 1982, then decreased to about 7,000 ha in 1990. The average yield for the period 1980-1990 was 920 kg/ha, but has generally been falling since 1983. Southern Mindanao has been the single most important soybean producing region in the Philippines for more than a decade, accounting for about 67% of total Philippine soybean production in 1990; Central Mindanao comes next with about 23%.

A brief history of soybean production in the Philippines from 1983 to 1990 appears on pages 99-10. Popular soyfoods products in the Philippines include: A. Fermented products: Soy sauce (toyo), fermented soybean curd (tausi [sic, salted, fermented black soybeans]), tempeh (tempe), soybean paste (miso), soft fermented soybean curd (tahuri). B. Non-fermented products: Soybean sprouts (toge, tauge), soybean cheese [curds] (tokwa), Geerlings cheese (taho [tofu]), soybean milk (soymilk), and roasted soybean powder (soy coffee).

Philippine imports of soybeans and soybean products have increased rapidly since 1980, yet 93% of these imports in 1990 were soybean meal, of which 38% comes from India, 33% comes from the USA, 22% from China, and 7% from others.

In April 1991 the General Milling Corporation’s soybean solvent extraction plant began operation in Tabango, Batangas. It is expected to reduce the country’s imports of soybean meal but increase the imports of raw soybeans. Address: 1. Scientist III; 2. Subject Matter Specialist. All: PCARRD, Los Baños, Laguna, Philippines.


Black soybeans are mentioned on pages 60, 121, 189, 200, 204 (also known as “Japanese black beans”).


**Summary:** Page 84: “The convent had a granary and once a month they hulled rice. On full moon days and important religious holidays they made fresh tofu and pickled tofu....”


**Summary:** A superb book, carefully researched and well. By telling, in depth, the story of one small community of Issei in Hood River, Oregon, from their youth in Japan until their return home after the brutal internment camps, she captures the exquisitely the story of the ordeals faced by the first generation of Japanese (such honest, hard-working people) in racist America. Through her many interviews, the Issei are able to speak for themselves, in their own words, throughout this book.


Page 58: Sekihan (steamed rice mixed with red beans [azuki]). Page 134: O-hagi (sweetened bean jam filled with mashed rice).

Linda Tamura is a native of Hood River and a third-generation Japanese American. Address: Prof. of education and chair of the Education Dep., Pacific Univ., Forest Grove,

• **Summary:** Contents: (1) Introduction. (2) Production: trend, major growing seasons and cropping systems, constraints, resolving the constraints, future research. (3) Processing, utilization and marketing: Consumption, processing, marketing, constraints, resolving the constraints. (4) Resources: Personnel, seeds. (5) On-going research processing, marketing, constraints, resolving the constraints. (6) Information required. (7) Conclusion.


Introduction: “Soybean has been cultivated in Vietnam for a long time. Le Quy Don, in his book “Van Dai Loai Ngu”, written in 1773, mentioned about soybean cultivation. It is the second most important legume in Vietnam. All soybean products are used as human foods and animal feed because of its high food value (40-50% of protein and 20-25% of oil).

“The Government of Vietnam, which is conscious of the importance of soybean and its role of human food and animal feed, and the possibility to increase its production, has listed soybean as the number two most important crop after groundnut in her agricultural development policy.”

Table 1: Area planted to soybeans in Vietnam grew from 17,078 ha in 1970 to 149,000 ha in 1990, projected to grow to 300,000 ha in the year 2000.

Production of soybeans in Vietnam increased from 5,277 tonnes (metric tons) in 1970 to 146,020 tonnes in 1990, projected to grow to 420,000 tonnes in the year 2000.

Yield of soybeans in Vietnam grew from 309 kg/ha in 1970 to 980 kg/ha in 1990, projected to grow to 1,400 kg/ha in the year 2000.

“Most of the soybean produced in Vietnam is consumed as human food prepared by traditional methods, which include fermented products such as soysauce, soypaste (miso), soycurd (fermented tofu), and soycheese, and non-fermented products such as soymilk, soycurd (tofu) and soybean oil.

Note: This is the earliest English-language document seen (March 2009) that uses the term “soypaste” to refer to miso.

Concerning the Vietnamese names of these foods, Huong Quan Nguyen (Zomore Quan) writes, in reply to a question from Soyinfo Center. 2008. Aug. 17. Soy sauce = “xi dau” (the Vietnamese “d” written without the bar across the vertical stroke is pronounced “Z”).

Soy paste = “tuong dau nhanh” or “tuong Cu Da.”

“Tuong” is a generic term meaning “sauce.” As you know, Cu Da is the name of the village famous for its soy paste. “Tuong Cu Da” literally means “sauce made in Cu Da Village.” Soy paste is made in many villages in North Vietnam, not just in Cu Da. I have heard that Tuong Ban and Tuong Pho Thoi are just as good as Tuong Cu Da.

Soy curd = “dau hu” (which is unfermented. Once the soy curd is fermented, it is referred to as “chao”).

Soy cheese = “chao” (this word has no diacritical mark).

Note: Zomore asked six Vietnamese people who are knowledgeable about soyfoods and all are aware of only one kind of fermented tofu in Vietnam; therefore they cannot imagine what fermented “soycheese” is. Address: Legumes Research and Development Centre, INSA, Dong Da, Hanoi, Vietnam.


• **Summary:** This is the second of the two most comprehensive books ever published on the soyfoods industry and market worldwide.

In May 1982 the first study of the burgeoning soyfoods industry in the Western world was compiled by Shurtleff and Aoyagi, and published by Soyfoods Center. In April 1985 the fifth edition of that book, titled *Soyfoods Industry and Market: Directory and Databook* (220 pages), was published. It contained statistics through 1984, the market size and growth rate for each soyfood type, rankings of leading soyfoods manufacturers of each soyfood type and the amount each produced, analyses, trends, and projections. This book is published to update the 1985 market study.

In the decade since 1984 the soyfoods market has continued to grow at a very healthy rate, with some soyfood types (such as soymilk) growing at a truly astonishing sustained rate—in both the USA and western Europe—as the statistics in this book show so vividly. In 1975 only 75 new commercial soyfood products were introduced in the USA, yet that number skyrocketed to 217 in 1979, reaching an amazing 422 new products in 1987.

During the decade from 1984 to 1994, Soyfoods Center has invested most of its time and resources in the production...
of SoyaScan, the world’s largest computerized database on soyfoods, which contains more than 44,500 records as of Jan. 1994. This database also includes a wealth of carefully researched statistics and analyses of the soyfoods market; those from the start of 1985 to the end of 1993 are contained in this book. Its scope includes all known information on this subject, worldwide. Its focus, however, is statistics, analyses, and trends concerning the soyfoods industry and market in the United States and Europe.

In May 1990 Soyfoods Center conducted an in-depth study of the tofu market in Europe (137 pages), and in July 1990 of the soymilk market in Europe (261 pages). All original interviews and published records from both of these market studies, plus a summary of each study, are included in the present book.

The SoyaScan database is composed of individual records. One record might be an original interview with the head of the largest soy company in Europe, on the size and growth of the soymilk market in Europe, and new trends in that market, conducted by William Shurtleff of Soyfoods Center. Another might be a published article or an unpublished document concerning the growth of the market for soy yogurts or soy sauce in America.

This book documents the growth of each product category in every country worldwide. The book contains three extensive and easy-to-use indexes: A subject/geographical index, an author/company index, and a language index. These allow you to find the exact information you need on the soyfoods industry and market quickly and easily. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

• Summary: Canada is selling more and more soybeans for food uses to East Asia. Thailand is the only country in the region that is self-sufficient in soybean production. Japan (population 123 million) imports more than 1 million tonnes per year, Taiwan imports 250,000 tonnes, Indonesia 150,000 tonnes, Korea 120,000 tonnes, and Malaysia 100,000 tonnes. Singapore and Hong Kong import all the soybeans they use.

In 1993 Ontario produced a record 1.7 million tonnes. Only 500,000 tonnes of this (29.4%) was exported, and only a fraction of that was suitable for making soyfoods such as tofu, natto, soymilk, Taiwanese fermented tofu (foo yee), etc. A large color photo shows ladies in Taiwan packing fermented tofu in jars.

Ontario has captured 56% of the Hong Kong market, and about 14% of the Malaysian market. But the Asian market is becoming more competitive because exporters from the USA are beginning to offer soybeans in bags as well as bulk shipments. Michael Loh, the OSGMB coordinator for export development, thinks Canada can achieve its goal of doubling soybean exports by the year 2000.

• Summary: Tofuyo is a unique fermented soy protein food made in Okinawa Prefecture, Japan. Crude protein content decreased during ripening. “Digestion of soybean protein was examined by slab polyacrylamide gel electrophoresis. Some polypeptide bands of soyglobulin, such as α-, α-, β-subunits in beta-conglycinin,” an acidic subunit in glycinin in the water-insoluble fraction of tofuyo disappeared after 3-months ripening, and that of the basic subunit in glycinin still remained. As maturation of tofuyo proceeded, it was found that soybean protein was hydrolyzed by proteases in the moromi (mash). During maturation, the amount of total free amino acids increased, and high levels of glutamic acid, aspartic acid, alanine and proline were found.

Tables show: (1) Changes in chemical composition of tofuyo prepared by Aspergillus oryzae during various ripening periods. (2) Changes in the free amino acid composition of tofuyo prepared by Aspergillus oryzae during various ripening periods.

Figures (all graphs) show: (1) Changes in ethyl alcohol concentration, pH and activities of various enzymes in the moromi (mash) during ripening periods of 0-5 months. (3) Changes in protein solubility ratio of tofuyo during ripening periods of 0-5 months. (4) Changes in the ratio of trichloracetic acid-soluble nitrogen to the total nitrogen during ripening periods of 0-5 months. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.

• Summary: Isoflavones are one class of phytochemicals and are found in soybeans in large amounts. Twelve isomers of isoflavones were quantified: three aglycons and nine glucosides. Soybeans contain two major isoflavone aglycons, genistein and daidzein, and a minor one, glycitein. In the seed, the isoflavones are present primarily as Beta-glucosides. The nine glucosides are: daidzin, genistin, glycitin; 6”-O-acetyldaidzin, -genistin, or -glycitin; and 6”-O-malonyldaidzin, -genistin, or -glycitin.

This paper gives data on the concentration and distribution of isoflavones in 29 commercial soybean foods, grouped into three types: Soy ingredients, traditional East
Asian soy foods, and second-generation soyfoods. Four values are given for each product in micrograms per gram, on an “as is” basis: daidzein, genistein, glycitein, and total isoflavones.


Some manufacturers use ethyl alcohol extraction to prepare soy protein concentrates; this process removes a substantial portion of the isoflavones. The products examined for this paper which had the lowest content of isoflavones (all less than 100 micrograms per gram) were: soy cheddar cheese A 34, soy protein concentrate 56, soy Parmesan 65, soy mozzarella cheese 76, flat noodle 85.

“Proposed anticarcinogenic doses of soybean isoflavones range from 1.5 to 2.0 mg per kg of body weight per day (Hendrick et al, 1994). There are a number of soy food choices that will fit this dose requirement without the need to consume unusual amounts of these soy foods.”

Isoflavone standards and extraction of isoflavones: Authentic standards of daidzein and genistein were obtained from commercial sources (ICN Pharmaceuticals, Plainview, New York, and Calbiochem Corp., San Diego, California). Daidzein and genistein were from previous work in the laboratory (Murphy 1981). The starting material for extracting isoflavones was defatted soybean flour. It was, in turn, extracted with acetonitrile (ACN) and 0.1 N HCl [hydrochloric acid] (1:5:1 w/v/v) according to the procedure of Murphy 1981. Address: Food Science and Human Nutrition, 2312 Food Sciences Building, Iowa State Univ., Ames, Iowa 50011.


Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.


**Summary:** A guide to Taiwan’s customs and etiquette. Ling-Li is a Taiwanese native and Chris, her husband, is an American who lived and studied in Taiwan for a number of years. In Chapter 3, “Settling In,” the section titled “A stroll through the wet market” [the traditional fresh vegetable market, where each vendor rents a stall] is a section (p. 50-51) about doufu and doufu products. “If it is marinated and dried further, it becomes doufu gan (dried bean curd [sic, pressed tofu]). If it is fermented, it becomes chou doufu (smelly bean curd).

Chapter 7, “Cuisine of the Ilha Formosa” is about Taiwanese restaurants—where happy noise and clanging dishes are part of what Chinese value in dining out.

Page 160-61: “Junior is off to cram school, so Mom eats a specialty at a push cart to remind her of the flavors of her youth. When they have all returned home they might go out together for syau ye (midnight snack). This might be a bowl of noodles, or chou doufu (smelly bean curd—they say it smells like a sewer and tastes like a dream; bean curd’s equivalent to Blue Stilton cheese).”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “smelly bean curd.”


**Summary:** Contents: Introduction. Manufacture. Packaging. Equipment. Coagulating agents. Modern methods of manufacture in China. High yield bean curd. Beancurd products (Chinese names are given in pinyin; a photo shows...

References. Acknowledgements.

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term “Fermented beancurd” to refer to fermented tofu.

Concerning smoked tofu: A clear illustration shows the cylindrical smoking chamber, apparently made from a 55-gallon drum. At the bottom is a 20-cm layer of smoking rice bran, half way up is a perforated metal sheet, and near the top is a rack on which the squares or strips of firmly-pressed tofu are smoked, and on top is a cover. Smoking takes several hours and may be cold smoking {below 30ºC} or hot smoking {below 70ºC}. The tofu is smoked in the smoke and the drying action (25% weight loss by evaporation). The tofu is stored for 10 days without refrigeration due to the natural preservatives present in the smoke and the drying action (25% weight loss by evaporation).  

Page 26 describes how a highly-flavored product is made by mixing pressed tofu with various spices, sugar, salt, and diced vegetables. It is steamed for 10-12 minutes, mixed with vegetable oil, spread on a bamboo mat, left in the sun to dry, then smoked to give it a golden color. Photos show: Smoked tofu squares on a woven bamboo tray. Rectangular pieces of tofu, each pressed in a cloth.

This booklet provides an excellent introduction to traditional methods of making tofu and tofu products in China, with many clear illustrations and photos. The author did the research while working at the Human Agricultural University in China. The publisher is working to enable low-income people in the Third World to develop and use technologies which give them more control over their lives and contribute to the long-term development of their communities.

In addition to reviewing the many varieties of tofu and tofu products in China (from deep-fried tofu to instant tofu mix), the booklet discusses of traditional manufacturing principles, those which have potential for large-scale manufacture, coagulants, and packaging equipment.

For further information contact Intermediate Technology, Myson House, Railway Terrace, Rugby, Warwickshire CV21 3HT, England, UK.


• Summary: On page xiv is a very interesting map of southern China, with a blowup of southern Kwangtung [Guangdong] province, the area around Canton the Pearl River, the South China Sea, Macao, and Hong Kong. For this area was at the heart of the Chinese diaspora—especially in the 19th and 20th centuries and especially from two small areas southeast of Canton: (1) Sam Yap (Three Districts) of Punyu, Shuntak, and Namhoi—the more affluent counties. (2) Sze Yap (Four Districts) of Hoiping, Sunwui, Toishan, and Yanping—the poorer and ruder area southwest of Sam Yap. Although the people from both areas speak Cantonese, they have difficulty understanding each other’s speech. Other important languages of the diaspora were Hakka and its numerous variants (spoken in Guangdong, Fujian, etc.) and Hokkien (spoken in southern Fujian, Taiwan, and by many overseas Chinese throughout Southeast Asia). It is closely related to Teochew / Teochiu, though mutual comprehension is difficult.

In Part Four: 1960s to 1980s, Chapter 16, titled “Food” contains a history (p. 320-23) of Amoy Food Limited, now an international firm, with its headquarters in Hong Kong, owned largely by overseas Chinese. For many overseas Chinese, “perhaps no label has quite the resonance of Amoy.” In 1908, T’ao-hua Ta-t’ung, the predecessor of the company, was founded in Xiamen for producing bottled soy sauce and dairy milk. Its founder was Yang Ko-fei, who soon brought in other shareholders. In 1911 clashes between the founder and other shareholders lead to a break-up of the company, with one party going it alone as T’ai-hua (Tao Fia), and the other as Ta-T’ung. Yang Ko-fei went with the latter company, who chief shareholder was Tan Kah Kee, the rubber and pineapple magnate.

It became increasingly apparent, however, that the two companies would do much better of they operated as a single unit. So in 1928, when a new rival appeared, they merged, with the smaller of the two now located in Hong Kong. Thereafter the company experienced steady growth. Eventually the branch in Hong Kong came to eclipse the parent company in Amoy. In 1937, when the Japanese invaded China and war broke out, almost the entire canning plant was moved to Hong Kong from Amoy. In 1951, when the company went public, the ownership passed mainly into the hands of overseas Chinese.

Today Amoy Foods’ products are on the shelves of supermarkets and Asian markets in 37 countries. Half of Amoy Foods’ shares are owned by the American food giant
Pillsbury (owner of Haagen-Dazs and the Burger King hamburger chain) and the other half by Hang Lung (a Hong Kong real estate company). Amoy's line of 34 sauces include dark soy sauce (lau-ch’ou), light soy sauce (sheng-ch’ou), black bean sauce [made of fermented black soybeans], sweet and sour sauce, etc.

On the roof of the Amoy factory’s main building a visitor can see a demonstration of the old-fashioned process; “here, an old man with sleeves rolled up goes from earthen vat to earthen at plunging his arm into the thick brew of black and yellow soy beans to give it a gentle, almost loving stir. He works rhythmically, with deep concentration. A Soy Master with thirty or forty years behind him, he stands in a line which goes back to the fifth century, from when dates the earliest surviving soy sauce recipe.”

Companies like Amoy have helped to make Chinese foods more widely available in the West. Not so long ago, Chinese cookbooks published in England said that Worcestershire sauce was an acceptable substitute for soy sauce, because the latter was available only at delicatessens and specialty shops [Asian grocery stores] in London. Even during the last five years, the range of Chinese foods available in London’s Chinatown has grown remarkably. In Chinatowns in the United States [and especially those in San Francisco ‘California’ and New York] the selection of Chinese foods has long [perhaps always] been greater than at those in London or other places in Europe.

Page 324: The first person to make tofu in Europe was Li Shih-tseng [Li Yü-ying, Li Shizeng], a Chinese intellectual and educator. As a young student of biochemistry in France in 1900, Li was to be greatly influenced by the writings of Nietzsche and Bergson. A Francophile, Li was one of the founders of the Work and Study Program, which sent Chinese students abroad for part-time work and part-time study. One of these students, who would later become a firm believer in the nutritional value of tofu and other soybean foods. His factory also made bean sprouts at Golden Monkey [Sichuan; 133-47 Roosevelt Ave.].” The dish was made with real soy beans and, for once, the dish contained enough oil—which Americans might not like.

A recipe that the menu calls “vegetable rolls” are actually “bean curd skins [yuba] so crisp they crackled with each bite, filled with juicy bean sprouts and brushed with a thick and pungent sesame sauce.”

At Taipei Wall Sea Street Taiwanese Restaurant [135-05 40th Road], hot pots are the signature dish. “Taiwanese food is unlike any other and this turned out to be a fine

Li was also a founder of the Université Franco-Chinoise at Lyons, a sort of accommodation and placement agency.

About the author (facing p. 418). Lynn Pan was born in Shanghai; she left as a child. She “has lived as an immigrant in North Borneo and England, and worked as a social scientist, journalist and writer in London, Geneva, Helsinki, and Hong Kong.” In 1981 she returned to Shanghai for the first time, and was gripped by deep, haunting sensations of nostalgia. She had found the place where she belonged, her inheritance, and she began to write this book. She is the author of at least five other books—all listed facing the title page. Her Epilogue and Afterword at the end of this book are both very interesting.


• Summary: Red koji was prepared by growing molds of the genus Monascus on steamed rice. Yellow koji was prepared by growing Aspergillus oryzae molds on steamed rice. In this study, tofuyo prepared with either or both of these types of koji was investigated. “The product obtained by using the combination of red and yellow kojis was preferred” to that made by only one koji. The most desirable product was obtained by using the mixed koji of composed 75% yellow koji and 25% red koji.

Crude protein content, hardness, and cohesiveness of tofuyo were found to decrease during the ripening period.


• Summary: This is a review of three Chinese restaurants in Flushing, Queens. The writer accompanied Ken Hom, a man who was famous for his eight books on Chinese food. Ken was happy because he “had just tasted the spicy pickled bean sprouts at Golden Monkey [Sichuan; 133-47 Roosevelt Ave.].” The dish was made with real soy beans and, for once, the dish contained enough oil—which Americans might not like.

A recipe that the menu calls “vegetable rolls” are actually “bean curd skins [yuba] so crisp they crackled with each bite, filled with juicy bean sprouts and brushed with a thick and pungent sesame sauce.”
place to sample it.” One dish, which the menu called “fried homemade pork,” consisted of “thin, chewy strips of meat marinated in fermented bean curd to give them a salty, funky flavor.” One of the recommended dishes is “shredded pork with dried bean curd” [probably doufu-gan, which is pressed tofu].


• Summary: Contains summaries of previous reviews of the Golden Monkey and the Taipei Wall Sea Street Taiwanese Restaurant, described in detail by Ruth Reichl in the Feb. 24 issue of this newspaper (p. C24). Mentions “fermented bean curd.”

In addition, there is a summary review of Penang Cuisine Malaysia which includes “Penang rojak, a refreshing peppery salad of cucumber, jicama, pineapple, zucchini and black bean sauce.” Also: “Whole fried pompano in black bean sauce.”


• Summary: Contents: Introduction. Soybean chemical composition. Unfermented soy foods: Soymilk, tofu (momen, kinugoshi or silken, packed tofu, aseptically packaged tofu, deep-fried tofu, kori tofu or dried-frozen tofu), other nonfermented soy foods (yuba, kinako or roasted whole soybean flour, fresh {edamame} and canned soybeans, texturized soy protein-based foods). Fermented soy foods: Miso, shoyu (soy sauce), natto, tempeh, sufu. Japanese Agricultural Standards. Identity preservation and transportation. Soybean quality characteristics: Overview, judging quality (tofu, natto), natto. Note: This is the earliest English-language document seen (Dec. 2005) that contains the term “roasted whole soybean flour.”

Tables: 1. Nonfermented soy food products and common names by country. 2. Fermented soy food products and common names by country. 3. Chemical composition of soy foods. 4. Per capita annual consumption of soybeans (kg) in selected Asian countries (China, Indonesia, Japan, Korea, Malaysia, Philippines, Thailand; for the years 1968, 1978, 1988, 1994).

