HISTORY OF RALSTON PURINA CO.

AND THE WORK OF

WILLIAM H. AND DONALD E. DANFORTH,

PROTEIN TECHNOLOGIES INTERNATIONAL,

AND SOLAE WITH SOY (1894-2020):

EXTENSIVELY ANNOTATED

BIBLIOGRAPHY AND SOURCEBOOK

Compiled

by

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DEDICATION AND ACKNOWLEDGMENTS

This book is dedicated to Ralston Purina Co. and to William H. Danforth - two great soy pioneers.

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...

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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.

INTRODUCTION

Brief Chronology/Timeline of Ralston Purina

1870 Sept. 10 – William Henry Danforth is born in Charleston, Mississippi County, Missouri, the 2nd child and eldest son (who survived childhood) of Albert Hampton Danforth (1842-1900) and Rebecca Hannah Lynn (1842-1913). He is one of 6 brothers and sisters.

1894 Jan. 8 – The Robinson-Danforth Commission Co. is incorporated in St. Louis, Missouri. The founders, William H. Danforth (lived 1870-1955), George Robinson, and William Andrews belong to the same church. The original capitalization is $12,000. The company begins by making horse and mule feed; their product is mixed with shovels on the floor of a back room.

1894 Oct. 25 – William Danforth is married to Miss Adda De Villers Bush in St. Louis, Missouri (*St. Louis Globe-Democrat*. 1894. Oct, 25, p. 7).

In the succeeding two years two children are born – Dorothy H. and Donald E. Danforth (Wayne Dawson. 2020. Family group record).

1896 March – Danforth becomes president of the company and on May 26 of that year he becomes the majority stockholder. The next day the mill is completely destroyed by the worst tornado in St. Louis' history.

"Will Danforth went to the bank and negotiated a loan solely on the strength of his determination to make good. From these beginnings grew the Ralston Purina Company, and the man William H. Danforth" (Ralston Purina Co. 1978. Oct. "William H. Danforth." News release).

1897 – A certain Dr. Ralston has founded the Ralston Health Club and is promoting whole grain (especially whole-wheat) health foods and breakfast cereals. William Danforth asks if his company could make the cereal; Dr. Ralston said "Yes." By June 1897 the Ralston Health Club Breakfast Food was being made by Purina Mills, St. Louis, Missouri (Slosson, E.E. 1897. *Wyoming Agricultural Experiment Station, Bulletin* No. 33. June. p. 76-77, 80).

1899 Dec. – Purina Mills advertises its Ralston Breakfast Food in *Scribner's Magazine* in a full-page ad (p. 65).

1900 April – "In five minutes its cooked" reads the slogan for Ralston Breakfast Food in *McClure's Magazine*, together with (for first time) the slogan "Where Purity is Paramount." Soon many other companies, including those outside the food industry, would start to use this slogan.

1902 – Will Danforth contacts Dr. Ralston again to seek his endorsement for the Purina whole wheat cereal. Dr. Ralston agrees on the condition that his name be added to the company name. So in 1902 Danforth changes his company's name to Ralston Purina Co. (Gray. 1994, p. 22; Mix. 1995, p. 119-21).

1903 April – Ralston Purina Foods first uses the word "Checkerboard" in a full-page ad (in *Smart Set*).

"He remembered the children of a family in his boyhood who were always clothed from the same bolt of checkered gingham. The checkerboard shirt or dress quickly identified each member of the family, and Mr. Danforth thought it would work with the products he manufactured. The Purina Checkerboard has become one of the most famous and effective trademarks in American business (Ralston Purina Co. 1978. Oct. "William H. Danforth." News release).

1904 – The St. Louis World's Fair, also known as the Louisiana Purchase Exposition is held at St. Louis, Missouri, in 1904 to commemorate the centennial of the purchase of the Louisiana Territory (in 1804). Ever the alert businessman, Will Danforth takes advantage of this by selling his cereal – "the most perfect whole wheat food ever made" – in an outside carrying bag covered with a checkerboard pattern, with the word "Ralston" written across the top of both sides. He even distributes posters titled "You Will Never Forget the World's Fair and Your Ralston Box: Begin to Live – now!"

In volume 1 of a two-volume book on the fair, in the section titled "The Concessions," a full-page table (page 587) states the Ralston Purina Co. sold $17,263.10 of "Purina Foods" – breakfast cereals.

1909 – William H. Danforth and a group of friends in St. Louis revive the old custom of meeting to sing Christmas carols. They do this for the sheer pleasure of singing and of bringing Christmas songs to others. There is no particular plan or organization. The group of carolers grows each year, and they find themselves the recipients of many gifts, wholly unsolicited. Such gifts are turned over to the Children's Aid Society. Then in 1924, the Christmas Carols Association is formed and the Danforth genius for organizing is applied. Up to the time of his death he had been the Association's only president (Ralston Purina Co. 1978. Oct. "William H. Danforth." News release).

1917-1918 – "During the First World War, Mr. Danforth served with the Third Division, American Expeditionary Forces. His keen sense of sales promotion, which characterized his entire business life, followed him to the battlefields of France as he observed the enthusiastic connotation that the word 'chow' brought to soldiers in the field. Rations labeled 'chows' seemed to out-taste and out-satisfy just plain food, so when he returned to his business after the war, he applied the name 'Chow' to all livestock and poultry feeds which his company manufactured. Thus came into being the famous 'Purina Chows.' (Ralston Purina Co. 1978. Oct. "William H. Danforth." News release).

1926 – Ralston Purina Co. establishes a 712-acre research farm at Gray Summit (43 miles southwest of St. Louis), Missouri to test, under real-life conditions, the effectiveness of its various scientifically-formulated livestock, pet, and poultry feeds.

Those who attend the American Soybean Association's 26th Annual Convention, held in St, Louis, visit the farm on 31 Aug. 1946. This farm is "conducted like any modern American farm. The farm and laboratories are staffed by almost 200 scientifically trained and practical research workers... Over 3,000 head of livestock and 45,000 poultry are handled annually" (*Soybean Digest*. 1946. July, p. 8-10).

Purina research work with soybean oil [meal] dates back to when this meal had to be imported from Manchuria. When the value of soybean oil meal was proven, the company began to establish soybean processing plants in different sections of the United States (*Chemurgic Digest*. 1946. Oct, 31, p. 347-49).

1929 Oct. 29 – U.S. stock market crash heralds the Great Depression, which lasts until about 1942.

1930 Oct. – Ralston Purina first starts crushing soybeans and using them in its livestock and poultry Chows at 804 North Fourth St., Lafayette, Indiana. In Sept., it begins advertising locally for soybeans (*Journal and Courier* {Lafayette, Indiana}. Sept. 22. p. 15; Sept. 26, p. 15). By July 1933, it enlarges and modernizes this plant (*Journal and Courier*, July 13, p. 1, 13; Oct. 29, p. 19), which is in operation by 17 Jan. 1934.

1931 – William H. Danforth writes *I Dare You*, which he has printed privately for personal friends and daring youth. His plan of four-fold personal development, which became the famous checkerboard logo, was think tall, smile tall, live tall, and stand tall.

1932 – William H. Danforth names his son, Donald, president – in charge of running the company from day to day – and himself chairman of the board. By 1948 Donald has increased company sales tenfold since taking office (*Fortune*. 1948).

1933 Oct. – Ralston starts crushing soybeans in St. Louis, Missouri – "in the heart of America's greatest soybean growing area." It will keep the meal and sell the oil (*St. Louis Globe-Democrat*. 1933. June 28, p. 17; *Republican Tribune* {Union, Missouri}. Nov. 24, p. 7).

1935 Jan. – Ralston starts crushing soybeans in Circleville, Ohio. "Two expellers to begin operation Jan. 15 have capacity of 1,200 bushels daily." Ralston Purina expects to crush 300,000 bushels of soybeans in 1935 (*Circleville, Herald.* 1934. Dec. p. 1).

1936 Sept – Ralston starts crushing soybeans in St. Osceola, Arkansas. (*Courier News*. June 3. p. 1).

1938 Sept. – In a full-page ad, Purina Mills claims to be "the largest user of soy bean oilmeal" in the USA. "Our twenty-two plants require the meal from over 3,000,000 bushels of soybeans annually to make Purina Chows"(*Proceedings of the American Soybean Association*. Rear cover).

1942 Dec. 1 – Ralston starts crushing soybeans in Iowa Falls, Iowa (*Soybean Digest*. 1943. Jan.).

1945 June. – Ralston starts crushing soybeans in Kansas City, Missouri (*Soybean Digest*. 1945. June 14).

1947 – Ralston Purina is now operating six crushing plants. All are using expellers rather than solvent extraction.

1949 July – Ralston first begins using solvent extraction when crushing soybeans. It does this at its plants in Iowa Falls, Iowa (*Soybean Digest*. p. 44).

1949 Aug. – Ralston starts crushing soybeans in Bloomington, Illinois (*Pantagraph* {Bloomington. Illinois}. 1948. June 15; *Soybean Digest*. 1948. July, p. 32).

1952 March – Ralston announces that it will add two soybean solvent extraction plants, one at Kansas City and one at Decatur, Illinois. The latter is in conjunction with the new Shellabarger mill which Ralston has just purchased (*Soybean Digest*. p. 26)

1953 Sept. – Ralston starts crushing soybeans in Decatur, Illinois (*Decatur Daily Review*).

1955 Dec. 24 – William H. Danforth, founder and a noted philanthropist, dies at his home in St. Louis, at age 85 of a heart attack. His son, Donald, succeeds him as chairman of the board (*St. Louis Post-Dispatch* (Dec. 25, p. 1, 4; 1956. Jan. 4. p. 15; *Soybean Digest*. 1960. Dec. p. 12).

"The Ralston Purina Company, which Mr. Danforth founded, has over 60 manufacturing plants in the United States, Canada, Central and South America and Europe. The company is the world's largest manufacturer of balanced rations for livestock and poultry. It is a major manufacturer of breakfast cereals, and one of the hundred largest corporations of America. Mr. Danforth was also a director of several large corporations. But his work with and for American youth was the source of his greatest satisfaction" (Ralston Purina Co. 1978. Oct. "William H. Danforth." News release).

1956 – "Ralston introduced Purina Dog Chow which becomes the market leader in just over a year. Purina Cat Chow followed in 1962 and was also successful" (Gray 1994, p. 101).

1958 Dec.– Ralston Purina becomes involved with isolated soy proteins through the acquisition of four soybean processing plants from Procter & Gamble (Buckeye Division) (Susan W. Vorih. 1993. Personal communication).

1958 Dec. – Ralston starts crushing soybeans in Louisville, Kentucky (*State Times* {Jackson, Mississippi} 1958. Nov. 4).

1958 Dec. – Ralston starts crushing soybeans in Memphis (Binghampton) Tennessee (*State Times* {Jackson, Mississippi} 1958. Nov. 4).

1958 Dec. – Ralston starts crushing soybeans in New Madrid, Missouri (*State Times* {Jackson, Mississippi} 1958. Nov. 4).

1958 Dec. – Ralston starts crushing soybeans in Raleigh, North Carolina (*State Times* {Jackson, Mississippi} 1958. Nov. 4).

1959 June – Ralston starts to make ProCote, industrial soy protein for coating paper, at its plant in Louisville, Kentucky (Susan W. Vorih. 1993. Personal communication).

1959 late – Ralston Purina began research on food-grade isolates starting in late 1959 under the direction of Mr. Bill Brew in St. Louis. Many consultants were paid for information. Pilot plant work was also performed in St. Louis prior to first contacts with Mr. Bob Boyer. Mr. Boyer was a spun protein specialist… Ralston Purina began more active involvement with food-grade isolated soy proteins in 1960 when the company started food-grade isolated soy protein research and pilot plant work at its headquarters in St. Louis, Missouri. A semi-works plant to produce edible soy proteins was erected in 1961 at Louisville, and both spray-dried and spun fiber proteins began to be produced and sold in October 1962. The spray-dried edible isolates, brand-named Edi-Pro A and Edi-Pro N, were sold to food processors (Susan W. Vorih. 1993. Personal communication).

1960 March – By this date Ralston Purina is using solvent extraction at its plants in Bloomington and Decatur, Illinois; Iowa Falls, Iowa; and Kansas City, Missouri (*Soybean Blue Book*. 1960. p. 56-74).

1961 – Ralston Purina makes its first edible soy protein product, a soy protein isolate (Dave Stone. 1982. Jan 13. Personal communication). However others give the date as 1960 and "after 1962" (F. Calvert. 1984. Feb. 19. Personal communication).

1961 – Protein Technologies International dates its origin from this year. "Since its start in 1961, the business has evolved from a small, food-grade soy isolate facility in Louisville, Kentucky, to an international supplier of protein, polymer, and fiber products with offices worldwide" (*Oil Mill Gazetteer*. 1987. Oct.)

1962 – Robert Boyer joins the research staff of Ralston Purina as a Protein Scientist; he continues to work there until his retirement in 1971 (*Cereal Foods World*. 1976. July. p. 297-98).

1962 Oct. – Ralston Purina Co., Special Soy Products Dept. starts to make Textured Edi-Pro (Spun Soy Protein Fibers) at its plant in Louisville, Kentucky (Dave Stone. 1982. Jan 13. Personal communication).

1963 Sept. - Mr. Frank Calvert was hired to head up Ralston Purina's R&D work on food-grade isolated soy protein in St. Louis. Calvert received a BS degree in chemistry from the Edison Institute of Technology while working at the Ford Motor Co. [with Robert Boyer] in Dearborn, Michigan. In 1965 Calvert was named director of soybean research, and in 1967 director of research of the Protein Division. In 1969 Calvert was promoted to director of research, New Venture Management, and finally in 1971 vice president and research director, New Venture Management. During these years, Calvert developed new soy protein isolation processes, 70 percent soy protein concentrate products, and modified soy protein coating compositions for industrial use. Calvert is considered a visionary in soy protein research and the accomplishments of his career were honored when the Protein Technologies International plant at Memphis was dedicated to him in 1973 in recognition of his years of service and dedication to protein technology (Susan W. Vorih. 1993. Personal communication).

1963 – Donald Danforth retires; Raymond E. Rowland is named Chairman of the Board and Chief Executive Officer (*The Ralston Chronicle*. 1894. Inside front cover).

1966 Oct. Ralston Purina first starts to sell Supro 610 – the first of its many Supro soy protein products (Susan W. Vorih. 1993. Personal communication).

1966 – Ralston Purina achieves its first $1 billion sales year (*The Ralston Chronicle*. 1894. ifc).

1966 – Ralston Purina Co., Special Soy Products Dept. starts to make Pur-A-Lec Lecithins (Standard Plastic and Fluid Grades; Bleached and Unbleached) (*Soybean Blue Book*. 1966. p. 106).

1968 – R. Hal Dean is named Chairman of the Board and Chief Executive Officer; he retired in 1981 (*The Ralston Chronicle*. 1994. Inside front cover).

1970 – Ralston opens Purina Protein Europe, in Brussels. This was a sales and marketing office that imported Ralston Purina products from the U.S. It is still going great (Dave Stone. 1982. Jan 13. Personal communication).

1970 – The 'Protein Project' became part of the New Ventures Group of Ralston Purina; the Project was headed by Paul H. Hatfield. Included in this early business development team were Dr. D.H. Waggle, R&D; Mr. Henry T. James, Director of Engineering, now retired; and B.P. Schwartz, Manufacturing. This team, working as a multi-functional and multi-disciplined team, emphasized process reliability, superior quality and performance products, combined with a worldwide perspective of market development (Susan W. Vorih. 1993. Personal communication).

1973 July 14 – Donald Danforth, retired chairman of the Ralston-Purina board, dies at age 74. Under Donald's leadership and vision, the company had thrived financially, even during the Great Depression (*St. Louis Post-Dispatch*. 1973. July 15. p. 3A).

1974 July – Fuji Purina Protein Ltd., a joint venture of Fuji Oil Co and Ralston Purina Co. is established in Osaka, Japan to make edible soy protein isolates in Japan. The firm, to be equally owned by both companies, will have a plant with a capacity of 200 metric tons per month (*Lincoln Star Journal*, 1974. July 31, p. 28).

As of 1982, this joint venture is still in operation (Dave Stone. 1982. Jan 13. Personal communication).

1976 Dec. – Ralston Purina's Protein Division opens the world's largest soy protein isolate plant in Pryor, Oklahoma at a cost of $15 million. The production capacity is highly confidential, however it can be said that the new plant doubles the combined capacity of Ralston's two existing isolate plants in Memphis, Tennessee (opened in June 1973), and Louisville, Kentucky. Japan. Nine different soy protein isolates, each with different functional properties, will be produced in the new plant: Edi-Pro A, Edi-Pro N, Supro HD-90, Supro 350, Supro 610, Supro 620, Supro 630, Supro 640, and Supro 710. A description of the properties of each is given. Some will be exported to Fuji Purina Ltd. in Japan (*Food Engineering*. 1977. Jan, p. 68-69).

1978 May 22-25 –Ralston Purina expresses its deepening interest in soy protein nutrition by hosting the Keystone Conference on Soy Protein and Human Nutrition at the famous Keystone ski resort in Keystone, Colorado. The event brought together the top researchers in the field (Wilcke et al. 1979).

1979 Jan. – Ralston Purina's new isolated soy protein begins operations in Ypres / Ieper, Belgium. Said to be of its kind in Europe, it was built at a cost of 10 million British pounds (£10 million) pounds by Ralston Purina Europe, a company started by Ralston Purina in 1972 to help them enter the European market. The isolate is available in 9 different forms (*Food Manufacture* {London}. p. 61-62).

1979 – *Soy Protein and Human Nutrition*, edited by Harold L. Wilcke, Daniel T. Hopkins, and Doyle H. Waggle is published by Academic Press (New York, NY; xiv + 406 p.) It contains the Proceedings of the Keystone Conference held in Keystone, Colorado, May 22-25, 1978. The conclusions presented in this book are:

"(1) isolated soy protein, when measured by human nutritional studies, is comparable in protein quality to other high-quality protein sources such as meat, milk and eggs;

"(2) due to its quality, latest information shows that properly processed isolated soy protein is a protein source that can be used in a wide variety of food applications such as infant foods, processed foods, and other modern food products; and

"(3) conventional methods of measuring protein quality for human nutrition are not adequate, and the protein quality of isolated soy protein is underestimated by the conventional and official methods for measuring protein quality."

1980 – Ralston Purina is the fifth largest soybean crusher in the USA and the world's largest manufacturer of isolated soy proteins.

1980 – Soy protein products are approved for use as a beef extender by the U.S. Armed Forces.

1981 Feb. **13** – In Louisville, Kentucky, a series of early morning explosions in the city's sewers sent manhole covers flying and left huge craters in streets. A hexane leak in Ralston Purina's Louisville plant is found to be the culprit. Purina decides to sell six of its soybean processing

plants to Cargill; a 7th at Memphis, Tennessee was closed. This removes the company from soybean commodity processing. With this transaction Cargill passes ADM to become America's largest soybean crusher (*Journal-Courier* {Louisville, Kentucky}. 1981. Feb. 14. p. 1-2; C.L. Kingsbaker. 1985. June 17).

This event leads the company to gradually think about getting out of low-margin commodity businesses and into higher-margin consumer products.

1981 – R. Hal Dean retires (*The Ralston Chronicle*. 1994. Inside front cover).

1981 July – William P. Stiritz is named CEO (*The Ralston Chronicle*. 1994. Inside front cover).

1982 Jan. – William P. Stiritz is named Chairman of the Board (*The Ralston Chronicle*. 1994. Inside front cover).

1983 – Use of isolated soy protein in foods in the National School Lunch Program is approved by the USDA. Practically this means extending ground meat (as in hamburgers) to lower the cost and fat, and to increase the protein – with no change in flavor.

1985 – In his letter to shareholders, CEO Stiritz writes: The "sale of our soybean processing [crushing] operations in January removed the Company from a commodities business and freed cash for other investment…"

Page 12: "Protein Technologies completed construction and start-up of a self-contained market development unit in Memphis, Tennessee, to permit rapid scale-up and marketing of new and improved isolated soy protein products." Sales of soy protein products were: $144.3 million in 1983, $154.3 million in 1984, and $126.4 million in 1985 (*Annual Report to Shareholders 1985*. Pages 12, 20).

1986 – Ralston Purina starts to make and sell Fibrim (Soy Fiber from Processing Isolated Soy Proteins) (*Oil Mill Gazetteer*. 1987. Oct.).

1986 July – The Protein Division of the Ralston Purina Co. starts to publish *Nutrition Overview*, a glossy scientific newsletter mostly about soy protein nutrition.

1986 Oct. – Ralston sells the Purina Mills animal feed business – its earliest, basic business – resulting in an after-tax gain of $209.3 million (Annual Report to Shareholders. 1987).

1987 July 1 – Ralston Purina Co. spins off Protein Technologies International (PTI) as a wholly-owned subsidiary to focus on sales of soy protein for food uses. Paul H. Hatfield is president. The company's sales of soy protein products were $139.8 million in 1986; $157.1 million in 1987; and $182.0 million in 1988. By April 1988 PTI offered 20 different isolated soy protein products (*Annual Report to Shareholders*. 1987. p. 8, 15).

1994 Feb. 3 – Ralston Purina celebrates its 100th anniversary at the Annual Shareholders Meeting in St. Louis (*The Ralston Chronicle*. 1994. Inside front cover).

1997 Dec. 3 – Protein Technologies International, a wholly-owned subsidiary of Ralston Purina Co., is acquired by DuPont for $1.554 billion comprised of DuPont common stock and the assumption of certain liabilities (*Annual Report to Shareholders*. 1997 (p. 1-2).

1998 May 4 – Protein Technologies International (PTI) of St. Louis, Missouri, submits a petition to the U.S. Food and Drug Administration (FDA) for a heart-health claim for soy protein (*Federal Register*. 1998. Nov. 10).

1999 Oct. 26 – The U.S. Food and Drug Administration approves a heart health claim for soy protein. This health claim, to be used on food labels and in food labeling, states that consumption of 25 grams of soy protein per day may reduce one's reduced risk of coronary heart disease.

This sets the stage for the introduction of new, great-tasting soy protein products (SuproVision. 1999. Dec.).

2001 Aug. 9 – The word "Solae" is first used as a brand name for DuPont's new isolated soy proteins (*Philadelphia Inquirer*. p. 35).

2001 Dec. 12 – "Nestle acquires Ralston Purina, creating Nestle Purina PetCare and helping to expand the availability of Purina products to pets and pet owners all over the world" (www.purina.com/about-purina).

Ralston Purina Co. ceases to exist.

2003 March – DuPont and Bunge form an agriculture, nutrition joint venture named Solae, LLC (*Oils & Fats International*. 2003. 19(2):2).

2003 June 25 – DuPont announces that it will move its Agriculture and Nutrition Group headquarters to Des Moines, Iowa, from Wilmington, Delaware. This group includes DuPont Nutrition & Health, which includes The Solae Co. (*Des Moines Register*, June 26, p. 35).

2005 Feb. 12 – The Solae Company unveils a new corporate tagline – "Better Ingredients for Better Living"™. (*Business Wire*).

2007 – Solae announces a collaboration with Monsanto Co. to develop products containing omega-3 fatty acids.

2011 May 16 – DuPont acquires Danisco, a food and ingredients company from Denmark (*News Journal* {Wilmington, Delaware}. May 17. p. 6)

2012 May 1 – The Solae Co. announces that DuPont has acquired Bunge's 28% share, thus taking full ownership of the company. DuPont then began the process of integrating Solae into Danisco (Wikipedia entry for Solae; (*News Journal* {Wilmington, Delaware}. May 2. p. A10, A12).

2015 – DuPont changes the name of Solae to DuPont Nutrition & Health. The current president is Matthias Heinzel (*Food Business News*. 2014. Dec. 5).

2017 Aug. 31 – Dow and DuPont merge to form DowDuPont (Web article).

ABOUT THIS BOOK

This is the most comprehensive book ever published about the history of Ralston Purina Co. It has been compiled, one record at a time over a period of 42 years, in an attempt to document the history of this important and interesting 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:

- 56 different document types, both published and unpublished.
- 853 published documents - extensively annotated bibliography. Every known publication on the subject in every language.
- 85 unpublished archival documents.
- 145 original Soyinfo Center interviews and overviews never before published, except perhaps in our books.
- 80 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.

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

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
tonnes = 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

HOW TO MAKE THE BEST USE OF THIS DIGITAL BOOK - THREE KEYS

1. Read the Introduction and Chronology/Timeline located near the beginning of the book; it contains highlights and a summary of the book.

2. Search the book. The **KEY** to using this digital book, which is in PDF format, is to **SEARCH IT** using Adobe Acrobat Reader: For those few who do not have it, Google: **Acrobat Reader** - then select the **free** download for your type of computer.

Click on the link to this book and wait for the book to load completely and the hourglass by the cursor to disappear (4-6 minutes).

Type [Ctrl+F] to "Find." A white search box will appear near the top right of your screen.
Type in your search term, such as Solae or St. Louis
You will be told how many times this term appears, then the first one will be highlighted.
To go to the next occurrence, click the down arrow, etc.

3. Use the indexes, located at the end of the book. Suppose you are looking for all records about tofu. These can appear in the text under a variety of different names: bean curd, tahu, doufu, to-fu, etc. Yet all of these will appear (by record number) under the word "Tofu" in the index. See "**How to Use the Index**," below. Also:

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 soybean 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.