Figures: 1. Flowchart of refrigerated and shelf-stable soymilk production. 2. JAS seal of approval. 3. Diagram of equipment used in large scale tofu production (each piece of equipment is numbered and labeled). 4. Flowchart of regular tofu production. 5. Graph showing percent transmittance of whey versus coagulant concentration for soymilks at 6% solids made from Weber, Vinton, and Amsoy soybeans. A concentration of 0.023 N was selected as the optimum coagulant concentration, since it gave the most transparent whey. 6. Graph showing percent transmittance of whey versus coagulant concentration for Amsoy soymilk at concentrations of 4, 5, and 8% solids. Concentrations of 0.018N, 0.019N, and 0.035N, respectively, were selected as optimum coagulant concentrations. 7. Flowchart of kinugoshi (silken) tofu production. 8. Flowchart of packaged tofu production. 9. Flowchart of aseptically packaged tofu production. 10. Flowchart of kori (dried-frozen) tofu production. 11. Diagram of equipment used in large scale production of dried-frozen tofu (each piece of equipment is numbered and labeled). 12. Flowchart of natto production. 13. Diagram of the interactive factors producing the characteristic attributes of miso. 14. Flowchart of tempeh production. Address: Iowa State Univ., Ames, Iowa.


• Summary: In the section on “Poultry,” the recipe for “Duck in fragrant soy sauce” (p. 104) has a headnote which begins: “A Teochew favorite sometimes made with goose, this is a simple but very tasty way of simmering duck in soy sauce flavored with ‘black’ spices (cinnamon, star anise and cloves).” The ingredients include: “4 cups light soy sauce. 3 tablespoons black soy sauce.”

Note 1. This is the earliest English-language document seen (Oct. 2010) that contains the term “fragrant soy sauce,” which refers to a kitchen preparation rather than to a commercial product.”

Note 2. Teochew food, from southern China, is characterized by steaming, light soups and fish dishes (p. 15).

Bean curd is mentioned on pages 10, 27, 48 (dried bean curd), 52 (firm bean curd), 66, 68.

Black soy sauce is mentioned on pages 14, 33, 39, 42, 52, 58, 64, 72, 82, 86, 98, 102, 104. Note: This appears to be a commercial product.

Deep-fried bean curd (tau foo pok) is mentioned on page 27.

Fermented bean curd (nam yee) is mentioned on page 27.

Soy sauce is mentioned throughout this book, including “light soy sauce” (which is saltier and paler than the dark black variety), “sweet soy sauce” (Indonesian, p. 33), and “black soy sauce.”


644. Zedong, Mao; Schram, Stuart R.; Hodes, Nancy Jane. 1995. Mao’s road to power: Revolutionary writings...
HISTORY OF FERMENTED TOFU


• Summary: In the section titled “Xunwu investigation (May 1930, p. 296-419) we read (p. 323): Dried bean curd roll [lit., curd bamboo] [sic, dried yuba roll]. This is made of thin sheets of bean curd [sic, yuba] rolled into tubes. One jin costs 2 mao and several fen; annual sales are 40 to 50 jin. It comes from Xingning.

“Doufumei [lit., bean curd mold]. This is fermented bean curd that comes from Mei xian. It is made from three items: soybean milk, taro, and flour. It is not made the way the dried bean curd [doufu-gan; pressed tofu] used by the common people is made.”

Bean curd [tofu] is mentioned on pages 184 (“Spoiled bean curd is not spoiled bean curd”), 335 (section), 336, 347. Soybean is mentioned on pages 318 (soybean business), 323 (soybean milk), 336 (soybean residue [okara]), 343 (yellow soybean sprout). Address: China.


Tables: (1) “Effect of steaming methods and varieties of rice on the production of enzymes and pigment of red koji.” (2) “Changes in chemical composition of tofuyo prepared by Monascus fungus during the ripening period.” (3) “Changes in breaking characteristics of tofuyo during the ripening period” (breaking strain, breaking stress, breaking energy). Flow chart of making tofuyo.

Figures: (2) Graph of “Changes in protein solubility ratio of tofuyo during the ripening period.” The ratio steadily increases.

“Tofuyo is very similar to the foods called sufu, tou-fu-ju and furu in China or tau-hu-yee in Thailand and its root is considered as sufu in China. It was brought to Okinawa from Fujian, China and has been introduced since at the period of the Ryukyu dynasty in the 18th century.”

“Traditionally, tofuyo is consumed directly as relish with liquor such as awamori or as cakes served with tea. Recently it has been used in sushi, cracker-spread, and many kinds of hors-d’oeuvre in the restaurants. Because tofuyo is a cream cheese-type product and has a mild flavor it would be expected to be suitable for use in western countries due to cholesterol free and low salt vegetable food for health” (p. 7). Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.


• Summary: The writer, Tami Ohnui (a specialist soybean grower) and Kei Fukui (an excellent Japanese cook) explain very briefly how to make fermented black bean sauce, soy sauce, fermented black beans (shi), tofu, fermented tofu, and edamame.


• Summary: To dine on real Asian food, look for real Asian restaurants. They are easy to find. “As New York’s Asian population has grown larger and more affluent, the demand for authentic Asian food has grown. Hundreds of New York restaurants now cater to a clientele with no need for menus written in English and no desire for food translated into American.

Until the Immigration and Nationality Act of 1965 (also called Hart-Celler Act, signed into law on Oct. 3 President Lyndon Johnson; it became law on 1 July 1968), which increased Asian immigration to the United States, “most Chinese food in America was a bad parody of Cantonese cooking.” But since then, we have increasingly had the opportunity to sample the real thing.

Shanghainese cuisine includes “mock duck made of tofu.”

Taiwan: To eat in Taiwan helps to understand the many cultures that have passed through this island. In the 1600s, settlers from Fukien [Fujian] arrived from the mainland, bringing their food with them. The Japanese occupied the island for 50 years (1895-1945) leaving their mark in the form of sushi, sake, and a unique lightness. Finally the Kuomintang came to the island (1949 to present), bringing people from all of China’s provinces. “Modern Taiwanese food blends all of these influences.”

Only a few restaurants in New York serve authentic Taiwanese food. “David’s Taiwanese Gourmet in Elmhurst [Queens] serves typical Taiwanese dishes like... fried fermented bean curd (a definite love or hate proposition).”

648. Yasuda, Masaaki; Kinjyo, Sakie; Miki, Eizo. 1996. Okinawa ni okeru tofuyo no sei zo ni kansuru kenkyu. XI. Tofuyo no jukusei katei ni okeru hadan tokusei, kuripu kyodo oyobi bisaikozo no henka [Studies on the manufacture of tofuyo in Okinawa. XI. Changes in breaking characteristics, creep behavior and microstructure of tofuyo.]

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Sandoz. Now Bernard gets a bonus of $100,000 a year in addition to his salary just to stay with Sandoz.

In the UK, Steve met with Graham Keene, head of marketing and sales for the Haldane Group. Haldane makes yogurt under 3 brands, and one of them was the best soy yogurt Steve has ever tasted anywhere. Their yogurt has a pH of 3.8 to 4.0 which gives it a shelf life of 3-4 weeks; there appeared to be no special tricks involved. Steve would soon like to travel to East Asia to take a closer look at Okinawan fermented tofu (Tofuyo). Steve spent $100,000 to find out what people mean when they say “I am a vegetarian.” They mean: “I avoid red meat.”

Cause marketing is where a company puts its advertising dollars into a cause, such as saving the rain forests or promoting vegetarianism.

The largest investor in White Wave has the surname “Demos,” and it is not Steve. Address: President, White Wave Inc., 1990 North 57th Court, Boulder, Colorado 80301.


• Summary:  
 This 2nd edition is about 108 pages longer than the original 1983 edition. Contents: Introduction to indigenous fermented foods. (1) Indonesian tempe and related fermentations: Protein-rich vegetarian meat substitutes. (2) Indigenous fermented foods involving an acid fermentation: Preserving and enhancing organoleptic and nutritional qualities of fresh foods. (3) Indigenous fermented foods involving an alkaline fermentation. (4) Indigenous fermented foods in which ethanol is a major product: Type and nutritional significance of primitive wines and beers and related alcoholic foods (incl. Chinese koji (big qu [bricklike in shape and made from barley or wheat and soybeans, inoculated with Aspergillus] molds), and small qu ([spherical, plate-circular or rectangular in shape and made from rice or rice bran with various herbs, inoculated with Mucor and/or Rhizopus molds], p. 449), Japanese amazake (p. 480-81). (5) Indigenous amino acid / peptide sauces and pastes with meatlike flavors (p. 509-654): Introduction. (A) Soy sauces: Japanese shoyu: Koikuchi, usukuchi, and tamari; Chinese chiang-yu, by Tamotsu Yokotsuka (p. 511-17). Biochemistry of Saccharomyces (Zygosaccharomyces) rouxii, by Steinkraus, Franta, and...


(D) Fish-soy sauce and fish-soy paste, by Ismail, p. 607-11.


(Mushrooms: Producing single-cell (microbial) protein on lignocellulosic or other food and agricultural wastes.

7 General papers related to indigenous fermented foods. Address: Inst. of Food Science, Cornell Univ., Geneva, New York.


• Summary: This is basically a macrobiotic cookbook. It is largely vegetarian, but has one long chapter of fish recipes (p. 189-220). No red meat or sugar is used. One long chapter, titled “Tofu, tempeh, & seitan” (p. 157-88) contains many recipes. Other soy-related recipes include: Basic miso soup (p. 38). Miso millet stew (p. 78). Minute miso soup (p. 102). Black soybean relish (p. 136; as black soybeans are simmered, they create their own gravy). Baked beans with miso & apple butter (p. 143). Tofu cheese (with miso, p. 162). Lemon miso sauce (p. 422). Also contains recipes for amasake, azuki beans, and sea vegetables.

The recipe for “Tofu cheese” (p. 162), which is very creative and delicious, was developed by Christina many years ago, but the method was kept a secret—until now! Basically extra firm tofu is fermented / pickled in white miso. This recipe is for those who can’t stand to give up cheese, and the resulting fermented soy cheese can be used in place of dairy cheese in many recipes, ranging from creamy white sauces to thin squares on a cracker. The tofu can be fermented in the miso anywhere from 12 hours to 4 days—depending on how strong you would like the flavor to become.


• Summary: A profile of the self-proclaimed King of Kowloon—a Hong Kong legend. He also goes by the name of Tsang Tso-choi, and some of the poor and common people “hail him as the authentic voice of real Hong Kong.” Of his shabby calligraphy, Lee Yun-woon, a trained calligrapher and scholar, says: “Some people like to eat stinky bean curd [a type of fermented tofu]. This is their business. Personally, I can’t stand it.”


• Summary: Contains a summary review of David’s Taiwanese Gourmet, a full review of which by Ruth Reichl appeared in this newspaper on 29 March 1996 (p. C1). Mentions “fermented bean curd.”


• Summary: Contents: Introduction. Fermented soy paste (jiang and miso): Varieties of miso and jiang, koji and microorganisms involved, koji starter and its preparation,
Chinese jiang preparation (traditional household method, pure culture method, enzymatic method), Japanese miso preparation (rice koji preparation, treatment of soybeans, mixing and mashing, fermentation, pasteurization and packaging), principles of jiang and miso preparation, major factors in jiang and miso making (raw materials, cooking temperature and time, conditions during koji preparation, proportions of ingredients, fermentation conditions, novel processing for special products). Soy sauce (jiangyou or shoyu): Varieties of soy sauce, soy sauce processing (traditional Chinese household method, modern Chinese method, processing of Japanese shoyu, comparison of soy sauce and jiang or miso preparations), principles of making soy sauce (action of koji enzymes, fermentation by lactic bacteria and yeasts, color and flavor formation, glutaminase and glutamic acid), chemical soy sauce, progress in soy sauce preparation (use of defatted soy grits or flakes, improvements in treating soybeans, development of an automatic koji-making system, application of microorganisms with specific activities, techniques to shorten production time, improvements in soy sauce clarification), chemical composition, quality attributes and standardization, mycotoxins. Tempeh: Varieties of tempeh, preparation (traditional method, pilot plant method, petri dish method), microorganisms involved, factors affecting tempeh fermentation (starter, dehulling and aeration, moisture, temperatures, acidity, losses of solids), changes during fermentation (general changes, protein, lipid, carbohydrates and other constituents), production of vitamins, storage, nutritional value. Natto: Preparation, microorganisms involved, factors affecting natto quality (raw material, soybean cooking conditions, storage), changes during fermentation, trends in research on natto and B. natto (development of novel strains of B. subtilis, purification and characterization of key enzymes, studies into genes encoding key enzymes of B. subtilis, studies of possible physiological roles of natto). Soy nuggets (douchi or hamanatto). Sufu: Preparation, types of sufu, microorganisms involved, effect of mold growth, effect of brine aging.


**Summary:** This full-color Japanese-style cookbook is loaded with color photos showing both steps in the process of preparing recipes and the finished dishes. Contents:

- Basic preparations: Parboiling soybeans, draining tofu, reconstituting Kôri-dofu, removing oil from abura-age, toasting okara.
- 1. Soybean cooking.
- 2. Tofu & natto dishes.
- 3. Other dishes from soybeans. Articles (summary of four articles), Chinese cheese “Furu.” Address: Sc.D. (Doctor of Science), nutritionist, and lecturer at Women’s Junior College of Nippon College of Physical Education.


**Summary:** This vegan cookbook contains a wealth of soy-related recipes. The glossary mentions tofu, soymilk, soymilk powder, tempeh, miso, soy sauce (shoyu, tamari) textured vegetable protein, Chinese condiments (hoisin sauce, Chinese black bean sauce, Chinese brown bean sauce, Szechuan hot bean paste), seitan, soy bacon bits or chips.

In the section titled “Ingredient substitutions,” under “Yeasted products” we read (p. 15): “I can think of no practical substitutes for light miso or certain fermented Chinese products like doufu-ru (Chinese fermented bean curd, which has a strong ‘blue cheese’ type of flavor).”

The recipe for “Buffalo potato wedgies” (an alternative to “Hot wings”) advises: “Dip the crusty wedges into Vegetable Dip (p. 48) -you can add a bit of crumbled, white Chinese fermented tofu (doufu-ru) to make it more like traditional blue cheese dressing or dip.”

Also includes soy-free options for recipes with tofu and soymilk. Address: Denman Island, east of Vancouver, British Columbia, Canada.


**Summary:** The author dedicates this book to Isobel, her daughter, friend and critic, “who can’t pass a day without tofu.”

The Introduction notes that Thailand has a strong and living Buddhist tradition. Since Nature provides plenty of food, Thai cuisine has evolved with a moderate use of red meat, following “the Buddhist precepts on the slaughter of animals.” But many Thais make an exception for seafood, with this charming rationale: “If a fish is stupid enough to swim into a trap and die, then we may as well eat it!”

This book relies heavily on tofu as a meat alternative. The index has 28 entries at “Tofu,” so we will list only a few representative examples below. Contains a wealth of full-page color photos. In place of widely used fermented shrimp and fish pastes, this book uses various salt-fermented soy products such as yellow bean sauce, Chinese bean pastes, fermented tofu in brine, and tempeh (p. 11).

The Glossary defines the following that contain soy: Chili bean paste, fermented tofu, Hoisin sauce, kecap manis, soy sauce (3 types), tempeh, tofu (tao hoo in Thailand);

“The soybean is singularly one of the most important food plants in the world.” Few other food products can match the versatility and goodness of tofu. Incl. firm tofu, soft tofu, fried tofu and “bean curd sheets” or sticks [yuba], yellow bean sauce.


**Summary:** Cha Am is a popular Thai restaurant which opened in Berkeley, California in 1985. This is a very beautiful and strange book. Beautiful because on every other page is a spectacular full-page color photo, showing the prepared recipes, ingredients, and many lovely scenes from Thailand. Strange because the word “vegetarian” is in the title, yet a large number of recipes call for meat or seafood (which have never been eaten by vegetarians) as the main ingredient.

Soy-related recipes include: Tau hoo neng: Steamed bean curd (p. 21). Tao hoo nam daeng: Bean curd stew (p. 27). Tao hoo op moor din: Clay pot bean curd (p. 33). Hoi jor name jim boi: “Seafood” rolls with plum sauce (p. 43; the filling is rolled in “bean curd sheets” [probably pressed tofu sheets, but possibly yuba], each 8 inches square). Tom som Tauhoo: Spicy bean curd soup (p. 63). Tao jiao lon: Spicy fermented soy bean dip (p. 185). On pages 212-13 are full-page color photos of various Thai soybeans and soyfoods.

The section titled “Gluten” (p. 214-17) describes this ingredient. The interesting glossary (p. 221-24) includes descriptions of: Bean curd (tau hoo is soft tofu; tao kwa is firm tofu, used for stir-frying, deep-frying, and braising). Bean curd, fermented (tau hoo yee: the two most common types are red and white. The red variety is cured in a brine with fermented red rice flavored with annatto seeds and rice wine). Bean curd, spongy (deep-frying gives tofu a spongy texture, so it can absorb the flavors of any sauce in which it is cooked a second time). Bean sauce (a seasoning made from fermented soybeans, flour, and salt. There are four popular types: yellow bean sauce, brown bean sauce, black bean sauce, and hot bean sauce. The preferred sauce is made from whole soybeans. The ground varieties are often quite salty). Beans, black fermented (also known as salted black beans, these are small black soybeans fermented with salt and spices. They are delicious when combined with garlic, fresh ginger, or chilies. Note: Fermented white soybeans are called tao jiao). Soy sauce (si iu; These recipes call for the Chinese rather than the Japanese type. The three most widely used soy sauces are light soy sauce [si iu khaol], dark soy sauce [si iu dam], and mushroom soy sauce).

Note: This is the earliest English-language document seen (Feb. 2004) that uses the word “tauhoo” to refer to tofu. Address: Bangkok, Thailand.

**Summary:** Contains a summary review of Taipei Wall Sea Street Taiwanese Restaurant, a full review of which by Ruth Reichl appeared in this newspaper on 24 Feb. 1995 (p. C24). Mentions “fermented bean curd.”


**Summary:** The role of the enzyme in the process of ripening tofu was investigated. “It was found that the digestion of soybean protein progressed as follows: initially, alpha-, alpha-, and beta-subunits in beta-conglycin, and then, the acidic subunit in glycine were degraded. However, the basic subunit of glycine still remained, and some polypeptide bands (around 10 kDa [kilodaltons, a unit of molecular weight]) were formed during the enzyme reaction.” The concentration of ethyl alcohol in the reaction mixtures affected the degradation rate of soybean protein by this enzyme. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.


**Summary:** Discusses: Soybeans (raw, dry, Singapore), soybeans (roasted), soybeans (toasted), green soybean pods, soy protein, soybean sprouts, tofu (raw), tofu (fermented, Singapore), curd (fermented), soy milk, soy cheese, Foo Jook (skimmed, dry supernatant [dried yuba sticks], raw, Singapore), Foo Jook (cooked), Tau Kwa, raw (pressed tofu, raw, Singapore), Tau Pok, raw (fried Tau Kwa, Singapore), bean curd (fried). Daidzein, genistein, glycitein. Address: 1-2. Cancer Research Center of Hawaii, 1236 Lauhala St., Honolulu, Hawaii 96813; 3-4. Dep. of Community, Occupational, and Family Medicine, National Univ. of Singapore, Singapore 0511, Republic of Singapore.


**Summary:** Contains summaries of previous reviews of the Penang Cuisine Malaysia and the Taipei Wall Sea Street Taiwanese Restaurant, described in detail by Ruth Reichl in the 24 Feb. 1995 issue of this newspaper (p. C24). Mentions “fermented bean curd,” tofu, and “fermented black beans.”


**Summary:** Page 63: “Hawkers also appreciated the open balconies of the older estates. They could trundle their carts of delicacies to the entrance and announce their presence and

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their snacks: red bean soup, grilled octopus, pigs' tripe, “tofu fa” (soyabean junket [curds made from soymilk]), “stinky tofu”, dough sticks and special congee. Each hawker had his own special call which was sung or chanted rather than shouted. Tenants living in top floors would then call out their order, lower baskets on ropes with money, and collect their snacks without having to walk down six flights of stairs. Many hawkers made their fortunes from nightly visits to the estates.”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “stinky tofu.”


• Summary: A very attractive book printed on glossy paper with at least one color photo on almost every page. The introduction and essays are by Kong Foong Ling. The index, which is poor, makes the book hard to use if you are looking for particular foods found throughout Asia such as soybeans, soy sauce, miso, salted / fermented black beans, yuba [bean curd skin], etc.


The “Ingredients” section includes: Bean curd (incl. cotton or momen tofu, silken bean curd, deep-fried bean curd or aburage, grilled bean curd or yakidofu, fermented bean curd or nam yee). Bean curd skin [yuba]. Black beans, salted (and fermented). Hoisin sauce (“A sweet sauce made of soy beans, with spicy and garlicky overtones”). Miso (incl. red miso and white miso). Salted soy beans (incl. “yellow bean sauce”). Soy sauce (incl. light soy sauce, black soy sauce, red soy sauce, Kikkoman, tamari, thick sweet soy sauce [kecap manis–Indonesian]). Temphe. Also: Red beans (dried azuki). Seaweed (incl. dried kelp, golden kelp, mozuku, salted dried kelp, laver or nori, wakame). Sesame (black and white seeds, tahini {tahinii}). Sesame oil. Sesame rice crackers.

Beancurd or bean curd is mentioned on pages 12, 29-30, 34, 36, 88, 94, 101, 155.

Fermented bean curd: p. 25.


• Summary: An outstanding book; the color illustrations of many ingredients are spectacular and very informative. The author has an insatiable curiosity.


Soy related entries: Bean curd (p. 26-28, incl. all the different types, yuba, deep-fried tofu types, fermented tofu incl. ch’ou doufu [chou doufu]: “Despite its overpowering aroma, slimy texture, unappetizing color and the unfortunate odor it leaves on the breath, those brave enough to partake of it consider it a delicacy”).

Bean paste, sweet (p. 29. The three colors and types are red {from adzuki beans}, yellow {from mung beans, husked and split}, or black {from black soy beans}. “The pastes are usually available ready-made sweetened in cans. It is possible to make your own, starting out with dried beans.” Name in Chinese: dow sa, tau sa {sweet bean paste}).

Bean paste, yellow (p. 29. Despite what the label says, this thick, salty condiment is brown, not yellow, in color).

Bean sauces (p. 29. “Made from fermented soy beans,” they range in color from yellow to brown to black [sweet black bean paste]. Their consistency is more like a paste that must be spooned from the jar than pourable tomato ketchup.

Beans, salted yellow (p. 31. Canned yellow soybeans which have been salted and fermented.

Beef (p. 31-37 incl. Teriyaki steak, Sukiyaki, Beef with black bean sauce, incl. “2 tablespoons canned salted black beans [soy nuggets]”).

Black bean (p. 43-44. Black soy beans which are fermented and salted. “Some are sold in cans in a salty liquid, others in plastic bags, covered with salt crystals.” Also called “preserved black beans”).

Flours & starches (p. 157-61). Incl. soy flour, which is “used mostly in Japan [where it is called kinako] and China. In Korea roasted soy bean flour and fermented soy bean flour are used to make a variety of bean pastes.”

Legumes & pulses (p. 206-18). A long and interesting section. All entries have a scientific name. Many have an illustration. Those found in many Asian countries (e.g., green bean, green pea) have the name in each country.

Includes: Introduction, adzuki bean, asparagus bean (see winged bean), asparagus pea, black-eyed pea (a variety of cowpea), black gram, blue pea, broad bean, butter bean (see lima bean), chick pea, cowpea (see yard-long bean), fenugreek, green bean, green pea, hyacinth bean (see lablab bean), lablab bean, lentil, lima bean, long bean (see yard-long bean), moong bean (see mung bean), moth bean, mung bean, parkia, peanut, pigeon pea, red bean (see adzuki bean), red kidney bean, rice bean, sataw bean (see parkia), snow pea, soy bean (short entry), sugar snap pea, tamarind, white gram (see black gram), winged bean (China: su-ling dou; India: Goa bean; Indonesia: kecipir; Japan: shikakumame; Malaysia: kacang botor; Philippines: sigarilyas; Sri Lanka: dara-dhambala. Thailand: thu pu). Yard-long bean (this is the fresh bean known by a host of names). Recipes: Adzuki bean soup.

Master sauce (p. 232). “Also known as ‘flavour pot’ or ‘lu,’ this sauce has a base of soy sauce, water, sugar and
Chinese wine or sherry, with a few variable additions...”

Miso (see soy bean products). Mushrooms & fungi (p. 237-40, incl. recipe for Braised bean curd, cloud ear and vegetables, and Braised soy mushrooms). Natto (see soy bean products).

Oils (p. 258-59, incl. coconut oil, gingelly oil [sesame oil], mustard oil, palm oil, palm kernel oil, peanut oil, perilla oil, sesame oil). Note: Soy oil is not mentioned here! Okara (see soy bean products). Salads, incl. recipe for Indonesian vegetable salad (gado-gado), that calls for 4 oz. fried bean curd. Shoyu (see soy sauce).


Tempeh (p. 386). Incl. recipes for Savoury Tempeh and Thai style tempeh. Tofu (see bean curd).

Also discusses: Adzuki bean, agar-agar (incl. almond bean curd, awayuki), almond, amaranth, cowpea, crab in black bean sauce (recipe at crab), daikon, millet, monosodium glutamate (“I would strongly recommend omitting it”), Nonya (pronounced “Nyonya.” The unique cookery found in Malaysia and Singapore resulting from the fusion of Malay and Chinese cuisine during the last century), peanut, peanut sauce, sago (this palm flowers only once in its life, at about age 15. Just before flowering, it builds up a large reserve of starch in the pith. The tree is felled, the pith scooped out, ground and washed to make sago starch), seaweed (incl. agar-agar, hijiki, kombu / konbu, mozuku, nori / laver, wakame), sesame paste, sesame seed, vegetarian meals (“By far the most important vegetarian food in the Far East... is bean curd”). Address: Australia.


* Summary: Contents: Introduction: Soybeans as a crop, composition and nutritional quality of soybeans, soyfoods— from the east to the west, soyfood classification.

Soymilk: Introduction, traditional soymilk, modern soymilk (techniques for reducing beany flavors, commercial methods, formulation and fortification, homogenization, thermal processing, and packaging), concentrated and powdered soymilk, fermented soymilk (with lactic acid bacteria), soymilk composition and standardization.


Fermented soy paste (Jiang and miso): Koji, koji starter, and inoculum (koji, koji starter, inoculum), Chinese jiăng (traditional household method, pure culture method, enzymatic method), Japanese miso (preparing rice koji, treating soybeans, mixing and mashing, fermenting, pasteurizing and packaging), principles of making jiăng or miso.

Soy sauce (Jiangyou or shoyu): Chinese jiăngyou (traditional household method, modern methods), Japanese shoyu (treatment of raw materials, koji making, brine fermentation, pressing, refining), principles of making soy sauce, chemical soy sauce (made by acid hydrolysis; heat with 18% hydrochloric acid for 8-12 hours, then neutralize with sodium carbonate and filter to remove insoluble materials), proximate composition of soy sauce, quality attributes and grades.


Note: For a biography of KeShun Liu PhD see p. 544. Address: PhD, Soyfoods Lab., Hartz Seed, A Unit of Monsanto, Stuttgart, Arkansas.


• **Summary:** Bacillus pumilus TYO-67 has been isolated from tofuyo, a traditional fermented food made from soybean milk in Okinawa, Japan. This bacterium secretes a soybean-milk-coagulating enzyme (SMCE), which is essential for making tofuyo, however reports on this microbial enzyme are very limited, and its properties have not been sufficiently characterized.

This bacterium was found to be the best producer of SMCE, induced by the addition of soy protein to the growth medium. The enzyme was found to be a monomer with a molecular mass of about 30 kDa [kilodaltons] and an isoelectric point at 9.75. The optimum pH for the enzyme was 6.0 to 6.1 and the optimum temperature was 65ºC. The enzyme was significantly activated by the addition of various ions and its thermal stability was significantly increased by the addition of a Ca (2+) ion.

This enzyme can be applied for the production of various processed foods from soy milk, and may also be widely applicable to other food processing. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-213 Japan.


• **Summary:** This edition contains a completely new “Appendix B–Directory of Tofu Makers” (p. 313-316, updated to 1 Aug. 1998). The page “About the Authors” (autobiographical) has been updated, and the original photograph has been replaced with two more recent ones—reflecting the fact that Bill and Akiko separated in Nov. 1993 and their marriage ended in May 1995.

After the first printing in Oct. 1998, the Preface was quite extensively revised (but not updated) to include more about how this book came into being (early dates and names), including the important contributions on Jeffrey and Gretchen Broadbent, and of Nahum and Beverly Stiskin. These Preface changes first appeared in the second printing of May 1999.

On page 336 is “The Best of Vegetarian Cooking from Ten Speed Press” (descriptions of eight cookbooks, with price and ISBN). The inside rear cover has been updated, and now includes current information about SoyaScan, the unique computerized database produced by Soyfoods Center. This database now contains more than 55,000 records from 1100 B.C. to the present, and more than 73% of all records have a summary / abstract averaging 128 words in length. A description of the four different types of records (published documents, commercial soy products, original interviews and overviews, and unpublished archival documents), and the number of each type, is given.

The front and rear covers, title page, table of contents, and the first page of each section have been redesigned to give the book a much more contemporary look. Still contains 500 vegetarian recipes—both western and eastern style.

Ten Speed Press gave this book a new ISBN: 1-58009-013-8. Yet despite the many changes described above, the authors preferred not to have this called a “new edition” or “revised edition.” Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.
• Summary: The writer uses as her guide a new book: The Asian Grocery Store Demystified, by Linda Bladholm. She took the book with her on an excursion to Manhattan’s Chinatown, and discovered the principles by which an Asian market is stocked or organized. “As I made my way, I saw smelled and learned about dried Chinese yam, dried oysters and fermented bean curd.”

• Summary: Expanding into each new country has unique difficulties. “In China, it took Walmart a while to manufacture fermented bean curd.”

Photos show: Sam Walton (once America’s richest man) and the front of a typical Walmart store.

• Summary: An original, well-researched and well-written book—though some of the terminology (such as “beancurd”) is outdated. Soyfood products include: Beancurd noodles (p. 38). Kinako (p. 47). Soy sauce, mushroom soy sauce, kecap manis (p. 53). Hoisin sauce (p. 54).

Chapter 10, titled “Soybean products” (p. 93-99) includes: Black bean sauce, dried soybeans, tempeh, beancurd (pressed beancurd, deep-fried beancurd, savory grilled beancurd {yaki-tofu}, freeze-dried beancurd {koyadofu}, bean curd sheets {yuba}), fermented beans (preserved black beans {tau see}, bean sauce, toen-jang, chili/hot bean sauce, fermented beancurd), okara, edamame, soybean sprouts, soy milk.

Note: This is the earliest English-language document seen (March 2009) that uses the word “toen-jang” (or “toen jang”) to refer to Korean-style soybean jang (miso).

Concerning preserved black beans: “Also called salted or fermented black beans or ‘tau see,’ this is made by steaming small black soybeans, then fermenting them with salt and spices. Used in a variety of dishes to add a pleasant rich aroma and salty taste... Crush or mash beans slightly to release more flavor or mix with garlic, fresh ginger, or chillies. Available in small glass jars, cans, and plastic bags. They should feel soft and not be dried out... Look for Pearl River Bridge brand labeled ‘Yang Jiang Preserved Beans’ in a 1-pound yellow canister, and Koon Chun Sauce Factory, Double Parrot, and Zu Miao Trademark brands all in 8-ounce bags.” Note: This is the earliest English-language document seen (Oct. 2008) that uses the term “tau see” to refer to Chinese-style soy nuggets (preserved black beans).

Concerning bean sauce: “Varieties of this Asian staple include yellow bean sauce, brown bean sauce, bean paste (tau jeong), or sweet bean condiment. All are made from yellow or black soybeans, fermented with salt and in the sweet Northern Chinese type, with sugar-sweetened crushed yellow [soy] beans. Two forms are found: whole beans in a thick sauce and bean paste, which is mashed, ground or pureed beans. The whole bean type has a rounder flavor and adds texture, while the pastes are very salty and should be used sparingly... The yellow bean paste is tau cheo... Sold in glass jars and cans. Look for Koon Chun Sauce Factory, Kon Yick Wah Kee bean sauce, Amoy, or Yeo’s.

Chapter 18, titled “Japanese food products” (p. 168-81) includes: Tsukemono (pickled in miso), miso paste, shiromiso, akamiso, mamemiso, natto, miso soup, noodle dipping sauce base (memmi), tamari sauce, teriyaki sauce, tonkatsu sauce.


• Summary: The 2,650 alphabetical entries in this excellent encyclopedia and cornucopia represent 20 years of Davidson’s work. The 175 illustrations by Laotian artist Soun Vannithone are superb. There are 39 longer entries about staple foods such as rice, noodles, and apples. A comprehensive bibliography provides access to further information. The book does not contain recipes.

Soy-related entries include: Bean sprouts (p. 64). Black beans, fermented (chi, p. 79). Kecap (Indonesian soy sauce, made “basically from soya beans and palm sugar only.” “The word ‘kecap’ has passed into the English language as catchup or catsup and then as Ketchup, which now means something quite different.” p. 429). Ketchup (“probably via the Malay word kechap, now spelled ketchup, which means soy sauce. The word was brought back to Europe by Dutch traders who also brought the oriental sauce itself. The sauce has changed far more than has the word, although the name has appeared in a large number of variations such as catchup and catsup.” Discusses tomato ketchup, mushroom ketchup, and ketchup made from oysters, mussels, walnuts, etc., p. 430-31). Koji (p. 435). Lecithin (p. 447). Miso (p. 509). Natto (p. 530). Soybean (p. 739). Soy milk (p. 739-40). Soy sauce (p. 740).
Tempe (or tempeh, p. 788). Tofu (p. 798-99), including plain tofu (dofu in Chinese), pressed tofu (dofu-kan, sic, doufu-gan), wu-hsiang kan, cotton tofu or momendofu, kinugoshi or silk tofu, sui-dofu, freeze-dried tofu (dried frozen tofu), smoked tofu. Cooked forms of tofu: Deep-fried tofu, doufu pok, cha-dofu, abura age or deep-fried thin slices which can be opened to make Inari-zushi, ganmodoki or deep-fried tofu balls, yaki-dofu or tofu which has been grilled. Fermented tofu: The generic term is doufu-ru. The most popular type is white doufu-ru, and there is red doufu-ru, tsao-dofu, ch’ou doufu [chou doufu], chiang doufu. In the Philippines fermented tofu is called tausi [sic, tahuri, tahuli]. Miscellaneous: A specialty of Japan is umesutsuke, “tofu pickled in plum vinegar with a purple exterior.” Note: As of Oct. 2011 not one hit / result for umesutsuke can be found on Google. Nor have we ever heard of such a Japanese tofu product. Dofu nao (literally “bean brain”) or smooth curds, yuba or “bean curd skin” or “tofu skin,” okara or “presscake” (pulped skins of soya beans) (p. 798-99). Yuba (p. 860-61).


The entry for “Fermentation states that the two main reasons for subjecting a food to fermentation are: (1) To “convert it from a form that will not keep, such as milk, to one which will, such as cheese.” (2) To “make foods which are indigestible in their original state, such as wheat or soya beans, digestible by turning them into products such as bread or tempe.” Other benefits include improvements in flavour. Many do not realize that fermentation is part of the process of making coffee, cocoa, vanilla, and many kinds of sausage. A brief biography and nice portrait photo of Alan Davidson, a man of extraordinary knowledge in the world of food, appear on the rear dust jacket.


• Summary: Translated from the German. Includes headings in Chinese. This book is a feast for the eyes, printed on glossy paper with informative color photos on almost every page. The structure and content are also creative and very interesting; it has caught the heart and spirit and nuances of the culture. On some pages, however, the type is too small to read. The name of most recipes and ingredients is given in their native language. A 2-page map of Southeast Asia appears near the front. The basic structure: Singapore (p. 12-109). Malaysia (p. 110-215). Indonesia (p. 216-301). Glossary (p. 302-04). Introduction to Chinese nutritional theory, by Andrea Fülling (p. 305-06): Introduction, yin and yang, the three warmers, the warming effect of foods (the five energy states are hot, warm, neutral, refreshing, and cold), the five elements. Acknowledgements. Photo credits. Index.

The contents includes: Healing herbs (p. 26-29). Soup as medicine (p. 30-33). Soybean (in Singapore, p. 40-47): Introduction (familiar forms are sprouts, soy sauce, beancurd, tempeh; new disguises are “vegetable protein,” emulsifier,” “lecithin,” “vegetable oil” which are found in dairy products, canned fish, candies, desserts, and much more), in the West soybeans are “often grown as monocultures, with the disadvantages that this entails, such as the use of chemical fertilizers and pesticides,” and genetically engineered soybeans, great nutritional value yet rarely used as whole dry soy beans, most of the harvest in SE Asia is processed into bean curd and tempeh, importance of fermentation, soy milk resembles cow’s milk and is an excellent substitute, soy sauce is used throughout this cuisine. Photo of green soybean plants with green pods.

Soybean sprouts: “Black soybeans are imported from Thailand and Myanmar (Burma).” After washing, the beans are spread out in deep baskets and kept in the dark for 6 days. “Before the baskets of sprouts can be sold, the top layer if green leaves is trimmed off. They are used as feed for chickens and ducks. One basket yields 154 lb (70 kg) and the output of a medium-sized business is 60 baskets a day.” Soybean “sprouts should never be eaten raw, nor should they be cooked for too long.” Mung bean sprouts are better known than soy sprouts, but both can be bought fresh.

Dou ban jiang (“Salted soya bean sauce.” Photo of jar and Sinsin label). Dou chi (“Black bean sauce.” Photo of jar and Sinsin label). Note: Typically Dou chi are named “Salted black beans.” Photo of five glasses showing how dry soybeans are transformed into soy milk, then curds.

Tofu: Meat from the fields (p. 42-44). The best tofu is made from special types of soybeans that are different from those that are crushed to make oil and meal. Most of the tofu in Singapore is made from soybeans imported from Canada. Describes the basic process for making commercial pressed
made with mold cultures of *Aspergillus oryzae*. Describes the process for both light and dark soy sauce; the koji is made in shallow round trays, ready after 4 days. It is “then transferred into fiberglass tanks [or earthenware jars], covered with brine, and left to ferment for 3 months,” after which the 1st extraction of crude soy sauce takes place [but not through pressure]. More brine is added and a second extraction takes place 1 month later; this process is repeated for the 3rd extraction. “At this point, the paths of the different soy sauces diverge.” The saltier, light-colored soy sauce is mixed with a preservative, pasteurized, “and stored in tanks or lotus paste.” Is the sweet black bean filling made from soy beans?

Instant cup noodles [instant ramen] (p. 48): Note: Wikipedia says at Momofuku Ando: ORS [Order of the Rising Sun], (lived March 5, 1910–Jan. 5, 2007) was the Taiwanese-Japanese businessman who founded Nissin Food Products Co., Ltd. He is famed as the inventor of instant noodles and cup noodles, which he launched on 25 Aug. 1958 (at age 48) under the name Chinkin Ramen—after months of trial and error experimentation to perfect his flash-frying method. On 18 Sept. 1981 he launched his most famous product, Cup Noodle.

Beansprouts (p. 154-57): With a long introduction, a description of the process, beautiful photos, and recipes: Taugeh goreng kucai (Fried beansprouts with chives). Taugeh masak kerang (Fried beansprouts with baby clams). Tahu goreng (Fried tofu with beansprouts). Bihun goreng (Fried rice noodles). Urap taugeh (Fried beansprouts with grated coconut).

Nasi tumpeng (rice cone) (p. 220). Served with sambal goreng tempe (crisp-fried marinated strips of tempeh). Gudeg (rice with green jackfruit cooked in a sweet sauce, p. 221) is served with a side dish of tahu goreng bacem (tofu cooked with spices, then fried).

Tempeh (p. 228-29), soybeans fermented with *Rhizopus oligosporus* mold. Indonesians consume more tempeh than tofu. The process is described, with 4 color photos: Recipe: Tempe goreng (fried tempeh).

Glossary (p. 302-04) includes: Fermentation. Soy sauce (“Probably the best-known Asian seasoning agent,...”).

Symbolic foods (p. 98-101): One of these is Moon Cakes from the mid-autumn festival (15th day of the 8th lunar month). “Traditional fillings include sweet black bean or lotus paste.” Is the sweet black bean filling made from soy beans?

Oyster sauce (contains no soy). Sesame oil (p. 49, with 7 photos).

Condiments (p. 50-51): Color photos show the front and label of 15 separate jars and bottles with a substantial description under each. Those containing soy are: Hoisin sauce. Dou chi (Fermented bean dried). Dou ban jiang (Tou cheong). Fu ru (Beancurd preserved). Jang ging (light soy sauce). Wei jiang you (Dark soy sauce). Tian jiang (Sweet sauce).

Peking duck (p. 62-65; soybean paste {no Chinese name is given}) and Hoisin sauce are ingredients in the sauce). One key is the crisp skin. It is served in thin Mandarin pancakes. Suckling pig (p. 86-87): Piglets are bred in Hunan province. Slaughtered at the age of 3-4 months. After a dead piglet has been patted dry, it is brushed with soy sauce, then coated with a marinade that includes fermented red bean curd and light soy sauce. As with Peking Duck, suckling pig is prized for its crisp, tasty skin. Six photos show the skewered baby pig.

Summary: Earlier this week a man in France was served with sambal goreng tempe (crisp-fried marinated strips of tempeh). Gudeg (rice with green jackfruit cooked in a sweet sauce, p. 221) is served with a side dish of tahu goreng bacem (tofu cooked with spices, then fried).
Or did he favor the Hawaiian style spatchcocking them and grilling them on the barbecue with sweet potatoes?”


• Summary: Contains excellent, original and detailed information about fermented tofu (sufu) and soy nuggets (douchi).

Contents: Introduction. Developing history of soybean and soybean foods in China: History of soybean cultivation in China (it began about 4-5,000 years ago), distribution and yield of soybean in China, important role of soybean in Chinese food culture and diet, fermented soybean foods. Present situation of fermented soybean foods in China: Kinds and distribution of Chinese fermented soybean foods (sufu, douchi, doujiang, soy sauce, etc.), processing technology and applied microorganisms for Chinese traditional fermented soybean foods (Sufu—classification of sufu, processing technology of sufu, microorganisms used in mold cultivation, microorganisms used in fermentation; Douchi—same categories). Developing tendency and countermeasure of fermented soybean foods.

Classification of sufu: (1) According to the color and flavor of product: red sufu, white sufu, green sufu, sauce sufu, colored sufu. According to the morphology of the product: biggest rectangle sufu, big sufu, middle rectangle sufu, chess sufu. Based on the type of microorganism applied in the process: bacterium sufu, mould sufu, halophilic pediococcus sufu.

Figures show: (1) The main soybean producing provinces in China (1996): Heilongjiang 31%. Shandong 9%. Henan 7%. Hebei 6%. Inner Mongolia 6%. Jilin 5%. Other 36%.

Tables show: (1) Steps in two types of sufu production: Mould sufu, and halophilic pediococcus production. (2) Species of microorganisms (16) isolated from sufu and the area of sufu production. (3) Characteristics of main kinds of Mucor applied in Sufu-making (for main kinds; for each kind is given: mycelium, sporangiophore, sporangiospore, spore axis, thick spore suitable temperature). (4) Brief introduction to six famous douchi: Four of the six are made using black soybeans (a) Sichuan province, Santai county. History goes back more than 300 years. Made with *Mucor racemosus* mold (naturally fermenting). (b) Sichuan: Yong Chuan Douchi, a famous brand. Made with Mucor mold. History goes back more than 300 years. (c) Hong chang fa douchi. About 60 year history. (d) Yang jiang douchi (Yangjiang douchi), made with *Aspergillus* mold and black soybeans. Note: Yangjiang is a city in Guangdong province, China. (e) Liu yang douchi (Liuyang douchi), made with *Aspergillus* mold and black soybeans. (f) Lin yi shui douchi, fermented with a bacterium. History goes back more than 130 years.


• Summary: Tables: (1) Traditional fermented soybean products in Thailand.

Soysauce (local name *si-iu*).

Soypaste [Thai miso] (local name *tao-chew*).

Fermented soy curd [fermented tofu] (local name *tao-hu-yi*). Made in central Thailand using bacteria, yeasts and molds (*Actinomucor elegans*) on tofu cubes. They are yellowish or red in color. The yellowish product is eaten directly as a relish, whereas the red product is cooked with vegetables or meat. Making fermented soy curd involved three steps: preparing the tofu, molding, and brine fermentation and aging. First a pure culture of the mold is applied to the surface. Then it is incubated at 20°C for 3-7 days. Finally it is aged in brine for about 40-60 days to develop flavor and aroma. Used as both a main dish and flavoring agent. The product is made in small-scale factories, as well as in soysauce and soypaste factories. The composition is given in Table 2.

Fermented whole soybean (local name *thua-nao*). Made in north Thailand from whole soybeans fermented with bacteria [like Japanese natto]. A paste or solid used as a main dish or flavoring.

Imitation fried pork rind (local name *kap-mu-tiem*). Made in north Thailand from fermented tofu. A solid. Used as a snack. Address: Inst. of Food Research and Product Development, Kasetsart Univ., Bangkok 10903, Thailand.


• Summary: The American Soy & Tofu Co. has been incorporated in Massachusetts by Michio Kushi. They hope to raise $15 million and are now raising venture capital. They plan to purchase 18 local tofu makers. The four prospective partners are: American farmers $2.6 million. East West Foundation (Kushi) $2.0 million. Tendre, a maker of frozen tofu from Wakayama prefecture, Japan $1.0 million. Michio Kushi $1.0 million. The company is planning to build a factory in Macon, Georgia, and to make tofu, margarine, and cheese.