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

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, Artemy A. Horvath, Englebert Kaempfer, Mildred Lager, William J. 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 of more than 70 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.

"**Note**:" When this term is used in a record's summary, it indicates that the information which follows it has been added by the producer of this database.

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3. An asterisk in a listing of the number of references [23* ref] means that most of these references are **not** about soybeans or soyfoods.

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

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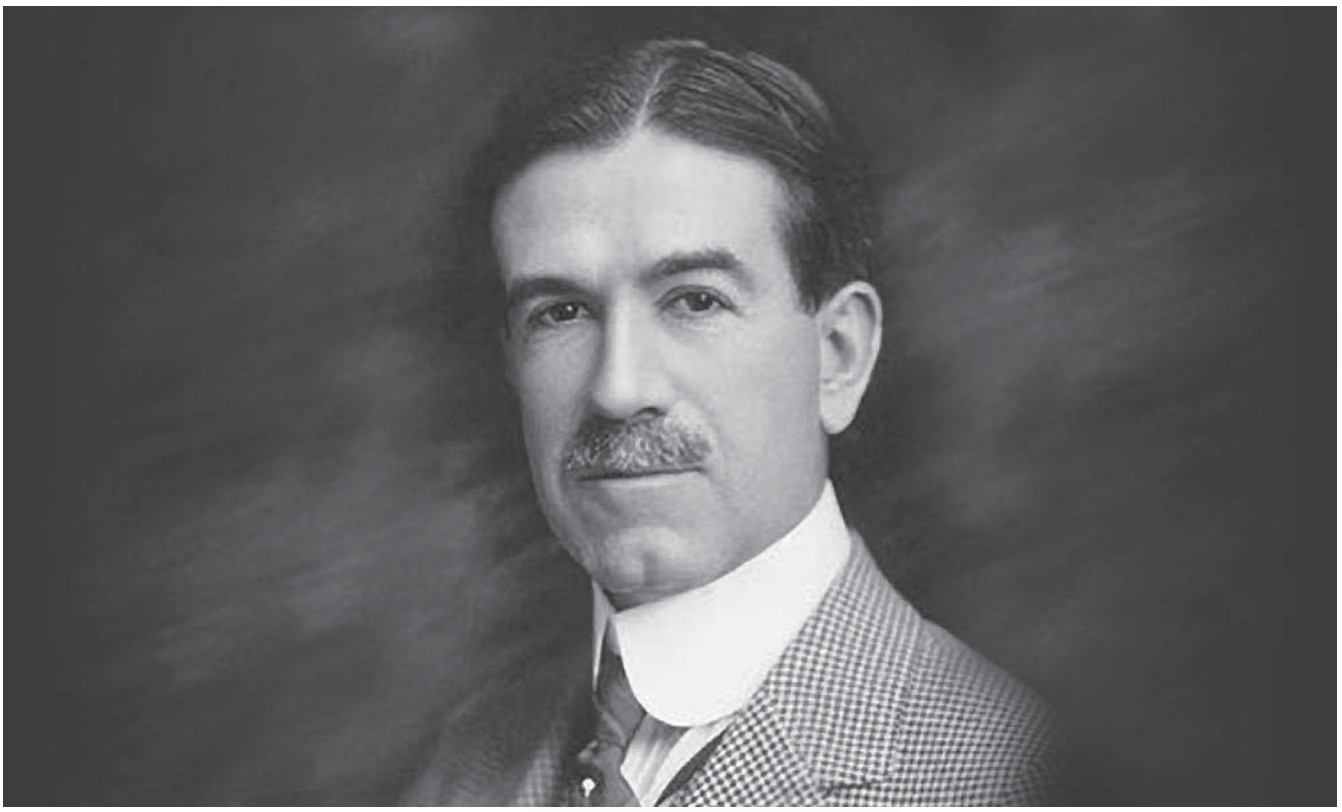
www.soyinfocenter.com

The tornado of 1896 nearly finishes the Company.

William H. Danforth

"Maud the Mule" is an early Purina mascot.

Early letterhead shows Danforth as President, and depicts the new mill at Eighth and Gratiot streets.



RALSTON PURINA COMPANY
Checkerboard Square
St. Louis, Missouri 63164

Our twenty-two plants require the meal from over 3,000,000 bushels of soybeans annually to make Purina Chows . . . the feeds for livestock and poultry that are famous for their Quality!

Purina Mills

Soybean Processing Plants at

CIRCLEVILLE, OHIO

LAFAYETTE, INDIANA **OSCEOLA, ARKANSAS**

ST. LOUIS, MISSOURI

When You Buy Purina Chows, You Make a Better Market for Your Soybeans

Family in which William Henry Danforth was a Child

Husband:		Albert Hampton Danforth
	Birth:	12 September 1842 in Henderson, Henderson Co., Kentucky
	Marriage:	7 November 1867 in Mississippi Co., Missouri
	Death:	24 December 1900 in Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; IOOF Cemetery
	Father:	Leander Foster Danforth
	Mother:	Jane Woodfork Jones
Wife:		Rebecca Hannah Lynn
	Birth:	15 July 1842 in Louisville, Jefferson Co., Kentucky
	Death:	9 December 1913 in Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; IOOF Cemetery
	Father:	Israel Lynn
	Mother:	Nancy Lovelace
Children:		
1	Name:	Frank Clinton Danforth
M	Birth:	22 September 1868 in Charleston, Mississippi Co., Missouri
	Death:	9 July 1869 in Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; Oak Grove Cemetery
2	Name:	William Henry Danforth
M	Birth:	10 September 1870 in Charleston, Mississippi Co., Missouri
	Marriage:	24 October 1894 in St. Louis City, Missouri
	Death:	24 December 1955 in St. Louis City, Missouri
	Burial:	Bel-Nor, St Louis Co., Missouri; Cremated
	Spouse:	Adda De Villers Bush
3	Name:	Katie Lynn Danforth
F	Birth:	30 June 1872
	Death:	22 September 1872 in Probably Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; Probably Oak Grove Cemetery
4	Name:	Harry Medley Danforth
M	Birth:	1 December 1873
	Death:	24 September 1874 in Probably Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; Probably Oak Grove Cemetery
5	Name:	Albert Hampton Danforth
M	Birth:	7 November 1876
	Death:	13 October 1945 in Washington, D. C.
	Burial:	St. Louis City, Missouri; Bellefontaine Cemetery
	Spouse:	Last Name Unknown Sammy
	Other Spouses:	Jean Fuller
6	Name:	Albert Leslie Danforth
M	Birth:	13 February 1887
	Death:	30 September 1913 in Asheville, Buncombe Co., North Carolina

Notes:

Albert Hampton Danforth

Parents Names, Birth, Death, Burial Source: Findagrave.com Memorial #158344419 for William H. Danforth.

Notes: (cont.)
Birth Place, Children, Spouse Name, Parents Source: Harrison-Ivie Family Tree via Ancestry.com.

In 1900 when the 1900 United States Census was taken, A. H. Danforth was a landlord, owned their own home which was a house, not a farm. Source: 1900 United States Census of Mississippi County, Missouri, Tywappity Township, Charleston City, Supervisor's District 12, Enumeration District 71, Sheet 19A, was taken on 22 June 1900 by Henry A. Danforth.

When Albert H. Danforth registered for the Civil War on 1 July 1864, he was 20 years old, had been born in Kentucky, and was living in Long Prairie, Mississippi County, Missouri. He had 14 months of prior military service. Source: US, Civil War Draft Registration Records, 1863-1865 via Ancestry.com.

On 7 November 1867, Albert H. Danforth married Rebecca H. Lynn in Charleston, Mississippi Co., Missouri. Source: Missouri, Marriage Records, 1805-2002 via Ancestry.com.

A. H. Danforth signed his will on 1 June 1900. It was filed for probate on 2 January 1901 in the Probate Court of Mississippi County, Missouri. In his will, he left 40 acres to his son, William H. Danforth, namely the SE of the NW quarter and SW of the SE quarter in Section 33, Township 27. Range 16 in Mississippi County, Missouri. In addition, he bequeathed his $25,000 and all the stock he owned in the Robinson-Danforth Milling Company of St. Louis, if he desired to take it at par value. If he took the stock, the value was to be deducted from the $25,000. In addition, he bequeathed to his son A. H. Danforth, Jr., 40 acres of land, namely the SE of the SW quarter in Section 2, Township 26, Range 15, and 80 acres, the East half of the NW quarter of Section 11, Township 26, Range 15, all in Mississippi County, and 20 acres N half of the NE of the SW quarter of Section 11, Township 26, Range 15, all in Mississippi County, He also bequeathed A. H. Danforth, Jr., $25,000. Any remaining property and stock, he bequeathed to his wife Rebecca, requesting her to keep the stock, bonds, etc. in the same form as they were in at the time of his death, believing that they were profitable. She was to used the income for her support. At her death, all of her inheritance would be divided between his legal heirs. Source: Missouri, Wills and Probate Records, 1766-1988, Volume 3, Page 135, via Ancestry.com.

Rebecca Hannah Lynn
Spouse, Children, Birth, Parents' Names, Death Source: Findagrave.com Memorial #79197767 for Rebecca Hannah Lynn Danforth.

Frank Clinton Danforth
Name, Birth, Death Source: Harrison Ivie Family Tree on Ancestry.com.

William Henry Danforth
Birth, Death, Parents, Spouse Source: Findagrave.com Memorial #158344419 for William H. Danforth.

Marriage Source: Article from *St. Louis Post-Dispatch* (St. Louis, Missouri) 24 October 1894, Page 10, Column 3; "Marriage Licenses," *St. Louis Globe-Democrat* (St. Louis, Missouri) 23 October 1894, Page 10, Column 4; and "Society", *St. Louis Globe-Democrat* (St. Louis, Missouri) 25 October 1894, Page 7. Column 4.

Photo Source: Danforth (padanforth) Family Tree via Ancestry.com.

William H. Danforth received a degree in Mechanical Engineering in 1892 from Washington University. Source: "Queen of the Veiled Prophet", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

In his passport application, William H. Danforth listed his wife as Adda B. Danforth. He was a miller living in St. Louis, Missouri. Passport issued for travel to various European countries. They were sailing on the Olympic ship from New York on June 25, 1921. Passport issued at Washington, D. C. on May 10, 1921.

In the 1900 United States Census, William H. Danforth was a miller. The family lived at 5625 Cates Avenue in St. Louis City, Missouri. Source: 1900 Census of St. Louis, Missouri, Ward 28, taken 15 June 1900 by Warren D. Crandall. Supervisor's District 11 Mo., Enumeration District 425, Sheet 14A.

Notes: (cont.)

In the 1910 United States Census, William H. Danforth was living at 17 Kingsbury Place in St. Louis, Missouri. He was 39 years old and had been married 15 years. He was a miller in the flour industry. His wife Adda B., age 39, married for 15 years, and the mother of 2 children, both alive in 1910. Also, in the family were their two children, Dorothy H., age 14, born in Missouri, and Donald E., age 11. and born in Missouri. Also living in the Danforth family was Adda's mother, Emma Bush. Emma was 59 years old, widowed, born in Ohio, and the mother of 2 children, both of whom were alive. Also living with the family were 3 servants. Source: The 1910 Census of St. Louis, Missouri, Supervisor's District 10, Enumeration District 449 was enumerated on 28 April 1910 by Frank Maganon(?).

The 1920 US Census the family of William H. Danforth was living at 17 Kingsbury Place, in St. Louis, Missouri, a home which they owned. William was 49 years old, born in Missouri, both parents were born in Kentucky, and was the president of a milling company. His wife Adda was 44 [sic, 49] years old, born in Missouri; her father was born in Kentucky and her mother in Ohio. Also in the family was their son Donald, who was 21 years old, born in Missouri, both parents born in Missouri, and he had attended school. He had no occupation listed. Emma Bush, mother of Adda B. Danforth, was living with the Danforths. She was 69 years old and widowed. She had been born in Ohio, her father in Pennsylvania and her mother in Ohio. Source: 1920 US Census of St. Louis City, Missouri, Supervisor's District 10, Enumeration District 591, Sheet 4!, Page 4020. The census was taken on 5 January 1920 by Douglas Wood. The 1920 Census was via Ancestry.com.

In the 1930 United States Census, the Danforths were living at 17 Kingsbury Blvd in St. Louis, Missouri. William H. Danforth was 59 years old. He had married at age 24. He could read and write, was born in Missouri, both parents were born in Kentucky. His occupation was manufacturing in the foodstuff industry. He was listed as an "employer" (rather than a "worker"). His wife, Ada B. [sic, Adda B.], was 59 years old, married at age 24, and born in Missouri. Her father was born in New York and her mother in Ohio. Also living in the Danforth household was Emma Bush, Adda's mother. Emma was age 78 and was married at 17 years old and could read and write. She was born in Ohio. Emma's father was born in Pennsylvania and her mother in Ohio. Living in the house was Lena Parr, age 27, and Josephine Woltshock, age 41, both shown as servants. Source: 1930 US Census of St. Louis, Missouri, Ward 25, Block 5619-5550, Enumeration District 96-170, Supervisor's District 8, Sheet 4A, Page 178. The census was taken on 4 April 1930 by Jessie S. Henderson via Ancestry.com.

Source of Photo of Adda B. Danforth and children Dorothy and Donald - Danforth family photos, taken ca 1900, via Ancestry.com.

William H. Danforth headed the Ralston-Purina Co., a company he founded, for 36 years. Upon retirement, he handed the reins of the company to his son Donald. Source: "Queen of the Veiled Prophet", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

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Katie Lynn Danforth

Source of Name, Birth and Death: Harrison Ivie Family Tree on Ancestry.com.

Harry Medley Danforth

Name, Birth and Death Source: Harrison Ivie Family Tree on Ancestry.com.

Albert Hampton Danforth

Birth, Death, Family Names Source: Findagrave.com Memorial #79195140 for A. H. Danforth.

Birth, Father Source: Passport Application for Albert Hampton Danforth, born 7 Nov 1976, in Charleston, Mississippi Co., Missouri. He was a broker from New York City, New York. He had been out of the United States from March 1917 to April 1917. Issued at Washington, D. C., 5 Nov 1918.

Notes: (cont.)

When Albert Hampton Danforth filled out his draft card for WWII, he was a broker working for Danforth and Company. He residing in Manhattan City, New York with his wife Jean. The card was dated 7 Sept 1918.

Albert's obituary stated that he was a native of Charleston, Missouri and died in Washington, D. C. It also stated that he was a brother of William H. Danforth, the chairman of the Board of the Ralston-Purina Company. Source: Obituary of Albert H. Danforth, published in the *St. Louis Post-Dispatch* (St.Louis, Missouri) on 15 Oct 1945, Page 13, Column 8.

Albert Leslie Danforth

Name, Birth and Death Source: Harrison Ivie Family Tree on Ancestry.com.

Ralston Purina Company

William P. Stiritz
Chairman
Chief Executive Officer

Family in which William Henry Danforth was a Parent

Husband:		William Henry Danforth
	Birth:	10 September 1870 in Charleston, Mississippi Co., Missouri
	Marriage:	24 October 1894 in St. Louis City, Missouri
	Death:	24 December 1955 in St. Louis City, Missouri
	Burial:	Bel-Nor, St Louis Co., Missouri; Cremated
	Father:	Albert Hampton Danforth
	Mother:	Rebecca Hannah Lynn
Wife:		Adda De Villers Bush
	Birth:	24 October 1870 in Cole Camp, Benton Co., Missouri
	Death:	2 September 1956 in St. Louis City, Missouri
	Burial:	Bel-Nor, St Louis Co., Missouri; Cremated
	Father:	Floyd Evans Bush
	Mother:	Emma Bohn
Children:		
1	Name:	Dororthy H. Danforth
F	Birth:	30 July 1895 in Missouri
	Marriage:	11 October 1917 in St Louis, Missouri
	Death:	19 May 1974 in Scarsdale, Westchester Co., New York
	Burial:	Cambridge, Middlesex Co., Massachusetts; Mount Auburn Cemetery
	Spouse:	Randolph P. Compton
2	Name:	Donald E. Danforth
M	Birth:	12 November 1898 in St. Louis City, Missouri
	Marriage:	3 March 1925 in St. Louis City, Missouri
	Death:	14 July 1973 in St. Louis City, Missouri
	Burial:	St. Louis City, Missouri; Bellefontaine Cemetery
	Spouse:	Dorothy E. Claggett

Notes:

William Henry Danforth

Birth, Death, Parents, Spouse Source: Findagrave.com Memorial #158344419 for William H. Danforth.

Marriage Source: Article from *St. Louis Post-Dispatch* (St. Louis, Missouri) 24 October 1894, Page 10, Column 3; "Marriage Licenses," *St. Louis Globe-Democrat* (St. Louis, Missouri) 23 October 1894, Page 10, Column 4; and "Society", *St. Louis Globe-Democrat* (St. Louis, Missouri) 25 October 1894, Page 7. Column 4.

Photo Source: Danforth (padanforth) Family Tree via Ancestry.com.

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Notes: (cont.)

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Adda De Villers Bush

Birth, Death, Burial, Parents Names Source: Findagrave.com Memorial #158344491 for Adda Bush Danforth.

Birth Source: Passport application #222001 filed on May 10, 1921 in Washington, D. C.

Source of Adda's Middle Name: Article "Society", *St. Louis Globe-Democrat* (St. Louis, Missouri) 25 October 1894, Page 7. Column 4.

In the 1900 United States Census, Adda B. Danforth had been married to William H. Danforth for 6 years (1894) and was the mother of 2 children, both alive in 1900. 1900 Census of St. Louis City, Missouri, Supervisor's District 11th Mo., Enumerator District 425, Sheet 14A. Census taken 15 June 1900 by Warren D. Crandall.

Adda Danforth was listed in "Who was Who in American Art, 400 years of artists in America." Second

Notes: (cont.)

edition. Three volumes. Edited by Peter Hastings Falk. Madison, CT. Sound View Press, 1999

By the time of Adda's death on 2 Sept 1956, the Danforths had moved to 17 Kingsbury Place in St. Louis. Her death certificate listed her date of birth, date of death, parents' names, her maiden name and her husband's name. Source: Death certificate State #31985. Registrar's #8113 from Missouri Digital Heritage, Missouri Death Certificates, 1910-1969.

Dororthy H. Danforth

Birth and Middle Initial Source: Missouri, Birth Registers, 1847-1910, Registry of Births-City of St. Louis, Record images for St. Louis, 1894-1895. Birth # 5704, July 30, 1895, No Page Numbers via Ancestry.com. Apparently Dorothy never used the name for which the "H" stood for, as no records have been found that show her middle name.

Marriage Source: "Society, Compton-Danforth Wedding", *St. Louis Globe-Domocrat* (St. Louis, Missouri) 12 October 1917, Page 7, Column 3 via Newspapers.com.

Birth, Death, Burial Source: Findagrave.com Memorial #196562176 for Dorothy Danforth Compton.

Dorothy was a graduate of Vassar College, a Trustee of the Danforth Foundation, and a Trustee of Morehouse College in Atlanta until 1969. Source: "Mrs. Dorothy Compton Dies; Daughter of W. H. Danforth." *Star Post-Dispatch* (St. Louis, Missouri) 20 May 1974, Page 61. Columns 1-4.

Death Source: Obituary of Dorothy H. (Danforth) Compton: "Mrs. Dorothy Compton Dies; Daughter of W. H. Danforth." *Star Post-Dispatch* (St. Louis, Missouri) 20 May 1974, Page 61. Columns 1-4.

Donald E. Danforth

Birth and Middle Initial Source: Missouri, Birth Registers, 1847-1910, Registry of Births-City of St. Louis, Record images for St. Louis, 1898-1899. Birth # 9994, November ?, 1898 via Ancestry.com. The record of his birth is under a piece of tape that was used to repair the page. The name, Danforth, Donald is obscured by the tape. The initial E. is visible. The record is definitely Donald E. Danforth since the parents were shown as Wm H. and Adelaide B. No Page Numbers, via Ancestry.com. Apparently Donald never used the name for which the "E" stood for, as no records have been found that show his middle name.

Birth Source: US Passport Application for Donald Danforth, issued 22 January 1923 in Washington, D. C. Passport application 4103 via Ancestry. com.

Birth, Death, Parents Names Source: Findagrave.com Memorial #36098548 for Donald Danforth, Sr.

Became President of the Ralston-Purina Co. when his father retired in 1932. Source: "10,000 Witness Gay Pagentry at Veiled Prophet Ball",*The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

Donald graduated from Princeton University in 1920. Source: "10,000 Witness Gay Pagentry at Veiled Prophet Ball", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

Source of Children of Donald Danforth: "Miss Dorothy Danforth Plans Wedding in June," St. Louis Star and Times (St. Louis, Missouri), 22 December 1948, Page 18, Column 1-4.

Source of Children and Ages: 1940 United States Census of Clayton Township, St. Louis Co., Missouri. Supervisor's District 12; Enumeration District 95-41, Sheet 1B. Census taken on 9 April 1940 by John M. Magnes. The father, Donald Danforth was shown as a Vice President in the Manufacturing industry.

Trustee of Princeton University. Source: "10,000 Witness Gay Pagentry at Veiled Prophet Ball", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

Donald was active in YMCA. He was named chairman of their advanced gift division to head their fundraising drive. Source: "10,000 Witness Gay Pagentry at Veiled Prophet Ball", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

Family in which Donald E. Danforth was a Parent

Husband:		Donald E. Danforth
	Birth:	12 November 1898 in St. Louis City, Missouri
	Marriage:	3 March 1925 in St. Louis City, Missouri
	Death:	14 July 1973 in St. Louis City, Missouri
	Burial:	St. Louis City, Missouri; Bellefontaine Cemetery
	Father:	William Henry Danforth
	Mother:	Adda De Villers Bush
Wife:		Dorothy E. Claggett
	Birth:	1901 in Missouri
	Death:	18 May 1990 in Clayton, St Louis Co., Missouri
	Burial:	St. Louis City, Missouri; Bellefontaine Cemetery
	Father:	William N. Claggett
	Mother:	Eleanor Evans
Children:		
1	Name:	William H. Danforth II
M	Birth:	10 April 1926 in Missouri
	Marriage:	1 September 1950 in St. Louis City, Missouri
	Death:	Aft. 2017
	Spouse:	Elizabeth Anne Gray
2	Name:	Dorothy Claggett Danforth
F	Birth:	21 September 1928 in Missouri
	Marriage:	11 June 1949 in St. Louis City, Missouri
	Death:	19 October 2013 in St. Louis City, Missouri
	Burial:	Cremated; Ashes in Columbarium at Church of St. Michael & St. George, Clayton, Missouri
	Spouse:	Jefferson Lewis Miller
3	Name:	Donald Danforth Jr.
M	Birth:	1932 in Missouri
	Death:	29 March 2001 in St. Louis City, Missouri
	Spouse:	Carolyn Borders
4	Name:	John "Jack" Claggett Danforth
M	Birth:	5 September 1936 in Missouri
	Marriage:	1 September 1957 in St. Louis City, Missouri
	Death:	Aft. 2017
	Spouse:	Sally Baird Dobson

Notes:

Donald E. Danforth

Birth and Middle Initial Source: Missouri, Birth Registers, 1847-1910, Registry of Births-City of St. Louis, Record images for St. Louis, 1898-1899. Birth # 9994, November ?, 1898 via Ancestry.com. The record of his birth is under a piece of tape that was used to repair the page. The name, Danforth, Donald is obscured by the tape. The initial E. is visible. The record is definitely Donald E. Danforth since the parents were shown as Wm H. and Adelaide B. No Page Numbers, via Ancestry.com. Apparently Donald never used the name for which the "E" stood for, as no records have been found that show his middle name.

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Source of Children and Ages: 1940 United States Census of Clayton Township, St. Louis Co., Missouri. Supervisor's District 12; Enumeration District 95-41, Sheet 1B. Census taken on 9 April 1940 by John M. Magnes. The father, Donald Danforth was shown as a Vice President in the Manufacturing industry.

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Donald was active in YMCA. He was named chairman of their advanced gift division to head their fundraising drive. Source: "10,000 Witness Gay Pagentry at Veiled Prophet Ball", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

William H. Danforth II

Source of Children of Donald Danforth: "Miss Dorothy Danforth Plans Wedding in June," *St. Louis Star and Times* (St. Louis, Missouri), 22 December 1948, Page 18, Column 1-4.

Source of Children and Ages: 1940 United States Census of Clayton Township, St. Louis Co., Missouri. Supervisor's District 12; Enumeration District 95-41, Sheet 1B. Census taken on 9 April 1940 by John M. Magnes.

Marriage Sources: Missouri, United Methodist Church Records, 1856-1970 and Missouri, Marriage Records, 1805, 2002, both from Ancestry.com.

Listed in many "Who's Who" publication in the United States from 1974-2006 via Ancestry.com.

William H. Danforth II was a physician and chancellor of Washington University in St. Louis, Missouri. Source: The Kansas City Star (Kansas City, Missouri) 17 Nov 1968, Page 20, Column 2. He graduated from Princeton University in 1947 and from Harvard Medical School in 1951. William H. Danforth II spent two years in the Navy as a doctor, then returned to St. Louis as a resident at Washington University Medical School. In 1957, he became an instructor; in 1960 an assistant professor; and in 1965 he was named president of the Medical School and vice chancellor of the university. Source: St. Louis Post Dispatch (St. Louis, Missouri) 18 December 1994, Page 37, Column 2.