Talk with Christine Akbar, who works with Michio Kushi at his home. 2000. Nov. 20. Macon, Georgia is the center for Japanese cherry trees in America; some 200,000 to 300,000 cherry trees now grow there. Mr. Kato who is head of the International Cherry Park Commission in Japan.
wants to disseminate Japanese cherry trees all over the world. His dream is to buy several hundred acres of land in Macon, Georgia, and to plant cherry trees in the form of a huge American flag: Red blossoms for the red stripes, white blossoms for the white stripes, and a 40-acre reflecting pond for the field of blue, with sprinklers coming out for the 50 stars. Each tree will have a donor/sponsor, whose name will appear on a plaque on or by the tree. Mr. Kato is from Wakayama, and he established a connection with the Tendre company which makes frozen tofu there. On the part of this land not used for cherry trees, Mr. Kato and Michio Kushi would like to build a factory to make soy products for the company he has started—American Soy and Tofu Co. Mr. Kato discovered Tendre; they could make frozen tofu in the factory. Aveline discovered the Okinawan fermented tofu named Tofuyo, which she loves; she would like to learn how to make it at the factory. Fred Sternau, who lives and works in New York state, (phone: 914-763-3662) is an old friend of Michio’s, and has a background in the investment banking business with Dean-Witter, is working now to raise the money from venture capitalists in America for the new corporation, and to develop a business plan. Christine thinks that someone else is working to raise money in Japan. Christine thinks that some money has been committed but she does not think that any of it has been “transferred.” “We should know more in one month. It’s just getting started.”

Note: Hiroaki Iwamoto is president of Tendre, Tanabe City, Wakayama prefecture. He holds a patent on his frozen tofu.


• Summary: This is the most important book on soyfoods in China ever written, and it is especially good on their origins and early history in China. It is also one of the best books seen on food in Chinese culture and history.

The section titled “Soybean processing and fermentation” (p. 292-378) comprises 14.3% of the book’s text, and has the following contents: Introduction. Soybean sprouts. Soybean curd and related products: The origin of bean curd, transmission of tou fu to Japan, products associated with tou fu (soymilk, tou fu chiang), toufu curds (tou fu hua or tou fu nao), pressed tofu sheets [ch’ien chang or pai yeh], yuba [tou fu i or tou fu p’ii], deep-fried toufu [yu tou fu or tou fu p’ao], pressed tofu [tou fu kan], five-spice pressed tofu [wu hsiang tou fu kan], plain dried tofu [pressed tofu] [pai tou fu gan], smoked tofu [hsiiun tou fu], dried tofu soaked in brine and fermented [ch’ou tou fu kan], frozen tofu [tung tou fu], making fermented toufu [fu ju], comparison of tou fu and cheese, addendum. Fermented soybeans, soy paste, and soy sauce: Ferments for food processing, fermented soybeans–shih, fermented soy paste–chiang, fermented soy sauce–chiang yu, soy fermentations in China and Japan.

Note: This is the earliest English-language document seen (Feb. 2004) that uses the term “hsun tou fu” [pinyin: xun doufu] to refer to smoked tofu. Soy is also discussed in other parts of the book. Address: Alexandria, Virginia.


• Summary: Table 29 (p. 322) shows a “Family of products related to soybean curd.” The last item in this Fuji (3 Cc = 3 Chinese characters are given). Description: Fermented tou fu. In China it has long been “renowned as one of those special gastronomic delectables that is often irresistible to the aficionado but obnoxious to the uninitiated.” The process for making it is the most interesting of all the products made from toufu, and therefore it deserves a more extensive treatment than the others.

The earliest known reference to fermented tofu is found in the Penglong Yehua [Night discourses by the Penglong mountain], by Li Rihua (who lived from 1565 to 1635). This document [which probably appeared in about 1610]. It says that the people in a particular district in southern Anhui province [in central eastern China] love to ferment toufu in the fall. They wait until it is covered with a hairy coat [of natural mold]. They carefully wipe off the hair and gently dry the cake. Then it is deep fried in hot oil, then drained and cooked with other foods. It is said to have the flavor of yu fish.

In 1680 a more detailed description of making fermented tofu (Fukien-style) appeared in the Shixian Hongmi [Guide to the mysteries of cuisine]. The best time to make this product is in the spring or fall. After the pieces of tofu are covered with a hairy growth, wipe off the hair with a piece of paper. Now make a mixture soy sauce, salt. Grind fresh red ferment, peppercorn, fennel and liquorice; mix the powder with salt and wine. Place the tofu in a jar and add the wine sauce mixture. Seal the mouth of the urn with clay, and allow it to stand for 6 months. The resulting product will have an excellent flavor.

Two other passages in this same book are also of interest. One describes the process for making tsao ju fu (3 CC), i.e. fermented tofu aged in the residual mash of grain wine. The other describes how to make doufu ju (3 CC) “a deep fried ‘stinky’ dewatered tofu. Take good quality [pieces of] tofu and grill in oil. Then cover with a cloth screen to keep out flies and other insects. When a “stinky” odour is developed, fry the pieces again in hot “boiling” oil. The flavor is excellent.

Note: This “stinky” tofu is probably chou doufu.
From these passages we see that by 1680 furu and rafu had apparently become synonyms for fermented tofu.

By the middle of the Qing (Manchu) dynasty (1644-1912; i.e. by about 1780) fermented tofu had begun to be famous nationwide. There was the furu of Suzhou (Suchow, a major city near the mouth of the Yangtze river in Jiangsu province in Eastern China), and there was the furu of Guangxi (Kuangsi, Kwangsi, a province in southern China along its border with Vietnam).

In 1790 the Suiyuan Shidan [Recipes from the Sui garden], by Yuan Mei praises the fermented tofu made in Suzhou and Guangxi.

Technically the most interesting descriptions for making fermented tofu appeared in about 1750 in the Xingyuan Lu [Memoir from the garden of awareness]. It gave five recipes and two different methods. In the second method, the molded tofu is allowed to age in the mash left from the fermentation of wine made from grains.

The molds responsible for converting tofu into fermented tofu in China have been isolated. The most important ones appear to be Mucor sufu, Macor rouxanus, Mucor wutangkiao, Mucor racemosus, Mucor sinensis (later identified as Actinomucor elegans) and Mucor dispersus.

In China, fermented tofu is typically packaged in squares about 3 inches wide and 3/4 inch thick. Because of its high salt content, fermented tofu is used as a seasoning to accompany bland foods such as rice congee or rice, or to flavor other cooked foods.

The next section (p. 328-30) is a “Comparison of tofu and cheese.” There is no evidence the Western style cheese, made by curdling dairy milk with the enzyme rennet, was ever made in traditional China even though dairy products and cheese was "Just like the original, it is made of soy, vinegar, and sesame oil, vegetarian gelatin, vegetarian Worcestershire sauce (“Just like the original, it is made of soy, vinegar, and spices, but without the anchovies”), wakame, wheat germ.


Note: Dr. Huang has been unable to find any mention of fermented tofu in the Bencao Gangmu [The Great Pharmacopoeia], by Li Shizen (1596). Address: Alexandria, Virginia.


milk, like yogurt, from Malaysia). Taotjo. Tempe (tempeh).

“Chee-fan” is described as “Curd-like” [fermented tofu] from China. Main microorganisms: *Mucor* spp., *Aspergillus glaucus*.

Note 1. Taokan (listed under Sufu, above) is not a fermented food. It is the Filipino equivalent of Chinese *doufu-gan* or “pressed tofu.” Filipino fermented tofu is *tahuri* (also spelled *tahuli*).

Table 2, “List of representative microorganisms associated with fermented cereal foods” (p. 74-48) contains two columns: (1) Type of microorganism (and within type, genus and species, listed alphabetically by genus). (2) Food produced.


The section on “Major commercial fermentation processes” includes (p. 752-53) soy sauce (from wheat and soybeans) and miso (from rice and soybeans)

Note 2. Koji, the basis of soy sauce, miso, and saké fermentations, is not mentioned in either of the first two tables. However it is mentioned by name on p. 753. Address: 1. American Inst. of Baking; 2. Prof. Emeritus, Kansas State Univ. Both: Manhattan, Kansas.


• **Summary:** Fiction (historical novel). A matchmaker has found Yun Yun a brutal husband. He hurts her, unsympathetically on their wedding night, and the next two days with him are terrible for her. But she looks forward to the third day when she can return home.

Page 100: “Tipping her bridal guide generously from her own small store of cash, Yun Yun asked the woman to buy some fried sesame dumplings, steamed sponge cakes, and turnip goh for her parents.

“Don’t you mean stinky beancurd and bitter melons?” [symbols of unhappiness] the guide asked.

“Yun Yun understood the woman’s meaning. But Yun Yun wanted to believe, had to believe that her parents had not failed entirely, that when she learned how to please her husband and in-laws, they’d soften, become kind.”


• **Summary:** In Princeton’s Gest Oriental Library are at least four good Chinese-language books on the history of tofu in China—all published after 1983.

Martin found a word *mao-doufu* (“hairy tofu”), which refers to a type of fermented tofu covered with the hairs of a mold mycelium. Address: PhD, Chinese bibliographer, Gest Oriental Library, 317 Palmer Hall, Princeton Univ., Princeton, New Jersey 08544-1005.


• **Summary:** This edition contains an updated “Appendix B–Directory of Tofu Makers” (p. 313-316, updated to 22 Feb. 2001). The copyright page and inside rear cover have also been updated. The preface has been expanded. Numerous other small changes have been made throughout the book.

Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.


• **Summary:** Nigel Slater does not like tofu, but he’s willing to give it a try. “Tofu, dou fu, bean curd, call the stuff what you will, has never exactly been on my shopping list.” Slater quotes from a new book titled *Sichuan Cookery*, by Fuchsia Dunlop, the BBC’s East Asia specialist. Note: Chengdu is the capital of Sichuan province.

“In most Chengdu markets the standard white bean curd is available in several consistencies; there is also smoked bean curd in thin, firm slabs with a honey-brown surface, glossy chunks of firm bean curd which have been simmered in five-spice broth, large squares of ‘bean curd skin’ [probably yuba], sausagel-shaped rolls of bean curd with an Edam-like texture, tender flower bean curd and ripe-smelling fermented bean curd in chilli sauce.”

Slater notes that in Chinese grocery shops in England, one can generally find three kinds of tofu: Firm tofu, smoked tofu, and silken tofu (slithery, “with the texture of a gently quivering custard, and the non-flavour of spring water”).

He gives two recipes from two different books: Fuchsia Dunlop’s home-style bean curd (with “500g block of bean curd”), and Vatcharian Bhumichitr’s tahu goreng (with “4 blocks soft bean curd, each about 5cm square”). The latter recipe comes from *Vatch’s Southeast Asian Salads*.


• **Summary:** This front-page story contains a long interview with Dana Jacobi, author of *Amazing Soy*, plus a large color photo showing ten different types of soyfoods. The writer
has discovered that “there’s a whole lot more to soy than plain tofu.” A sidebar titled “Name that food” is a glossary including: Edamame, silken tofu, miso, tempeh, fermented bean curd, fried tofu balls, yakidofu, yuba, soynuts, soy sauce, soy milk. Contains four recipes from Jacobi’s book. Address: Staff writer.

• Summary: Taipei, Taiwan, Oct. 6–Hsu Wang, age 65, is revered as a puppeteer in Taiwan, where puppetry is a serious business. In the 1950s and 1960s, puppetry was at its height of popularity in Taiwan. Mr. Hsu has always used glove puppets, which have a long tradition in China. Today his audience laughed, oohed and aahed. “A downpour failed to disrupt the show, only compelling some to seek shelter and watch from the corridor of food stalls selling squid soup and fermented tofu.”

• Summary: Continued: Chinese civilization, which is 5,000 years old, has an epic culinary legacy. The numerous tofu recipes and types of special tofu are based on the landscape, environment, and history of this singular nation. Four types of special tofu include iced bean curd, moldy bean curd, blood bean curd, and cured (smoked) bean curd.

Emei mountain (Emeishan) in southwest Sichuan province is sacred to Buddhists, with numerous temples throughout the mountain range. A 3-day supply of food is carried up the hill to the monasteries each day. Iced bean curd, found in this remote area, is made when snowy winter conditions make it difficult to transport food up the hill. An old monk tells of a very nutritious wild plant called the “magic taro.” The taro is mixed with rice flour and cooked into a porridge—a process similar to making soymilk from soybeans. The monks developed the ingenious idea of preserving the taro porridge by ladling it in a layer about 2 inches thick over firm, level snow, then letting it freeze for over a month. Finally they dry the frozen taro in the sun to produce “iced bean curd.” Each brown piece (which is about 7 inches square and 1.5 inches thick) can be stored for up to 5 years. It looks like a little honeycomb and has a neutral taste. However it has the capacity to absorb the flavors of myriad spices, herbs, and sauces, from soya and chili, to sweet and sour. Its versatility gives it a place at every meal. Note: This type of tofu is apparently made without the use of soybeans.

The town of Tanko, set against the northern slopes of Huangshan or “Yellow Mountain (Anhui Province), is revered for its moldy bean curd, which is said to have been a favorite of emperor Zhu Yuanzhang, founder of the Ming dynasty and the first Ming emperor [lived 1328-1398; ruled 1368-1398]. Born into a peasant family, in 1344 he became a mendicant Buddhist monk. While begging for alms, he was sometimes rewarded with moldy tofu. When he became emperor [in 1368], he declared moldy tofu a royal dish. Today this Huangshan delicacy is fermented by using the excess water from the initial process of making tofu. The acidic nature of the water [whey] helps to raise the temperature and humidity of the container. Each piece of moldy tofu is about 3 by 2 by 1 inches, covered with a white mold mycelium, is incubated in large, stacked wooden trays. Since wet and humid weather are naturally conducive to fermentation, moldy tofu is best made during the summer, when the process takes only a few days; in winter it takes twice as long. At the end of the fermentation process, moldy tofu is firmer that regular tofu. “It is, in effect, tofu that has gone bad.” Famous dishes in Huangshan are well known for various tofu specialties, such as Braised moldy tofu–in which the tofu, with its fluffy white mycelium intact, is stir-fried in a wok. But moldy tofu is an acquired taste and, despite its fame, not everyone appreciates its heady, strong flavor.

In the verdant plateau north of Huangshan (Yellow Mountain) is the age-old town of Xidi. Behind the ancient memorial archway is a tofu specialty that marks an agricultural festival. The palm-sized innovation looks like a Western doughnut, but in place of the hole, the tofu is indented at the center on both sides. At the end of the lunar year, the townspeople prepare for the agricultural festival that marks the end of the agricultural year. For this festival, celebrated on the 8th day of the last lunar month, the community preserves the harvest for the months ahead. Meat would be preserved in salt. In Xidi, the same technique has been adopted to the preservation of tofu. Historically these people have traded and traveled by sea over long distances. So they developed a kind of tofu that can keep for days after being cured over woodsmoke. Many small cylindrical cups made of woven bamboo are each lined with a filter cloth. Fresh curds are ladled in until the cup is full. The ends of the cloth are twisted tightly around the top as the whey begins to drain. A weight is then placed on top to press the curds into very firm tofu. Spices like peppercorn, anise, and cinnamon are added to the soymilk before it is boiled. Then common salt is used as the coagulant!

Across China, the methods of tofu preparation reflect the availability of ingredients in that locale. In Xidi, salt is added to the tofu in a cloth filter; it quickly absorbs the liquid in the tofu. This tofu is left outdoors, where it is dried by the sun and wind is a week’s time, leaving behind a yellowish-brown mass. It is now ready to eat. Regular tofu is soft, smooth, and tender; it must be eaten fresh. Cured tofu is hard and old; it can keep for up to 2 years. This method of curing tofu has been handed down for centuries. The people of Xidi (in Zhouxi) are keepers of a rich and ancient heritage.

China has sovereignty over many ethnic minorities, each with its own history and culture—which each has managed to
keep alive. The Miao tribe lives across the Guizhou region. They work hard, love to dance, and have a strong tradition of ancestral worship. Every new year the Miao worship their ancestors and gods by offering sacrifices, at a very important ceremony. They kill a chicken (which is considered a luxury among the hill tribes) and a pig (which they have been fattening for a year). Blood tofu is made only once a year, at the time of the spring festival. The pig is slaughtered and fresh blood is drawn from it. Most of the meat is preserved with salt. Cooking blood tofu is a long and complicated process. First the tofu is crumbled in a large bowl, then ingredients such as lard, peppercorn, and finally fresh pig’s blood are mixed in them kneaded together by hand to form a ball about 5 inches in diameter and pink in color.

The technique of smoking food has special significance in China. In ancient times, the preparation of a royal feast of smoked dishes ranked among the highest tributes paid to royal guests. Using firewood and withered grass, the process of smoking blood tofu, which takes about 20 days, will cause each ball to shrink to about 3 inches in diameter and become dark brown in color, but will preserve it for a long time. After being smoked, it is boiled with cured meat for 40 minutes to add a spicy, hot flavor. This Miao delicacy is used to greet and honor their guests. The villagers have waited a year for this feast.

“Eaten in every corner of China, tofu is inexpensive, nutritious, and readily available... Tofu cannot claim the celestial role of manna from heaven. If anything, it is as down to earth and mediocre as the people who have made tofu throughout the millennia. Yet the unassuming masses cannot deny that bean curd has given them sustenance through hardship. Indeed, it has brought with it a certain taste of pleasure and satisfaction in their lives.”


• Summary: This is a unique color documentary about tofu in China, narrated by John Culkin (with a few English subtitles when Chinese are speaking), written by Zoe Siu Moi Yee and Lo Wing Yi, directed and executive produced by Tely Fung Wing Chuen, with photography by Ko Chiu Lem. Copyright 2000, it was broadcast in Canada in Dec. 2001. The cinematography is very well done, interesting, and often beautiful. Although the narrative contains many errors and much strange and condescending language, it also contains some new information, especially about unusual types of ethnic or regional tofu varieties. However tofu is presented as an ancient, exotic, foreign food, with no suggestion that it might become part of Western diets.

The story begins: In the “epic struggle for survival, one food has emerged the champion of the poor during the centuries of hardship. Inexpensive and yet nutritional, it is the humble bean curd–tofu.” It is “rich in amino acids and anticarcinogens.” “At once a much-needed protein supplement and a veritable health food for the poor, bean curd is an oddity in its own right. And if legend has it right, then maybe tofu is a manna from heaven for the Chinese.

“The mythology of tofu begins with the diminutive and unimpressive soya bean.” In Guizhou province (in southwest China), despite the harsh weather and rough terrain, soybeans grow well. In the village of Shenlin “soyabean constitutes the staple food of the people.” All the families in Shenlin know how to make tofu but only 4 make and sell it (for 1 yuan/catty) to earn a living. One “old woman has devoted her life to the art of tofu-making, not so much for the income as for the pleasure of keeping up an old tradition.” As pasta is to the Italians, so where you find Chinese you will find tofu. Today most of the tofu in China is made from soybeans imported from the USA and South America.

The Chinese greatly enjoy cooking; more than 30 products are derived from tofu. For example, crispy bean curd is used in Chinese hot pots. Pressed tofu is eaten during Chinese New Year in Nanjing.

Two sisters of the Miao minority hill tribe make tofu starting at 8:00 each evening. The first step is to make soymilk, which can provide a “valuable nutrition supplement to children in poverty-stricken areas.” Soymilk must first be boiled thoroughly (usually in a large wok-shaped container) before it is sold at the market. In rural communities, where central heating is a rare luxury, “many Chinese start the day by warming up with hot soymilk and Chinese-style fried doughnuts.” The Miao sisters sell soymilk in plastic bags to make it easier to handle. They make 600 packs each night; it is ready for distribution to retailers at dawn.

When hot soymilk cools, a thin layer forms on its surface. This “looks like a pale wrinkled pancake” and is called “bean curd skin” [yuba]. It is one of the most expensive soya products and only a few good-quality (transparent) pieces can be obtained per batch of soymilk. The rest is considered a lower grade product due to color deterioration which causes the lower layers to gradually turn opaque. Though it is an extravagance, those who love its flavor and texture find it well worth the expense. Modern technology now makes it possible to mass-produce bean curd skin.

“In the half-forgotten village” of Kaili, in Guizhou province, the art of making pressed bean curd still thrives. “Plaster of Paris catalyzes the ingredients and coagulates the soymilk. Surprisingly, the process has no adverse side-effects.” Various local flavoring agents are added, resulting in a line of “dried of products.” Regular flavors include marinated bean curd and pungent bean curd. Exotic varieties include cowhide bean curd and tea-flavored bean curd. These are sold as snacks in local markets.

Curing the tofu with woodsmoke enables it to be preserved for 7 more days. Since the smoking process is time
Chinese greatly enjoy wine, as well as bean curd. “It adds not human beings, but apes, that curd is wrapped in mustard leaves and stored for 12 months” in the tofu down into amino acids. “Sometimes the bean curd is wrapped in mustard leaves and stored for 12 months while fermentation takes place, breaking the protein in the tofu down into amino acids. Sometimes the bean curd is wrapped in mustard leaves and stored for 12 months” to create a special product. In China “it is believed it was not human beings, but apes, that first discovered the joys of fermented food”--according to legends in ancient literature. Chinese greatly enjoy wine, as well as bean curd. “It adds a certain flavor to otherwise harsh rural lifestyles. Here, to make poverty bearable, the saying goes, ‘All you need is one piece of fermented tofu for one meal and a bottle of fermented tofu to last the year.’”

In its heyday, a little village in Anhui province (eastern China) was home to about 200 families “solely engaged in making tofu.” “It is famed for producing the best and most sought-after in China.” Concerning the origin of tofu, “most Chinese generally subscribe to the legend of a certain feudal lord, Liu-An of Huai-Nan. Two thousand years ago, during the Han dynasty, Liu-An searched far and wide for the fountain of youth. He believed he could discover the secret of immortality and turn it into a magic pill. When his valiant efforts failed, he threw his half-finished potion into a river in disgust. Natural plaster in the river chemically reacted with the mythical ingredients. And so it was that the first block of bean curd was bestowed upon humanity.” The legendary location of his famous experiment is where the “tofu village” stands today. The little stream of historic fame still runs through the village. In its water, the people “wash their clothes, clean their shoes, and prepare the beans that will be made into tofu.” One catty of soybeans will yield as much as 3-5 catties of tofu. “The people of this village are content that theirs is the original and authentic recipe for tofu. They have inherited a gift from history.” The myth of Liu-An has secured this obscure little village its place in Chinese history.

Many Chinese use bicycles or walk with a shoulder pole to carry their tofu to the nearest market. Some leave home as early as 5:00 in the morning and walk for 2 hours. Today, mass-produced tofu in China is driving village tofu makers out of business.

Freshness is tofu’s strength, but also its weakness. “Tofu has a short shelf life and cannot be taken on longer journeys. Even the highly pungent preserved bean curd needs to be eaten fresh. This bean curd, with its forbidding coloring and pungent aroma, can only be found in Nanjing. This brown, smoked bean curd is a “dry” variety with a special, and no less enticing smell.” To make pungent black tofu, the beans are ground in a mechanical grinder, the soya mixture is first placed in a U-shaped rattan mold, immersed in a large pot, then marinated in a special sauce (made from a centuries-old recipe including anise, cinnamon, peppercorn, and black sesame seeds, in wide-mouth earthenware vats, 3 feet in diameter) to produce its unique color and flavor. This tofu is part of the famous Qinghai cuisine of Nanjing, named after the Qinghai River. To preserve its unique flavor, it must be steamed before it is rinsed. Aficionados of pungent black tofu “agree with most visitors that its bold smell evokes the odor of football [soccer] shirts after a tough game.” Continued.