Dorothy Claggett Danforth

Dorothy was selected as Queen of the Veiled Prophet Ball. Source: "10,000 Witness Gay Pagentry at Veiled Prophet Ball", *The St. Louis Star and Times* (St. Louis, Missouri), published 9 October 1947, Page 22, Full Page.

Source of Marriage: "Society, Compton-Danforth Wedding," *St. Louis Globe-Democrat* (St. Louis, Missouri), published 12 October 1917, Page 7, Column 3.

Source of Children of Donald Danforth: "Miss Dorothy Danforth Plans Wedding in June," *St. Louis Star and Times* (St. Louis, Missouri), 22 December 1948, Page 18, Column 1-4.

Source of Children and Ages: 1940 United States Census of Clayton Township, St. Louis Co., Missouri. Supervisor's District 12; Enumeration District 95-41, Sheet 1B. Census taken on 9 April 1940 by John M. Magnes.

Notes: (cont.)

Donald Danforth Jr.

Source of Children of Donald Danforth: "Miss Dorothy Danforth Plans Wedding in June," *St. Louis Star and Times* (St. Louis, Missouri), 22 December 1948, Page 18, Column 1-4.

Source of Children and Ages: 1940 United States Census of Clayton Township, St. Louis Co., Missouri. Supervisor's District 12; Enumeration District 95-41, Sheet 1B. Census taken on 9 April 1940 by John M. Magnes.

John "Jack" Claggett Danforth

Source of Children of Donald Danforth: "Miss Dorothy Danforth Plans Wedding in June," *St. Louis Star and Times* (St. Louis, Missouri), 22 December 1948, Page 18, Column 1-4.

Source of Donald Danforth's Children and Ages: 1940 United States Census of Clayton Township, St. Louis Co., Missouri. Supervisor's District 12; Enumeration District 95-41, Sheet 1B. Census taken on 9 April 1940 by John M. Magnes.

Marriage Source: Engagement announcement, *St. Louis Globe-Democrat* (St. Louis, Missouri) 16 June 1957, Pages 1D, Column 1, and Page 6D, Column 3.

John C. Danforth was Missouri Attorney General, a US Senator and Chancellor of Washington University. *St. Louis Post Dispatch* (St. Louis, Missouri) 15 Nov 1997, Page 7, Column 1.

John C. Danforth was an ordained Episcopalian minister. Source: *St. Joseph New Press* (St. Joseph, Missouri) 18 July 1973, Page 15, Column 4.

Biography from the Biographical Directory of the United States Congress, 1774-2005 via Ancestry.com: a Senator from Missouri; born in St. Louis, St. Louis County, Mo., September 5, 1936; graduated, St. Louis County Day (High) School 1954; graduated from Princeton University 1958, Yale University Law School and Yale Divinity School 1963; admitted to the New York bar in 1963, and commenced practice in New York City; ordained clergy, Episcopal Church 1963; attorney general of Missouri 1969-1976; unsuccessful Republican candidate for nomination to the United States Senate 1970; elected as a Republican to the United States Senate in 1976 for the term commencing January 3, 1977; subsequently appointed on December 27, 1976, to fill the vacancy caused by the resignation of Stuart Symington for the term ending January 3, 1977; reelected in 1982 and again in 1988, and served from December 27, 1976, to January 3, 1995; was not a candidate for reelection in 1994; chairman, Committee on Commerce, Science and Transportation (Ninety-ninth Congress); resumed the practice of law; U.S. Ambassador to the United Nations 2004-; is a resident of St. Louis, Mo.|Bibliography: Danforth, John C. Resurrection: The Confirmation of Clarence Thomas. New York: Viking, 1994.

Children's Names Source: *Dayton Daily News* (Dayton, Ohio) 10 September 1999, Page 4, Column 2.

RALSTON PURINA COMPANY

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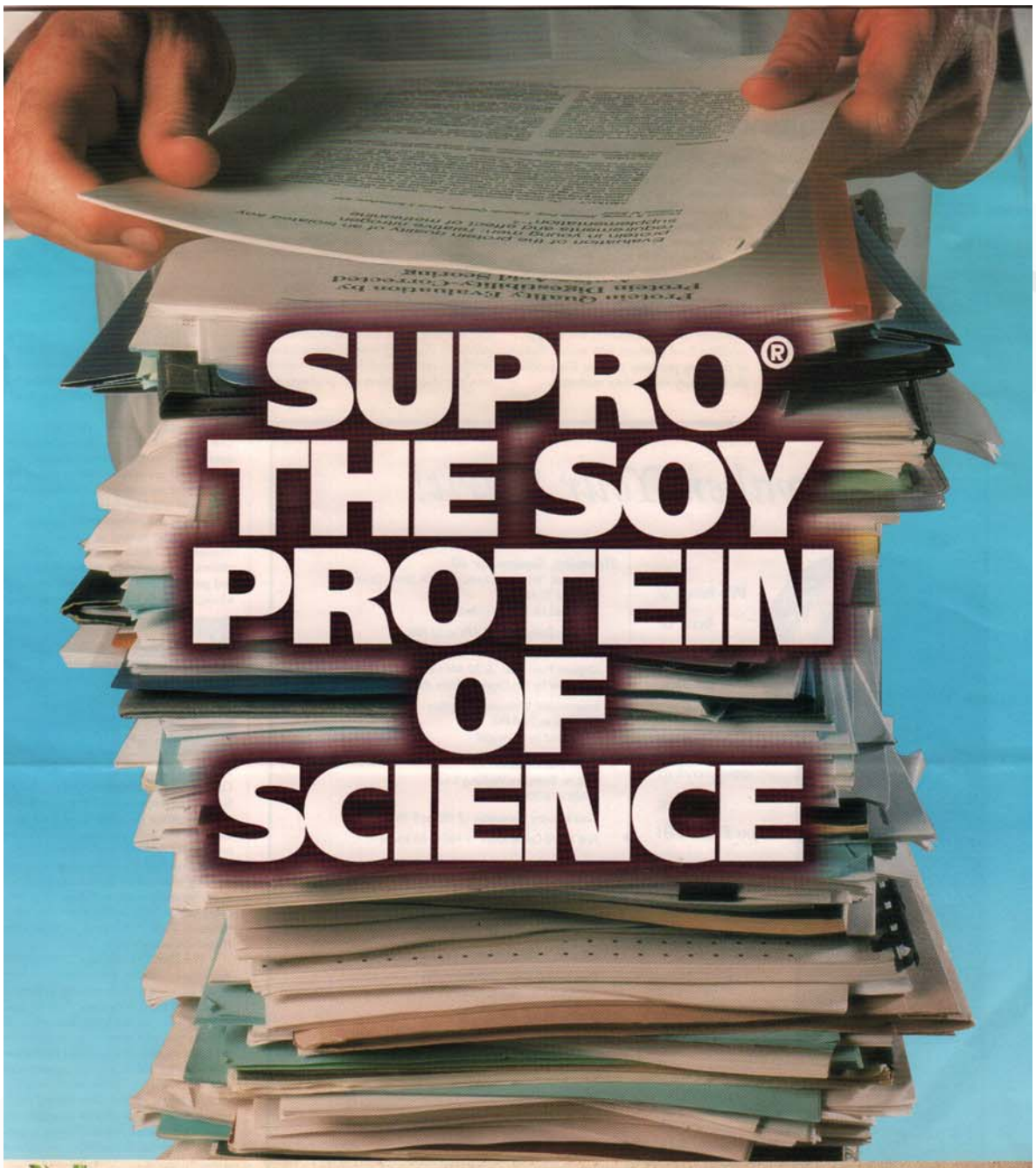
RALSTON PURINA PET PRODUCTS

ENERGIZER

PROTEIN TECHNOLOGIES INTERNATIONAL

ANNUAL REPORT TO SHAREHOLDERS 1996



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1. *St. Louis Globe-Democrat* (*St. Louis, Missouri*). 1894. Marriages. Oct. 25. p. 7.
• ***Summary:*** "This evening at the Pilgrim Congregational Church will be solemnized the marriage of Miss Adda De Villers Bush to Mr. William Henry Danforth, both of this city. The bride is a daughter of Mr. Floyd E. Bush, of 5710 Cates avenue, and the groom is a member of the Robinson-Danforth Commission Company. Miss Mabel Evans will act as maid of honor, and Mr. Harry D. Chapman, of Sioux City, will be best man. The bridesmaids will be Misses Edna Udell, Emma Hollister, Mollie Hall, Bessie Robinson, Martha Richards and Hetta Cook, and the groomsmen Messrs. Warren Healey, Tom Rutledge, Palmer Clarkson, Harry Hall, George Robinson and Albert Danforth, of Charleston, Missouri. After the ceremony there will be a reception at the bride's home, 5710 Cates avenue."

2. Slosson, E.E. 1897. The composition of prepared cereal foods. *Wyoming Agricultural Experiment Station, Bulletin* No. 33. 84 p. June. See p. 76, 77, 80.
• ***Summary:*** In table 1, "Composition of prepared cereal foods as purchased" (p. 76), in the first group, showing those based on wheat, is a detailed analysis of 13 breakfast foods, including No. 16 "Ralston Breakfast Food," which contains 15.10% protein, the highest the group of 13. Table 2 (p. 77) is the same except the composition is "calculated as water-free." Again Ralston Breakfast Food is tops, with 16.73% protein.

There follows a brief description of each of the foods tested. On page 80 we read: "No. 16 Ralston Health Club Breakfast Food. Purina Mills, St. Louis, Missouri. 'The Ralston Health Club in analyzing the various breakfast foods on the market found one that proved to be the only perfect and by far the most healthful breakfast food in the country.' 'Cooks in five minutes.' Package 5 x 2¼ x 7 inches. 20 cents. Weight of contents, 31.6 ounces."

Note 1. This document proves that Purina Mills was selling a breakfast cereal with the brand name "Ralston" by June 1897, earlier than the 1898 date widely given in the literature.

Note 2. This is the earliest document seen (Sept. 2020) that mentions "Purina Mills" (St. Louis), which was later named Ralston Purina Co. Address: Chemist, Laramie, Wyoming.

3. St. Louis Merchants' Exchange. 1897. Annual Statement of the Trade and Commerce of St. Louis. St. Louis, Missouri: Press of R.P. Studley & Co. 281 p.
• ***Summary:*** On page 134 is a table titled "Private elevators," which has four columns. For Purina: Owner: Purina Mill Co. Name: Purina. Capacity (bulk grain): 15,000 [bushels]. Located: 8th and Gratoit Streets.

Note 1. A St. Louis historian says that "Gratoit" is pronounced GRAT-chut. Note 2. This seems like a large capacity for a relatively new company. Address: St. Louis, Missouri.

4. Maxwell, W.J. 1898. Greek letter men of St. Louis. New York and Chicago: Umbdenstock. 140 p. See p. 89. *
• ***Summary:*** "Danforth, William H.–Missouri Gamma–Washington University–[graduated] 1892–President Purina Mills, 8th and Gratoit–5625 Cate's Ave."

5. Ralston Purina Company. 1898 Annual report. St. Louis, Missouri.
• ***Summary:*** Talk with Ralston Purina Library. 1994. April. The earliest Ralston Purina annual report they have is from 1946. Address: Ralston Purina.

6. Wiley, H.W. 1898. Foods and food adulterants: Cereals and cereal products. *USDA Div. of Chemistry, Bulletin* No. 13. Part 9. See p. 1343.
• ***Summary:*** In the section titled "Breakfast foods," page 1343 states:

"15325. Ralston Health Club Breakfast Food, indorsed [sic] by Ralston Health Club, Martyn College, Washington D.C. Manufactured by Robinson-Danforth Company, proprietors, Purina Mills, St. Louis, Missouri. 'A perfect food made from selected wheat, rich in gluten.'

"15326. Granose Flakes. Manufactured solely by the Sanitarium Health Food Company, Battle Creek, Michigan. 'Represents the entire wheat berry undeteriorated by any milling process and thrice cooked, whereby the starch is largely converted to dextrin.'

"15329. Granulated Rye. Manufactured by the Health Food Company, 61 Fifth avenue, New York. 'Made from the best rye, hulled by the wet process and reduced to a granular meal without the injurious heating of millstone grinding.'" Address: Chief Chemist, USDA.

7. Woods, Chas. D.; Merrill, L.H. 1899. Cereal breakfast foods. *Maine Agricultural Experiment Station, Bulletin* No. 55. p. 93-106. Nov.
• ***Summary:*** "The general use, at the present time, of cereals on the breakfast table is largely due to the improved condition in which these foods are now offered. Twenty years ago uncooked decorticated oats, (sold under the name of oat meal), graham flour, corn meal, and hominy, all of which required long cooking, made up nearly the entire list of breakfast cereals available to the average housekeeper. Today it is possible to purchase at a moderate price cereal foods which have been previously thoroughly cooked, and subsequently dried so they will keep indefinitely."

This report gives a chemical analysis and the "fuel value per pound" of 41 of America's leading precooked cereal breakfast foods, found in the Bangor (Maine) market, including 3 gluten preparations. The chemical composition of the three gluten foods most commonly used in New

England is analyzed. These are widely prescribed for diabetic patients by local physicians. The foods were Cooked Gluten, and Whole Wheat Gluten (both made by the Health Food Company of New York), and Dr. Johnson's Glutine (made by Johnson Educator Food Store, Boston, Massachusetts). A table shows that they contain only a little more protein (16.88%, 17.89%, and 15.31% respectively), and a little less carbohydrates (76.80%, 73.85%, and 82.53%) than ordinary bread flour (which contains 15.02% protein and 82.91% carbohydrates).

"Gluten preparations, containing as high as 70 per cent of protein, were on the market five years ago, and there are now preparations carrying from 30 to 50 per cent of gluten which can be used with reasonable safety by persons suffering from diabetes... Samples of flour made from the hard spring wheat of the Northwest not infrequently carry more protein than the sample of Dr. Johnson's Glutine and nearly as much as the two other samples here reported upon. Too much can hardly be said in condemnation of the foisting, by false statements in advertising such materials upon diabetic patients, imposing upon physicians as well as the public."

Another interesting wheat-based product is Ralston Health Club Breakfast Food, made by the Robinson-Danforth Company. It contains 12.16% protein, 85.36% carbohydrates, and 1.56% fat. The report says of this product: "Ralston Breakfast Food, 'a perfect food made from selected wheat rich in gluten,' is also apparently made from soft winter wheat. The sample examined carries 10.70 per cent of protein, and hence could not have been made from a 'wheat rich in gluten.' It is a well made preparation, but its cost of 8 cents a pound is too high."

Other interesting observations: "There is probably no other cereal food on the market so widely and extensively advertised as Shredded Wheat Biscuit. For the most part its advertising matter is free from exaggerated statements." Grape Nuts are manufactured by the Postum Cereal Company. "The claims of the makers are preposterous." Note the very early use of the term "Health Food" in a company name; Cooked Gluten and Wheatena were both made by the Health Food Company. This was probably the Battle Creek Sanitarium Health Food Co. (located in Battle Creek, Michigan; incorporated 1898, yet its forerunner, the Sanitarium Food Department, was making Wheatena and gluten products by 1882), which merged with the Sanitas Nut Food Co. (founded 1899) to become the Kellogg Food Co. in 1908. Note also that no company with "Kellogg" in its name is listed.

Mazama is made by the Mazama Health Food Co. (p. 94). Address: Orono, Maine.

8. Purina Mills. 1899. Ralston Breakfast Food: Cooks in a single boiler in five minutes (Ad). *Scribner's Magazine* 26(6):65 (Advertising section). Dec.

• ***Summary:*** This full-page ad contains an illustration of a steaming pot (with handle) of Ralston Breakfast Food. The text at the bottom reads: "The reason is that as each grain of Ralston strikes the boiling water it bursts and swells up like pop corn. 1 cup Ralston–6 cups boiling water, prepares a breakfast for 5 persons.

"If you have any difficulty obtaining Ralston Breakfast Food from your grocer, send us his name and 2¢ stamp for a sample, enough for a breakfast.

"Purina Mills."

Note: The slogan "Where Purity is Paramount" does NOT appear in this ad. Address: 703 Gratiot St., St. Louis, Missouri.

9. Moore & Son. 1900. Moore's: The proper place to trade (Ad). *Evening Star* (*Toronto, Ontario, Canada*). Feb. 23. p. 6.

• ***Summary:*** "Special sale of breakfast cereals.

"Ralston Health Pan Cake Flour–12¢.

"Ralston Health Flour–50¢ sack.

"Health Food–12½¢ package.

"Finest quality rolled oats–35¢ stone...

"Granose Flakes–15¢ package." Address: 402 Spandia, Toronto. Phone: 804.

10. Purina Mills. 1900. "In five minutes its cooked": Ralston Breakfast Food (Ad). *McClure's Magazine* 14(6):107 (Advertising section). April.

• ***Summary:*** A full-page ad. The top half of the ad contains an illustration of a woman at the stove (cooking Ralston Breakfast Food), looking over her right shoulder at a huge clock on the wall. The time is 6:55–time for breakfast. A box of Ralston Breakfast Food is in the right foreground.

The text reads: "Saves time, temper and digestion. Most cereals require a double boiler and at least 20 minutes cooking, while Ralston Breakfast Food is prepared with ease and dispatch in a single boiler in five minutes.

"The vigor and strength imparting properties of Ralston come from Gluterean Wheat, the whole berry of which is milled into Ralston Breakfast Food.

"There's not another dish so delicious for breakfast that contains as much nutrition as Ralston Breakfast Food.

"Ask your grocer. If he doesn't keep Ralston, send us his name, and we'll send you a free sample.

"Purina Mills, 'Where Purity is Paramount.' Manufacturers of Purina Health Flour, (Whole Wheat), In 5 lb. packages and 12 lb. sacks."

Note: This is the earliest document seen (Sept. 2020) that contains the phrase or slogan "Where Purity is Paramount." Soon many other companies, including those outside the food industry, would start to use this slogan. Address: 756 Gratiot St., St. Louis, Missouri.

11. *Dietetic and Hygienic Gazette* (*New York*). 1900.

Department of notes and queries. 16(9):575-78. Sept. See p. 576. *
• ***Summary:*** The answer to the question "Which breakfast foods are most nutritious?" (p. 575-76), includes: "Preparations containing admixtures of barley and rye, as in the 'Ralston Health Food,'... are much enjoyed by some and are both wholesome and nutritious."

12. Photograph of Adda Danforth, William H. Danforth, with her two young children. 1900.

• ***Summary:*** The date of this photo is probably 1899 or 1900. The young girl is Dorothy, born July 1895. The baby is Donald, born Nov. 1898.

13. Purina Mills. 1901. Ralston Breakfast Food: A breakfast for thirty people in a two pound package (Ad). *Kneipp Water Cure Monthly and Herald of Health* (*The*) (*New York City*) 2(7):199. July.
• ***Summary:*** An illustration shows the cereal box. On the front panel: "Health. A perfect food made from selected wheat rich in gluten." "Sliced dates and Ralston Breakfast Food make a delicious dessert. Our 'Little Book of Ralston Recipes' tells of other dainty dishes." "Purina Mills, 'Where Purity is Paramount.'" Address: 748 Gratiot St., St. Louis, Missouri.

14. Purina Mills. 1901. Ralston Breakfast Food is a hot weather blessing (Ad). *Atlantic Monthly* 88(529):47. Atlantic Monthly Advertiser. Nov.
• ***Summary:*** A ¼-page ad. The top half of the ad contains an illustration of a woman (bearing a checkerboard blouse) in a kitchen, with a box of Ralston Breakfast Food on the shelf, and a steaming bowl of the prepared food on the shelf. A clock on the wall show's that it's 6:55 a.m.–time for breakfast,' The text reads: "It cooks in 5 minutes–that's why... With fruit you have a delicious and complete breakfast, the effect of which is to nourish every part of the body without overheating the blood. A free sample for your grocer's name. Purina Mills. 'Where Purity is Paramount.'" Address: 822 Gratiot St., St. Louis, Missouri.

15. Purina Mills. 1901. The world's fare (St. Louis, U.S.A. 1903) Ralston Purina Cereals (Ad). *Atlantic Monthly* 88(530):119. Atlantic Monthly Advertiser. Dec.
• ***Summary:*** "Don't confound them with foods of less quality that cost just as much–every package is guaranteed to contain the finest grain, hygienically milled to retain the nutritive elements which Nature intended. The most liked cereal of the century is Ralston Breakfast Food.

It represents the high quality maintained in every checkerboard package that goes forth from Purina Mills, 'Where Purity is Paramount.' Accept no substitutes, be sure you get the checkerboard kind.

"$1.00 and your grocer's name brings you the full... prepaid; 5 2-lb. packages and 1 12-pound sack of Purina... Flour–the biggest dollar's worth ever offered."

In the top 40% of the ad is an illustration of the World's Fair–soon to be hosted by St Louis. But instead a large building there are four large boxes of cereal (Ralston Breakfast Food, PanKake Flour, Ralston Health Oats), each topped by a cupola and flag, with tiny people walking among them. Address: Gratiot St., St. Louis, Missouri.

16. Purina Mills. 1902. Bring home a package of Ralston with the basket of peaches (Ad). *Smart Set* (*The*) (*New York City*) 7(4):Third from last page (unnumbered). Aug.
• ***Summary:*** A full page ad. "There's no dish to compare with Ralston and sliced peaches. This combination (served with cream and sugar) is a complete breakfast in itself–it's simply delicious. Try it tomorrow.

"The choicest wheat (so rich in gluten) gives to Ralston Breakfast Food its natural, wholesome flavor. Ralston is a pure, simple food, easily prepared... so be sure to buy a 15-cent package with the basket of peaches."

Across the top 1/3 of the ad is a wooden basket of peaches with a box of Ralston Breakfast Food (with a

checkerboard border) in with the peaches. At the bottom left is an illustration of bowl of the cereal served with sliced peaches. To the right of it: "Purina Mills, 'Where purity is paramount.'"

17. Purina Mills. 1902. Get a wagon free for your children: Ralston Purina cereals (Ad). *World's Work* (*The*) 4(6):83 World's Work Advertiser. Oct.
• ***Summary:*** A ¼-page ad. The top half of the ad contains an illustration of a boy pulling a small wagon from the front and a girl pushing it from the rear. The wagon is piled high with boxes of Ralston Purina Cereals, each with a checkerboard border. On the side of the wagon, in big letters: "Ralston Purina Cereals. Famous Health Foods.

The text reads: "Only one wagon to a family. Send us $2.00 and your grocer's name and we will send you Freight Paid, (everywhere east of the Rocky Mountains,) an elegant Wagon, strongly built, with iron axles, size 2 feet long by 14 inches wide, containing 5 pkgs. Ralston Breakfast Food, 1 pkg. Ralston Health Oats, 1 pkg. Ralston Barlet Food, 1 pkg. Purina Pankake Flour, 1 pkg. Ralston Hominy Grits and 2 12-lb sacks Purina Health Flour,–$2.00 worth of Cereals.

"Purina Mills, 'Where Purity is Paramount.'" Address: 803 Gratiot St., St. Louis, Missouri.

18. Ralston Purina Co. 1902. Photograph of William H. Danforth.
• ***Summary:*** The caption: "William H. Danforth, partnering with George Robinson and William Andrews, enters the business of feeding farm animals by founding the Robinson-Danforth Commission Company. The name is changed to Ralston Purina in 1902."

19. Purina Mills. 1903. Here's a perfect feast: Ralston Breakfast Food and Purina PanKakes (Ad). *Outlook* (*The*) (*New York City*) 73(5):Back cover. Jan. 31.
• ***Summary:*** A full-page ad. An illustration shows these two foods on a large cloth-covered tray against a read and white checkerboard. At the bottom two corners of the ad are boxes in which the two foods are sold.

The text: "These 2 packages for 25 cents at your grocer's." "Remember, these products are 'Appreciated in a Million Homes' which is a magnificent recommendation. Insist on getting Checkerboard Packages. Made by.

"Purina Mills, St. Louis [Missouri]. 'Where Purity in Paramount.'"

Note: This ad also appeared on the back cover of *Everybody's Magazine*, Feb. 1903.

20. *Table Talk* (*Philadelphia*). 1903. How to follow *Table Talk's* bills of fare. 18(1):30-36. Jan. See p. 34.
• ***Summary:*** This article begins: "Each nation has its own way of celebrating the advent of the New Year." The section titled "peanut butter" states: "Our vegetarian friends first introduced us to peanut butter. It has taken favorably with the public in general, and first-class grocers now sell it in bulk for about twenty cents a pound or put up in glass jars at a slightly advanced price. It is palatable and wholesome, but too rich to partake of unsparingly; the children like it spread on bread for lunch or supper, and it is a good filler for five-o'clock tea sandwiches."

On page 30 are bills of fare (menus) for 11 days (Jan. 21-30), with dishes specified for breakfast, lunch, and dinner (or breakfast, dinner, supper on some days). Foods recommended for breakfast: Ralston Barley Food, Granola, Grape Nuts, Graham Gems, Ralston Breakfast Food. Peanut butter is not mentioned on that page.

21. Ralston Purina Foods. 1903. Checkerboard package: Old John Graham said (Ad). *Smart Set* (*The*) (*New York City*) 9(4):Next to last page (unnumbered). April.
• ***Summary:*** A full page ad. "... in his 'Letters from a Self-Made Merchant to his Son:' 'It's the quality of the goods inside the package which tells when they once get into the kitchen and up to the cook."–and it is the quality of the foods inside the 'checkerboard' packages which sold Ten Million Packages in the past ten months–test them for yourselves."

Across top of ad: "Checkerboard package." Illustration at top left of ad shows "Old John Graham." Across bottom 1/3 of ad are three different products in their packages (L-R): (1) "Purina Whole Wheat Flour. Health Flour–Makes Brain Bread. Purina Mills, breakfast foods," in checkerboard

sack. (2) "Ralston Breakfast Food–Purina Mills health," in checkerboard box. (3) Ralston KornKins–Old fashioned corn meal," in checkerboard sack.

Across bottom of ad: "Appreciated in a million homes."

22. Ralston Purina Company (The). 1903. Ralston Purina Foods (Ad). *Delineator* (*The*) (*New York City*) 61(6):1090. June.

• ***Summary:*** A vertical ¼ page ad. An illustration shows a man seated on a chair, holding a book at which two children are looking. "Introducing the Ralston Purina Miller–a good, wholesome fellow, who makes all the good things in checkerboard packages, at the Big Mill, 'where purity is paramount."

He explains that the company makes Ralston Health Oats (for cold mornings), Ralston Breakfast Food (made of wheat; good year round), Purina Health Flour (for making whole wheat bread). Next to his chair is a sack of Purina KornKins and a box of Ralston Cereal Coffee.

23. Ralston Purina Co. 1905. Ralston Wheat Porridge (Ad). *Vegetarian Messenger and Health Review* (*Manchester, England*). Jan. p. 14a.

• ***Summary:*** "Should be in every home. It's good for you and it tastes good. 2 lb. 'Checkerboard' Packet, 7½ d." Address: London Agency: 43 Great Tower St., E.C.

24. Ralston Purina Mills. 1906. The pure food for children: Wheat hearts for little sweethearts (Ad). *Outlook* (*The*) (*New York City*) 83(17):Unnumbered page near end of issue. Aug. 26.

• ***Summary:*** A ¼-page ad. "In Ralston Health Food are the *hearts* of wheat–made into the richest, daintiest, the most delicious of foods, rich in gluten–absolutely pure. A chemist's certificate of purity on every package.

"No other food so perfectly meets the needs of growing children. Not pre-digested, but easily digested–gives the stomach something to do, but not too much.

"Not a food fad or fancy–but a staple breakfast food with body to it. When ready to serve, 14 lbs. for 15 cents–50 plates.

"Ralston Health Food, sterilized by our new patent process, is always fresh and good. Ralston retains the natural, nut-brown color of the grain.

"Ask for Ralston this time, and insist on getting it. Your grocer is instructed to give you back your money if you don't like the first package.

"Try Purina Whole Wheat Flour–for sale by all Good Grocers. Ask for the checkerboard sack and get the best.

"Ralston Purina Mills. "Where Purity in Paramount" St. Louis, Missouri. Portland, Oregon. Tillsonburg, Ontario [Canada].

In the upper left corner of this ad is a photo of the head and shoulders of man wearing a brimmed cap. In the lower right corner is a portrait photo of a child with fairly long hair.

25. Ralston Purina Mills. 1907. Ralston Health Food (Ad). *Pearson's Magazine* (*New York*) 17:In unnumbered pages of ads at rear. April.

• ***Summary:*** A half-page vertical ad. Shows an illustration of "The Pure Food Man" holding up a box of "Ralston Health Food near his left shoulder with his left hand. The text on his white shirt and checkerboard apron reads: "One food you know is Pure–'Cause there's Chemists' Certificate of Absolute Purity on Every Package.

Most people 'stick' to Ralston Health Food–tastes so good–because–it is good. Not a fluff but a staple food–hearts of wheat–not with the color, flavor and nutriment bleached out to make it white–Ralston as all the natural golden color, sweet nut-like flavor and wholesome deliciousness of the grain.

"Always good–kept so by our process of Sterilization."

On his checkerboard apron is a 2nd ad, for Purina Whole Wheat Flour, which "won the Grand Prize (Highest Award) over all other whole wheat flours at the recent St. Louis Fair." "Ralston Purina Mills. Where purity is paramount. Checker board sacks and packages." Address: St. Louis, Missouri; Portland, Oregon; Tilsonburg, Ontario, Canada.

26. Ralston Purina Mills. 1907. Ralston Health Food (Ad). *Pearson's Magazine* (*New York*) 17:Near end of unnumbered pages of ads at rear. June.

• ***Summary:*** A half-page vertical ad. The top half shows an illustration of the head and shoulders of a man with a straw and grain of wheat balanced on the visor of his cap. The bold text reads: "The Ralston miller. The pure food man." Checkerboard sacks and packages.

The bottom half of the ad shows his hands on a checkerboard box, on the front of which is written: "I'm proud of the Chemists' Certificate of absolute Purity on every package of Ralston Health Food.

"'I'm proud of the healthy, happy people that eat Ralston.

"'I'm proud of the golden-yellow hearts of selected wheat, with all their natural nutriment and rich, nut-like deliciousness, that go into the Ralston Packages.

"'Ralston isn't mere fluff–it's real food, always keeps good because I *sterilize* it.'"

"A package makes 50 plates of food. The Ralston Miller. 'Where purity is paramount.'"

This ad also appears near end of unnumbered pages of ads at rear of Sept. issue, and in December issue. Address: St. Louis, Missouri; Portland, Oregon; Tilsonburg, Ontario, Canada.

27. Ralston Purina Mills. 1907. Ralston Health Food: I stand for purity in food. *McClure's Magazine* 29(6):59 of ads at end of issue. Oct.

• ***Summary:*** A half page vertical ad (right half of page) near the rear of this issue shows a strong- and healthy-looking man standing upright, wearing a white shirt and cap. His left land, at waist level, is holding one "ear" of a upright sack of Purina Whole Wheat Flour. His closed right hand rests atop a box (with a checkerboard pattern) of "Ralston Health Food" breakfast cereal, which rests atop the opposite side of the bag.

Across the top of the ad: "The pure food man. The Ralston miller." Written on his white shirt: "'I've won the Chemists' Certificate of absolute Purity on every package of Ralston Health Food–the golden hearts of choicest wheat with all the natural nutriment and flavor. It's always good because I *sterilize* it. A package makes 50 plates of Food.'"

"'Where purity is Paramount.'" Mills in St. Louis, Missouri. Portland, Oregon. Tilsonburg, Ontario, Canada. Address: St. Louis, Missouri.

28. Ralston Purina Mills. 1908. Ralston health food: The food for growing children (Ad). *Collier's* 41(5):33. April 25.

• ***Summary:*** A 1/8 page ad. "If you want to grow children who are bright, sturdy, good-natured, and healthy, feed them on Ralston Health Food." It is the "ideal food for growing children because it is n-a-t- u-r-a-l food [natural food] and thus easily digested and rich in nature's own deliciousness and nutriment." It is "not white–but has the natural golden color of wheat. Ralston Health Food is sterilised–so always good. 15-cent packages make 50 plates of *food."* Order it from your grocer today.

Illustrations show: (1) The front and one side of a package of Ralston Health Food. (2) The Ralston Miller (face and cap). (3) The heads of two children growing like flowers out of heads of wheat.

Note 1. This is an example of the attempt to link health, packaged breakfast cereal, and the needs of children with a brand name.

Note 2. Ralston Health Food was being advertised as early as 1905. Address: St. Louis, Missouri; Portland, Oregon; Tilsonburg, Ontario.

29. Congregational Church (Shirley, Massachusetts), Ladies Sewing Circle. 1908. Choice selection of tested recipes from many households. Morrisville, Vermont: Wm. H. Nichols Cook Book Pub. Co. 105 p. See p. 44. Illust. No index. 19 cm.

• ***Summary:*** On the unnumbered page after page 44 (in what looks like a disguised ad) are four recipes that call for Ralston Health Food: Ralston cocoanut pudding ("one cup cooked Ralston"), Ralston Scalloped Oysters ("Four cups milk, one cup Ralston"), Ralston Cheese Souffle ("One-fourth cup Ralston Health Foods,... Cook Ralston and milk five minutes"), and Ralston scalloped salmon ("Three cups of water, one-half cup Ralston Health Food,... Have water boiling, then stir in Ralston Health Food. Boil 10 minutes; add butter, yolks of eggs, pepper and salt;...)"

At bottom of page: "If your grocer is not supplied with Ralston Health Foods, end us his name. Ralston Purina Company, St. Louis, Missouri."

The section on "Sandwiches–fillings" (p. 16) states: "Nut–Peanuts or walnuts chopped very fine are an addition to almost any sandwiches."

Note: This book appears to have a 2nd title page: "The Home Comfort Cook Book," by the same group of ladies. Address: Massachusetts.

30. Frear, William; Given, G.C.; Broomwell, A.W. 1908. Breakfast foods: Containing the results of an investigation of breakfast foods and pancake flours on sale in the markets of Pennsylvania. *Pennsylvania Dep. of Agriculture, Dairy and Food Division, Bulletin* No. 162. 40 p. See p. 17-19, 21.

• ***Summary:*** In the analyses, "Ralston Health Food" appears under "Farina preparations" (p. 17, 19).

"No. 2667 and No. 3697; Ralston Health Food: The label says 'When you open this package you can see thousands of tiny *almond-colored grains...* These are the true Wheat-hearts, or Seeds-germs of Wheat. And these germs of wheat are full of the Vegetable Phosphorus that makes *children grow like magic and develop strong mentally.* They are what make Nerve-worn people whole again, calm, composed and restful. They are what supply new Mind-Power by providing the brain all the phosphorus it can use in heavy Thinking without exhaustion of the Nerve Cells... They make good the defects in *other* Foods that lack Phosphorus... Remember you can see these Wheat-hearts or Phosphorus germs in this very package of Ralston Health Food... You can't see *them in any other* Cereal Food. Why?'"

"The germs are present here, as they are in Graham flour, and in many other wheat preparations. They are visible in other preparations, contrary to the plain implication of

this label. The composition of the food, compared with that of the pure germ, shows low protein and fat; moreover, the phosphoric acid in No. 2667 is only 0.33 per cent., not more than is exhibited by many other wheat preparations, such, for example, as cracked wheat...” Address: 1. State College, University Park, Pennsylvania.

31. Ralston Purina Co. 1909. A health prescription for growing children. Rx–A liberal serving of Ralston Health Food every day... (Ad). *Pearson's Magazine* (*New York*) 21(5):Unnumbered page at end. May.
• ***Summary:*** “–plenty of fresh air–sunshine–and sleep.” Mothers! It’s an important question–it’s serious–this choosing of the correct food for growing children. Do you want your children keen–active–bright eyed–clear skinned–full of life–red blood–and energy? Do you want their nerves steady–and their muscles firm? Do you want them to play well–sleep well–and study well? Then you must seriously consider the proper food–you must choose a food that’s full of nutriment–phosphorus–and that is easily digested.”

“Feed them Ralston Health Food. They always like it–for its good to eat and good for them to eat.” Ralston Health Food is sterilised by our special process.”

“Purina Whole Wheat Flour contains the same qualities as Ralston Health Food. Get a sack from your grocer. Packed in 6, 12, 24, 48 lb. bags.”

“Ralston Purina Co. ‘Where purity is paramount.’”

Photos show: (1) A large box of Ralston Health Food. (2) A young boy and girl on roller skates, playing. Address: St. Louis, Missouri; Tillsonburg, Ontario, Canada; Portland, Oregon.

32. Francis, David R. 1913. The Universal Exposition of 1904. 2 vols. St. Louis, Missouri: Louisiana Purchase Exposition Co. See vol. 1, p. 587. 28 cm.
• ***Summary:*** Also know as the St. Louis World’s Fair, the Louisiana Purchase Exposition was held at St. Louis, Missouri, in 1904 to commemorate the centennial of the purchase of the Louisiana Territory (in 1804).

In volume 1 of this two-volume book, in the section titled “The Concessions,” a full-page table (page 587) states that C.H. Sumner, concessionaire, no. 587, sold “Peanut Butter.” Gross receipts: $705.11. Net collections: $199.87.

The same page notes that the Ralston Purina Co. sold $17,263.10 of “Purina Foods.” Address: St. Louis, Missouri.

33. Joslin, Elliott Proctor. 1916. Treatment of diabetes mellitus, with observations upon the disease based upon one thousand cases [5th ed.]. Philadelphia and New York: Lea & Febiger. xvi + 17-440 p. 25 cm.
• ***Summary:*** Joslin (lived 1869-1962) recommended the use of Hepco Flour, a soybean product, in his diabetic diets. Page 397 states: “Soya bean is also extensively used, and probably deserves a still wider introduction into the diabetic diet. It is used in the manufacture of Hepco Flour.” Page 400 states that “soy bean meal” [probably soy bean flour] contains 34.0% carbohydrates. “Ralston Health Food” is a type of “Cereal breakfast food.” Page 402 notes, under “fresh vegetables,” that soy beans [i.e. green vegetable soybeans] contain on average 28.0% carbohydrates (range 19.3-39.0%).

In the section titled “Composition of so-called diabetic foods” (p. 406-17) the author notes that such foods have been more thoroughly studied at the Agricultural Experiment Station in New Haven, Connecticut, than elsewhere. The lengthy list that comprises most of this section is based on original analyses found in Connecticut Agricultural Experiment Station Reports, for 1913, Part 1; for 1914, Part 5, and for 1915, Part 5. The table contains the following columns: Date of analysis. Manufacturer and brand. Protein per cent. Carbohydrate per cent. Fat per cent. Starch per cent. and Calculated calories per 100 grams. The following contain soy: Cereo Co., Tappan, New York: Soy Bean Gruel Flour (1913 [date of analysis]). Health Food Co., New York: Protosoy Soy Flour (1913, 1914), Protosoy Diabetic Wafers (1913, 1914). Jireh Diabetic Food Co., New York: Soja Bean Flour (1913). Theo. Metcalf Co., Boston, Massachusetts: Soja Bean Meal, 18% starch (1913). Waukesha Hepco Flour (1913).

A large number of companies in the USA and Europe make products containing gluten; among these are The Kellogg Food Co. in Battle Creek, Michigan. The Nashville Sanitarium Food Co. in Nashville, Tennessee makes Malted Nut Food, Nut Butter, Nuteysa, and Nutfoda.

A list of 13 peanut butter manufacturers is given (p. 415), including The Kellogg Co. (Battle Creek, Michigan), Beech-Nut Packing Co. (Canajoharie, New York), and H.J. Heinz Co. (Pittsburgh, Pennsylvania). The fat content of the various brands ranges from 42.8% to 51.3%; Kellogg’s is 49.7%. Two companies whose peanut butter was analyzed in 1899 were: Atlantic Peanut Refinery, Philadelphia, Pennsylvania, and Peanolia Food Co., New Haven, Connecticut.

Special protein preparations include Soson and Tropon (made in Germany), and Plasmon (made in London, England). Address: Asst. Prof. of Medicine, Harvard Medical School, Massachusetts.

34. *SoyaScan Notes.* 1916. Chronology of Procter & Gamble and Buckeye’s work with soybeans. 8 July 1993. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1901–Procter & Gamble (P&G) establishes and incorporates the Buckeye Cotton Oil Co. They leased an oil mill and put it under the Buckeye Cotton Oil Company name. The buckeye is the official Ohio state tree. During its early years, Buckeye crushed cottonseeds.

1911–P&G introduces Crisco shortening–a revolutionary new product. “The name Crisco was derived from the words CRYStalized Cottonseed Oil. P&G needed

the oil for Crisco, Ivory Soap, and other products. Then they had to find a market for all the cotton linters (the fuzz of short fibers) stuck to the cottonseeds. So P&G started selling cotton linters (cellulose) to many different companies.

1916–By this year P&G was using soybean oil in soap.

1929–Buckeye Cotton Oil Co. purchases a mill at Louisville, Kentucky, and in the spring of 1931 Buckeye crushes Procter & Gamble's first soybeans, using expellers, at this mill in Louisville.

1935 Oct.–Buckeye starts crushing soybeans at the Binghampton mill in Memphis, Tennessee.

1939–P&G orders a solvent extraction unit for processing soybeans from Hansa-Muehle in Germany. But it was sitting at the docks in Hamburg, Germany, when World War II broke out in 1939. Because of the blockade it never left Germany. So P&G went to the French Oil Mill Machinery Company in Piqua, Ohio, to have a similar unit designed and built to Buckeye's specifications.

1941 Feb.–Buckeye finally begins processing soybeans at Louisville, Kentucky, using solvent extraction, after a year's experimental work. Then during World War II, when the cotton crop declined, there was still enough demand for cellulose, that P&G bought large acreages of southern wood pine to use for its pulp. But since Buckeye's primary job was crushing oilseeds, P&G decided to have Buckeye switch from crushing cottonseeds to crushing soybeans, primarily to supply Procter & Gamble with soybean oil for food products such as Crisco.

1946–P&G introduces Tide, the most successful of its new line of detergents. Research on detergents increases.

1948–Buckeye starts solvent extraction of soybeans at New Madrid, Missouri.

1949 Sept.–Buckeye is crushing soybeans at Raleigh, North Carolina. During the 1950s the company continued studying cleaning compounds and detergents.

1946-47–Procter & Gamble starts using industrial-grade soy protein isolate, made at their Louisville plant, in the wall cleaner named Spic and Span. Spic and Span was launched in the 1930s by the Spic and Span Co. of Saginaw, Michigan. It was operated by two ladies who developed the recipe (which contained glue) in their kitchen and patented the process. P&G bought the company in 1945, right after World War II. At that time the front panel of the box read: "The perfect cleaner for all painted and varnished surfaces. No rinsing. No wiping. P&G introduced a new, improved formula in about 1950–"Cleans extra fast yet extra kind to hands"–but no ingredients were listed on the box. In the fall of 1946, Procter & Gamble needed a raw material to use in the new formula of Spic and Span. It was found that a protein product that could be made from soybeans at Louisville would supply this demand. As a result, a unit for making industrial-grade isolated soy protein was erected at the Louisville mill. This adequately took care of Procter & Gamble needs. "After a few years, the Spic and Span formula was changed again so there was less need for this protein product and it was necessary to develop outside markets where it was used largely as a substitute for casein in the paper trade."

1952–1953. Two technical bulletins dated from these two years state that this isolated soy protein is now named Buckeye Protein. It is used for paper coatings, sizings, fire-fighting foam, adhesives, water-dispersible paints, etc.

1958 July.–The name Buckeye Cellulose Corp. starts to be used in place of the previous Buckeye Cotton Oil Co. in connection with P&G's soybean processing activities.

1958 Dec. 10–Ralston Purina Co. finalizes the purchase of mills (located in Louisville, Kentucky; New Madrid, Missouri; Memphis, Tennessee; and Raleigh, North Carolina) from P&G/Buckeye. Ralston Purina wanted to expand its mixed feed operations. By 1958 the increasing importance of soybean meal for animal feed has made it desirable for soybean crushers to enter the mixed animal feed business. That was not Buckeye's or P&G's kind of business, so it became sound business policy P&G to buy soybean oil on the open market and to dispose of the facilities for crushing soybean seeds.

Note 1. In Oct. 1962 Ralston Purina produced its first commercial edible isolated soy proteins (under the Edi-Pro brand) in this Louisville plant using technology largely developed by Frank Calvert and Robert Boyer when they worked as researchers for Henry Ford. By 1976 Ralston Purina was the world's leading manufacturer of edible isolated soy proteins–and this plant, purchased from Buckeye/P&G, was their flagship plant in America.
1955 Sept.–Buckeye is crushing soybeans at Little Rock, Arkansas; Wilson, Arkansas; and Greenwood, Mississippi.

1958.–Buckeye is crushing soybeans at Memphis, Tennessee (Hollywood mill) and Augusta, Georgia.

1978 Sept.–Buckeye Cellulose Corporation is still a member of the National Soybean Processors Association; it crushes soybeans in its mills at Little Rock, Arkansas; Augusta, Georgia; and Memphis, Tennessee (Hollywood mill at 1355 Lynnfield Road).

1992–P&G sells the Buckeye Cotton Oil Co., dividing it into several parts. Several of the cellulose processing operations (P&G Cellulose) are sold to Weyerhauser, and Bob Cannon, a retired P&G executive who used to run Buckeye, sets up a group that buys the Memphis operation. Bob, who lives in Memphis, has been with Buckeye for about 30 years.

The company's files in Memphis (Phone: 901-320-8100) are probably much more complete on soybean operations than those in Cincinnati. Another good person to contact would be Walter L. Lingle, Jr., who was president of Buckeye in 1958 at the time it sold 4 mills to Ralston Purina. He lives in Cincinnati and has a "perfect memory" (Office phone: 513-621-4525). He set a lot of P&G's international operations.

Note 2. This information was compiled with great help from Ed Rider (Corporate Archivist) and Diane L. Brown (Archivist), Procter & Gamble Co., P.O. Box 599, Cincinnati, Ohio 45201-0599.

35. Friedenwald, Julius; Ruhräh, John. 1919. Diet in health and disease. 5th ed. Reset. Philadelphia, Pennsylvania, and London: W.B. Saunders Co. 7-919 p. Illust. 25 cm. [4 soy ref]

• ***Summary:*** Most of the passages cited are similar to the 1913 ed., except for the following: The section titled "The soy bean" is now on p. 135-36. A table (p. 137) shows the "Composition of fresh and dried legumes (incl. soy beans, cow peas, chick-peas, peanuts) with that of other foods." At the top of page 137 are 4 references to soy by Ruhrah (3) and Friedenwald and Ruhrah.

The section on "vegetarianism" (p. 141-42) begins: "Theoretically vegetarians are supposed to subsist on an exclusive diet obtained from the vegetable kingdom, including vegetables, cereals, fruits, nuts, etc. [sic], but as a matter for fact many add milk, butter, eggs, gravies and animal fats. The disadvantages of a strictly vegetable [vegan] diet are too obvious to require comment."

In the chapter on "Infant feeding," the section on "Other food for infants" has a subsection on "The soy bean," which is now on p. 302-03.

In the chapter on "Diseases in which diet is a primary factor" is a section on "Substitutes for bread" (p. 596-97) which includes gluten bread and bran bread. Table 1, "Analysis of diabetic foods," shows (p. 602) that the "Ralston Health Food Co." makes "Gluten flour" which was first analyzed in 1895, then later in 1902-03. The same chapter has a long table titled "Analysis of diabetic foods" (p. 610-13). A 7-day vegetarian diet with a minimum of protein menu is recommended for treatment of cancer by Bulkley at the New York Skin and Cancer Hospital (p. 673-73).

In the chapter on "Recipes" is a section on "Bread" (p. 773-74) which includes whole-wheat bread, zwieback, and bran muffins for constipation. A recipe for Camplin's bran cakes (p. 792) is given. The same chapter has a section on "Soy bean cookery" (p. 798-810) with the same recipes as in the 1913 edition. Address: 1. Prof. of Gastro-Enterology; 2. Prof. of Diseases of Children. Both: Univ. of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.

36. [Archival file on soybeans in Cuba: Docket (*Legajo*) 2, files 1-10]. 1920-1946. Santiago de las Vegas, Cuba: Department of Agriculture (Departamento de Agricultura). Unpublished documents. [Spa]*

• ***Summary:*** This is a 3½-inch thick stack of ten bound, unpublished reports and collections of papers. File 1. Information concerning the soybean (*frijol soya*), with analysis of the seed and soybean products during the years 1920, 1933, 1934, 1936, 1939, 1942. The first page is an analysis (conducted in 1920) of the oil and water content the following soybean varieties listed in ascending order of oil content: Blanca (17.5% oil, 10.40% water), Amarilla, Negra, Wilson Five, Pekin [Peking], Early Brown, Gigante, Virginia, Arlington, Black Eyebrow, Hahto, Biloxi (19.40% oil), S.P.I. 40125 (19.60% oil, the highest). Many analyses from later years are also given.

File 2. Correspondence concerning soybeans from 1934 to 1946.

File 3. Donations of soybean seeds from 1928 to 1936, sent from the Cuban Department of Agriculture (Agricultural Experiment Station at Santiago de las Vegas) to farmers in Cuba. By March 1933 two-pound packets of unnamed soybean varieties were being sent to quite a few farmers. By 1934 ½-pound packets of each of 5 named varieties were being sent to farmers.

File 4. Donations sent out in 1937. File 5. Donations in 1938-1940. File 6. Donations in 1941-1946.

File 7. Information on the industrialization of soya in Cuba during the years 1936-1941. Includes various letters to and from companies, including the Ford Motor Co. and the *Compania Nacional de Aceites* (both in Havana, each letter is cited separately). On 30 Jan. 1940 some 40 pounds of soybean meal were sent for use as pig feed.

File 8. Information on soil inoculated with bacteria for the cultivation of soybeans during the years 1933-38, 1940, 1941, 1943, 1945.

File 9. Soybean varieties in Cuba during the years 1930, 1935, 1937, 1938, 1942, 1943. A document dated 15 Jan. 1937 (cited separately) lists 18 soybean varieties that have germinated in Cuba owned by the Cuban Department of Agriculture. In the museum are six varieties that have not germinated in Cuba. A similar list dated 18 Nov. 1938 (cited separately) shows 23 soybean varieties in Cuba; twelve of these are not found in the list of 15 Jan. 1937. A list dated 24 June 1942 gives 34 soybean varieties actually cultivated in Cuba.