• Summary: Chengdu is the capital of Sichuan province. “In most Chengdu markets the standard white bean curd is available in several consistencies; there is also smoked bean curd in thin, firm slabs with a honey-brown surface, glossy chunks of firm bean curd which have been simmered in five-spice broth, large squares of ‘bean curd skin’ [probably yuba], sausage-shaped rolls of bean curd with an Edam-like texture, tender flower bean curd and ripe-smelling fermented bean curd in chilli sauce.”


• Summary: This book focuses on ingredients and essential kitchen tools used in Chinese cooking. For each it gives all or most of the following: Name romanized in Mandarin Chinese and Chinese characters. A glossy color photo of the item. A basic description. Appearance and taste. Method of manufacture. Buying and storing. Culinary uses. 1-2 recipes. The many color photos are very useful, but the index is hard to use

Soy related: Black bean sauce recipe (p. 33). Soy (soy sauce; jiang you, p. 64-67; Recipes are Soy chicken and Soy duck. Mushroom soy sauce is a Cantonese specialty. Chili soy sauce is sold in small bottles). Seasonings section: Oyster sauce (haoyou, p. 79. Soy sauce is a typical ingredient).
Salted black beans (*douchi*, p. 88-89). “They are very popular all over China, especially in rural households in Chinese history, and the ancestor of soy sauce. Indeed the water in which salted black beans has been soaked is often used as a substitute for soy sauce by low-income people, to save money. To make douchi: Boil black soybeans until soft, then soak in water overnight. Steam them for 3 hours the next morning. Inoculate them with *Aspergillus oryzae* mold and ferment for 15-21 days. Then cover beans with a brine solution and alcohol, and allow to mature for at least six months. Then spread them out to dry in the sun. Steam them again until soft and spread in the sun to dry. Repeat the last step one more time. The product is, at last, ready to use).

Black bean sauce (*chizhiang*, p. 90-91). “I have a strong suspicion that commercial black bean sauce {liquidized, salted black beans seasoned with soy sauce, salt, sugar and spice} is a Hong Kong invention concocted mainly for the convenience of Westerners. I cannot remember ever seeing it in China, nor can I find any mention of its existence in any Chinese publication, past or present.” “Commercial black bean sauce is less aromatic that the fresh paste one makes oneself... Some varieties also include added orange peel, ginger, chilies or garlic.” A number of different brands are available. The author uses this only for convenience. “One of the most popular variations is black bean and garlic sauce.” Recipe {served in most non-Cantonese restaurants}: Red bean paste pancakes).

Yellow bean sauce (*huangjiang*, p. 92-93). “Sometimes labeled brown bean sauce or ground bean sauce *mochi jiang*, this is the soybean paste made from crushed or ground, salted and fermented yellow soybeans, which are sweeter and less salty than black beans.” Spices and other seasonings can be added to this basic bean sauce giving many varieties. In different regions of China, seasonings and spices are added in different proportions. Hoi Sin sauce {p. 94} is one example. Guilin chili sauce {p. 95} and Peking Duck sauce {p. 93} are others. To make: Soak soybeans for 16 hours. Then steam until soft. Ferment beans for about 5 days, stirring and turning every other day. Blend into beans salt, sweet glutinous rice wine, and dark brown sugar. Fill a pottery jar with them—not too tightly, nor too loosely. Seal opening tightly then let jar stand for 2 days. Turn jar upside down in a cool, dry place and ferment beans for 3 more months. The beans are now ready to be used as is, or to be ground and blended with additional seasonings.

Hoi Sin Sauce (*haixian jiang* in Mandarin or *hoisin jiang* in Cantonese, p. 95. This very popular Cantonese specialty, also known as “barbecue sauce,” has become almost as popular as soy sauce in most households. To make: Season yellow soybeans with sugar, vinegar, salt, chili, garlic, sesame oil, and red coloring; thicken with flour and water. The author believes that Hoi Sin sauce should not be used with Peking Duck).

Guilin Chili sauce (*Guilin lajiao jiang*, p. 95. Guilin is the capital of Guangxi, located just north of Guangdong {Canton}. To make: Mix fermented and salted beans with fresh red chilies. Then stir in the lesser ingredients: garlic, salt, sugar, and starch. The author’s favorite authentic brand, Mount Elephant, is sold in a rustic brown earthenware pot. Recipe: Chicken cubes with chili bean sauce).

Chu Hou bean paste (*chuhou jiang*, p. 96. To make: Use yellow soybeans, wheat flour, sugar, lard or vegetable oil, and sesame. Recipe: Chu Hou chicken).

Sweet bean paste (*dousha*, p. 97. Although there are red and black sweet bean pastes, they are both made from red beans [azuki beans]. “I discovered this unexpected fact only very recently, while researching this book.” To make basic red bean paste: Gently boil red [azuki] beans in water until soft. Grind to a pulp, then clean and strain them to get rid of the hull / skin; filter and press. To this basic unsweetened paste, mix in crushed rock sugar. For “sweet black bean paste, add additional sugar with lard or vegetable oil, then heat while stirring until the color turns black. Essence of fragrant flowers, such as roses or sweet-scented osmanthus *Osmanthus fragrans; cassia* is usually blended with the black paste, which is shiny black. Sweet bean paste is widely used as a filling for steamed buns *baozi*, cakes and other desserts. “In China, sweet black bean paste is far more popular than the red variety, and as a child, I always preferred the sweeter taste of the former.” Recipe {served in most non-Cantonese restaurants}: Red bean paste pancakes).

Chili bean paste (*toban jiang*, p. 98. This is distinguished from other thick seasonings in that is made from broad beans rather than soybeans. The most delicious product comes from Pixian County, in the Chengdu Plains near Chengdu–the capital of Sichuan province. Recipe: Home-style braised bean curd).

Fermented bean curd (*doufu nai*, literally “bean-curd milk,” p. 102-03. It has often been compared with a strong cheese and is definitely an acquired taste: “you either love it {as does almost everyone in China} or hate it {as does almost everyone else}. But everyone loves it when it is disguised as a seasoning. Also called *jiang doufu*. A legend of its origin states that two immortals told a street bean-curd seller how to make it, starting with molded bean curd. “Since the 15th century Fengdu fermented bean curd has held an excellent reputation.” Today the two leading brands are The Immortals and The Two Immortals. To make it: (1) Make bean curd [tofu]. (2) Lay cubes of bean curd on beds of rice straw for about 5 days in spring or 7 days in winter. (3) Dry the mouldy [moldy] bean curd in the sun, then marinate with salt, sorghum spirit and spices. Mature in brine in sealed
earthware urns for at least 6 months. The two basic types are red and white. The red type, which has the milder flavor of the two, has ground red rice added to it instead of spice. In China, it is most widely consumed for breakfast with rice congee. Recipes: Pork chops with red fermented bean curd. Sichuan-style fried green beans).

Vegetables section: Soybean sprouts (Huang douyu, Glycine hispida, p. 150-51). Soybean sprouts are much more widely used in China than mung bean sprouts. For how to grow at home, see p. 148. Soybean sprouts are almost twice as large as mung bean sprouts both in length and diameter. Soybean sprouts are the main ingredient in Vegetarian stock {p. 71}. Neither soybeans nor their should ever be eaten raw. Recipes: Soybean sprouts salad {with parboiled soybeans}. Assorted vegetable soup).

Under Lotus root (p. 144) is a recipe for Braised pork lotus root that calls for “dried bean curd sticks.”

Under Ginkgo nut (p. 167) is a recipe for Vegetarian casserole {A slightly simplified version of Buddha’s Delight, p. 193} that calls for “3 8 inch long pieces (1 oz.) dried bean curd sticks, soaked.”

Note 1. This is the earliest English-language document seen (June 2011) that uses the term “dried bean curd skin sticks” to refer to dried yuba sticks. The recipe intends to call for “Three 8-inch long dried bean curd sticks.” Later, we are instructed to “Cut the bean curd sticks into short sections,...”

Preserved and processed foods section: Pickles (Jiang cai, p. 185, are vegetables pickled in soy sauce-based hydrolysate).

Bean curd (tofu, doufu, p. 196-99. Bean curd was invented in China “and is regarded as the country’s national dish...” Proof exists that bean curd, made from soybeans, was sold in markets during the Tang dynasty {618-907}. Until the 17th century, bean curd was eaten exclusively by the poor until Kung Xi {1662-1722}, a Qing dynasty emperor, “discovered it while visiting Suzhou in Jiangsu province when he ventured out incognito to mingle with the people in the streets. When he returned to Peking, the Emperor ordered the chefs of the Palace kitchen to produce bean curd dishes. Overnight, humble bean curd became nobleman’s fare and is now popular worldwide.” It is off-white in color. Under “Medicinal uses: The nutritional benefits of bean curd cannot be exaggerated.” Free of cholesterol, it is ideal for combating heart disease and high blood pressure. It is also extremely easy to digest, so it is very good for infants, the elderly and invalids. Recipe: Sichuan spicy bean curd [Ma po doufu]. Fish and bean curd caserole. Stir-fried shrimp with bean curd. Stuffed bean curd {Popular in Canton and with the Hakka people}.

Deep-fried bean curd (youzha doufu, p. 200. Sold in the form of small cubes, large squares, or triangles. Used in soups, stews, casseroles, braised dishes or stuffed triangles). Pressed bean curd (doufu-gan, p. 201. After being pressed it is typically seasoned with soy sauce and a little five-spice, or star anise, or cinnamon).

Dried bean curd skins (fuzhu, fupi, p. 202-03. One kind is a thin flat sheet; the other is rolled into a stick. The sticks require much more soaking before use—several hours or overnight. Recipes: Bean curd skin and asparagus soup. Vegetarian bean curd skin roll).

Tofu (in recipes only): p. 75, 139, 189.

Note 2. This book was first published in Great Britain in 1999 by Kyle Cathie Limited. This is the first U.S. edition. Address: Author and chef, London.


Fermented tofu is mentioned on pages 9, 164 (1 tablespoon red fermented tofu), 167, 193, Contains a glossary of Chinese food and cooking (p. 288-89) which includes an entry for “fermented tofu,” which is sometimes called “preserved tofu or tofu cheese and is used as a condiment or flavoring.”

Photos show: Kung Wo Bean Curd factory in Hong Kong. A soy sauce factory and its canned “Premium Soy Sauce.”

• Summary: Page 398: “Some things about Taipei were exactly the same as when I’d lived there twenty years earlier: the smells wafting from the ubiquitous snack carts offering egg-wrapped pancakes with chili sauce, the aptly named ‘stinky beancurd’ and betelnut wrapped in vine leaves. Open-fronted restaurants served up steaming bowls of soy milk, sweet or savoury, as well as bubbling soups of puffed beancurd and stewed meats.”

• Summary: Contains entries for: fermentation, fermented foods, fermenter (fermentor), fungi, miso, natto, ogi, oncom, shoyu (see Soy sauce), soy paste (see Miso), soy sauce (shoyu), sufu, tempeh, tofu (an intermediate in Sufu production). Address: London.

703. Asimov, Eric. 2002. $25 and under: A Sichuan place...

*Summary:* This is a review of the Chinese restaurant Spicy and Tasty, located at 133-43 Roosevelt Ave., Flushing, Queens. Among the “Best dishes” are Lamb with bean sauce, and Ma-po bean curd.

In Sichuan cookery, “la” refers to the spiciness imparted by chili peppers or oil, whereas “ma” refers to a flowery, tingly sensation imparted by Sichuan peppercorns.

The writer loved “the hot bean paste sauce that encased a whole fish.” “But the spiciness of ma-po bean curd, made with ground pork, gave shape to this otherwise bland dish.”

“The writer loved “the hot bean paste sauce that encased a whole fish.” “But the spiciness of ma-po bean curd, made with ground pork, gave shape to this otherwise bland dish.”

But nothing poses a more difficult obstacle than what is disguised on the menu as ma-la fried tofu. This benign name conceals a fermented bean curd dish that, in Taiwan, where it is prized, is known more accurately as ‘foul-smelling tofu’” [probably ch’ou toufu].

*Summary:* The writer grew up in China: His mother was American born and his father (of Chinese ancestry) was a graduate of Yale Univ. [New Haven, Connecticut]. Describes how his family cook made fuyu [fermented tofu] from fresh tofu at home in China. His wife, Wonona, has selected some recipes using this typical Chinese fermented product: Fried bean curd with chili (“with 2 squares fuyu, also known as fermented soy bean cubes, mashed” and “1 square firm bean cube, cut into 1-inch pieces”). Stewed bean curd with dried fish (with “1 pound silken bean curd, cut into ten pieces,” “½ square fermented red fuyu, mashed,” “½ square fermented white fuyu with chili,” and 1 tablespoon fuyu liquid). Chicken with fuyu flavor. Address: Kings Park, New York 11754.

*Summary:* Tip #3 is “Eat soya products. Studies suggest that soya helps to reduce low density lipoproteins (LDL) cholesterol. Try portions of tofu, tempeh (fermented tofu [sic]), and soya milk.”  
Note: Tempeh and fermented tofu are two completely different foods made from soybeans.


A tofu glossary, gives for each of 16 entries: Chinese characters, pinyin transliteration, English term, how sold and used. Soymilk (doufu, doujiang), tofu flowers (doufu hua, douhua, doufu nao), silken tofu (nun doufu), soft tofu (ruan doufu), firm tofu (ying doufu), pressed tofu (doufu gan), five-spice pressed tofu (wuxiang doufu gan), pressed tofu sheets (baiye, qianzhang), pressed tofu loops (baiye jie), pressed tofu noodles (gansi, doufusi), yuba (doufu pi, fuye), fermented tofu (furu, doufuru), vegetarian chicken, duck (suji, suyia), stinky tofu (cho doufu), tofu puffs {deep-fried} (you doufu), deep-fried tofu (zha doufu). Address: Staff writer.


*Summary:* At last we have the definitive book on Thai cooking. David Thompson, who spent years in researching and writing this book, is the Australian chef at Nahm in London’s Halkin Hotel; before that he was owner of the Darley Street Thai in Sydney.

Recipes include: Stir-fried Siamese watercress with yellow beans, garlic and chillies (Pak bung fai dtaeng; with “2 tbsp yellow bean sauce, rinsed” and “2 tbsp light soy sauce”). “This simple dish can be enhanced with... roast duck and fermented bean curd.”

(Korean kanjang and doenjang, Japanese shoyu and miso, tempe, Chinese sufu), other fermented products (Chinese red rice 'Anka', enzyme foods). Mycotoxin formed during fermentation. Conclusion.

Page 162: “...soybean sauce, kanjiang, and soybean paste, doenjang, have been used in Korea for more than 2000 years and formed the characteristic flavor of Korean cuisine. The term “Shi” [soy nuggets], the Chinese letter indicating meju, first appears in Jiujupian written in the Han period (206 B.C. to 208 A.D.) of China. Bowazhi of Jin (265-420 A.D.) of China describes that Shi [soy nuggets] originated in a foreign country, and the letter is a dialect. Xintangshu of the Tang period (618-807 A.D.) in China names Shi as a special product of Balhai or Bohai (688-826 A.D.), a nation founded by the refugees from defeated Kokuryo (37 B.C. to 668 A.D.).

“It is generally recognized that Koreans were the first to experiment with soybean fermentation, sparking the beginning of the soy sauce culture of the Orient (Lee 2001). Their traditional fermentation technology was so advanced that they taught their techniques to neighboring countries.”

Page 162-63: “Meju [soybean koji], the fermentation starter for Korean soy sauce, kanjang, is made from soybean... The ripening of kanjang mash in the brine is ended in 1-2 months.”


• Summary: This oversized paperback book, loaded with glossy color photos, is an expanded version of the original 1998 edition. The introduction and essays are by Kong Foong Ling. The index, which is poor, makes the book hard to use if you are looking for particular foods found throughout Asia such as soybeans, soy sauce, miso, salted / fermented black beans, yuba [bean curd skin], etc.


The “Ingredients” section (p. 10-17) includes: Bean curd (incl. cotton or momen tofu, silken bean curd, deep-fried bean curd or aburage, grilled bean curd or yakidofu, fermented bean curd or nam yee). Bean curd skin [yuba]. Bean curd skin [yuba]. Black beans, salted (and fermented). Hoisin sauce (“A sweet sauce made of soy beans, with spicy and garlicky overtones”). Miso (incl. red miso and white miso). Salted soy beans (incl. “yellow bean sauce”). Soy sauce (incl. light soy sauce, black soy sauce, red soy sauce, Kikkoman, tamari, thick sweet soy sauce (kecap manis--Indonesian)). Tempheh. Also: Red beans (dried azuki). Seaweed (incl. dried kelp, golden kelp, mozuku, salted dried kelp, laver or nori, wakame). Sesame (black and white seeds, tahina [tahini]). Sesame oil. Sesame rice crackers.

Korea (p. 109+). Page 110: There are also many fermented pastes and sauces for dipping, called chang. Every restaurant and home has its own formula for making chang. Based on a fermented mash of soy beans, the three most common varieties are kan chang (dark and liquid), daen chang (thick and pungent), and gochu chang (fiery and hot).

Soynbean is mentioned on pages 8, 11, 68, 89.

Beancurd or bean curd is mentioned on pages 10, 11, 26, 32, 33, 35, 36, 40-42, 68, 70-71, 74, 89, 90, 92, 93, 94, 96, 100, 102, 104, 107, 111, 112, 113, 119, 120, 127, 133, 158, 172, 175, 185, 189, 190, 191, 192.

Bean curd skin [yuba] is mentioned on pages 11, 35, 36.

Bean paste and bean paste sauces, p. 8, 32.

Fragrant soy sauce is mentioned on page 128.

Also: Red bean paste, p. 46 (canned, azuki).


• Summary: This is a superb, massive, beautiful and unique book--a wholistic study of food in Thai culture overflowing with lovely and expressive color photos by Earl Carter.


Introduction: The author has written this book, in part, to describe this ancient cuisine which “reached an apex in the last decades of the 19th century,” and “before it is eroded, altered and modernised.” The transliteration is phonetic; it is not the official system devised by King Rama VI.

The section titled “The importance of Buddhism” (p. 38-40) in Thai cookery and culture states: “It is the obligation of every Thai male to become a monk for at least three months, usually around the age of 20...” This a rite of passage from childhood to adulthood, and acquaints each young man with the basics of Buddhism and meditation. Strict Buddhist
abstain from eating meat and “there is a strong tradition of vegetarianism in Thailand.” Meat does not have a primary role in the Thai diet and most Thai believe that forgoing meat earns merit for themselves or another. Some give up meat once a week, or for a prolonged period, or even for an entire year.

Chapter 6, “Ingredients and basic preparations,” discusses the following: Bean curd (dtor huu): There are several types, from firm to soft. The author prefers the softest kind, sometimes called “silken bean curd.”

Fermented bean curd (dtor huu yit): Of Chinese origin and fermented with a red mold, it is sold in small jars and comes in two types: “very red, or creamy white veined with pink. The author prefers the latter, which is more versatile and subtle.

Fermented soy bean (tua nao): This ancient fermented product was once used extensively in Thai cookery. But it as largely been replaced by shrimp paste, so it is not so common now. “Before tua nao is used in a recipe, it is grilled or toasted, then ground.”

Soy sauce (nahm siu ua): A lighter-style soy sauce is generally preferred by Thai cooks. “Sweet Indonesian soy sauce (kecap manis) is used only occasionally. Yellow bean sauce (dtow jiaiw): “This is a sauce based on yellow soy beans, which are salted and then fermented with rice mould... [it] tastes delicious, very much like Japanese miso.” Its use usually indicates a dish of Chinese influence. There are two basic types: “the first, and more traditional is creamy white; the more common one is honey brown.”

Peanuts and wing beans [winged beans] are also discussed in chapter 6.


• Summary: On 7 Aug. 1942 Japanese planes dropped anthrax on a town in China. Yalin Zhou recalls that it was beautiful as it floated down, like willow pollen or flowers, flowing with the wind.

But at midnight on that same day, “in the village of Tangjia in Zhejiang, CaiQiu Tang woke up screaming. Her pillow was wet with blood... The skin on my face had rotted and turned black, and my flesh was all pulpy like fermented tofu. All the teeth on one side of my face had fallen out...”

This is the story of Japan’s secret Unit 731 of the Japanese Kwantung Army in Manchuria, organized in 1936, that conducted experiments on people living in China and Manchuria in order to try to perfect germ warfare (biological warfare). It is one of the largest and yet least known of the crimes against mankind.


• Summary: Angiotensin I-converting enzyme (ACE) inhibitory activity was observed in a tofuyo (fermented soybean food) extract. Address: 1-3, 5. Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 902-0213, Japan.


• Summary: The Flower Drum, the most famous restaurant in Melbourne, and perhaps in all of Australia, opened in 1975, founded by Gilbert Lau—who was born and raised near Canton. The menu is fundamentally Cantonese, but open to other influences, including many of Australia’s unique and delicious ingredients.

One dish is a lamb clay pot, “starring a cheap cut of Australia’s favorite meat, called the flap, made tender by long cooking in moist heat, with fermented bean curd that tasted vaguely like cheese, and spinach plunged into the broth for just a moment. Delicious. So delicious that customers from Hong Kong come in and order 20 pounds to go.”


• Summary: An overview, with two chapters on fermented soyfoods (natto and miso) cited separately. Chapter 1, titled “History of fermented foods” (p. 1-25) includes brief and vague histories of “Soy foods” including (p. 18-19) soy
Chapter 4, titled “Kefir: A fermented milk product” (p. 77) states that kefir can be made by growing kefir grains in soybean milk (Abraham and de Antini 1999, p. 327-33).

Chapter 9 is “Natto—A food made by fermented cooked soybeans with Bacillus subtilis (natto)” (p. 227-245).

Chapter 11 is “Miso: Production, properties, and benefits to health” (p. 277-87). Chapter 12 is “Korean fermented foods: Kimchi and doenjang” (p. 287-305). Soyfoods mentioned on page 289 include ganjag (soy sauce), doenjang (fermented soybean paste), chongkukjang (quick fermented soybean paste), and gochujang (hot chili pepper soybean paste); each of these is a major condiment in Korean cuisine.


• **Summary:** A recipe for Spinach and tofu calls for “2 tablespoons spicy fermented tofu” (p. 106).

Address: Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.

Address: Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.


• **Summary:** Contents: Introduction. Soybean oil. Traditional soyfoods: Nonfermented soyfoods (soymilk, tofu, variety and current market, nutritional value and health benefits, general processing, soymilk film {yuba}, okara, soybean sprouts, vegetable soybeans, roasted {soynuts} or cooked whole soybeans), fermented soyfoods (fermented soy paste {jiang and miso}, soy sauce, Japanese natto, tempeh, sufu or Chinese cheese, soy nuggets {douchi or Hamanatto}). Soy protein products: Soy flour, soy protein concentrated, soy protein isolate, textured soy proteins. Modern soyfoods. Soy-enriched products. Functional soy ingredients / dietary supplements: Soy lecithin, oligosaccharides, isoflavones, tocopherols, phytosterols, trypsin inhibitors.