File 10. Various businesses related to soya during the years 1933-1946. Includes letters to Ing. Antonio Portuondo from E.F. Johnson of Purina Mills and from W.J. Morse of USDA (each dated 1938, and cited separately). Address: Cuba.

37. Hartz, Jacob; Hartz, George; Thorell, Alf. R. 1925. A record of the organization and incorporation of Hartz-Thorell Supply Co., a corporation. Stuttgart, Arkansas. 6 p. 36 cm.

• ***Summary:*** The Hartz-Thorell Supply Co. company was incorporated under the laws of the state of Arkansas on 10 Jan. 1925, officially registered on 15 Jan. 1925. The capital stock was $15,000. Each share sold for $50.00. On 10 Jan. 1925 the three founders owned the following number of shares: A.R. Thorell: 60 shares worth $3,000. Jacob Hartz:

45 shares worth $2,250. George Hartz: 45 shares worth $2,250. The signature of each of these three men appears three times in this document.

The charter (p. 5) states that the general nature of the business was to buy and sell rice farm supplies. Officers: Jacob Hartz, president. George Hartz, vice-president. A.R. Thorell, secretary and treasurer.

Talk with Marion Hartz. 1997. April 28. The record books of the Hartz-Thorell Supply Co. and the minute books are now in the possession of Mr. Thorell's only survivor, his daughter Adelle, who lives in Stuttgart, never married, and who is one year older than Marion.

George Hartz was Jacob Hartz's father and Marion's grandfather. Originally named Gerhardt Hartz, he was born into a Roman Catholic family in Bavaria [Germany], and in about 1870 immigrated to the USA as a young man (about age 19) together with an older sister who was going to get married; she settled in Racine, Wisconsin. He was granted full citizenship to the USA in about 1880 at Rock Island, Illinois; Marion still has the citizenship papers. George's main business was operating the Purina Feed Agency in Stuttgart; they sold incubated eggs, feed delivered in a little old Model-T Ford pickup truck, etc. George married Suzanna Simon of Racine, Wisconsin; they met in Racine. Both families were Catholic. When George retired, Jacob Hartz and A.R. Thorell purchased his stock; George died in about 1934-35 in Stuttgart. He is buried at the Catholic Cemetery outside Stuttgart.

Note: This is the earliest document seen concerning the Hartz-Thorell Supply Co., a corporation. They were not yet involved with soy beans. Address: Stuttgart, Arkansas.

38. Merritt, Frank Clinton. 1928. History of Alameda County, California. Vol. 1. Chicago, Illinois: S.J. Clarke Publ. Co. 694 p. See p. 254. Illust. Portraits. 27 p. *
• ***Summary:*** In the chapter on Oakland in the 1890s, the author goes block by block. giving details on the companies in the major buildings. In the old Central Bank Building, on the northeast corner of Broadway and 14th (p. 254): "The fifth floor housed the Ralston Health Food Company, the Mutual Benefit Life Insurance Company,..."

Note: Frank Clinton Merritt was born in 1889.

39. Ft. Worth Salvage Co. 1930. Fire sale: Water damaged feeds of Ralston Purina Co. (Ad). *Fort Worth Record-Telegram* (*Fort Worth, Texas*). May 24. p. 5.
• ***Summary:*** "Steer cubes, bran, shorts, egg mash, sheep cubes, alfalfa leaf meal, soy bean meal, steer meal, corn gluten feeds, hog feed.

"Sale by..."

Note: This ad also appeared in the May 25 (p. 19), May 26 (p. 14), May 27 (p. 18), May 28 (p. 24), May 29 (p. 20), May 30 (p. 20), May 31 (p. 10), June 1 (p. 32)... June 8 (p. 29). Address: Taylor and Weatherford Streets.

40. *Journal and Courier* (*Lafayette, Indiana*). 1930. Soy bean mill changes hands: Local company sells plant to Ralston Purina concern of St. Louis–manager here. Sept. 22. p. 15.
• ***Summary:*** "Announcement has been made of the sale of the Lafayette Milling company's soy bean mill at 800 North Fourth street to the Ralston Purina company of St. Louis, Missouri, one of the largest food and feed manufacturing concerns in the country. The company has already taken over the plant and George H. Steele has arrived here from St. Louis to act as resident manager. Jesse C. Young will remain with the establishment as buyer. The plant is engaged in the manufacture of oil and meal from soy beans. This is the Ralston Purina company's first soy bean mill, although the company manufactures many other kinds of feed. The plant is said to have a capacity of half a million bushels of soy beans a year."

Note: This is the earliest document seen (Sept. 2020) that mentions the Lafayette Milling Co. in Lafayette, Indiana.

41. Ralston Purina Co. 1930. Soybeans (Ad). *Journal and Courier* (*Lafayette, Indiana*). Sept. 26. p. 15, cols. 7-8.
• ***Summary:*** "We have purchased the soybean plant located at 800 North Fourth Street from the Lafayette Milling Company. We will operate this plant as soon as soybeans are harvested and will pay the full market price for the beans. See Mr. Jesse Young, 804 North Fourth Street, Phone 5426."

Note: This ad also appeared in the Sept. 29 (p. 13), Oct. 1 (p. 13). Oct. 3 (p. 19), Oct. 6 (p. 15), Oct. 8 (p. 15), Oct. 13 (p. 15), Oct. 15 (p. 15), Oct. 17 (p. 19) issues. In all but the first ad, the phone is given as "5421." Address: 804 North Fourth St., Lafayette, Indiana.

42. Smith, D.B. 1930. Soy bean industry (Letter to the editor). *Journal and Courier* (*Lafayette, Indiana*). Oct. 13. p. 6.
• ***Summary:*** "Editor Journal and Courier: By the purchase of the soy bean oil plant on North Fourth street by the Ralston Purina company of St. Louis, a new impetus is given the young soy bean industry. With the resources of the Purina company behind the project, we may reasonably expect the gradual establishment of plants in the soy bean centers and the development of the industry to major proportions.

"There is an urgent demand for soy bean oil. Many uses have been found for it and many more will be found through research and experimentation in the future.

"The development of the soy bean industry augurs well for the farmer. There is already a very large acreage here in the middle-west through its value to the soil and as a valuable feed for stock, and through additional uses, we may see the lowly soy bean transformed into one of the major crops in the middle-west and a new and most welcome help to the farmer on a rough road back to normalcy. Who knows

it may be his guiding star?" Address: Boswell, Indiana.

43. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: 804 North Fourth St., Lafayette, Indiana.
Date of Introduction: 1930 October.
Ingredients: Soybeans.
New Product–Documentation: Ad in *Journal and Courier* (Lafayette, Indiana). 1930. Sept. 26. p. 15 "We have purchased the soybean plant located at 800 North Fourth Street from the Lafayette Milling Company. We will operate this plant as soon as soybeans are harvested and will pay the full market price for the beans. See Mr. Jesse Young, 804 North Fourth Street..."

Ad in *Proceedings of the American Soybean Assoc.* 1936. "Grow soybeans: To make the meal, to build the feeds, your livestock needs." [Aug.]. Back cover. Purina Mills has modern soybean processing plants in three locations, including Lafayette, Indiana.

USDA Northern Regional Research Laboratory. 1943. "Soybean processing mills in the United States." *USDA Bureau of Agricultural and Industrial Chemistry.* AIC-26. 10 p. Nov. See p. 2. Lafayette, Indiana: "Ralston Purina Company." (Medium = capacity between 50 and 200 tons/day of soybeans).

44. *Journal and Courier* (*Lafayette, Indiana*). 1931. Record shipment of local soy bean oil. May 9. p. 3.
• ***Summary:*** "Eight tank carloads of soy bean oil manufactured at the Lafayette plant of the Ralston-Purina company on North Fourth street were shipped from the city recently on the Monon railroad, each carload of the product representing approximately 400 acres of soy beans.

"The local factory, formerly belonging to the Lafayette Milling company, is operating at full capacity, Jesse Young, the manager, announced Saturday. It is employing 20 men.

"Soy bean oil is sold by the company to many different industries and is always in demand. It is used in the manufacture of soap, oleomargarine, paints and varnishes, salad oil and nitro-glycerin. Its newest uses are for core oil in foundries and in manufacture of disinfectants. The by-product, soy bean meal, is all absorbed by the company's various plants [for use in livestock and poultry feeds].

"The company buys its soy beans from farmers in the vicinity of Lafayette."

A large photo shows a Monon line engine the railroad tank cars with the Ralston Purina plant in the background.

45. *Prairie Farmer.* 1931. Soybeans make poor quality pork: Soybean oilmeal O.K.–There is danger in feeding whole soybeans. 103(32):3, 20. Oct. 31.
• ***Summary:*** When whole soybeans are fed to hogs, the result is undesirable soft, oily pork. "Soybean mills located in *Prairie Farmer* territory are: Allied Mills, Peoria, Illinois. Funk Bros., Bloomington and Taylorville, Illinois. Archer-Daniels Midland Company, Chicago, Illinois, and Toledo, Ohio. Evans Milling Company, Indianapolis, Indiana. Ralston-Purina Company, LaFayette, Indiana. Procter and Gamble, Louisville, Kentucky. Early-Daniels Company, Cincinnati, Ohio. Staley Company, Decatur [Illinois]. Shellabarger Company, Decatur [Illinois]."

Two photos show: "The loin and bacon on the left are from a soybean-fed hog. The right from corn-fed hog." The samples on the left are soft (drooping over a pail) and fatty.

Note: This is the earliest document seen (Aug. 2020) that mentions Ralston Purina Co. in connection with soybeans.

46. Danforth, William H. 1931. I dare you! St. Louis: Privately printed (for my personal friends and daring youth who may cross my path). vii + 89 p. 21 cm. 10th ed. published April 1941.
• ***Summary:*** William Henry Danforth, born in 1870, was the founder of Ralston Purina Co. His plan of four-fold personal development, which became the famous checkerboard logo, was think tall, smile tall, live tall, and stand tall. Contents: Foreword. Author's preface. I dare you. You can be bigger than you are. Are you one of the precious few? (who dare to dare). I dare you to adventure. I dare you to do things. Now for the start. I dare you to be strong. I dare you to think creatively. I dare you to develop a magnetic personality. I dare you to build character. I dare you to share. Launch out into the deep. I dare and share. Address: Chairman of the Board, Ralston Purina Company, Checkerboard Square, St. Louis. Missouri.

47. Ralston Purina Co. 1932. X-tra chick feed (Ad). *Journal and Courier* (*Lafayette, Indiana*). Feb. 26. p. 15, cols. 3-4.
• ***Summary:*** "Today there's a new tag on the feed bag that makes it easier for you to choose feed for your chicks..."

Across the bottom of the ad in bold letters: "Always in the market for soybeans." Address: 804 North Fourth St., Lafayette, Indiana.

48. Ralston Purina Co. 1932. Soybeans (Ad). *Journal and Courier* (*Lafayette, Indiana*). Aug. 16. p. 11, col. 8.
• ***Summary:*** "Old or new, 40¢."

Note: This small but bold ad also appeared on Aug. 18 (p. 13) and Aug. 20 (p. 11). However, in each ad the price increased. On Aug. 18 it was 42¢ and on Aug. 20 it was 43¢.

49. *Gazette* (*The*) (*Montreal, Quebec, Canada*). 1932. Soya bean milling now project here: Canadian flour millers interested in English and German experiments. New product possible. Tests of soil in Eastern Canada may lead to crops of soya bean. Aug. 27. p. 2.
• ***Summary:*** "Successful experiments in milling soya bean

flour in England and Germany have interested a group of Canadian flour millers in the possibility of the soya bean being milled in Eastern Canada, and negotiations towards end are already under way between the Canadian millers and German interests controlling the new Berczeller process of milling soya bean flour, it was learned by The Gazette yesterday.

"Once definite arrangements have been made for the milling of soya bean flour in Canada, the beans will be imported from North Manchuria. Later, if tests of soil in eastern Canada are successful, it is hoped to grow crops of soya beans in Ontario and Quebec Experiments to this effect already being carried out by the Department of Agriculture of Ontario, at the Instigation of the Ralston-Purina Company, of Woodstock, Ontario, and agronomists under the Hon. Adelard Godbout, Minister of Agriculture of Quebec, are also carrying out experiments in this province.

"If soya beans–hitherto native to Chinese soil–can be grown in Canada, it is pointed out, the Dominion will boast of a rich agricultural product which can be ground for its vegetable oil, milled as a flour or milled as an animal feed. The oil is valuable to the chemical industry, and at the present time is sold in the San Francisco [California] market at rates of 5 cents a pound for crude imported oil, 6 cents a pound for refined Manchurian oil, and 5½ cents a pound for domestic refined oil.

"Scientific research into the properties of the soya bean–a delicacy unknown to the Occidental gourmet, but cherished by China's bourgeoisie–reveals that the bean is of great nutritive value, surpassing all other vegetable foods in view of the fact that it contains no starch or other carbohydrates. Its principal constituents are protein and fat, lecithin, which is a nerve food usually found in eggs; mineral salts, and a series of vitamines.

"Hungary's Success: During the course of the Great War, persistent efforts were made by several governments, especially that of Germany to produce an edible food from soya beans, particularly a food acceptable to the Occidental palate. But it was only a few years ago that a Hungarian scientist–Dr. Berczeller–discovered a means of completely extracting from the bean its bitter content, and of preventing fats from turning rancid, without impairing the food values of the bean, This process–the Berczeller process–has been already adapted by an English company which has started operations at Rickmansworth, near London, and a large quantity of specially prepared soya beans are now being milled into flour and sold to bakers, confectioners and food manufacturers.

"The success of the experiments carried out in England and Germany proved interesting to the Canadian millers, with the result that negotiations were opened with the German interests controlling the Berczeller process with a view towards milling soya flour in eastern Canada. And if experiments in growing the soya bean in Ontario and Quebec are successful, it is hoped Canada will be in the advantageous position whereby its soya bean mills will obtain their product in the country instead of having to import it from distant North Manchuria, where production is invariably haphazard as a result of floods and of warfare and banditry."

50. Ralston Purina Co. 1932. Special report on Purina core oil. St. Louis, Missouri. *
Address: St. Louis, Missouri.

51. Ralston Purina Co. 1933. Cash for soy beans (Ad). *Journal and Courier* (*Lafayette, Indiana*). Feb. 28. p. 9, col. 8.
• ***Summary:*** "We are prepared to pay you spot Cash for soybeans or we will make you a very liberal exchange of our full line of Purina Animal and Poultry Chows or Chicken Feeds."

Note: This ad also appeared on March 1 (p. 9) and March 2 (p. 15). Address: 804 N. 4th St., Lafayette.

52. *St. Louis Globe-Democrat* (*St. Louis, Missouri*). 1933. Soy bean plant completed here: New unit to furnish market for crop in this area. June 28. p. 17.
• ***Summary:*** "Installation of a large new plant in St. Louis for the manufacture of commercial soy bean products was announced yesterday by William H. Danforth, chairman of the board of the Ralston Purina Company.

"'The addition of the new unit to the present plant equipment of Purina Mills,' Danforth said, 'will serve two purposes. It will furnish industry with the basic soy bean ingredients which are used today in the manufacture of an infinite variety of products. And this St. Louis plant, located in the heart of America's greatest soy bean producing country, will also provide the farmers of this region a profitable market for the soy beans which they raise.

"'Soy beans have increased much faster in commercial value than other farm products. They can be grown anywhere in the corn belt or northern corn belt, and therefore the crop lends itself well as a substitute for corn, wheat or cotton wherever reduced acreage in these products is desired.'

"The new plant is installed with the latest type of machinery and equipment for handling and processing soy beans for market. Plans for another mill in Indiana are under way."

53. *Journal and Courier* (*Lafayette, Indiana*). 1933. Industry to build new plant and enlarge operations here: Ralston-Purina Company buys old Kern Packing site and will erect modern factory employing large work force–outgrows present home. July 13, p. 1, 13, col. 5.
• ***Summary:*** "Erection of a new and much larger home for the Lafayette branch of the Ralston-Purina company, on the old Kern Packing company site on lower Wabash avenue,

was announced Thursday by Jesse Young, local manager."

"Came Here in 1930: In July 1930 the Ralston company, of St. Louis, bought the soy bean plant of the Lafayette Milling company and took over its operation, turning out soy bean meal and oil and doing a large business in this line. The plant is still located in property of the Lafayette Ice and Coal company, on North Fourth street, in a part of the old brewery, on which work is in progress, impetus was given to a plan to move the soy bean plant and the decision followed to enlarge its operations. Present quarters will be retained until the new building is completed.

"Large Structure: The new structure will be of concrete, about 220 feet long and 75 feet wide, according to Mr. Young, and will be built along the Monon switch, providing convenient rail facilities. In addition to the soy bean processing plant to be moved to the new site..."

"Excellent Site: The new site, purchased of the Dryfus Packing and Provision company, is considered ideal in all respects. In addition to its location on a railway switch, the plant will be easily accessible, over paved roads and streets, to farmers."

A continued market will be provided for soy beans.

"The Ralston Purina company is described as the largest processor of commercial feeds in the country, operating 17 feed mills, as well as a rolled oats mill and breakfast food plant. Products are sold in every state of the union, and the firm also enjoys a large export business in food and feeds."

54. *Journal and Courier* (*Lafayette, Indiana*). 1933. Ralston-Purina plant is rushed. Sept. 19. p. 9.
• ***Summary:*** "Work on the new plant of the Ralston-Purina company on lower Wabash avenue is progressing at such a satisfactory rate that it is expected the company will be able to begin operations by the middle of October. The large fireproof elevator has been completed, the workmen of A.E. Kemmer, general contractor, are erecting the press room and the boiler room is still to be built. All the structures are of reinforced concrete. The principal output of the mill will be soy bean oil and various feeds. About 35 men will be employed in operations when the plant opens. Jesse W. Young is the local manager and the present plant in the building of the Lafayette Brewery, Inc., at the north end of North Fourth street will be moved to the new plant as soon as the latter is ready."

55. *Journal and Courier* (*Lafayette, Indiana*). 1933. 10 new industries established in St. Louis in September and five others expanded. Oct. 29. p. 19.
• ***Summary:*** This "according to the monthly report of the Industrial Bureau of the Industrial Club of St. Louis."

"Following are expansions: Ralston Purina Co., Inc., 835 South Eighth street, has opened a new soy bean plant, the first of its kind in St. Louis. The plant will operate three shifts, 24 hours a day. In addition to soy bean meal, the company will make soy bean oil for use in manufacturing paints, linoleum, salad and cooking oil, lubricants, disinfectants and allied products."

Note: This plant had been placed in operation by 24 Nov. 1933.

56. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1933 October.
Ingredients: Soybeans.
New Product–Documentation: "Soy bean plant completed here: New unit to furnish market for crop in this area." 1933. *St. Louis Globe-Democrat* (St. Louis, Missouri). June 28. p. 17

Ad in *Proceedings of the American Soybean Assoc.* 1936. "Grow soybeans: To make the meal, to build the feeds, your livestock needs." [Aug.]. Back cover. Purina Mills has modern soybean processing plants in three locations, including St. Louis, Missouri.

National Soybean Processors Association. 1941. Year Book, 1941-1942. Members. See p. 18. Ralston Purina Co., St. Louis, Missouri (J.H. Caldwell).

USDA Northern Regional Research Laboratory. 1943. "Soybean processing mills in the United States." *USDA Bureau of Agricultural and Industrial Chemistry.* AIC-26. 10 p. Nov. See p. 2. St. Louis, Missouri: "Ralston Purina Company." (Medium = capacity between 50 and 200 tons/day of soybeans).

Note: This is the earliest known commercial soy product made in Missouri.

57. *Republican Tribune* (*Union, Missouri*). 1933. Soybeans an important crop. Nov. 24. p. 7.
• ***Summary:*** "Soybeans, although tracing their origin through more than 5,000 years of Manchu Dynasties in China, had to 'migrate' to the United States to come to their own in the vegetable kingdom.

"Introduced in this country as a farm crop only in 1904, and heretofore grown by farmers chiefly for hay, the soybean now has become one of America's foremost basic commodities. It was estimated the 1932 crop was about 16,000,000 bushels, and a large plant for the manufacture of soybean products has been constructed by the Ralston Purina Company in St. Louis, which is in the heart of America's greatest soybean-producing area. This plant, the first in Missouri, has just been placed in operation, and the company is building another new one at Lafayette, Indiana. In addition to soybean meal, the company will make soybean oil for use by manufacturers of paints and linoleum, core oil for foundries, salad and cooking oils, soaps, greases, lubricants, disinfectants and allied products."

58. *Journal and Courier* (*Lafayette, Indiana*). 1934. Ralston

plant now operating. Jan. 17. p. 12.

• ***Summary:*** Lafayette's newest important industry, the local plant of Ralston-Purina company on lower Wabash avenue, is now in operation, manufacturing soy-bean meal and oil and various livestock feeds made from corn, oats and concentrates. Thirty men are employed at the modern factory and it will afford a new market for soy-bean, corn and oats raised in this section of the state.

"Jesse W. Young, resident manager, announces that the plant will require for its various products a total of 2,200 bushels of soy-beans and 1,500 bushels of corn and oats each day. Both the soy-bean department and the feed mill are fully equipped with the latest machinery, housed in buildings so designed and erected as to provide maximum efficiency. The fire-proof structures are commodious and include a large elevator and warehouse as well as the production departments.

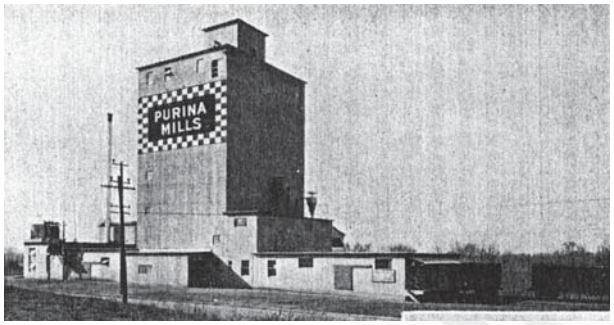
"Both the soy-bean products and those of the feed mill are sold generally over the country. The soy-bean meal is used in stock food concentrates and the oil has manifold uses. Some is used for salad dressing and other edible purposed and some goes into the manufacture of paints. The company also manufactures an oil for foundry use. The chow foods, now being manufactured here, are for livestock feeding.

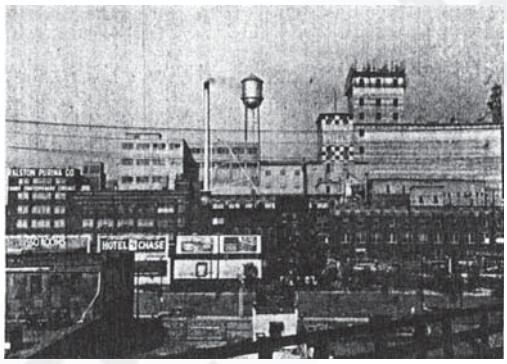
"Norman Adkins of this city, is superintendent of the plant, and H. Montgomery is western district salesman with headquarters at the plant."

59. Ralston Purina Co. 1934. Soybeans for beginners. St. Louis, Missouri. 10 p. Prepared by E.F. Johnson. 23 cm.

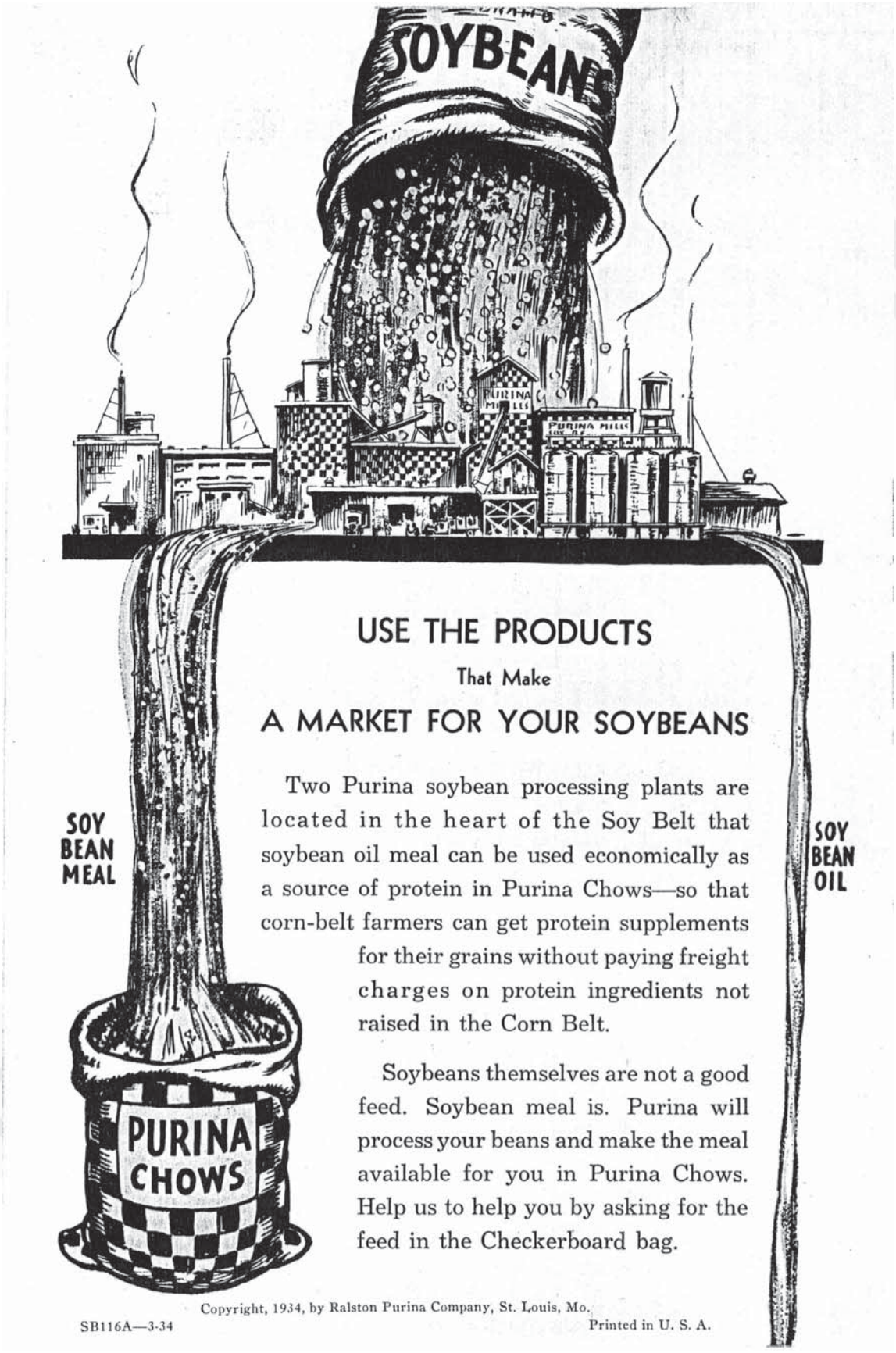
E. F. Johnson

• ***Summary:*** Discusses the advantages of soybeans in agriculture. Contents: On the cover is a map of the Midwest showing the company's soybean processing plants in St. Louis, Missouri, and Lafayette, Indiana. "Our Processing Plants are in the Heart of the Soy-Belt." Note: This is the earliest document seen (Nov. 1998) that uses the term "soy belt." Introductory message from J.H. Caldwell, Vice-President of Ralston Purina Co. (10 March 1934, St. Louis, Missouri). Two ways soybeans can make you money this year: Introduction (the corn-hog reduction program), solving the corn acreage reduction problem, in the regular corn-belt rotations. Select the right variety: Varieties recommended for commercial production (Manchu, Illini, Dunfield, Harbinsoy), promising new varieties (Mansoy, Scioto), guide for the beginner, hay varieties (Virginia, Wilson, Peking). Seed bed preparation. Inoculation essential. Seeding: Should soybeans be seeded in rows or solid, early planting gives best yields, rate of seeding, too deep planting a serious mistake. Harvesting: Combine method recommended, grain binders used in many sections, mowing machine and windrower preferred by some growers. Threshing. Yield of grain ("Experienced growers on good soil secure yields of 30 to 40 bushels per acre consistently"). Storing seed. Marketing: Cash markets now available, how price is determined. Future outlook for soybeans: Introduction (the government is reducing cotton acreage by 35%), apparently no danger of over-production of soybeans. Chinch bugs do not destroy soybeans. A soybean program ("Increase your farm returns by substituting soybeans for oats"). Ad: Use the products that make a market for your soybeans: "Two Purina soybean processing plants are located in the heart of the Soy Belt..." Soybean oil meal is used in Purina Chows.





The introductory message states: "This booklet is published by the Purina Mills, one of the largest processors of soybeans, in the hope that it will help many corn-belt



USE THE PRODUCTS

That Make

A MARKET FOR YOUR SOYBEANS

Two Purina soybean processing plants are located in the heart of the Soy Belt that soybean oil meal can be used economically as a source of protein in Purina Chows—so that corn-belt farmers can get protein supplements for their grains without paying freight charges on protein ingredients not raised in the Corn Belt.

Soybeans themselves are not a good feed. Soybean meal is. Purina will process your beans and make the meal available for you in Purina Chows. Help us to help you by asking for the feed in the Checkerboard bag.

SB116A—3-34

Printed in U. S. A.

farmers who are growing soybeans as a commercial crop for the first time.

"The material has been prepared by E.F. Johnson, former operator of the Johnson Seed Farms [of Stryker, Ohio], famous for their early work on soybeans. For years Mr. Johnson was active in Farm Bureau work and talked soybeans on hundreds of institute programs throughout the Corn Belt. He has consolidated here a summary of the best experiences of hundreds of soybean growers in Ohio, Indiana, Illinois, Missouri, and Iowa.

"The Ralston Purina Company uses large quantities of soybean meal in the manufacture of Chows, and find it one of the best sources of protein for the manufacture of real feeds for all livestock. Appreciating the need of a larger and more uniform production, we have added a Soybean Seed Department to our organization, to cooperate with growers in solving their soybean problems, and to serve as a reliable source of seed of those commercially proven varieties that will give best results under average conditions."

Photos show: (1) E.F. Johnson (facing p. 1). (2) The new Purina Mills plant at Lafayette, Indiana (p. 7). (3) New additions to the St. Louis plant. "Both equipped with modern soybean processing machinery. These two plants furnish corn-belt growers with the best possible market for their beans" (p. 7).

"How price is determined: Since soybeans furnish less than one-twentieth of our total supply of vegetable protein and are almost a negligible factor in supplying vegetable oil requirements, prices of soybeans naturally are mainly influenced by the prevailing prices of oil and meal from cotton seed and flax."

"Feeding tests on Purina Mills' Experimental Farm show that feeds carrying large amounts of soybean meal give results similar to those secured with combination of both vegetable and animal proteins. No other vegetable protein seems to have this peculiar advantage."

Note: This is the earliest document seen (Sept. 2020) that mentions Ralston Purina Co. in connection with soybean crushing or work to promote soybeans production in the USA. Address: St. Louis, Missouri.

60. *Circleville Herald* (*The*) (*Circleville, Ohio*). 1934. Ralston-Purina Co. plans extensive soybean market: Two expellers to begin operation Jan. 15 have capacity of 1,200 bushels daily; four more to be installed next summer. Dec. 1. p. 1.

• ***Summary:*** "The Ralston-Purina Co. is installing two French soybean oil expellers, the latest type in soybean processing machinery.

"The expellers will have a capacity of 1,200 bushels daily.

"The remaining part of the soybean unit will be the last word in expelling machinery. Definite plans have been completed for installation of four more expellers next summer bringing the plant's daily capacity up to 3,600 bushels daily or 1,000,000 bushels of soybeans a year.

Ray E. Rowland, manager of the plant, said Saturday that the Ralston-Purina Co. expects to crush or process 300,000 bushels of soybeans in 1935. 'We are now in the market for 500,000 bushels of soybeans,' Mr. Rowland said, 'and we definitely expect to start processing January 15.

"Must Ship Most: 'We probably will ship most of the required beans into Circleville from Illinois and Indiana this year due to the fact that soybeans are not yet available in Ohio. However the local company will have seed to sell farmers that are interested next spring in the new cash crop.' the manager continued.

"Soybeans will fit nicely into the program of Illinois farmers next year because of the fact that the corn crop reduction acreage can be put in soybeans. Soybeans distribute the labor better on the farm inasmuch as the beans are harvested after wheat and before corn husking. The beans can also be harvested and wheat seeded on the soybean ground without plowing in the fall for wheat.

"The United States, Mr. Rowland pointed out, can consume three times the number of bushels of soybeans that are grown today and affect the present market price. Year in and year out, soybeans will compare favorably with wheat as a cash crop, he declared.

"Wisconsin Graduate: Mr. Rowland is a graduate of the University of Wisconsin college of agriculture. He taught in the university one year and has been with the Ralston-Purina Co. about 10 years. Before coming to Circleville he was assistant sales manager over Indiana, Ohio and Michigan. He is qualified to discuss your agriculture problems, crop rotation, inoculation of seed, and feeding problems."

Note: This plant is in Circleville, Ohio.

61. Ralston-Purina Co. 1935. Soy bean meeting called: Special meeting called (Ad). *Circleville Herald* (*The*) (*Circleville, Ohio*). Jan. 12. p. 3.

• ***Summary:*** "Tuesday, January 15, 1935

"Memorial Hall, 1:30 P.M.

"Circleville, Ohio

"For farmers in Pickaway County interested in growing soy beans

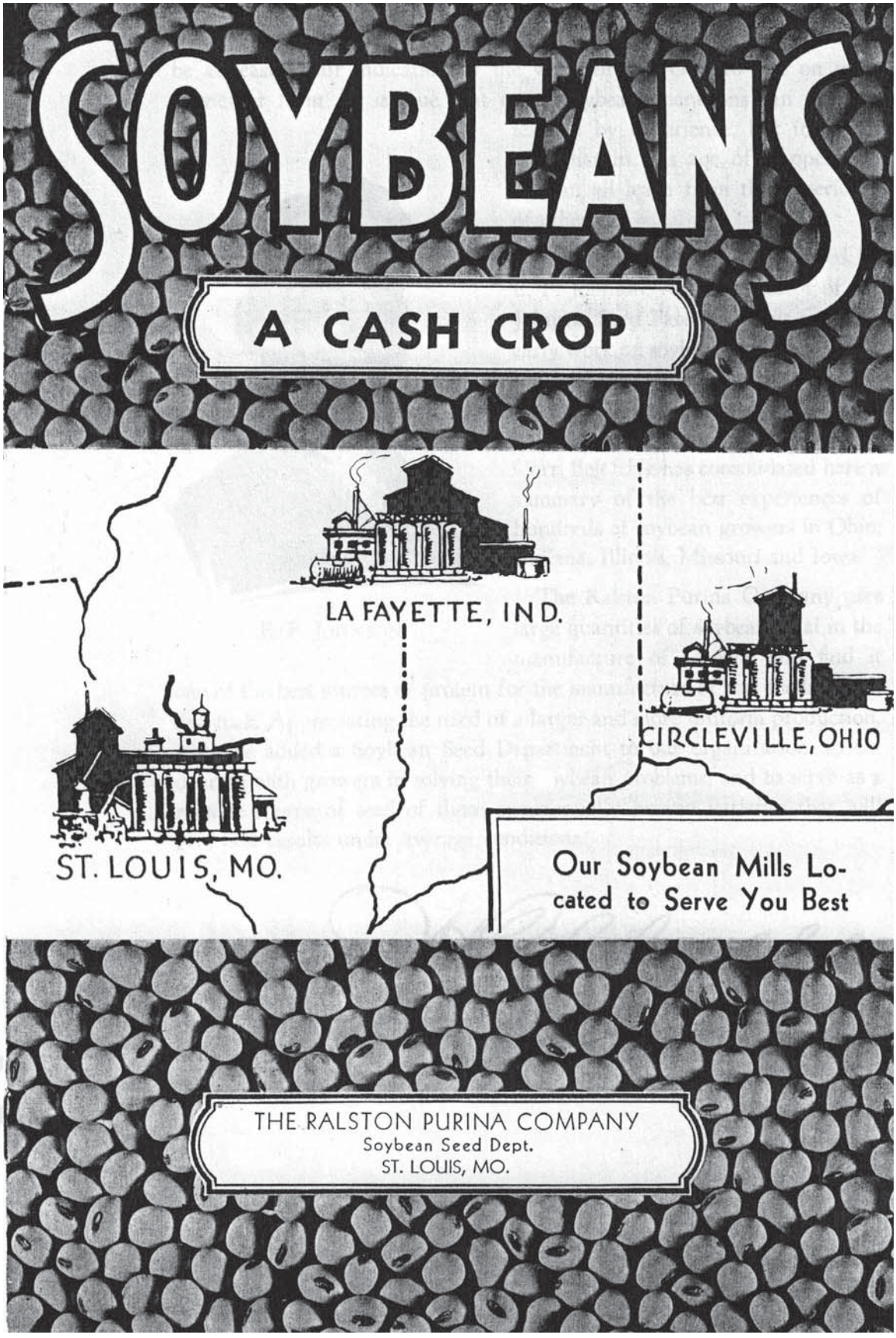
"Cultural practices–seeding–and varieties of Soy Beans to sow in this area in this area will be discussed by officials of the Ralston-Purina Company.

"All are urged to come."

Note: This ad also ran in the Jan. 14 issue (p. 3).

62. Ralston Purina Co. 1935. Soybeans: A cash crop. St. Louis, Missouri. 10 p. Prepared by E.F. Johnson. Jan. 23 cm.

• ***Summary:*** This booklet (also prepared by E.F. Johnson) is somewhat similar to that titled "Soybeans for beginners," published by Ralston Purina in March 1934. Contents: Map of the Midwest showing the company's soybean



processing plants in St. Louis, Missouri, Lafayette, Indiana, and Circleville, Ohio. "Our soybean mills located to serve you best." Introductory message from J.H. Caldwell, Vice-President of Ralston Purina Co. (15 Jan. 1935, St. Louis, Missouri). Soybeans–A cash crop: Introduction, three outstanding reasons for great interest in soybeans this year (1) Year-round cash market now established. (2) Chinch bugs leave soybean alone. (3) Soybeans can be planted on corn-reduction acres. Established markets necessary for expansion. Soybeans are an easy crop to grow: Seedbed preparation most important operation (weeds, stand, yield), a simple prescription for a good seed bed. Varieties recommended for commercial production (Dunfield, Manchu, Illini), recommended new varieties (Mandell, Scioto, Manchuria, Mukden. Note: Virginia, Wilson, Ebony, Pekwa and Kingwa are not recommended due to low oil content and less attractive meal). Growing soybeans commercially: Inoculation, solid or row seeding, rate of seeding, date of seeding, don't plant too deep, cultivation. Harvesting: Combine method recommended, grain binders used in many sections, mowing machine and windrower preferred by some growers, use regular grain separator for threshing. Yield of grain ("Soybeans will yield from 20 to 40 bushels to the acre... Yields of 40 to 45 bushels per acre are not uncommon in Illinois"). Storing and marketing soybeans: Sell through your local elevator, value of meal and oil determines price of soybeans. Future outlook for soybeans in U.S.: Introduction, increased acreage next year anticipated, wide diversity of use of soybean products: Flour, soybean oil meal, soybean oil, other uses (milk, cheese [tofu] bean sprouts, flavoring sauce, substitutes for coffee and peanuts). Using soybeans to check chinch bug movement. A soybean program. Ad: Use the products that make a market for your soybeans: "Three Purina soybean processing plants are located in the heart of the Soy Belt..." Soybean oil meal is used in Purina Chows.

Photos show: (1) E.F. Johnson (facing p. 1). (2) The 7-story Purina Mills plant at Circleville, Ohio, "complete with new modern soybean processing machinery" (p. 6). Purina Mills plants at Lafayette, Indiana, and St. Louis, Missouri (p. 7).

"Future outlook for soybeans in U.S.: Previous to 1934, 4,000,000 bushels was the largest amount of soybeans to be processed from a single crop. At least 9,000,000 and possibly 10,000,000 bushels of the 1934 crop will be processed into meal and oil... We predicted last year that the reduction in cotton-seed meal through the passage of the Bankhead Bill would result in a big increase in demand for soybean meal and in higher prices on soybeans. Both of these predictions have already been proven. The big increase in soybean meal this year still is far short of supplying the loss in cottonseed meal." Address: St. Louis, Missouri.

63. **Product Name:** Soybean Oil, and Soybean Oil Meal.
Manufacturer's Name: Ralston Purina Company.
Manufacturer's Address: Circleville, Ohio.
Date of Introduction: 1935 January.
Ingredients: Soybeans.
How Stored: Shelf stable.
New Product–Documentation: *The Circleville Herald* (Circleville, Ohio). 1933. July 10. p. 1, col. 8. "Crites elevators sold to Purina Co.: no figures made known by counsel." Announcement of the sale of the sales of the elevators and mills of Crites Inc. of this county to Ralston-Purina Co., nationally known feed manufacturers, was made Monday by J.C. Harlor, Columbus attorney for Crites Inc. The purchase price of the properties was not disclosed. The Sterling and Frankfort properties of Crites Inc. are not included in the sale. The deal is one of the largest in Pickaway county's history.

The Circleville Herald (Circleville, Ohio). 1934. Dec. 28. p. 1. "Kiwanians hear Rowland; induct 5 new members." "A splendid talk on soy bean production" and the "operation of his plant was made before the Kiwanis club Thursday evening by Ray Rowland, manager of the Ralston Purina Milling Co.

"Ralston-Purina Co. plans extensive soybean market: Two expellers to begin operation Jan. 15 have capacity of 1,200 bushels daily; four more to be installed next summer. 1934. *Circleville Herald* (The) (Circleville, Ohio). Dec. 1. p. 1. "The Ralston-Purina Co. is installing two French soybean oil expellers, the latest type in soybean processing machinery.

"The expellers will have a capacity of 1,200 bushels daily.

"The remaining part of the soybean unit will be the last word in expelling machinery."

Ad in *Proceedings of the American Soybean Assoc.* 1936. "Grow soybeans: To make the meal, to build the feeds, your livestock needs." [Aug.]. Back cover. Purina Mills has modern soybean processing plants in three locations, including Circleville, Ohio.

USDA Northern Regional Research Laboratory. 1943. "Soybean processing mills in the United States." *USDA Bureau of Agricultural and Industrial Chemistry.* AIC-26. 10 p. Nov. See p. 3. Circleville, Ohio: "Ralston Purina Company." (Medium = capacity between 50 and 200 tons/day of soybeans).

Soybean Digest. 1946. Sept. p. 12. "Ralston Purina Company's 5 soybean processing plants or cash markets for soybean growers." Includes Circleville, Ohio.

64. *Star Press* (*The*) (*Muncie, Indiana*). 1935. Soybean meet at Lafayette: several Delaware County farmers to make trip. Aug. 20. p. 17.
• ***Summary:*** "Delaware County farmers who turn some acreage to the cultivation of soybeans have been invited to attend one of a series of soybean meetings being held

in Indiana under the auspices of the American Soybean Association. The limited number of programs sent here have been mailed out from the office of M.E. Cromer, county agriculture agent, who is endeavoring to encourage the formation of a large contingent from this county to make the trip to the meeting to be held at Lafayette Friday.

"Marion Russell, Hamilton Township and A.C. Franklin, Salem Township, have already announced plans to attend, and others are interested. Persons not having automobile loads or others who do not have means of conveyance are asked to communicate with the office of Mr. Cromer before Friday. If enough interest is shown it is probable that a bus will be chartered for the trip.

"Arrange Demonstrations: Demonstrations at the Lafayette meeting will be at the Purdue University Soils and Crops experiment field. Groups will be taken over the field to study work being done in soybean cultivation.

"The demonstrations in which the Delaware County bean growers are particularly interested, are to include: Rotations grown for 18 years with and without soybeans, to show their place in rotations, and fertility effect; effect of soybeans on success with clover sown in wheat; effect of soybeans on yields of common crops following them; effect of various soil treatments on the soybean crop; comparison of standard and new varieties of soybeans; method and rate of seeding soybeans; soybeans inoculation results; discussion of hay and seed harvest; preparation of soybean ground for wheat; plant breeding studies.

"Luncheon at noon will be followed by a program on the use of soybean products.

"Movie on Evening Program: At 1 o'clock speakers are to discuss:" The program (speakers and topics) is given.

"Representatives from industries in other states and the soybean committee of the recently formed Farm Chemurgic Council will appear briefly on this program, along with members of the Purdue staff.

"There will be an inspection trip to the Ralston-Purina soybean processing plant in Lafayette, and this will be followed by a soybean grading demonstration at Purdue Agricultural Hall, and soybean breeding plots will be shown. In the evening the agronomists and others will have opportunity to see movies of soybeans as they are produced in the Orient, and an informal round-table discussion will bring the program to a close."

65. Johnson, E.F. "Soybean." 1935. Commercial soybean prices. *Proceedings of the American Soybean Association* p. 5-9. 15th annual meeting. Held 21-22 Aug. 1935 at Evansville and 23 Aug. at Lafayette, Indiana.
• ***Summary:*** "The corn belt has definitely added soybeans to its farm rotation. Soybean acreage in the last few years has grown by leaps and bounds, partly due to the increased acre return, partly due to weather and insect pests causing less injury to this legume, and partly as a result of attempts to regulate and control the acreage of other crops. Industries have put forth every effort of known science to utilize this increase...

"Previous to 1928 the supply and demand for soybean seed was the major factor in determining prices." Three graphs show the prices of various commodities from Jan. 1932 to June 1935. Fig. 1 shows the prices of linseed oil, soybean oil, and cottonseed oil. For most of this time, linseed oil was the most expensive and cottonseed oil was the least expensive, but in June 1935, cottonseed oil was the most expensive and soybean oil was the least expensive.

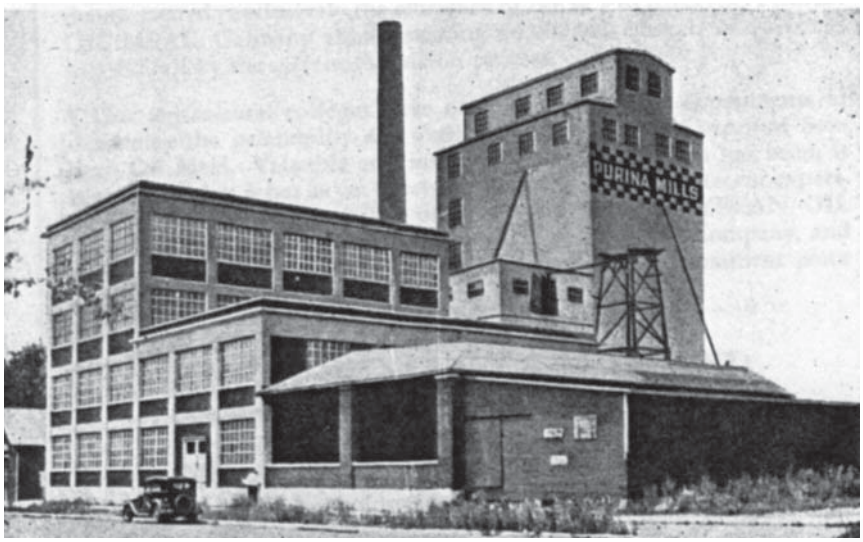
Fig. 2 shows the prices of linseed oil meal, soybean oil meal, and cottonseed oil meal. For most of this time, linseed oil meal was the most expensive and cottonseed oil meal was the least expensive, but in June 1935, linseed oil was the most expensive and soybean oil was the least expensive.

Fig. 3 shows the prices of soybeans, soybean oil, soybean meal. All prices have risen.

A table (p. 8) shows imports of soybean oil, soybean oil meal and cake, and soybeans [whole] from 1915 to 1934. Imports of soybean oil reached a peak of 335.9 million lb in 1918 and have fallen dramatically since. Imports of meal and cake reached a peak of 85,928 tons in 1929. Imports of soybeans have been quite steady, averaging about 50,000 bushels (peak: 89,067 bushels in 1917). Three tables (p. 9) give figures for the following areas: USA, Illinois, Indiana, Iowa, Missouri, Ohio, North Carolina for the years 1922, 1924, 1927, 1930, 1934, and 1935. The tables are: 1. Total soybean acreage. 2. Acreage from which soybean seeds were harvested. 3. Crop harvested for seed (1,000 bushels).

Photos show (1) "New expeller soybean oil meal plant, Ralston-Purina, Lafayette, Indiana." On the tall tower is written "Purina Mills." (2) "Soybean oilmeal plant, Purina Mills, Circleville, Ohio" (p. 20). Address: Ralston Purina Co., St. Louis, Missouri.

66. Kishlar, Lamar. 1935. Soybean oil in the foundry. *Proceedings of the American Soybean Association* p. 19-20. 15th annual meeting. Held 21-22 Aug. 1935 at Evansville and 23 Aug. at Lafayette, Indiana.
• ***Summary:*** "Whenever a hollow casting of metal is made, a core is used to form the hollow space in the casting. The core must have considerable strength to withstand rough handling and to support the weight of the molten metal. At the same time it must be of such a nature that the hot metal will burn away the binder of the core and the core material will pulverize when the casting is cold so that the pulverized core material may be removed thru some small opening in the casting. Cores are usually made of a mixture of sand and drying oil which is formed into the desired shape and baked to give maximum strength... Soybean oil meets all of the requirements for an excellent core oil and is now used extensively in a number of the largest foundries..." Eight reasons are given for this widespread usage. A photo shows



a Purina Mills "soybean oilmeal plant" at Circleville, Ohio. Address: Manager of Research, Ralston-Purina Co., St. Louis, Missouri.

67. Purina Mills. 1935. Grow soybeans: To make the meal, to build the feeds, your livestock needs (Ad). *Proceedings of the American Soybean Association* p. 50 (Back cover).

• ***Summary:*** Ralston Purina now has "three modern soybean processing plants located in the heart of the soy belt. We buy beans, and we make feeds for livestock and poultry, containing soybean meal as a source of protein. We especially invite you to visit our new Lafayette plant on Friday afternoon, August 23rd." Purina mills are at Lafayette [Indiana], Circleville [Ohio], and St. Louis [Missouri].

An illustration shows a huge bag, labeled soybeans, pouring the beans into the top of a Purina Mills soybean crushing plant. Out of the bottom of the plant, flowing like a small river into a checkerboard bag labeled "Purina Chows," is soy bean meal; soy bean oil flows out and down on the right.

68. *Flour & Feed.* 1936. New soybean committee. 36(9):19. Feb.

• ***Summary:*** "The Grain & Feed Dealers' National association has appointed a soybean committee to disseminate information to members.