Tables: (1) Classification of various edible soy products in the current market. Address: Univ. of Missouri, Columbia, Missouri.


• **Summary:** This is a guidebook to 53 of China’s most popular destinations. Each Chinese word, term or phrase is written in both pinyin (with tones included) and Chinese characters (CC).

The section on “Shaoxing” discusses Chinese wine, spirits, and food at length. Under “Food and restaurants” (p. 343-44) we read: “Shaoxing’s preserved tofu (shaoxing furu + 4 Cc) takes tofu and preserves it in Shaoxing wine, giving it a mellow flavor... Shaoxing stinky tofu (shaoxing youzhachoudoufu + 6 Cc) tastes better than it sounds or smells; it’s particularly good deep fried.”


• **Summary:** The subtitle (on the cover only): “The 40-day health experience that will change your life forever.” Another anti-vegetarian, occasionally anti-soy, pro-meat book. He states that soy is “an inferior protein” and calls vegetarian eating “The Hallelujah Diet.” Mr. Rubin claims that phytic...
acid in soy is toxic, and that only fermented forms of soy are safe. He claims that Asians eat tofu mostly in the form of fermented tofu (a preposterous claim) and that this is the only way to consume it, because the phytic acid is toxic and has to be destroyed in the fermentation process. He attacks vegetarians as well as vegans because of an “anemic history of health.”

Note: The author lists his credentials on the book’s title page and cover as “N.M.D., Ph.D.” According to the website “Quackwatch,” his NMD (naturopathic medical doctor) is from the School of Natural Medicine at the Peoples University of the Americas (link), a nonaccredited school with no campus. His Ph.D. is from the Academy of Natural Therapies (link), a nonaccredited correspondence school that the State of Hawaii ordered to close last year (link).

In addition, his CNC (Certified Nutritional Consultant) comes from the American Association of Nutritional Consultants, whose only requirement for a “professional member” status has been payment of a $50 or $60 fee. “The CNC requires passage of a test based mainly on the contents of books that promote nutrition quackery. Rubin’s book, ‘The Maker’s Diet,’ is number 14 on the New York Times list of hardcover advice books.” Address: Palm Beach, Florida.

• **Summary:** The section titled “Preserved tofu” includes: Tofu preserved in soy sauce with garlic (p. 82). Tofu preserved in miso (p. 82). Tofu preserved in herb oil (p. 83). Tofu preserved in kochujang (p. 82).

• **Summary:** “Night markets can be found throughout the city, with... food carts selling such favorites as oyster noodles and stinky tofu, a fermented bean curd.”

• **Summary:** A very attractive, complex character, Chinese-language edition of The Book of Tofu (2nd ed. Ten Speed Press). Address: 1. Soyfoods Center, P.O. Box 234, Lafayette, California 94549.


**Summary:** Tainan Restaurant, 218 Barber Court, Milpitas (p. 61) is a Taiwanese street-food cafe that offers “deep-fried ‘stinky’ tofu.”

At Sunset Super (p. 254-55), located in Outer Sunset (2425 Irving Street, between 25th and 26th Avenues in San Francisco. Phone: {415} 682-3738) the aisles are packed with preserved foods of every variety, some identified only by Chinese characters. Among these you will find “jars of preserved tofu [probably fermented tofu] in a whole range of treatments.”

The word “tofu” appears on 15 pages in this book: 52 (“cold tofu salads.” “Spicy Bean Curd Beef”), 57 (“classic Preserved Egg with Tofu plate”), 58 (“a variety of lamb, beef, seafood, and tofu selections”), 105 (“fried tofu (aburage)”), 110 (“a delicious tofu soup”), 111 (“bean sprouts, tofu,...”). Pyung Chang Tofu House, 4701 Telegraph Ave., at 47th St., Oakland... “silky tofu”), 112 (“Yoo devotes great care and attention to everything that arrives at your table, from the house-made kimchee to the locally produced tofu in the soon doo boi”), 113 (“kimchee jigae {spicy tofu soup}”), 262 (“freshly made tofu” at San Jose Tofu Co., 175 Jackson St., San Jose. Phone: {408} 292-7026), 291 (“Amidst the smoked tofu dip”).

Clams with black bean sauce (p. 51). Address: San Francisco Bay Area, California.

• **Summary:** This is a truly remarkable book—the most original and comprehensive book seen to date on the food plants, plant foods, and the economic botany of China. It is the author’s supremely valuable life’s work.


On the inside front cover and facing right-hand page is a large map of China, with each province shown, and the localities of Shiu-Ying Hu’s botanical activities in China clearly show in symbols: white triangle = before and white circle = after 1950. A black triangle or circle = staying 8 or
more years. In each triangle or circle is a number, keyed to a list of the names of 65 localities. She did more research in southern China than in northern.

There is no country in the world today “where the value of useful plants is more thoroughly appreciated than in contemporary China” (p. vii, Foreword 1).

Dr. Hu is an expert taxonomist and economic botanist. She “draws on the fields of plant taxonomy, morphology, economic botany, pharmacognosy, and phytochemistry to name a few, yet the text is far from a dry recitation of facts and statistics. What brings the work to life are the numerous anecdotes and personal experiences she shares. Indeed, this latter element gives the book the aspect of a personal memoir.” “The major divisions... are taxonomic and within each division the plants are arranged alphabetically by scientific name. Also provided are the names in Chinese characters, the transliteration in English of both the Putonghua and Cantonese pronunciations for the Chinese names, common names in English, and a brief commentary” (p. ix-x, Foreword 2).

“The food plants of an area provide the material basis for the survival of its population” and furnish inspiration for its cultural development. “In China, 1,156 species and 274 varieties and/or cultivars of food plants have been recorded and are used” by the people. The preparation of this work began in 1957 and a compilation was distributed at the Ninth Pacific Science Congress. Born in 1908, the author entered a boarding school in Xuzhou, Mary Stevens Girls’ High School, run by Presbyterian missionaries. In like manner she went to Ginling College, a small liberal college of arts and sciences in Nanjing. After college she entered Lingnan University (formerly Canton Christian College) in Guangzhou, from which she graduated with the master of science degree in June 1937—a month before the Marco Polo Bridge Incident on July 7, 1937, when the Sino-Japanese War broke out in Beijing. She fled to Chengdu, Sichuan, where in Jan. 1938 she accepted a teaching position in the Department of Biology, West China Union University–also a missionary college. In the late 1930s and early 1940s, Hu had botanized in western Sichuan at a time when only a few men (notably Armand David, Joseph Rock, and E. Wilson) had explored that region. During summer vacations, she took students to botanize around Muping. At West China Union University, Hu continued her field studies, taught courses in botany, and was elected president of the International Women’s Club. The vice president of the club, who was a Radcliffe graduate, applied to Radcliffe for a fellowship for Hu.

She left China on 2 Aug. 1946 for graduate work at Radcliffe College; it was like a metamorphosis—the United States was a completely new world. In 1946 she was offered a graduate fellowship for a doctorate (PhD) program at Radcliffe College under Prof. E.D. Merrill, then Director of the Arnold Arboretum (Harvard Univ.) from 1935-1946. Her doctoral dissertation on the genus Ilex (Aquifoliaceae) was carried out at the Arnold Arboretum under the direction of E.D. Merrill. After completing the requirements and finishing the dissertation for a doctorate degree at Harvard, in April 1949, she became the herbarium assistant at the Arnold Arboretum. From 1953 to 1957 she worked on the Flora of China Project at Arnold Arboretum. Among other things, she became famous for her Chinese dinners with staff and students alike. She officially retired from the Arnold Arboretum on 30 June 1976.

Dr. Hu returned to China in July 1975, after 29 years abroad. Since the normalization of diplomatic relations between the USA and China in 1978, she has made many trips to China, and travelled studied extensively (p. xi-xii, 12-14). As of Aug. 2011 Dr. Hu resides in Hong Kong and is closely associated with the Chinese University of Hong Kong.

A photo (Fig. 1) shows the author in 1941 as a young lady in Tibetan attire; she spent summers in the area formerly called “Eastern Tibet.”

Fig. 34, an illustration composed of seven superb line drawings (each with a scale) showing the soybean plant, a flowering branch, the front view of a flower, a lateral (side) view of the same, a fruit (pod with 2 seeds) with one side of the pericarp (outer pod) removed—showing the seeds, a soybean seed showing the acentric hilum, the micropyle and the hypocotyl ridge, soybean sprouts from a market showing the smooth fleshy cotyledons, the hypocotyl and the very small plumule.

Fig. 35. Four black and white photos showing: (1) Two round trays of koji, made of cooked soybeans, roasted wheat flour, and fungal spores, in shelves, to be used for making soy sauce. (2) Large earthen jars with convenient hat-like covers, containing the koji, salt and water, placed in the yard of the jiang-yuan (2 CC = Chinese characters given) (“jiang garden”), exposed to the sun during the day and dew at night, covered only when it rains and stirred occasionally. (3) A man stirring hot soymilk in a large shallow cauldron before adding pulverized calcium sulfate for precipitation of the soybean protein, used to make tofu. (4) A wooden frame [curding box], lined with cloth for filtering the coagulated protein and solidifying the mass (under small pressure) to make bean curd.

Soybeans (Huang-dou, 2 CC). Before World War II, the United States was a net importer of soybeans; now she is a net exporter. “Although soybean products have entered American supermarkets, several Chinese uses of soybean can introduce more variety and tastier food into many homes (Figure 35). Included... are: green immature soybean, soybean curd, soybean sheets [pressed tofu sheets], firm bean curd squares [pressed tofu], soybean skin [yuba], and soybean sprouts.” With the exception of soybean sheets, all these items are available in Chinese American grocery stores. “The Food Plants Research Institute, Amherst,
Massachusetts, is in the process of introducing soybean sheets (3 CC) to American markets (p. 118-19).

Hordeum vulgare L. var. vulgare–Barley Da-mai (W.-G. Ta-mai) (2 CC, ‘big grain’), “... also ground with sorghum and soybean for a coarse, healthy, fiber bread flour.”

Glycine max (L.) Merr—Soybean. Da-dou (W.-G.: Ta-tou). (2 CC) (‘giant bean’), Huang-dou (W.-G.: Huang-tou). (2 CC) (‘yellow bean’). “Seed mixed with gao-liang (kaoliang) and barley, ground together for flour, used to be the staple of the rural population in the Yellow River Region; soaked, cooked with salt, served as tidbits in northern China; used as source for all the following forms of Chinese food” (p. 474).

Dou-you (W.-G.: Tou-yu). (2 CC) (‘soybean oil’). Cooking oil extracted from the soybean. (p. 474). Address: Botanist, Arnold Arboretum, Harvard University; Honorary Professor of Chinese Medicine, The Chinese University of Hong Kong.


• Summary: This is a truly remarkable, original and comprehensive book. Bean curd cheese is called dou-fu-ru (tou-fu-ru) (3 CC = Chinese characters given) “bean curd milk.” Unlike bean curd, it is “soft and aromatic, used as a dip, a spread, or an ingredient in cooking.” It is made from cubes of bean curd 3 cm on a side. These are placed in a single layer “on flat trays which are stacked on shelves in a closed room to ferment. When white mold grows up to 2-3 cm thick over the bean curd, salt and spices” and/or coloring matter are added and “the mixture is placed in an earthenware urn for aging.”

“The common type of bean curd cheese is chou-dou-fu-ru (4 CC) (rotten bean curd cheese) which appears gray and soft, and each square covered with a thin, slimy film. The Chinese people eat it as a relish, and in America it is served on crackers as an hors d’oeuvre. A similar type is la-dou-fu-ru (4 CC) (hot rotten bean curd cheese), which is seasoned with red hot pepper flakes or powder before aging. A milder type appears brown. It is prepared by adding powdered, red fermented rice [hong zao / ang-kak], salt and spices to the bean curd before aging. The finished product is firmer than the common gray type, and it has a special aroma. It is called nan-ru (2 CC) (southern bean curd cheese), and is used not only as a relish, but also for cooking a special chicken dish, nan-ru Chicken. All three types of bean curd cheese are available in American Chinese [grocery] stores, either in bottles or in cans (p. 36).

Zygomycetes (pronounced zy-go-my-SEE-teez)–Rhizopus stolonifer is the white mold used to make dou-fu-ru (Bean curd cheese). In “home-made bean curd cheese, airborne spores of the fungus germinate and grow on the bean curd, completely covering it with the white mycelium; spices and salt added afterward” (p. 262).

Fungi–Ascomycetes (pronunciation as-ko-my-SEE-teez)–Monascus purpureus Went. (1) Hong-ku (W.-G. Hung-ch’u) (2 CC, red brewer’s yeast [sic, it is a fungus / mold]). (2) Hong-zao (W.-G. Hung-tsoa) (2 CC, red fermented grain [also called ang-kak]). “Mycelium and spores of fungus and fermented rice grain; used to cook chicken, prepare brown-red [brown or red] bean curd cheese, or to color pastry” (p. 263).

Dou-fu-ru (W.-G.: Tou-fu-ru). (3 CC) (‘bean curd cheese’). “Soft products of bean curd prepared after fermentation of Rhizopus (for the gray types) or Monascus (for the red types)” (p. 474). Address: Botanist, Arnold Arboretum, Harvard University; Honorary Professor of Chinese Medicine, The Chinese University of Hong Kong.


• Summary: In Chapter 7, “Enjoying life,” in a section titled “Old section walking tour” we read (p. 180): “... or hold your nose past a chou doufu (‘stinky tofu’) stand. Enjoy it all. This is the Real Thing.” But watch out for pickpockets.”

Note 1. The Chinese Communist Party (CCP) was as founded in the anti-imperialist ferment of foreign-controlled Shanghai (p. 8).

Note 2. Rebecca has lived in China for 11 of the past 15 years, including 5 years in Shanghai. She has now returned to the USA to live with her husband and their daughter.

Address: 1. USA.


• Summary: The first edition of this remarkable book (1999) is already a “classic.” “Alan Davidson famously wrote eighty percent of the first edition, which was praised for its wit as well as its wisdom. Tom Jaine, editor of the second edition, worked closely with Jane Davidson and Helen Saberi to ensure that new contributions continue in the same style... The text has been updated where necessary” and there are many new entries. The front matter, which is 10 pages longer, begins with “Alan Davidson: A tribute” (p. viii; he died in 2003) followed by a “Preface to the Second edition” by Tom Jaine. Entries in the 1st edition are generally on a different page in this edition. Tofu, for example, formerly on pages 798-99, is now on pages 801-02; however the information is the same. The marvelous illustrations in both editions are by the same artist. The last page of this edition is page 907 compared with page 902 in the 1st edition.


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for roasting or braising meats, it contributed color as well and is slightly sweeter in taste. Used as a browning agent dip. “Black soy sauce is darker, thicker and richer in color, thinner, and is used as a seasoning in cooking and as a table black soy sauce. Regular soy sauce {light} is saltier and seasoned soy sauces for seafood and chili soy sauces”).

Yellow bean paste (“tau cheo in Hokkien is also known as fermented bean paste or black bean paste and is similar to Japanese miso”). Address: Freelance writer, artist and cook, Penang, Malaysia.


• Summary: A colorfull book with marvelous, creative illustrations. The recipe for “Pork and taro bowl” (p. 28) has a headnote which begins: “This is a festive Hakka dish, obligatory for every Hakka celebration... Red preserved bean curd (nam yee) has a pungent flavor rather like strong cheese. It comes in cubes packed in jars or bottles and is available in Asian food stores.” The recipe calls for “2 tablespoons red preserved bean curd (nam yee).”

Note 1. This is the earliest English-language document seen (Oct. 2010) that uses the term “red preserved bean curd” to refer to a type of fermented tofu.

The recipe for “Five spice rolls” (p. 29) notes that these rolls are a Fukieneese favorite. “Dried sheets of bean curd skin [yuba] are traditionally used to wrap them and can be bought from health food stores or Chinese grocers.” The recipe calls for “4 large sheets dried bean skin.” The directions read: “2. Wipe the dried bean curds skins with a damp cloth to soften them, then cut the sheets in to sixteen 6-inch (15-cm) squares. Set aside.

The recipe for “Good luck ’spring rolls” (p. 45) calls for “10 sheets dried bean curd skin.”

The recipe for “Braised assorted vegetables” (p. 52) is an adaptation of the traditional Buddhist vegetarian dish Lohanzai. Popular additions include “dried bean curd sticks.” The basic recipe calls for “1 tablespoon red preserved bean curd” [nam yee].

Six recipes call for “black soy sauce.”

In the “Vital ingredients” section [glossary] (p. 134-41) are entries for the following soy-related ingredients: Dried bean curd skin [dried yuba]. Hoisin sauce (a sweet brown sauce based on yellow soybeans), Hot bean sauce or chili bean sauce (”a smooth red sauce made from yellow bean sauce mixed with chilies”). Oyster sauce (contains soy sauce). Preserved bean curd (“has the consistency and pungency of strong smelling cheese.”) The two main varieties are red (colored with red rice) or brown; chili and rice wine are often added. “Red preserved bean curd (nam yee) has chili and hoisin sauce added to it during fermentation”). Soy sauce (The two main varieties for cooking are light and black soy sauce. Regular soy sauce {light} is saltier and thinner, and is used as a seasoning in cooking and as a table dip. “Black soy sauce is darker, thicker and richer in color, and is slightly sweeter in taste. Used as a browning agent for roasting or braising meats, it contributed color as well as flavor. Also available are mushroom-flavored soy sauces, seasoned soy sauces for seafood and chili soy sauces”).

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has about the same quality as beef, but lower than that of eggs or milk. While noting that about 85% of all soybeans are genetically engineered, she fails to mention that most traditional soyfoods in the USA are made from organic, non-GE soybeans. She discusses the important part that soy plays in the Okinawan diet, where the people have the highest longevity in the world. Yet soy “should be viewed as part of a diverse diet, not as a nutritional silver bullet.” We heartily agree. She lists the many traditional soyfoods (p. 231-32), made basically the traditional way, including: Bean sauce (jiang), miso, natto, soy milk (non-industrial), soy sauce, sufu (fermented tofu, incl. Filipino tahuri), tofuyo (fermented tofu from Okinawa), tamari (liquid left after miso is made), tempeh, tofu, and edamame. She recommends that we avoid modern soy protein products made from defatted soybean meal (typically extracted with hexane solvent), including soy protein isolate, “industrial soy milk,” soy based infant formula, and soy sauce which uses defatted soybean meal instead of whole soybeans. But what would she do with all the oil left over after using whole soybeans?

Concerning a diet rich in fish, meat, and poultry. She partly ignores the ethical issues involved in killing billions of those animals each year and the environmental issues involved in raising them. These are both huge issues. Several complex issues that she addresses head-on and in a fair, interesting way: (1) Is milk good for humans (p. 39-86).

One of the basic hopes / agendas behind this book is partly ignores the ethical issues involved in killing billions of those animals each year and the environmental issues involved in raising them. These are both huge issues. Several complex issues that she addresses head-on and in a fair, interesting way: (1) Is milk good for humans (p. 39-86).

One of the basic hopes / agendas behind this book is that people will start to leave cities, buy a piece of land (as the author’s own family did when she was age 2), grow their own food and raise their own animals for milk, meat, and eggs. There is a steadily growing number of books advocating this traditional way of life.

The Glossary (p. 306-15) contains many good definitions that most people will be able to understand. The bibliography (p. 316-21) is substantial, and there are also endnotes (p. 290-303) but the book would be better if more of its controversial or historical statements cited authoritative sources. Address: USA.


Tables: (1) Dipicolic acid in natto and Bacillus subtilis natto. (2) Fibrinolytic activity in human plasma after the intake of natto. (3) Expired gas and intestinal gas after intake of tempeh. (4) Isoflavone content in tempeh. (5) Antioxidation activity of the aromatic components of shoyu (soy sauce). (6) Functional effects of melanoidine contained in shoyu (soy sauce) and miso (soybean paste).

Figures: (1) Graph of the effects on O-157 as a result of the addition of natto bacillus. (2) Graph of the effects on H. pylori (Sydney strain) resulting from the addition of natto extracts. (3) Photo of fibrinolytic activity of natto. A piece of natto commonly sold on the market was placed in a petri dish with artificial thrombus. (4) The molecular structure of nattokinase. (5) Photo of fibrinolytic activity of nattokinase. (6) 3 graphs of changes in the fibrinolytic parameters in the blood after oral administration of nattokinase to human volunteers. (7) Graph of the effects of natto extracts on blood pressure. (8) Graph of the inhibitor activity of platelet aggregation. (9) 2 graphs of the concentration of vitamin K<sub>2</sub> in human blood after the intake of natto. (10) Bar chart of change in the concentration of menaquinone-7 in plasma after ingestion of natto. (11) Graph of the effects of the tempeh bacteria on aflatoxin-producing bacteria. (12) Diagrams of the aromatic components of shoyu (soy sauce). (13) Bar chart of the effects of the concentration of nitrous acid on the antitumor activity of shoyu (soy sauce). (14) Chart of the carcinogenesis inhibitor effects of HEMF against proventriculus tumors induced by benzo[a]pyrene. (15) Bar chart of standardized mortality from stomach cancer relative to the level of frequency of eating miso soup. (16) Graph of changes in blood pressure by oral administration of miso (soybean paste) extracts. (17) Graph of reaction between coloring degree of miso and its antioxidative activity. Address: Dep. of Physiological Chemistry, Kurashiki Univ. of Science and the Arts, Kurashiki, Japan.


• Summary: Of all the words and terms for foods or seasonings made from soybeans, this one has taken the longest to become standardized. Forty different names appear in 400+ English-language records in our SoyaScan database from 1902 to the present. Some of these are foreign words, such as tahuri, tahuli, or tajure, from the Philippines. The standard term is now “fermented tofu,” however several other terms still appear in the literature. Column 1 shows the number of records in the SoyaScan database that mention this word or term: 122–Fermented tofu. 89–Sufu. 32–Bean cheese. 24–

The large number of names can be accounted for by four main factors: (1) Fermented tofu is made in many different countries in East- and Southeast Asia, and in each country it has a different name. (2) In China, where this food originated, many different varieties are made in different parts of the country, leading to a surprising proliferation of names and ways of Romanizing those names. (3) Fermented tofu is used more as a seasoning than as a food. In Asia, it is typically used as a seasoning placed atop a bowl of rice. Thus, it is not as conspicuous as a typical food, such as tofu. (4) Fermented Tofu has never been widely used as a food (or widely available) in English-speaking countries, so the demand for a standard name (like yogurt) has been weak. Yet most Americans who try this food, like it very much, and some say the various wine-fermented varieties are among the most delicious seasonings they have ever tasted.

Etymology: Fermented tofu first appeared in June 1946, just as the word “tofu” was starting to replace “bean curd” in English.