"The committee is expected to inaugurate a campaign of education on soybeans. There are many things connected with the handling of soybeans that many grain and feed dealers do not know. Future markets on soybeans will be necessary before long. One of the things the new committee might straighten out is the confusion in the public mind about the difference between soybean oilmeal and the whole soybeans. The Chicago packers at a recent meeting stated emphatically that raw [sic, whole] soybeans fed to hogs make soft, oily pork, which must be discounted in price. The faults commonly attributed to whole soybeans do not apply to soybean oilmeal. These two supplements are different in composition and produce different results when fed to pigs.

"Following are the members of the committee:

"Austin D. Sturtevant, chairman, Bartlett-Frazier Co., Chicago, Illinois; H.R. Schultz, Standard Soybean Mills, Centerville, Iowa; Harold L. Gray, Crabbs, Reynolds, Taylor Co., Crawfordsville, Indiana; Arthur C. Smith, Archer-Daniels-Midland Co., Milwaukee, Wisconsin; Lew Hill, Lew Hill Grain Co., Indianapolis, Ind.; H.W. Glessner, Baldwin Elevator Co., Decatur, Ill.; Ray Rowland, Ralston Purina Co., Circleville, Ohio; P.C. Knowlton, Knowlton Grain Co., St. Louis, Missouri."

69. Farm Chemurgic Council. ed. 1936. Proceedings of the Second Dearborn Conference of Agriculture, Industry, and Science. Dearborn, Michigan: Farm Chemurgic Council; New York: The Chemical Foundation, Inc. 409 p. Held 12-14 May 1936 at Dearborn, Michigan.

• ***Summary:*** The conference is sponsored by the Farm Chemurgic Council and The Chemical Foundation, Inc.

to "Advance the industrial use of American farm products through applied science." Mr. Wheeler McMillan, Permanent Chairman. Mr. Victor H. Schoffelmayer, Permanent Secretary. Contents: Introductory. 1. Council luncheon. 2. General opening session. 3. Symposium on new things. 4. Power alcohol. 5. Starches and sugars. 6. Plastics. 7. Cellulose. 8. Farm chemurgic banquet. 9. Soy bean. 10. Insecticides and fertilizers. 11. Closing general session. 12. Business session. 13. Appendix.

The Soy bean is the only crop discussed as such. Chapter IX (p. 243-67) contains the six papers presented: 1. Soy beans as a farm crop, by Mr. E.D. Funk; 2. The processing of soy beans, by Mr. Clark Bradley; 3. The rôle of soy bean oil in paint formulation, by Mr. E.E. Ware; 4. Soy bean proteins, by Mr. W.J. O'Brien; 5. Soy bean chemistry, by Dr. H.R. Kraybill; and 6. Mixing soy bean oil and tung oil, by Mr. F. Taggart. A discussion followed, moderated by Dr. C.C. Concannon.

Of the many exhibits, the application of vegetable oils in the manufacture of paints and the manufacture of molded plastics from farm grown materials were given most attention. Both of these projects were demonstrated in 5 different displays. Exhibitors included: Ford Motor Company, I.F. Laucks, Inc. and O'Brien Varnish Company.

Soy bean oil for tractors (p. 360): "If he [the farmer] can extract soy bean oil and run tractors on soy bean oil, he does not have to ship the soy beans to market and pay the freight, and let the industrialist extract the oil... he can run his Diesel tractor on the oil, and be ahead of the game all around." Also encourages farmers or groups of farmers to do the initial steps of processing their own soybeans to make industrial products. Note 1. This is the earliest document seen (April 2017) that mentions the use of soybean oil as a specifically "diesel" fuel. Many earlier documents on this general subject referred to its use as "artificial petroleum."

The casein plastics have increased their consumption during the depression. Their total now reaches 4 million pounds. They are used mostly in buttons and costume jewelry. "Of the soya bean plastics little can yet be definitely said as to prices or possibilities. Their characteristics are naturally similar to the casein materials and like them, they are comparatively expensive." Noted from the Chemurgic point of view is that the Ford plant output is said to be 300,000 pounds a year; 100,000 pounds of which represent soy bean material.

Financial report. Disbursements for the first year of the Council's activities ending April 30, 1936 (including organization expense of the First Dearborn Conference): Total Dearborn office–$55,093.39. Total New York office (including printing and distribution of 40,000 copies of Proceedings of First Dearborn Conference)–$44,567.41. Total for the year–$99,660.80. All financial support was supplied by the Chemical Foundation, Inc.

Conference attendance: 1000 attend second conference; 35,000 attend nationwide meetings. Geographically, public meetings have included every section of the country. "The actual number of meetings organized specifically to further the Council's activities or at which the Council's program was presented, was in excess of 100, and the combined total attendance is estimated in round numbers at about 35,000."

The Soy Bean Committee (p. 391, 396-97). The meeting was called to order by Edward J. Dies, Executive Secretary of the National Soy Bean Processing Association [National Soybean Processors Association], Board of Trade Building, Chicago. Members present included E.D. Funk, Burlison, and Kraybill. Those present by invitation included Dr. J.W. Hayward of Archer Daniels Midland Co. (Milwaukee, Wisconsin), E.E. Roquemore of Allied Mills (Chicago, Illinois), E.F. Johnson and Lamar Kishlar of Ralston-Purina Co. (St. Louis, Missouri). Other members listed as being on the committee were Dr. A.A. Horvath, Chemist, Agric. Exp. Station, University of Delaware, Newark, Delaware. And Dr. Henry A. Gardner, Director, National Paint, Varnish & Lacquer Association, 2201 New York Avenue, N.W., Washington, DC. Mr. Adrian Joyce, President. The Glidden Company, 1963 Union Trust Building, Cleveland, Ohio. Note 2. This is the earliest document seen (Oct. 2005) showing that Dr J.W. Hayward is now working for Archer Daniels Midland Co.; an expert on soybean meal, he was formerly at the Univ. of Wisconsin.

"A sub-committee composed of Messrs. I.C. Bradley, president of the National Soy Bean Processors Association, Ware and Burlison, charged with certain work, found that the particular activity would now be carried on by the newly organized Soy Bean Laboratory at Urbana, which under the direction of the Federal government, will coordinate its work with that of the Experiment Stations of twelve cooperating states. Dr. Kraybill then sketched in broad outline aims and purposes of the new Laboratory and indicated potential benefits to all interests from grower to consumer."

"On motion of Mr. Bradley the resignation of Mr. H.G. Atwood as Chairman of the Committee was accepted and Edward J. Dies, Executive Secretary of the National Soy Bean Processing Association, was elected as Chairman" (p. 396-97).

Photos show: (1) General view of the exhibition hall from the entrance. (2) Mr. Francis P. Garvan, father of the Farm Chemurgic Council and President of The Chemical Foundation. (3) Dr. Charles M.A. Stine, Mr. Williams Haynes, Mr. Howard E. Coffin.

Note 2. This is the earliest document seen (July 2019) that mentions the "National Soy Bean Processors Association" (spelled with "Soy Bean" written as two words).

Note 4. This is the earliest document seen (July 2019) that mentions Edward J. Dies in connection with the National Soybean Processors Association. Note the unusual spelling of the name of the Association of which he is executive

secretary. Address: Dearborn, Michigan; New York.

70. *Courier News* (*The*) (*Blytheville, Arkansas*). 1936. Purina Company buys oil mill: acquires cottonseed crushing plant from Osceola Cotton Oil Co. June 3. p. 1.
• ***Summary:*** "Osceola, Arkansas–The Ralston Purina Co. of St. Louis [Missouri], one of the country's large manufacturers of stock and poultry feeds and other cereal products, has purchased the cottonseed crushing plant of the Osceola Cotton Oil Co., just north of town.

"The new owners took possession of the plant Monday. R.V. Mudden who has been plant superintendent for the Osceola company for a number of years, has been named manager.

"The plant will crush both cottonseed and soybeans, Mr. Madden said today. Repairs are now being made but they will be complete in time for the opening of the cotton season.

"The Osceola mill was the first in Arkansas to crush soybeans on a large scale and Mr. Madden is looking forward to expansion of this side of the business. The plant will be prepared to handle all the yellow soybeans produced by farmers in this section, he said.

"No changes are contemplated in the mill's office and the plant personnel except that the Ralston Purina people plan to send a man from St. Louis to succeed Leo Schreick as cashier and bookkeeper.

"The Osceola Cotton Oil Co. was organized in 1898. The principal stockholders are H.J. Hale, president, J.L. Williams, Mrs. Ida Tucker and E.S. Driver of Osceola, and Ike Miller of Blytheville." Address: Stuttgart, Arkansas.

71. Breedlove, L.B. 1936. Soy bean–The magic plant: Industrial uses already manifold with more in prospect. Article XV. *Chicago J. of Commerce and La Salle Street Journal.* July 7. p. 11.
• ***Summary:*** Introduction: Casein and soy bean glues. Lecithin from new plants. Use in ice cream and soup tablets (as well as linoleum, printing inks, and lubricating oils). Industrial forms using soy beans. New laboratory to study uses (regional laboratory in Illinois).

Casein is widely used to make glue. The casein (about 18% by weight) is used with borax water and glycerine in a state of hydrophilic solution to form the highly cohesive jellies called glues.

"The fir and plywood industry of the Pacific coast now uses extensively glue made with soy bean casein. Over half of the box shook plywood industry-cut boxes made for assembly at the shipper's plant–in the southern and eastern part of this country recently has adopted soy bean glue in preference to other glues. Tests by chemists of the plywood industry have proven that glue made from soy bean oil will not dissolve in water. The total consumption of soy bean glue for various uses in the wood working industries of this country is nearly 1,500 tons per month.

"Lecithin from new plants: Lecithin is used to give chocolate candy a gloss. Gumdrop manufacturers put in a drop of this substance to prevent hardening in storage. Cotton textile plants produce a soft, supple finish to their goods by the use of lecithin. Tanneries want their chrome leather to take up plenty of grease and lecithin has been found to be the best agent to increase the absorption.

"During the last decade mills for commercial extraction of lecithin from soy beans were successfully operated in Germany and Denmark, and, according to [Bruno] Rewald, over one million pounds are used annually in the German margarine industry. For a number of years soy bean lecithin was imported into the United States in competition with the lecithin extracted from eggs, but recently two mills were constructed in this country to supply the domestic demand. Lecithin is used in margarine to secure a better distribution of the fat.

"A solid made by vulcanization of soy bean oil with sulphur, known as factice, a compounding ingredient for the rubber manufacturer, was introduced last year... This brown compounder is used to increase the aging, curing, strength and wear resisting qualities of automobile tires and other heavy rubber products,..."

The following is a partial list of firms which buy soy beans and make industrial [non-food, non-feed] products from them: Archer-Daniels-Midland Company, Milwaukee, Wisconsin makes refined oils and kindred products. Armstrong Cork Company, Lancaster, Pennsylvania makes cork coverings and linoleum. Armstrong Paint and Varnish Works, Chicago, Illinois makes soaps and paints. The Blanton Companies, St. Louis, Missouri makes soaps. Davies-Young Soap Company, Dayton, Ohio makes soaps. Detroit Graphite Company, Detroit, Michigan makes soy bean oil varnish. E.I. duPont de Nemours and Company, Wilmington, Delaware makes paints, Duco finishes, plastics. Ford Motor Company, Dearborn, Michigan makes plastic automobile parts. Fischer's Surfa-Saver, Inc., Cincinnati, Ohio makes soft soap. Funk Brothers Seed Company, Bloomington, Illinois makes oil meal feeds. The Glidden Company, Chicago, Illinois makes paints, varnishes, lacquers. I.F. Laucks, Inc., Seattle, Washington, and Portsmouth, Virginia makes glues. Paintcraft Company, Galesburg, Illinois makes paint. Peterson Core Oil and Manufacturing Company, Chicago, Illinois makes core oils. Procter and Gamble, Cincinnati, Ohio makes soaps. Purina Mills, St. Louis, Missouri, makes oil meal feeds. Sherwin-Williams Company, Chicago, Illinois makes paints, varnishes, lacquers. A.E. Staley Manufacturing Company, Decatur, Illinois makes refined oils and kindred products. Stamford Rubber Company, Stamford, Connecticut makes rubber compounders. Woolsey Paint and Color Company, Jersey City, New Jersey makes paints and varnishes.

The Bankhead-Jones Act of 29 June 1935 authorizes the USDA to establish several specialized laboratories in the

major agricultural regions of this country. The department last month designated the College of Agriculture of the University of Illinois as the regional government research laboratory to serve the 12 north central states. The 3 objectives of the laboratory are discussed. "It is expected that twenty research men will soon be at work in the 6,000 square feet of space that the new laboratory will occupy." Address: Staff member, Chicago Journal of Commerce.

72. Johnson, E.F. "Soybean." 1936. Export demand for soybean products. *Proceedings of the American Soybean Association* p. 53-54. 16th annual meeting. Held 14-16 Sept. in Iowa.

• ***Summary:*** "In considering European markets for soybean products, soybeans and soybean oilmeals or cakes seem to deserve major attention.

"The possibilities of exporting American No. 2 yellow soybeans depends upon the following conditions:

"1. Manchuria with an average soybean production of twenty times our 1936 commercial crop will control the world price in all important countries.

"2. Although the quality of our soybeans is superior to the Manchurian shipments of the past, our soybeans do not show as high a protein content, forcing foreign processing plants to reduce the guaranteed protein content of the meal manufactured.

"3. Labor is so cheap in China and Manchuria (about one-tenth of our average wage) that all Manchurian soybeans are exported in bags. Many processing plants in Europe do not have facilities for unloading bulk soybeans.

"4. Until our American crop reaches a size much larger than at present, it seems uneconomic to export soybeans and import, over present duties, vegetable oils which can be replaced by domestic soybean oils.

"European countries are large buyers of soybeans, with Germany leading and England, Belgium, Holland, France and Denmark following in that order. The total import of soybeans to the above countries approximated 100,000,00 bushels annually."

"Practically all European countries import tremendous quantities of vegetable protein, either in the form of oilseeds or oilmeals. Germany, due to the constant shortage of vegetable and animal fats, is a typical illustration of a country importing oilseeds. The first six months of 1936 finds Germany importing approximately 1 million tons of oilbearing seeds, with soybeans making up the largest item, with a little over one-third of the total tonnage."

Note: This is the earliest English-language document seen (Aug. 2016) that contains the word "oilbearing" (spelled as one word) in connection with soybeans.

"Denmark, on the other hand, is a typical example of an importing country that imports both oilbearing seeds and large quantities of oilmeals. Denmark imports annually over one million tons of oilbearing seeds and vegetable oilmeals–650,000 tons of oilcakes and oilmeals, and 470,000 tons of oilseeds. Of this, we find 9,000,000 bushels of soybeans and 35,000 tons of soybean cakes and oilmeal, making a yearly total consumption of 260,000 tons of soybean oilmeal and cakes."

European rations are very flexible. Examples are given (ranging from 57% to 5%) of the combined percentage of protein and fat from different oilseeds such as cottonseed cake, sunflower cake, groundnut cake, soybean cakes, copra cakes, or rapeseed cakes.

"European standards for vegetable oilmeals are much more specific than American standards. It is practically impossible to sell a soybean cake or oilmeal of less than 48% combined protein and fat (or 44% for solvent extracted) analysis, and a 51% combined protein and fat is very much preferred and constantly offered by Manchurian mills.

"Our most difficult problem of exporting American soybean oilmeals or oilcakes involves first, producing a higher protein and fat analysis meal than is sold domestically; second, packaging it in the size and type of package desired by the trade; and third, solving the problem of having almost no processing plants located to work meal to the seaboard economically.

"European countries are much interested in our soybean oilmeal. They like the uniform, high quality of the shipments that have been made this past year. We also have a distinct advantage in that Manchurian shipments require six to eight weeks on the water, while ours require three to four weeks. In addition, our shipments are not subject to the extreme temperature variations enroute that Manchurian shipments must encounter.

"Aside from the matter of world prices, none of the other matters are difficult of solution, and the future holds plenty of excellent possibilities for a steady movement of soybean oilmeal and cake to the Scandinavian and northern European countries." Address: Ralston Purina Co., St. Louis, Missouri.

73. Purina Mills. 1936. Here's your best market for soybeans and other farm produce! (Ad). *Proceedings of the American Soybean Association* Back cover.

• ***Summary:*** "Purina Chows have used the meal from over 2,000,000 bushels of 1935 crop soybeans–thereby furnishing a substantial and profitable outlet for your soybeans." "Feed from the Checkerboard Bag to insure getting best feed for your animals and poultry, and to make a better market for your soybeans."

Purina Mills are located at: Osceola, Arkansas; Lafayette, Indiana; St. Louis, Missouri; and Circleville, Ohio.

An illustration, colored brown and yellow on white, shows a huge bag, labeled soybeans, being poured onto the top of a Purina Mills crushing plant. Out of the bottom flows soybean meal (on the left) into a checkered bag of Purina

Here's Your Best Market For Soybeans And Other Farm Produce!

Purina Chows have used the meal from over 2,000,000 bushels of 1935 crop soybeans—thereby furnishing a substantial and profitable outlet for your soybeans.

That's why, when you buy Purina Chows for livestock or poultry, you are definitely helping yourself and your neighbor in two most profitable ways: First, you are using the maximum amount of ingredients produced on your or your neighbor's farm. Second, you are certain to get the very best feeding results. Many years of intensive experimental tests have given us the accurate scientific knowledge needed to provide the right amounts of soybean oil meal in each individual Purina ration that insures utmost feeding value and greatest profit to you.

FEED FROM THE CHECKERBOARD BAG to insure getting best feed for your animals and poultry, and to make a better market for your soybeans!

Purina Mills

Osceola

Lafayette St. Louis

Circleville

Visitors always Welcome at our Plants

Chows; soy bean oil flows out on the right.

74. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Osceola, Arkansas.
Date of Introduction: 1936 September.
Ingredients: Soybeans.
New Product–Documentation: *Courier News* (The) (Blytheville, Arkansas). "Purina Company buys oil mill: acquires cottonseed crushing plant from Osceola Cotton Oil Co.: June 3. p. 1 "The plant will crush both cottonseed and soybeans, Mr. Madden said today. Repairs are now being made but they will be complete in time for the opening of the cotton season.

"The Osceola mill was the first in Arkansas to crush soybeans on a large scale and Mr. Madden is looking forward to expansion of this side of the business. The plant will be prepared to handle all the yellow soybeans produced by farmers in this section, he said."

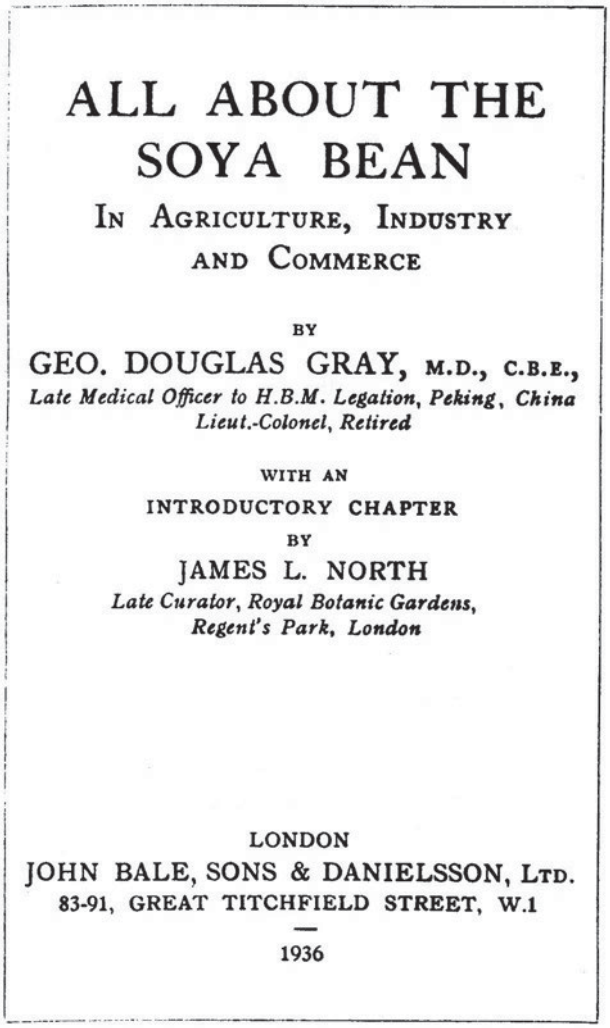
Ad in *Proceedings of the American Soybean Assoc.* 1936. "Here's your best market for soybeans and other farm produce!" [Sept.]. Back cover. Purina Mills are found in four locations, including Osceola, Arkansas.

Ad in *Proceedings of the American Soybean Assoc.* 1937. "Purina brings a soybean market to your door!" [Sept.]. p. 67. "Purina's four large plants in the heart of the soybean producing area offer a quick, convenient market for your soybean crop." One of these soybean processing plants is in Osceola, Arkansas.

Note: This is the earliest known commercial soy product made in Arkansas. However Ralston Purina no longer owned this plant by Sept. 1946 (*Soybean Digest.* 1946. Sept., p. 12).

75. **Product Name:** Soybean Meal for Livestock Feeding (10 Types).
Manufacturer's Name: Purina Mills.
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1936.
New Product–Documentation: International Inst. of Agriculture. 1936. Manufacturers of industrial soy products. p. 207.

76. Gray, George Douglas. 1936. All about the soya bean: In agriculture, industry and commerce. London: John Bale, Sons & Danielsson Ltd. ix + 144 p. Introduction by James L. North. Late curator, Royal Botanic Gardens, Regent's Park, London. Index. 28 cm. [19 ref]
• ***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 Messrs. Wm.



ALL ABOUT THE SOYA BEAN

IN AGRICULTURE, INDUSTRY AND COMMERCE

BY

GEO. DOUGLAS GRAY, M.D., C.B.E.,
Late Medical Officer to H.B.M. Legation, Peking, China
Lieut.-Colonel, Retired

WITH AN INTRODUCTORY CHAPTER
BY
JAMES L. NORTH
Late Curator, Royal Botanic Gardens, Regent's Park, London

LONDON
JOHN BALE, SONS & DANIELSSON, LTD.
83-91, GREAT TITCHFIELD STREET, W.1
1936

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.

Addenda: Soya bean products in the USA. Dieting and recipes. Statistics. India. Bibliography.

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.

"The Premier Oil Extracting Mills, Ltd., Hull.

"Messrs. Wray Sanderson & Co., Hull.

"The Medina Refinery Ltd., Deptford, London.

"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), Cereo 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. (Galesburg, 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." Note 1. 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. Soybean salad. Roasted soybeans [like dry-roasted peanuts]. Soybean croquettes. Soybean soufflé. Stuffing for baked fish*. White sponge pudding*. Shortbread*. Madeira cake*. Soya soup à la Reine (uses Heudebert soya flour). Soya chocolate (with soya flour). Soya vegetable soup (with soya flour). Soya bean sprout salad.

Note 2. This is the earliest English-language document seen (Jan. 2013) that uses the term "soya bean sprouts" to refer to these sprouts. Address: M.D. (Scotch physician), C.B.E., England. Late medical officer to H.B.M. Legation, Peking, China. Lieut.-Colonel, Retired.

77. Johnson, E.F. "Soybean." 1937. Is the soybean over-exploited? *Grain & Feed Review* 26(5):14-18. Jan.
• ***Summary:*** The author, a supporter of the soybean for 25 years, feels the potential for industrial uses of the soybean is being exaggerated.

Contents: Introduction. Soybean flour. Green vegetable soybeans. Lecithin. Soybean oil. Soybean oil vs. linseed oil. Soybean oil vs. cottonseed oil. Soybean oilmeal. Foreign competition. Industrial use of soybean oilmeal: I.F. Laucks and glue, The Glidden Company and paper sizing, Archer-Daniels- Midland Company and soybean flakes used to build a larger and firmer head on a glass of beer. Soybean oilmeal in semi-plastics (not much is used). Industrial exploitation of cornstalks. Soybean crop and equipment increase (Four major factors have contributed to the rapid rise in soybean production: (1) Net return per acre for soybeans compared with oats and other farm crops; (2) The peculiar resistance of soybeans to drouth and insect damage, especially chinch bugs; (3) The benefits from growing the crop, both related to crop rotation and soil fertility. And the government's attempt to control surpluses of other crops. Farmers have been paid from $6 to $12 to grow soybeans instead. In response to these, soybean "processing plants have sprung up like mushrooms everywhere").

Investments and crushing capacity. The soybean is still a youngster. Misleading advertisements (by industrial manufacturers). Processors not over-exploiting. Southern soybean expansion.

A photo shows S.F. "Soybean" Johnson. Address: Associated with Ralston Purina, St. Louis, Missouri. Chairman, Statistical Committee, National Soybean Processors Assoc.

78. *Wentzville Union* (*The*) (*Wentzville, Missouri*). 1937. I Dare You–A challenging book by a practical business man, July 30. p. 5, col. 5.
• ***Summary:*** "Not often does a two-fisted, hard-hitting business man have the time or the inclination to write from

his experiences such an inspirational book as 'I Dare You.' William H. Danforth, author of this challenging volume, has drawn from the wealth of his own experiences in writing this daring message.

"Nationally Known: As founder of a large feed and cereal business, lecturer, church worker, author and world traveler, William H. Danforth, chairman of the board of Ralston Purina Company, has dared to do many big jobs. As an employer he challenges the physical and mental best of every one of his thousands of employees. But his influence extends outside his business organization. In the field of education, and in church circles, William H. Danforth is known as the challenger who dares young people to bring out the best that is within them.