Definition: There are two basic types of fermented tofu: Molded and unmolded–brined. The former is by far the most popular worldwide. The molded varieties are made using an unusual two-part fermentation, as follows: (1) Firm tofu is drained, dried, diced, inoculated with spores of an Actinomucor or Mucor mold. The cubes are incubated until each cube is covered with a fragrant white mycelium of mold. These molded cubes are called pehtzes. This mold is the source of enzymes for the next part. (2) The pehtzes are placed in glass jars and covered with a brining solution consisting of water plus about 12% table salt (NaCl) and about 10% ethanol (typically from rice wine). Various seasonings are often also mixed into the brining solution, or covered with sake lees. The jars are sealed and the fermented tofu will be ready to eat in 2-6 weeks. I have chosen only the 12 most widely used English-language terms, but am also including a short list of the other 40. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

736. Ross, Julia. 2007. Making tracks. Time (Asia). April 12. • Summary: In Tainan, Taiwan, a “crowd converges on weekends to inhale the aroma of xiao chi, or street snacks: fermented tofu, fried wontons, grilled mushrooms and ‘coffin cakes,’ the local version of pot pies.”


The recipe for “Tofu cheese” (p. 118-19) is very creative and delicious.

About the author: A brief biography is on the rear cover; a color portrait photo is on the front cover. Address: Emmy Award-winning host of national public television’s Christina Cooks.


• Summary: The chapter titled “Tofu, vegetable burgers, and other high-protein foods” (p. 637) has this contents: Introduction. The umami factor. The basics of tofu: The tofu lexicon (regular tofu, silken tofu, pressed or extra-firm tofu, smoked tofu, fried tofu, baked tofu, fermented or pickled tofu, tofu skins {dried bean stick, yuba, bean curd sheets or skins}). Buying and storing tofu. Preparing tofu (freezing, squeezing, puréeing,...) Address: New York Times food writer.


• Summary: Contents: Preface. Acknowledgements. Part I. Tofu: Food for mankind. 1. Protein East and West. 2. Tofu as a food. 3. Getting started. Our favorite tofu recipes (lists about 80 recipe names for each of the different types of tofu, plus soymilk, yuba, whole soybeans, gô, okara, and curds; very favorites that are also quick and easy to prepare are preceded by an asterisk).

Part II. Cooking with tofu: Recipes from East and West (500 recipes). 4. Soybeans: History, cooking with whole dry soybeans, roasted soybeans (iri-mame), fresh green soybeans (edamame), kinako (roasted full-fat soy flour), soybean sprouts (daizu no moyashi), natto (sticky fermented whole


Part III–Japanese farmhouse tofu: Making tofu for more and more people. 17. The quest. 18. Making community tofu. 19. The traditional craftsman. 20. Making tofu in the traditional way. Appendices: A. Tofu restaurants in Japan (many are vegetarian). B. Tofu shops in the West (Directory of 43 shops in the USA, 3 in Europe {Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Netherlands, Portugal, Spain, Switzerland, UK, Wales}, and 3 in Latin America {Brazil, Colombia, El Salvador, Guatemala, Mexico}). C. People and institutions connected with tofu. D. Table of equivalents. Bibliography. Glossary. Index. About the authors (autobiographical sketches; a photo shows Shurtleff and Aoyagi, and gives their address as New-History of Fermented Tofu, 304


- Summary: Contents: Introduction. Non-fermented soyfoods: Soymilk (traditional soymilk, modern soymilk {techniques to reduce beany flavors, formulation and fortification, homogenization, thermal processing, and packaging}), tofu (preparation methods, factors involved in tofu-making {soybean varieties, storage and pretreatment, solids concentration, heating, type of coagulants, coagulant concentration, coagulation temperature, coagulation time, process automation, packaging}, varieties of tofu {silken tofu, regular and firm tofu, varieties of tofu products}), green vegetable soybeans, soybean sprouts, yuba, okara, roasted or cooked soybeans. Fermented soyfoods: Terms (Koji {fermentation, koji starter, inoculum}), fermented soy paste (preparation method {preparing rice koji, treating soybeans, mixing and mashing, fermenting, pasteurizing and packaging}, processing principles), soy sauce (preparation method {treating raw materials, koji making, brine fermentation, pressing, refining}, processing principles, chemical soy sauce), Japanese natto (preparation method, processing principles), Indonesia tempeh (processing method, processing principles), fermented soymilk, fermented tofu (preparation method, processing principles), soy nuggets (Chinese douchi, Japanese hamanatto).

Conclusion.


- Summary: A rediscovery of 88 Tofu House, which opened in 2000 and has now achieved cult classic status. It is located at 5490 Buford Highway. Phone: 770-457-8811.

“... spicy bowls of kimchi, pickled tofu, daikon, salted fish, sprouts and more–helps focus one’s attention.”

• Summary: Contents: Introduction. The distribution of fermented legumes in local food systems. The absence of fermented legumes from western food history. The future of fermented legumes in the West. Address: Johns Hopkins Univ., USA, emeritus professor of anthropology.


Tofu is a popular daily food throughout Vietnam. It would be difficult to find anyone who eats rice but never eats tofu. “Most Vietnamese consider tofu a traditional, cheap, and well-liked dish.”

In Vietnam, certain villages have long specialized in tofu production. “Elderly informants told us that it is a hereditary trade, handed down from generation to generation for a long time.” But these elders do not know when or how this skill came to Vietnam.

In Vietnam, it is hard to find early documents that mention tofu or soybeans, for after so many decades of war, many of the old scripts and documents have been lost. For example, the Dai Viet Su Ky Toan Thu (Complete Set of Dai Viet History) is thought to be the most reliable history of Vietnam. The introductory chapter of the 1983 edition states that it was written by Le Van Huu (lived AD 1230-1322), finished in 1272, and consisted of thirty volumes. But no original is known to exist today, and some scholars doubt that there ever were 30 volumes. The original of the 1983 version was edited and printed in 1697 by historians who lived some 400 years after the original edition was first printed.

Two early Vietnamese books that mention soybeans and tofu have been found. Both are available in modern editions: (1) Van Dai Loai Ngu, by Le Quy Don (lived AD 1723-1783); modern edition published 1962. In his discussion of grains, he mentions soybean (dai dau). (2) Nu Cong Thank Lam, by Le Huu Trac (lived AD 1720-1791); modern edition 1971. He stated that the soybean (dau nanh) has a sweet and warm nature, and “is good for recovery after an injury, for the beauty of women, for bone marrow, for vitality, and as an antidote for ingested toxins. He noted the tofu contains nourishing substances (known today as amino acids and vitamins).” He described two methods of separating liquid soymilk from the solid residue and then of curding the soymilk to make tofu, and he gave eight vegetarian dishes made with tofu—including: Tofu soaked in soy sauce; Wine fermented tofu. Grilled vegetarian tofu chao.

Le Quy Don and Le Hu Trac are two famous 18th century Vietnamese polymaths. Since both men were born in the early 1700s, it seems quite likely that tofu existed in Vietnam during the 1600s.

However, some scholars believe that tofu arrived in Vietnam much earlier, in the 10th to 11th centuries. These scholars given four reasons for their belief—all based on circumstantial evidence.

(1) Early relations and mass migrations: China and Vietnam have had relations for more than 2,000 years. Chinese imperial envoys imparted cultural information to small groups of Vietnamese leaders. Moreover, there were many wars between China and Vietnam throughout their ancient history. The migration of thousands of people during these times also spread cultural knowledge—such as (perhaps) how to make tofu.

(2) Migrations of Chinese and Vietnamese Buddhists: Because Buddhists have traditionally been vegetarians, they have long been interested in soybeans and soyfoods. A book titled Thien Uyen Tap Anh, considered to have first appeared in the 13th to 14th centuries AD, states that “the Buddhist master Vo Ngon Thong (’AD 826) came from Quang Dong (Guangdong [Canton]), China... In December 1820 he came to Kien So temple (now in Gia Lam district, Hanoi) to meditate and founded the ‘Vo Ngon Thong’ sect in Vietnam” (Vietnam Buddhist Church 1990). Elsewhere the book describes how two other Chinese Buddhist masters came to Vietnam during the periods 1054-1071 and 1091-1170. In addition, the monks who were students of these masters went to China during this period to meditate. The Vietnamese may well have learned how to make and use tofu during this time either in Vietnam or in China.

(3) Exchanges between the imperial governments of China and Vietnam: There were frequent high-level exchanges. The Complete Set of Dai Viet History mentions that in the year 1007 the Vietnamese emperor sent two envoys to Song dynasty China; they returned in 1009. In the year 1020 another envoy went to China and returned. These envoys may have eaten tofu while in China, and they may have asked for training in how to make it.

(4) Vietnamese folk songs and sayings: “These suggest an ancient origin for tofu in Vietnam.” The words to one song say: “If you want to enjoy tofu with traditional Chinese soy sauce, sharpen your knife ad scissors, shave your head, and become a monk.” This suggests that tofu first appeared in Vietnam in Buddhist temples—during the Northern Song dynasty in China, and the Ly and Tran dynasties in Vietnam. Nevertheless, these are only theories.

Since ancient times, Vietnamese have eaten “vegetarian
dishes every day, including tofu, in accord with their beliefs that vegetarian food is clean and promotes tranquility."

In Vietnam today, various types of tofu are sold including: Firm tofu, grilled tofu, deep-fried tofu, fermented tofu, and soft tofu. It is used in four basic categories of dishes: vegetarian, nonvegetarian, vegetarian soups, and nonvegetarian soups. The two most popular dishes cooked in Vietnamese homes are: Boiled tofu with sauce (dau phu luo). Tofu cooked with tomatoes and ginger (dau phu sot ca chua).

Other foods made from soybeans: (1) Soymilk, served sweetened with sugar. Before carbonated beverages / soft drinks became popular, during the hot summer months, soymilk was the favorite drink in Vietnam. Today some families still make soymilk at home. (2) Soy sauce (dau tuong). (3) Sweet silken tofu, curded with calcium sulfate (tao pho). (4) Meat alternatives made from tofu. Address: National Academy of Social Sciences and Humanities, Hanoi, Vietnam, researcher at Chinese Studies Institute.


**Summary:** Contents: Introduction. Historical background. Production and marketing of tofu. Consumption–tofu and related foods consumed in China include: (1) Tofu. It is called *doufu* in Standard Chinese or Mandarin (Putonghua), *dau-fu* in Cantonese, and *tau hu* in Minnanhua or Hokkien (2) *Doufujiang*, more commonly known as *doujiang*, which is soymilk. (3) *Doufu hua* (soybean custard), or more commonly *douhua*. (4) Zhihu [fuzhu] (tofu sticks).

(5) *Doufu pao* (small blocks of deep-fried tofu puff). (6) *Dong doufu* (frozen tofu). (7) *Doufugan* or *dougan*–fresh tofu that has been firmly pressed to partly dehydrate it, and then is air dried. Chinese-style pressed tofu can be further processed to make... (8) *Xun doufu* (smoked tofu).

(9) *Wuxiang doufu* [also called *wuxiang doufugan*] (five-spiced tofu). (10) Pressed tofu can be soaked in brine and fermented to make *chou doufu*, which is usually referred to as “smelly tofu” but which Hsu and Hsu (1977, p. 301) translate as “molded beancurd.” (11) Tofu can also be fermented to make *doufuri*, or simply *furu*. (12) *Okara* is described (p. 106) as “leavings” or “soybean dregs,” or “tofu lees.”

Note: This is the earliest English-language document seen (Oct. 2011) that contains the term “smelly tofu.”

Photos show: (1) Person making tofu in a Yongchun village, Fujian–filtering. (2) Grinding unripe soybeans (*maodou*) for sale at a morning market in Kunming, Yunnan. (3) Soybean plants in between rice plots in a village in Ganluo Country, Sichuan. (4) Selling bean curd custard in Chengdu, Sichuan. Address: Chinese Univ. of Hong Kong, chair of the Dept. of Anthropology.


**Summary:** Cecilia (Sun Yun) was born on 18 September 1920 in Wuxi, near Shanghai, China—when her mother was age 38 and 17 years after the birth of her oldest sister. Cecilia was the 7th daughter in a family of ten children. In China, everyone considers themselves a year older on New Year’s day. Her mother, Sun Shuchun Hui, gave birth to twelve children—nine girls and three boys—over the course of 24 years, but two did not survive. Her father, Sun Long Guang (“unofficial” or familiar name Yung Xiao), born in 1878, was a gentle, progressive, scholarly man who had been schooled in France in the early 20th century, after the overthrow of the Qing Dynasty in 1911. Like many intellectuals in his generation, he worked to bring Western liberal ideas and modernization to China. He retired from his engineering job with the railway at age 50 so he could tend the gardens he loved, listen to music, and read. He was unusual in having no concubines, and all in his family were proud of him for that.

Her mother (whom she called “Um-ma”) had tiny, four-inch-long bound feet, which were very painful to her. Between ages 5 and 7, when her foot bones were still fairly stiff and malleable, they were broken. “The toes were folded down under the ball of the and the arch folded in half, then the whole food was wrapped tightly in gauze bandages so that it would essentially stop growing. The smaller the foot, the more desirable the woman, and thus the more marriageable she would be. It was an unbelievably lengthy and painful process, and often girls died from the resulting infection” (p. 49). Cecilia’s father absolutely forbade the binding of his daughters’ feet. So they grew up being able to run, dance, play tennis and ice skate. Cecelia rode her bicycle daily to the Fu-Jen Catholic University. Cecilia’s mother tottered around the family home, overseeing the servants, nannies, and cooks. By the late 1930s in China, “in all but the most rural areas, the custom of foot binding became a thing of the past” (p. 50).

When Cecilia was age 4, the whole family moved from Wuxi to Beijing, the capital of China. In those days it was very unusual for a family to move such a long distance, from one province to another. However, her parents were “drawn to the capital because of its intellectual and cultural offerings.” They moved into a huge walled compound with enormous red gates. It was “an actual palace that took up an entire city block and had been built in the 16th century for a minister to one of the last emperors of the Ming dynasty. It had 52 rooms and six bathrooms in seven
parallel buildings” (p. 50). The dining room was the most important room in their home that was where their family life took place. Her “mother was so short, she needed to stand on a stool to see into the pots on the stove.” Yet she ran the kitchen with absolute authority. “Like all upper-class Chinese women of her time, she did not actually cook.” “She instructed her chefs as to how she wanted things done.” This included “making her own soy sauce, a few bottles of which contained shrimp roe—though those are the ones she brought out only for special occasions” (p. 51). Her mother was a perfectionist.

They were served breakfast, typically rice congee—a kind of rice porridge—with assorted condiments including sausage, dried fish, thousand-year eggs, vegetables pickled in jiáng, and fermented bean curd [stinky tofu; chouchou doufu].

In 1937 the Japanese finally arrived at Beijing; the city had been bracing for their arrival since 1931 when they had invaded Manchuria. Almost overnight, food (including soy sauce and fresh dofu / tofu) became scarce and life became difficult. In 1940 the Japanese moved in and occupied their home, but let them stay in a small part of the building. Soon Cecilia and Teresa (sister #5, Qin) began to think about leaving Beijing for Chongqing (in Sichuan province), where Chiang Kai-shek had moved the national government headquarters after the fall of Nanjing, his previous capital.

In Jan. 1942 they fled in disguise for Free China, calling their adventure “The Long Walk.” After many amazing adventures, they arrived in Chongqing in June 1942. Soon she was seriously dating two men. She decided to marry the businessman, Chiang Liang. They were married in May 1945 in Chongqing. China was still divided by war. In China, the groom’s family pays for the wedding. A few days after the Japanese surrender to the Allies on 15 Aug. 1945, her husband announced that he wanted them to move to Shanghai, so they took the scenic 1,500 mile trip up the Yangtze from Chongqing to Shanghai; it took them 2 weeks.

1946 June–Their first child, a daughter named May, was born in Shanghai. At about this time, Chiang Kai-Shek moved the Nationalist capital back to Nanjing, which is close to Shanghai. The civil war with the Communists resumed.

1949 Jan.–Communist forces capture Beijing.

1949 May 25–Communist forces capture Shanghai, shortly after Cecilia, her husband, and the eldest of their two children have flown to Tokyo (April 29), where they stayed at the Chinese Mission. But Cecilia was soon homesick for Chinese food.

1951 fall–She (with a small group of Chinese friends) opens a large (400-seat) Chinese restaurant in Tokyo named The Forbidden City; it was a huge success from the very beginning.

1960–Cecilia moves to San Francisco from Tokyo and opens The Mandarin (for details see Chapter 1). 1961–Her husband comes to check out her restaurant, then dismisses The Mandarin as insignificant; he had expected something much grander. She realized right then their marriage was over.

1962–Her two children, Philip and May, come to live with her in San Francisco. The restaurant prospers and grows.

1968–She moves The Mandarin to larger quarters at Ghirardelli Square; to do so she takes out a $750,000 personal loan. It opens in June 1968 with “special little round cruets for soy sauce that looked like perfume bottles” (p. 22).


1975 July–Cecilia travels to Beijing to visit her ailing father; it is their last visit.

Cecilia’s Pantry (p. 5-7); soy-related items. “Bean sauce–Made from ground, salted, and fermented yellow soybeans mixed with seasonings.” “Black bean sauce A prepared sauce sold in a jar and made from salted black [soy] beans mixed with soy [sauce], salt, sugar,...” “Hoisin sauce–This thick, sweet-spicy sauce, made from ground soybeans mixed with sugar, flour, and vinegar,...” Soy sauce: Cecilia likes the Lee Kum Kee band, but also uses Pear River Bridge soy sauce–Made from ground soybeans mixed with seasonings.” “Black bean sauce A prepared sauce sold in a jar and made from salted black [soy] beans mixed with soy [sauce], salt, sugar,...” See Soyinfo Center for details.

**Summary:** Partial contents: Chapter 6. “Natto: A soybean foods made by fermenting cooked soybeans with *Bacillus subtilis*. Chapter 11. “Miso: Production, properties, benefits to health.”

Chapter 12. “Korean fermented foods: Kimchi and doenjang,” by Jeonghee Suh, Young-Kyung Lee Kim, and Hoonjeong Kwon, has a long section on doenjang, including: Cancer: Epidemiology, anticarcinogenic and antimutagenic activities in vitro and animal models. Cardiovascular disease: Inhibition of angiotensin converting enzymes, antithrombotic activities


Two references to sufu (fermented tofu) appear on page 464.


**Summary:** This culture collection organization is similar to the National Center for Agricultural Research Utilization (NCAUR) in Peoria, Illinois. Contents: Home (incl. current news, biodiversity). About CBS. Research. Collections. Databases (18). Publications. Service. Links.

When we searched the 1st database, the “Filamentous fungi database,” it was very slow to load and to search. It “contains data on more than 38,000 strains in the CBS collection,” we got interesting results searching for: (1) Temphe–14 hits = records found. In each record, temphe appears in the field “Substrat.” The “Taxon name” (scientific name) of *Rhizopus oligosporus* has been changed to *Rhizopus microsporus var. oligosporus* (Saito) Schipper & Stalpers. In some records the name of the collector and date collected are given. Country and locality (where collected): Indonesia.


(2) *Rhizopus oligosporus*: 5 hits.

(3) Miso: 3 hits. One substrate was soy sauce and another was koji starter culture. The fungi were: *Aspergillus oryzae var. oryzae*. *Aspergillus sojae* Sakaguchi & K. Yamada ex Murakami.

(4) Soy sauce: 13 hits. In addition to the two molds used to make miso, there was also: *Aspergillus oryzae var. effusus* (Tiraboschi) Y. Ohara.

(5) Chinese cheese: No hits.

(6) Fermented tofu: No hits.


(8) Douchi or doushi or doushii or dowsee or dowsi or tou-shih or tou-shih or fermented black beans or preserved black beans: No hits.

(9) Aspergillus: 1,213 hits.


(11) Soybean: 18 hits. Substrate is usually “soil from soybean field.” Molds are Penicillium and Aspergillus species.


**Summary:** Cecilia (Sun Yun) was born on 18 September 1920 in Wuxi, near Shanghai, China. When she was age 4, she moved with her family to Beijing, where she grew up in Beijing, the seventh daughter among 10 children in a very wealthy family. There was a shop in Beijing near her family home that had been making stinky doufu for about 100 years. It is now in the 4th generation. She thinks stinky doufu originated in Beijing, but she is not sure. She has also tasted it many times more recently in Taiwan.

Stinky tofu is dark gray in color, which is not very appetising. And it has a very strong odor, which smells up the whole room in which it is served. When she was a child, her family would store it in their ice box after buying it.

She knows of two types of stinky tofu: Regular (*chou doufu*) and spicy (*la chou doufu*).

At her home, and she thinks throughout China, it was always served as a seasoning for congee / rice porridge (*shifan, or zhou in Cantonese*) for breakfast only. It was served in its own small dish next to the bowl of congee so each person could use it to season the congee as he or she wished. Other seasonings included *jiang cai* (vegetables pickled in jiang).

She thinks young people in China do not like or consume stinky tofu as much today as several generations ago. Address: Former owner, The Mandarin restaurant,
Mr. Nguyen is the father of Andrea Nguyen, who is now writing a book about tofu in Asia.


• Summary: If you go to a Lo Dau Hu (Viet tofu shop) in the United States, the most common types of tofu you’ll find are: (1) Dau dau phu: block/regular tofu (2) Dau hu chien: fried regular tofu (in pieces). (3) Fried tofu with stuff suspended in it (e.g., wood ear mushroom and glass noodles) that’s similar to the Japanese approach to making gomoku dofu. (4) Che dau hu: Soft tofu to be served with sugar and ginger syrup.

Yuba (tofu skin): At Vietnamese restaurants, you sometimes get a side dish of tofu skin rolls made from Tau hu ky [pronounced tau hu kay], the Vietnamese name of yuba.

In Vietnam, fermented tofu is named “chao.”

Note: One popular Vietnamese yuba recipe is Com tam tau hu ky suon bi (Broken rice with yuba wrapped shrimp, pork chop, and pork skin). A detailed recipe can be found on the Web under its Vietnamese name. “Even though this dish originally arose from a culture of poverty—the Vietnamese rice farmers couldn’t sell the broken grains of rice so they used it for themselves—today, you can find this dish served in almost every Vietnamese restaurant due to the simplicity as well as the variety of toppings available,...”

Other Vietnamese yuba recipes on the Web include: (1) Tom tau hu ky (Vietnamese shrimp paste wrapped in yuba). Fresh yuba is wrapped around a spoonful of shrimp paste, then the packet is deep fried. (2) Com tam suon nuong tau hu ky (Broken rice with pork and shrimp cake wrapped in yuba). Address: vietworldkitchen.com, California.


• Summary: Mr. Nguyen is the father of Andrea Nguyen, author of Into the Vietnamese Kitchen (2006, Ten Speed Press) and was kindly introduced to Soyinfo Center by Andrea, who is now writing a book about tofu in Asia.

Mr. Nguyen was born and raised in Vietnam, and lived there with his wife and family until April 1975 when he fled to the USA just before the fall of Saigon and the American defeat in what Vietnamese call the “American War.”

He was governor and military sector commander of two provinces in the Mekong Delta of Vietnam (Vinh Binh {now called Tra Vinh} from 1956, and Kien Phong {now called Dong Thap Muoi} from 1956-1960), and of Binh Thuan, in the south of central Vietnam, from 1960-1963. While he is not a specialist in Vietnamese food, he knows as much about it (or more) as the typical person born and raised in that country.

Question: Do Vietnamese eat soybeans as a green vegetable (green vegetable soybeans, edamame)? Ans: No, and there is no specific name for them.

Question: Please tell me about soymilk in Vietnam. Ans: Its name in Vietnamese is sua dau nanh (with diacritical marks). It was very popular, but mostly in the cities (as we were in Viet Nam before 1975). Don’t know exactly at the present time. Use it at breakfast or at any time during the day as a beverage. It is sold in a plastic container, at tofu shops or at marketplaces. Nobody made it at home at our time in Viet Nam (before 1975). But soybean milk machines are now on the market at non-expensive prices. Probably some people are making it at home for freshness. It is typically served sweetened or plain; not salty. It has a fairly long history. Its popularity is increasing with the propagation of the soybean’s benefits.

Question: Please tell me about yuba (the film that forms atop soymilk when it is heated) in Vietnam. It is often called beancurd skin or (when dried) beancurd sticks in Vietnamese cookbooks. Ans: It is called phu chuc (dried rolled yuba; dried rolled yuba sticks; fuchu or fu zu in Chinese) in north Viet Nam, and tau hu ky in south Viet Nam. Fresh dry yuba is tau hu ky xau (it needs to be frozen or refrigerated and thawed before using) and regular dry yuba is tau hu ky kho.

All Vietnamese (north, center, and south) use only one language but there are differences in tone and accent in pronunciation, and also in the naming of some things and objects. The phonetic adaptation from Chinese or French words are also different, it may be the reason of Tau Hu Ky for Fu Pi and Phu Chuc for Fu Zu.

Yuba is very popular, used in households, market stalls, and restaurants—especially in place of meat in vegetarian dishes and diets (influenced by Buddhism). It is sold in dry form, either unfried or fried, in a package at any market place. It is made only by special factories of Chinese origin. It is served as a wrapper for shrimp or meat, then fried. Also in soup—fried and served with broken steamed rice, and many other dishes at home and restaurants from selected to street corners. It is especially useful in the preparation of vegetarian dishes as a substitute for real meat. In one popular dish (called Chan Thienn Ky), tau hu ky [yuba] is wrapped around minced shrimp to make a little packet, which is deep-fried; it is somewhat like the Cantonese dim sum item of shrimp in “tofu skin” but Viet people commonly serve it as a side dish on rice plates. Another popular yuba recipe in Vietnam is Com Tam Tau Hu Ky Suon Bi (Broken rice with yuba wrapped around shrimp, pork chop, and pork skin).
Note: A Google search for “tau hu ky” will bring up many other recipes, images, and videos in Vietnamese and English. Yuba has a long history in Viet Nam, being introduced along with Chinese cuisine. Today its use is increasing along with the demand for new recipes and awareness of the benefits of consuming foods made from soybeans. Yet it is still not an item in everyday meals, but is reserved for special occasions, whether at home, in a restaurant, or at parties.

Question: When the French divided today’s Vietnam into Tonkin (north), Annam (middle) and Cochinchina (south), were there any cultural or language differences between the three? Were the divisions based on these cultural and language differences or not? Ans: No major difference in culture or language existed between the three regions at that time. The French made the division just for more efficiency and convenience in their colonization of Viet Nam. The French split Viet Nam up into many areas with different administrative systems so as to maintain the division, in order to make their occupation more efficient [and to try to prevent or limit the growth of nationalist or resistance movements].

Question: Please tell me about soybean cultivation in Vietnam. Ans: At this present time, because of the huge demand of soybean for edible oil and meal or cake for animal feeds, milk for human consumption, large areas in the South (east and west parts) are being used for cultivation of soybean. Production in the North and Central regions, due to limitation of available lands, may be sufficient only for regional production of Tuong and Tofu. Five different kinds of seeds are being introduced and tested and yield/ha are much better. Areas in the south-west (Mekong delta) will produce 3 crops per year.

For centuries soybeans have been cultivated in Viet Nam. Before the vegetable oil from soybean was introduced, each region produced what people need for daily consumption. This has been changed completely because of the huge demand of soybean for edible oil and meal or cake for animal feeds, milk for human consumption, large areas in the South (east and west parts) are being used for cultivation of soybean. Soybeans are cultivated along the hillsides or high level areas not submerged by water, or in between the rice crops seasons. In the south western region (Mekong delta) where the field is submerged under the water every year for 4 months, farmers can now plant soybean after the rice crop harvest. They burn the hay, make holes and put the seeds down, cover with hay, let it grow, fertilize (chemical), use pesticides and herbicides. After 75-82 days they can harvest (still by hand), or use a machine to pull out the beans, then dry them. Viet Nam is presently divided into 62 provinces and towns; soybean is planted in 43 of them. At the present time, no information is available about large size farms using complete machinery like in the USA, but an area like the Mekong Delta may open up and introduce this kind of large farming process. The highlands in Viet Nam offer tremendous opportunities for development of modern farming (mechanized) but require enormous investments in knowledge, experience, and quick flexibility of action and funds. A state economy system cannot afford to let that happen, I would say.

Viet Nam still has to import 400,000 to 500,000 tons of soybean every year from China, Kampuchea [Cambodia], Thailand, Canada and the USA.

Today, soybeans are most widely used as a food in the south of Vietnam. My estimate of the amount of soybeans used in traditional foods (in descending order of popularity) is: Tofu, soy milk, tuong (a thick fermented soy sauce), chao (fermented tofu), soy sauce (liquid), tau hu ky (yuba).

Additional remarks: Tuong should be considered in this study, as tuong is a sauce made and used only in Viet Nam. It is made from rice and soybean, plus salt, in a very delicate way, serving as sauce for eating and cooking. Long ago the northern Viet term for soybeans was “dou,” as in Chinese. But soybeans were also called “dou tuong” because they were so widely used in Vietnam to produce the popular fermented sauce “tuong.” That’s why today the Vietnamese term for soy sauce is either “nuoc tuong” [sauc + tuong; a lingering reference] or “xi dau,” from the Cantonese phonetic.

All the Vietnamese (old generation, of north and center origin) living in the US, miss “tuong” very much as the Tuong Cu Da being sold in the market places here is not the real thing—in terms of composition, taste and flavor. The three best kinds of Tuong are: (1) Tuong Cu Da. (2) Tuong Ban, in north Viet Nam, and (3) Tuong Nam Dan, in Nghe An (central Viet Nam).

Note: Andrea adds: “These are really cool tuong sauces!” Address: San Clemente, California.


• Summary: The subtitle of this article reads (in Japanese): (Heisei 21 nendo Nippon Shokuhin Kagaku Kagakukai Sho). This means that in 2009 this article won an award from the Japanese Society for Food Science and Technology.

Tofuyo is a type of low-salt fermented tofu. This study describes the chemical characteristics of tofuyo and the role of molds of the genus Monascus in its production.

The tofuyo fermentation process is unique in that its soybean proteins undergo limited hydrolysis by proteinases [enzymes that break down protein] in the presence of ethyl alcohol which originates from awamori.

Note: Awamori is Okinawan distilled liquor; it is made from Thai-style long-grained Indica rice and black koji mold, indigenous to Okinawa; after distillation it is often aged like whiskey.
The main constituents of tofuyo are basic subunits of glycemin and polypeptides. During maturation, the soy proteins in tofuyo are digested into peptides and amino acids. The amount of free glutamic acid and aspartic acid are strongly correlated to the good taste (umami-taste) of tofuyo.

Address: Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.


• Summary: This is a very interesting, original, well researched and well written book. It is also the best source of detailed, well documented information on kinema and its close relatives seen to date.

The word Sanskrit word Himalayas means literally “abode of the snows.” This region is the home of over 65 million people. Those in the eastern Himalayas are of Mongolian ethnicity and ancestry.

Chapter 3, titled “Fermented legumes,” includes a section titled “3.1 Important fermented soybean foods” which states (p. 65): “Some of the common ethnic nonsalted sticky fermented soybean foods of the eastern Himalayas are kinema (Nepal, Darjeeling hills, Sikkim, and South Bhutan), hawaijar (Manipur), tungrymbai (Meghalaya; food of the Khasi and Garo peoples), bekang (Mizoram; food of the Mizo people), aakhone (also called asone, Nagaland; food of the Sema Naga), and peruyyan (Arunachal Pradesh). Manipur, Meghalaya, Mizoram, Nagaland, and Arunachal Pradesh are small states in northeastern India.

All of these foods are similar to kinema.

For all these six foods is given: The name of the food, a close-up photo of the food, indigenous knowledge of preparation, a flow chart showing the indigenous method of making the food, culinary practices (how the food is prepared / cooked and eaten), economy (its role in the local economy), microorganisms (dominant and secondary).

Section 3.3 is “Microbiology” (of fermented legumes): Kinema (microorganisms, source of inoculation in kinema production optimization of fermentation period, in situ fermentation of kinema, selection of starter culture, monoculture fermentation of kinema, development of pulverized starter for kinema production, phylogenetic similarity of Bacillus strains from Asian fermented soybeans), other fermented soybean foods of north east India.

Section 3.4 is “Nutritive value” (table 3.1 compares the nutritional composition of raw soybean and kinema). And section 3.5 is “Conclusion.”

The long and very interesting section (9.1.1) on the “Antiquity of kinema” (p. 230-34) states that it is a food of the Kirat ethnic group (to which the Limboo belong) of eastern Nepal. The origin of the word “kinema” can be traced back to the word kinaba of the Limboo language (ki = fermented; namba = flavor). It is not clear whether kinema appeared first, then was disseminated and diversified, or vice versa. The Limboo believe that their discovery and domestication of the soybean (which they named chembi) in mentioned in one of their oral myths, as explained.

Kinema is made by fermenting whole soybeans, without inoculation, with strains of Bacillus subtilis bacteria. It is alkaline in nature / pH, has a sticky, stringy texture and a strong flavor.

Natto is believed to have been introduced to Japan from China during the Nara period around 710-714 AD (Ito et al. 1996; Kiuchi 2001). Kinema might have originated in east Nepal around 600 B.C. to 100 A.D. during the Kirat dynasty.

Products closely resembling kinema are popular foods in many non-Brahmin communities in the eastern Himalayas. “The Lepcha [the aboriginal inhabitants of today’s Sikkim] call it satlyanger; the Tibetans and Bhutia [of Bhutan and Sikkim] call it bari; the Khasi [of Meghalaya] call it tungrymbai; the Meitei [of Manipur] call it hawaijar; the Mizo [of Mizoram] call it bekang; the Sema Naga [of Nagaland] call it aakhone; and the Apatani [of Arunachal Pradesh] call it peruyyan.”

Soybean products closely resembling kinema outside of the Himalaya region are natto of Japan, chungkokjang of Korea, and thua-nao of Thailand [From Google Books Preview].

Dr. Susuke Nakao (1972) coined the term “natto triangle,” but Tamang proposes that the hypothetical triangle be renamed “Kinema–Natto–Thua-nao triangle” (or KNT triangle). An illustration / map (Fig. 9.1) shows this triangle with Japan, Nepal-India-Bhutan, and Thailand at its three angles; it also includes chungkokjang (Korea), pepok (Myanmar), sieng (Thailand), and douche [douchi] from south China. These mildly alkaline, sticky fermented foods are popular among the peoples of Mongolian origin. This may be due to their typical flavor called umami (Kawamura and Kara 1987). This flavor is developed during the hydrolysis of soy protein (by protease enzymes) into amino acids during fermentation. Have people of Mongolian origin evolved or developed particilar senses which inclines them to enjoy the umami flavor? In the eastern Himalayas green vegetable soybeans are also boiled and eaten.

Section 10.3, “Commercialization through ethnic food tourism,” suggests that just a tourists visit the vineyards of France, tempeh shops in Indonesia, and artisans or factories that make shoyu or sake in Japan, there are potential tourist sites for experiencing how traditional foods are made in the Himalayan villages. For kinema, try visiting Aho village in Sikkim.

About the author (p. xix): A good biography and portrait photo are given. In the “Acknowledgments” (p. xvii) he writes: “I am thankful to my wife Dr. Namrata
Thapa for constant support and technical assistance in the preparation of this book. Over the past 16 years the team of brilliant Ph.D. students that I have recruited from the Food Microbiology Laboratory, Sikkim Government College, Gangtok, has been the real driving force in researching and identifying the scientific mechanisms of ethnic Himalayan fermented foods.” He then lists their names. Address: Food Microbiology Lab., Sikkim Government College, Gangtok, Sikkim 737 102, India.


• Summary: On page 33 is an “English version of the menu for the Sun Sun Café [at 307 J St., Sacramento] in the 1950s. Since Sacramento had a relatively large Chinese-speaking community, there was also a Chinese version of the menu available.”


• Summary: “Fermented tofu is considered to have originated in China; however, the exact time and place of its origin remain uncertain. Hong (1985) reported that the first description concerning fermented tofu was found in Peng Long Ye Hua written by Li Ri-Hua in the Ming dynasty (1368-1644), where it was prepared with molded tofu. Reference to furu appeared in the famous book on Chinese medicinal and herbal materials, Pen Ts’ao Kang Mu (Honzo Kou Moku, in Japanese) published by Li Shih-Chen in 1596. In this book, furu was prepared without the molding procedure. From these old records, it appears that there were two techniques involved in furu production, treatment with and without mold. Although the name rufu appears in the section of animals of this book, it is not fermented tofu, but refers to milk-curd, which is produced from the coagulation of protein in milk under acidic conditions.

“During the Ch‘ing dynasty (1644-1912), many records on fermented tofu production appeared, indicating that the molding procedure had become mainstream. The making of fermented tofu with the molding procedure is described in the book, Shi Xian Hong Mi written by Wang Zi-Zhen, in the middle of the Kang-Xi period (1681-1706). Interestingly, the author found that the fermented tofu was made with the ‘red koji’ [beni-koji] in this record. From this description, it is strongly suggested that the origin of tofuyo is the fermented tofu described herein. References to rufu often appear in documents of that time. Rufu seemed to be one of the finest products in the district of Jiang Nan, China, and was introduced in a kind of guidebook on local production, Jiang Nan Tong Zhi (1736). In this record, rufu was not milk-curd, but fermented tofu. It was revealed that the methods of making fermented tofu recorded in Xing Yuan Lu written by Li Shi-Ting in the middle of the Quianlong period (1757-1776) are similar to present-day methods. Fermented tofu, rufu, was also described in Sui Yuan Shih Dan written by Yuan Mei (1782), and the white type of rufu (containing shrimp eggs) or famous production sites, and other aspects, were introduced in this document. From a variety of literature, it can be concluded that the development and spread of fermented tofu occurred in the Ch‘ing dynasty, and became popular in the diets of people in mainland China and Taiwan, and continues to be enjoyed even today. As the Chinese fermented tofu spread to other countries in East and Southeast Asia, it was given its own name in each country, as described in the Introduction. From that time to the present, the fermented tofu of each country has been traditionally made in the home or small cottage industries.” Address:
Faculty of Agriculture, Univ. of the Ryukyus, Okinawa pref., Japan.


• Summary: James lived on Okinawa Island for a total of 14 years as a U.S. Marine. Tofuyo is made on many of the Okinawa Islands and the Ryukyu Islands of Japan. He has tasted several different varieties of tofuyo on the island of Ishikawa, a tiny inhabited island south of Okinawa in the archipelago, which almost no outsiders visit. The people and culture there are very traditional—as from a bygone era. The tofuyo there is cured using seawater and is very delicious—as is the unique tofuyo. Address: Tucson, Arizona.


• Summary: The link is now http://www.ars.usda.gov/SP2UserFiles/Place/12354500/Data/isoflav/isoflav_R2.pdf. “Legumes and legume products” starts on p. 16. Start by going to page 24, which is where the soy section begins. Then you can do a PDF search for fermented soyfoods such as: Tempeh, miso, soy sauce, natto, or Sufu (fermented tofu)—and you will see that they are NOT lower in total (or specific isoflavones) than nonfermented soyfoods such as: Tofu, soymilk soybeans (immature), soybeans (mature), etc.


• Summary: No. 41 is “Stinky tofu, Southeast Asia.” “So is the legendarily divine taste really worth the effort? Sure it is.”


• Summary: (a) Soy nuggets. (b) Red fermented tofu. (c) White fermented tofu. (e) Fermented tofu in jar (Beancurd preserved). (g) Fermented tofu (b-c, e, h-s). Fermented tofu. (t-y) Tofuyo. (Source: Wikipedia).


• Summary: 965 A.D.—Tofu is first mentioned in China in a document, the Qing Yilu (Wade-Giles: Ch’ing I Lu) [Anecdotes, Simple and Exotic], by Tao Ku. It states: “In the daily market were several catties of doufu. People of the region called doufu the ‘vice mayor’s mutton.’” It goes on to tell the story of a vice mayor named Jishu, who was so poor that he couldn’t afford to buy mutton. Instead he bought a few pieces of tofu every day and ate them as a side dish with rice. Soon people in the area came to call tofu the “vice mayor’s mutton.” The story implies that tofu was widely consumed in China in those days and that it was less expensive than mutton.

1183 A.D.—Tofu is first mentioned in Japan in the diary of Hiroshige NAKAOMI, a Shinto priest of the shrine at Nara; the tofu was used as an offering at the shrine’s altar.

1489—The word “tofu” is first written in Japan with the characters used today.

1603—The word “tofu” is first mentioned in a European-language (Portuguese) document, Vocabulario da lingoa de Japam... [Vocabulary of the language of Japan], the earliest dictionary of the Japanese language compiled by Europeans (Jesuits living in Nagasaki, Japan). Tofu is referred to as Cabe, Tôfu, or Taufu.

1613—The word tofu is first referred to (though indirectly) for the second time by a Westerner, Captain John Saris, in the log of his trip to Japan. He wrote “Of Cheese [probably tofu] they have plente. Butter they make none, neither will they eat any Milke, because they hold it to bee as bloud [blood], nor tame beasts.” This is the earliest English-language document that mentions tofu in connection with Japan.

1665—Tofu is first mentioned specifically by a Westerner, Domingo Fernández de Navarrete, in his book A Collection of Voyages and Travels. Navarrete, who served as a Dominican missionary in China, wrote: “Before I proceed to the next chapter, because I forgot it in the first book, I will here briefly mention the most usual, common and cheap sort of food all China abounds in, and which all men in that empire eat, from the emperor to the meanest Chinese, the emperor and great men as a dainty, the common sort as necessary sustenance. It is call’d teu fu, that is, paste of kidney-beans. I did not see how they made it. They draw the milk out of the kidney-beans, and turning it, make great cakes of it like cheeses, as big as a large sieve, and five or six fingers thick. All the mass is as white as the very snow, to look to nothing can be finer. It is eaten raw, but generally boil’d and dressed with herbs, fish, and other things. Alone it is insipid, but very good so dressed and excellent fry’d in butter. They have it also dry’d and smok’d, and mix’d with caraway-seeds, which is best of all. It is incredible what vast quantities of it are consum’d in China, and very hard to conceive there should be such abundance of kidney-beans. That Chinese who has teu fu, herbs and rice, needs no other sustenance to work; and I think there is no body but has it, because they may have a pound (which is above twenty ounces) of it any where for a half-penny. It is a great help in case of want, and is good for carriage. It has one good quality, which is, that it causes the different airs and seasons, which in that vast region vary much, to make no alteration in the body, and therefore they that travel from one province to another make use of it. Teu fu is one of the most remarkable things in China, there are many will leave pullets for it. If I
am not deceiv’d, the Chineses of Manila [Philippines] make it, but no European eats it, which is perhaps because they have not tasted it, no more than they do fritters fry’d in oil of Ajonjoli ([sesame seed] a very small seed they have in Spain and India, which we have not) which the Chineses make in that city and is an extraordinary dainty."

1704–Friar Domingo Navarrete’s book is published in English. This is the earliest English-language document that mentions tofu in connection with China.

1770 Jan. 3–James Flint in Capringe writes Benjamin Franklin in London (in response to an inquiry from Franklin) a detailed description of how the “Chinese convert Callivances into Towfu” (soybeans into tofu).

1770 Jan. 11–The earliest document seen in which an American mentions tofu is a letter written by the famous Benjamin Franklin (who was in London) to John Bartram in Philadelphia, Pennsylvania. He sent Bartram some soybeans (which he called “Chinese caravances”) and with them he sent “Father Navarrete’s account of the universal use of a cheese made of them in China, which so excited my curiosity, that I caused enquiry to be made of Mr. [James] Flint, who lived many years there, in what manner the cheese was made, and I send you his answer. I have since learned that some runnings of salt (I suppose runnet) is put into water, when the meal is in it, to turn it to curds.”

1821–The second earliest reference seen to tofu in America, and the first to be published in the USA, appeared when A.F.M. Willich of Philadelphia mentioned it in The Domestic Encyclopedia. Speaking of soybeans (which he called “the seeds of the Chinese plant Dolichos soja”), he wrote: These seeds are used in China and Japan as food; they are made into a kind of jelly or curd, which is esteemed very nutritious, and which is rendered palatable by seasonings of different kinds.”

1870 Dec.–The term “Bean curd” is first used by Emil V. Bretschneider, writing in English in the Chinese Recorder and Missionary Journal (Foochow, p. 173). He said: “Bean-curd is one of the most important articles of food in China.” Then he gave an accurate description of how it was made.

1880–Tofu is first made in Europe by Paillieux, in France, for the Society for Acclimatization (but not on a commercial scale).

An asterisk (*) at the end of the record means that SOYFOODS CENTER does not own that document. A plus after eng (eng+) means that SOYFOODS CENTER has done a partial or complete translation into English of that document. An asterisk in a listing of number of references [23* ref] means that most of these references are not about soybeans or soyfoods.

California.

1910–Europe’s first commercial soyfoods manufacturer, named Caséo-Sojaïne, is founded by Li Yu-ying, a Chinese citizen, biologist and engineer, at 46-48 Rue Denis Papin, Les Vallées, Colombes (near Asnières), a few miles northwest of Paris. By May 1911 he was making and selling tofu, and by August 1911 he had added smoked tofu, pressed tofu sheets, fermented tofu cheese (in Gruyère, Roquefort, and Camembert flavors), and soymilk.

1923–The two oldest existing Japanese-American tofu companies (House Foods & Yamauchi Inc. of Los Angeles and Aala Tofu Co. of Honolulu) are founded in Hawaii. They both began as H. Iwanaga Daufu at 1031 Aala St. in Honolulu. In 1926 the company was renamed Shoshiro Kanehori Tofu, and in 1937 Haruko Uyeda Tofu, still at the same address. In about 1939 the company was purchased by Mr. and Mrs. Shokin Yamauchi, who later renamed it Aala Tofu Co. Their son, Shoa Yamauchi, made tofu at the family company until 1946, when he went to Los Angeles, purchased the Hinode Tofu Co., and began making tofu there in 1947. After becoming Matsuda-Hinode Tofu Co. in 1963, the company was renamed House Foods & Yamauchi Inc. in 1983.

1929 Nov.–T.A. Van Gundy, a Seventh-day Adventist and founder of La Sierra Industries in Arlington, California (near Riverside), becomes the first Westerner to make tofu commercially when he introduces La Sierra Soya Cheese. This tofu was canned and pimiento was added to prevent graying after canning. Continued.
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