"Ranks Among Best Sellers: 'I Dare You,' at first printed [in 1931] privately for circulation among associates and friends, has today found its way into schools, churches, camps, and libraries all over the nation. So rapidly has the popularity of this little book [21 cm, vii + 89 p.] grown that today it is ranked among the best sellers of the nation.

"William H. Danforth, in explaining why he wrote 'I Dare You' says that as a business man he agrees that he should stick to business, but that he had the urge to share his philosophy with the few who are headed somewhere. 'I Dare You' will be passed by those who are afraid, says the author. 'It will only bore the sophisticated and amuse the skeptic. It will antagonize some. Many will not even know what it is about. It is written only for those who believe they can be bigger and more important than they are.'

"(Editor's Note: A folder on 'I Dare You' can be had for the asking by writing the 'I Dare You' committee, St. Louis, Missouri, 825 S. Eighth St.)"

A portrait photo shows "William H. Danforth, founder of the Ralston Purina Company and author of 'I Dare You.'"

79. Johnson, E.F. 1937. Soy Bean Committee. Soy bean products. *Farm Chemurgic Journal* 1(1):166-69. Sept. 17. Proceedings of the Third Dearborn Conference of Agriculture, Industry and Science. Reprinted as "Statistics of Soybean Industry" in Grain and Feed Journals Consolidated, June 23, 78(12):544.

• ***Summary:*** This report, which appears in Chapter VII, "Committee reports," discusses the need for specifications and standards for soy oil in interior and exterior paints. E.F. Johnson of Ralston-Purina, chairman of the Statistical Committee of the NSPA, presented statistics on production of soybean oil, meal, and flour, and on crushing capacity. Some 95% of the soybeans processed in 1935-36 passed through the plants of NSPA members. Soy bean oilmeal (own production, bought from members, and carryover) 556,879 tons. It was used for feeds (531,081 tons; 95.4% of the total), export (25,870; 4.6%), industrial purposes (1,003; 0.18%), and unknown (935).

Soy bean oil (own production, bought from non-members, and carryover) 185,523,376 pounds. It was used for edible products (158,077,696 pounds; 85.3% of the total), paint, varnish, linoleum, etc. (15,292,221 pounds; 8.2%), and unknown (12,153,459 lb).

Soy bean flour 21,915,349 pounds.

The present crushing capacity of NSPA members is 42,980,000 bushels, and of non-members 2,800,000 bu, with new constructions, enlargements, and additions of 4,200,000 bu for a total capacity (strictly soy beans) 50,080,000. Adding to that half the capacity of cottonseed mills in soy bean areas 5,400,000 gives a total capacity of 55,480,000 bu.

Industry members present at the meeting include Mr. E.F. Johnson, Secretary [Edward J.] Dies, Mr. E.D. Funk, Mr. H.A. Gardner, Mr. M.F. Taggert, Mr. Roquemore, Dr. W.L. Burlison, and Dr. H.R. Kraybill.

Note: This is the earliest document seen (Jan. 2019) that contains industry or market statistics for soy flour by geographical region. Address: Ralston Purina Co., St. Louis,

Missouri.

80. Kishlar, Lamar. 1937. Some nutritive developments in soybean products. *Oil and Soap* 14(9):237-39. Sept. [6 ref]
• ***Summary:*** "A paper presented at the Spring Meeting of the American Oil Chemists' Society, Dallas, Texas, May 13-14, 1937.

"It is the purpose of this discussion to review a few of the nutritive developments in soybean products which are partly the reason for the popularity for these products for edible uses." Address: Manager of Research, Ralston Purina Co., St. Louis, Missouri.

81. Purina Mills. 1937. Purina brings a soybean market to your door! (Ad). *Proceedings of the American Soybean Association* p. 67.
• ***Summary:*** "Purina is helping the soybean grower in three ways... First: Purina's four large plants in the heart of the soybean producing area offer a quick, convenient market for your soybean crop." The company has soybean mills in Osceola, Arkansas; St. Louis, Missouri; Lafayette, Indiana; and Circleville, Ohio.

Second: The meal from over 3 million bushels of soybeans went into Purina Chows last year.

Third: Purina provides better-balanced feeds for livestock and poultry. "Purina soybean meal is the expeller type, heated to the correct temperature to give greatest feeding returns ad greatest profits! Feed from the checkerboard bag to get the best feed for livestock and poultry–and at the same time create a better market for soybeans!"

82. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1937. Johnson elected pres. of soybean processors. 20(6-7):11. Nov/Dec.
• ***Summary:*** "E.F. Johnson, St. Louis [Missouri], widely known soybean authority, on October 22, was elected president of the National Soybean Processors association, succeeding I.C. Bradley, Taylorville, Illinois, who had served for two years.

Gives a brief biography of Johnson, who began to study soybeans at Purdue Univ. (Indiana) and who is now associated with Ralston Purina Co. of St. Louis.

83. Johnson, E.F. 1938. Re: Sending new soybean varieties to Cuba. Letter to Ing. Antonio Portuondo, Agricultural Experiment Station (*Estacion Experimental Agronomica*) at Santiago de las Vegas, Cuba, Jan. 26. 1 p. [Spa]*
• ***Summary:*** "Soybean" Johnson, who went to Cuba on vacation, is sending the experiment station 3 new soybean varieties with pedigrees: Mandell, Macoupin, and Higan Mame. Address: Purina Mills, St. Louis, Missouri.

84. National Farm Chemurgic Council, Inc. 1938. Official program–Fourth Annual Chemurgic Conference of Agriculture, Industry and Science. New York, New York. 8 p. 18 cm.
• ***Summary:*** On the cover: The conference will be held at the "Hotel Fontenele, Omaha, Nebraska. April 25, 26, 27, 1938. Purpose: To advance the industrial use of American farm products through applied science."

"Tuesday, April 26. 9:15 A.M. Soybean section: Planning a soybean agenda for next year. Presiding: Edward J. Dies, Chairman, Soybean Committee. 'Soybean oil,' H.R. Kraybill (Purdue Univ., West Lafayette, Indiana), Lamar Kishlar (Ralston Purina Co., St. Louis, Missouri), E.E. Ware (Sherwin-Williams Co., Cleveland, Ohio). 'Soybean oilmeal,' J.W. Hayward (Archer-Daniels-Midland Co., Minneapolis, Minnesota), E.S. Dyas (Iowa State College, Ames, Iowa). 'Solving problems of southern soybean growers,' C.O. Eddy (State Experiment Station, Baton Rouge, Louisiana), Jacob Hartz (Stuttgart, Arkansas), Walter Godchaux (New Orleans, Louisiana).

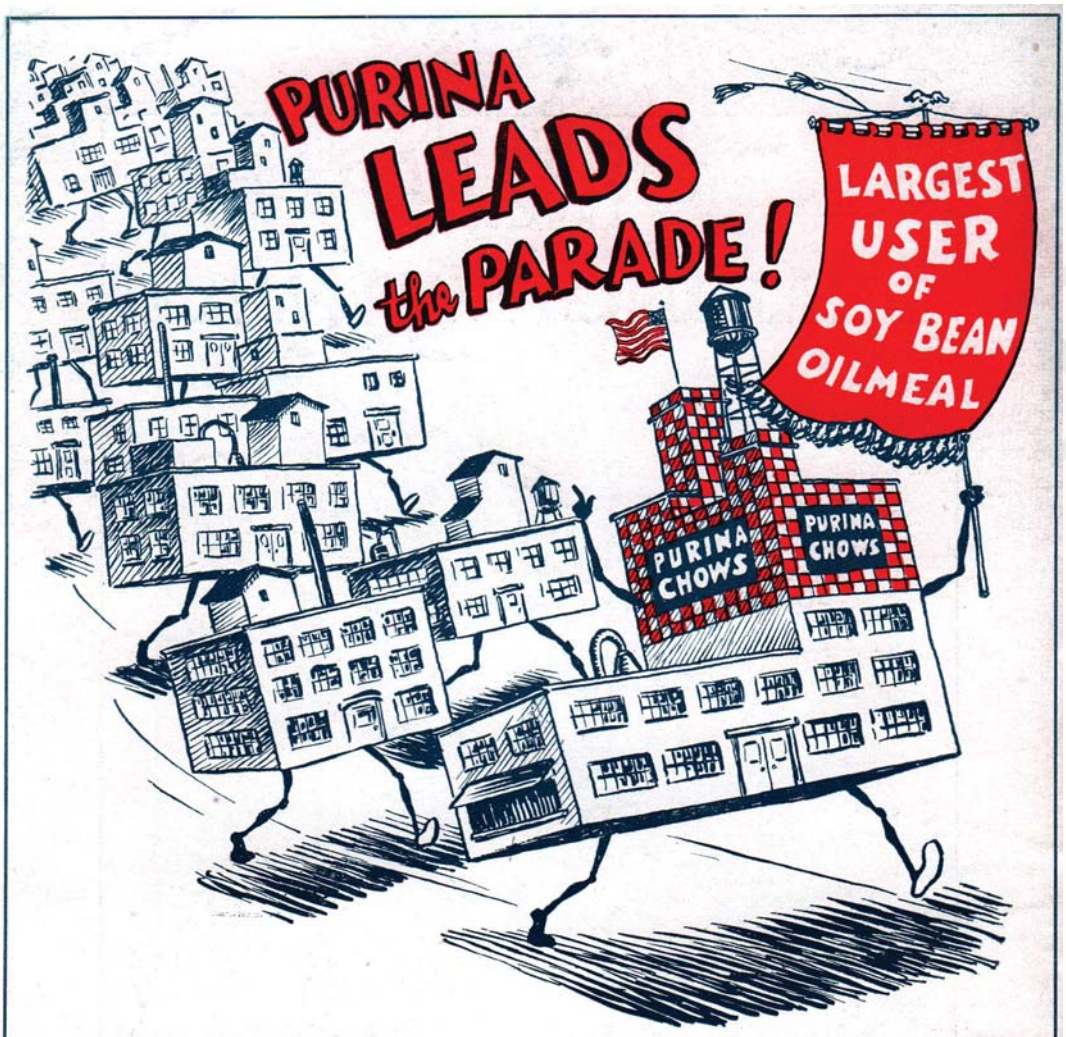
"General soybean section. Presiding: Eugene D. Funk, Bloomington, Illinois. 'Work of the U.S. Regional Soybean Industrial Laboratory,' O.E. May, Director, U.S. Regional Soybean Industrial Laboratory, Urbana, Illinois. 'Value of recent developments in soybean oil to technical trades,' M.F. Taggart, (O'Brien Varnish Co., South Bend, Indiana). 'The story of soybean glue,' Hugh F. Armstrong, (I.F. Laucks, Inc., Portsmouth, Virginia). 'Past and future prospects for utilization of soybean products,' E.F. Johnson, (President, National Soybean Processors Association). Address: R.A. Boyer (Ford Motor Co., Dearborn, Michigan). General discussion.

The conference also included four luncheons, an agrol session (agricultural alcohol), a chemurgic banquet, a closing general section, an open form near the end, with Wheeler McMillen (President, National Farm Chemurgic Council) presiding. Address: 654 Madison Ave., New York, N.Y.

85. Purina Mills. 1938. Purina leads the parade! Largest user of soy bean oilmeal (Ad). *Proceedings of the American Soybean Association* Back cover.
• ***Summary:*** See next page. "Our twenty-two plants require the meal from over 3,000,000 bushels of soybeans annually to make Purina Chows."

"Soybean processing plants at , Ohio. Lafayette, Indiana. Osceola, Arkansas. St. Louis, Missouri. When you buy Purina Chows, you make a better market for your soybeans."

86. Hunter, J.E. 1938. Soybean oil meal as a vitamin supplement. In: Soybean Nutritional Research Council, ed. 1938. The Composition and Nutritive Properties of Soybeans and Soybean Oil Meal; A Literature Review. Chicago: SNRC. 62 p. See p. 31-33. Oct. [13 ref]
• ***Summary:*** "With our increasing knowledge of the distribution and function of the vitamins, the importance of the various ingredients in the diet becomes increasingly



Our twenty-two plants require the meal from over 3,000,000 bushels of soybeans annually to make Purina Chows . . . the feeds for livestock and poultry that are famous for their Quality!

Purina Mills

Soybean Processing Plants at

CIRCLEVILLE, OHIO

LAFAYETTE, INDIANA

OSCEOLA, ARKANSAS

ST. LOUIS, MISSOURI

When You Buy Purina Chows, You Make a Better Market for Your Soybeans

evident. Soybean oil meal has been known in the industry primarily as a protein concentrate, and its vitamin content has been considered as secondary when it is used as an ingredient in feed mixtures.

"Recent work, however, has given it a definite place among vitamin supplements, as well as shown it to be an excellent source of high quality protein.

"Vitamin A: Reports in the literature (1-6), on the carotene (or vitamin A) content of soybean products are conflicting, but perhaps this discrepancy is due to the variation between different varieties. In any case, an analysis of over 50 varieties has been reported (7) in which a range of from 10 to 210 gamma of carotene per 100 grams of soybeans was recorded. This would be a range of about 0.16 to 3.5 International Units of vitamin A per gram. Soybean oil meal and flour processed in this country (7) contain about 0.3 of an International Unit of vitamin A per gram.

"Vitamin B1: It has been reported (7) that soybean oil meal contains 1 to 2.8 International Units of vitamin B1 per gram. This makes it a significant source of this vitamin, equal to or better than such grains as corn and wheat.

"Vitamin B2 (Flavine): Norris and his co-workers (8) within the past two years have shown the essential nature of riboflavine in the diet of chicks and also demonstrated its necessity for hatchability of fertile eggs. These workers have introduced the term 'Chick Unit' as a measure of the riboflavine in the feed mixture. They have found that soybean oil meal contains 3 Chick Units per gram. Working with rats, Levine and Remington (9) have given soybeans a value of 2.4 to 3.2 Bourquin-Sherman units per gram. Kishler (10) of Purina Mills agrees with these findings. These data make it clear that soybean oil meal contains at least three times the value of whole grain and cereals and about one-sixth the value of high quality dried skim milk.

"Vitamin E: Vitamin E has also been found in considerable quantities in soybean oil. U. Suzuki (11) reports that birth and normal gestation result with soybean oil as the only source of vitamin E. He stated that it is a much poorer source than wheat germ oil, however. The amount remaining in soybean oil meal remains to be found by future investigation.

"Vitamin F: Another of the factors associated with soybean oil is the anti-dermatitic factor, vitamin F, believed to be closely related to the unsaturated fatty acids, linoleic and linolenic acids or their isomers. Both of these acids in the form of methyl esters have been shown (12) to be effective in curing the deficiency disease associated with the lack of this vitamin.

"Vitamin K: This is a new factor which has been found to be essential in the clotting of blood. It is present in abundance in soybean oil (13) but no specific assay of soybean oil meal has been reported.

"The vitamins A, E, F and K are found in too low quantities in soybean oil meal to make them important in regular dietary practice. They may, however, be shown to have considerable more importance in special diets in pathological cases.

"To date soybean oil meal finds its highest practical value from the vitamin standpoint in its content of the vitamin B2 (flavine) complex. Since the Sherman-Bourquin technique gives it a value of about one-half that of milk and the Norris method gives it only one-sixth, it would appear that factors other than riboflavine may be contained in soybean oil meal." Address: USA.

87. *St. Joseph Gazette* (*Missouri*). 1938. Soy beans to be processed in St. Joseph: Corporation formed with capital of $100,000. Dec. 7. p. 2-3.

• ***Summary:*** Formation of the Dannen Soy Bean Manufacturing Corporation was announced last night; it will soon be processing soy beans in St. Joseph.

"H.L. Dannen, president of the new corporation, also announced that a lease has been obtained on the Grain Belt Mills, Lake road; machinery has been purchased and the plant will begin operation by Feb. 1" [actually Feb. 22, according to H.L. Dannen's 1939 appointment book].

"Only one plant in state: The processing of oil and other by-products from soy beans has been a big industry in Eastern states for 10 years, Mr. Dannen said, and the production of the beans has been moving westward. There is only one [soy bean] processing plant now operating in Missouri and that is in St. Louis, he added." Note: Ralston Purina started operating a soy bean crushing plant there in Aug. 1935.

Since thousands of products are made from soy beans, but edible and industrial, "there is no difficulty in disposing of the by-products. Of course the meal from the beans is among the best stock feed."

The articles of incorporation were filed yesterday with the county recorder. The shareholders of the capital stock are: H.L. Dannen, 40 shares. His son, Dwight L. Dannen, who will be vice-president, 9 shares. Arline Mannscreck [H.L.'s daughter, Mrs. Charles Mannschreck, of St. Joseph], one share. A.L. Guitar and David W. Hopkins, 25 shares each. "Those five also form the board of directors. The company is incorporated for 50 years." The goals of the enterprise are also described in the articles of incorporation.

"Mr. Dannen said the Grain Belt Mills building was leased 'because it is a modern, fireproof building and just what we need.' He said some of the machinery in the building would be used and the big presses needed would have to be ordered from Piqua, Ohio" [from the French Oil Mill Machinery Co.].

Mr. Dannen has been buying soy beans for some time and already has 30,000 bushels on hand. He would like to operate the new plant 24 hours a day if enough soybeans can be obtained. "The center of the soy bean crop in Missouri is now located around Milan or Macon and is moving this

way."

"The new corporation will be entirely separate from the Dannen Grain and Milling Company, of which Mr. Dannen is the head. His son, Dwight L. Dannen, is no located in St. Louis operating a branch of the milling company, but will return to St. Joseph to be with new factory, he said."

88. Levinson, Arthur A.; Dickinson, James L. Assignors to The Glidden Company (Cleveland, Ohio). 1939. Method of preparing feed material. *U.S. Patent* 2,162,729. June 20. 3 p. Application filed 8 June 1938.
• ***Summary:*** Solvent extracted soybean meal or flakes is texturized, as in an "Anderson expeller," to make a feed for livestock or dogs. The meal containing 4.5 to 7% moisture is subjected to a pressure between 2,000 and 5,000 pounds per square inch at a temperature between 150º and 200ºC for a sufficient time to toast the meal without scorching.

Talk with Ed Meyer, former top researcher at The Glidden Co. and at Central Soya Co. 1993. May 10. The Glidden Co. sold a textured soybean meal mainly to Morrell & Co. for use in pet (especially dog) foods–but also to some other dog food companies. At that time all dog food was canned (no dry or semi-moist) and this textured soy flour kept a certain amount of its integrity during retorting–so the dog-food people liked it. The solvent defatted soybean meal was run through an expeller (also called a screw press) to give it texture, then the resulting cake was broken up into bits or grits. No die was used. Glidden's early texturizing process was covered by a 1939 patent issued to Arthur Levinson and James Dickinson. These two inventors never got much credit for their invention (in part because they unfortunately did not use the term "texturize") and it played no role in the subsequent technology based on extrusion. If Levinson and Dickinson had used the key term "texturize," their patent would have been "prior art" making it more difficult for people to subsequently be issued patents on extruded materials or texturizing. An expeller, which was designed to press the oil from oilseeds, is less well suited to texturization than an extruder–which has no openings along the barrel and which gives more sheer working and alignment of the protein to create that meatlike texture.

Ed Meyer notes (July 1993): "After reading this patent carefully, it is a moot point to me whether this is an antecedent to Flier's patent" [see Ronald J. Flier [pronounced FLEER]. 1976. U.S. Patent #3,940,495. Assigned to Ralston Purina Co.]. Address: 1. Chicago, Illinois; 2. Itasca, Illinois.

89. Johnson, E.F. 1939. Re: Status of Federal Soybean Laboratory. Letter to Mr. Edward J. Dies, [Head, National Soybean Processors Assoc.], 3818 Board of Trade Building, Chicago, Illinois, June 23. 2 p. Typed, without signature.
• ***Summary:*** "The situation at Washington [DC] as relates to the future of the soybean laboratory is anything but encouraging. Two or three years ago, when the Bureau of Soils was very solicitous of getting favorable consideration, they were very willing to lead the various officials at the University of Illinois to believe that the arrangement on housing and so forth was only very temporary. At that time the Bureau of Chemistry and Soils placed the new building to house the soybean laboratory as the number one recommendation of the department. Today it occupies tenth position, a point that Senator Lucas' office made very clear to me in discussing the possibility of some action on a new building.

"There is no doubt that two things have occurred with the establishment of the four federal laboratories. In the first place, I think this increase of money has somewhat gone to the heads of the officers of the Bureau of Soils and they intimate that they might well have the full authorization for handling much more of the money that goes to the Department of Agriculture. Such feelings are substantiated by confidential reports from some of the other departments.

"The second important happening has been that officials of the Bureau of Chemistry and Soils, which very definitely includes Dr. May and Dr. Knight, realize that the appropriations for the four federal laboratories are a part of the AAA program, one of very uncertain future political favor. They are determined, it seems, to make a tie-up so as to use the soybean laboratory as a protection for those other laboratories, even I believe being perfectly willing to force the movement of this laboratory to Peoria, as so doing would help protect the federal laboratories.

"Their present proposal, which they finally agreed to withdraw temporarily, was to have the soybean laboratory report directly to Peoria. They also proposed to make at least the acting head of the soybean laboratory an appointee of the Peoria laboratory and then assign him to the soybean laboratory.

"I had the matter of a new building up with the office of Senator Lucas and of course there is no assurance in the first place that any funds will be available. In the second place, Senator Lucas' office was very positive that any solicitation on the building must originate from the University. They also reminded me that the Bureau of Soils' position of placing the new building in tenth position was a serious matter.

"I think temporarily at least my remonstrating with them slowed up any attempt to put in changes. I believe that we have an opportunity to marshal our forces and prevent such a calamity happening. It is my thought that possibly Mr. Atwood should approach Secretary Wallace, that the soybean growers association and the processors association should go directly to Jardine, and the entire situation must be gone over in detail with Dr. Burlison.

"Confidentially, I believe that Milner will resign in the very near future and that probably Hopper will be named head of the laboratory. I am unable to advise as to how much of Milner's action is due to dissatisfaction with the present maneuvering with the soybean laboratory and how much is

due (as he will probably claim) to his preference to stick with strict research and not become administrative.

"The Bureau of Soils conceded that one argument I made had considerable weight. I presented the argument that if the Department placed the soybean laboratory subject to the Peoria laboratory by requiring it to report thusly, the soybean people would have little argument to present to Congress for the soybean laboratory not to be included as an integral part of the Peoria laboratory. This initial step would automatically block any arguments that we might try to put up to prevent a cut-off of the soybean appropriation and a moving of the laboratory to Peoria.

"Your very truly, Ralston Purina Company, E.F. Johnson, Soybean department.

"P.S. although I question whether sufficient funds could be secured to immediately start work on a new building, my understanding is that it is practically impossible to secure such appropriates unless building plans and specifications are available. With this in mind, it may be best to petition Senator Lucas to ask for $25,000 to be used in the preparation of plans and specifications for such a building at this time."

Note 1. This is a key document for understanding why much of the Soybean Laboratory was removed from the University of Illinois and merged into the Northern Regional Research Lab.

Note 2. On 3 July 1939 H.P. Rusk returned a copy of this letter sent to him by W.L. Burlison, Head, Agronomy Dep., Univ. of Illinois. Rusk said he read it "with a good deal of interest."

Source: Univ. of Illinois Archives, Agriculture, Dean's Office Subject Files 1895-1994. R.S. 8/1/2. Box 28. Folder: Soybean Regional Research Lab. Address: Soybean Department, Ralston Purina Co. [St. Louis. Missouri].

90. Johnson, E.F. 1939. Re: Soybean laboratory at Urbana and Peoria. Letter to W.L. Burlison, Head, Dep. of Agronomy, University of Illinois, Urbana, Aug. 7. 1 p. Typed, without signature (carbon copy).
• ***Summary:*** "I have your letter of August 2 in which you advise that indirectly you have learned that Dr. Markley has been ordered to Washington [DC].

"My guess is that unless something drastic is done in the way of building or housing, not only will the best men in the soybean laboratory be moved to Peoria, but the entire laboratory will be moved there in the not too distant future.

"However, I have washed my hands of any further activity."

Source: Univ. of Illinois Archives, Agriculture, Dean's Office Subject Files 1895-1994. R.S. 8/1/2. Box 28. Folder: Soybean Regional Research Lab. Address: Soybean Department, Purina Mills, Ralston Purina Co., St. Louis. Missouri.

91. Purina Mills. 1939. Purina leads the parade! Largest user of soy bean oilmeal (Ad). *Proceedings of the American Soybean Association* Back cover.
• ***Summary:*** "Our 22 plants require the meal from over 3,000,000 bushels of soybeans annually to make Purina Chows." "Soybean processing plants at Circleville, Ohio. Lafayette, Indiana. Osceola, Arkansas. St. Louis, Missouri. When you buy Purina Chows, you make a better market for your soybeans."

92. Shoenfield, Allen. 1940. Field widens for soy bean: Planes, cars, houses of plastics forecast. *Detroit News.* Aug. 20. p. 7, col. 1.
• ***Summary:*** Some 200 members of the American Soybean Association attended meetings on the closing day of their annual meeting at Dearborn Inn today. "E.F. Johnson, representing a St. Louis [Missouri] processing plant [probably Ralston Purina Co.], said several airplane factories are experimenting with soy plastics for wings and fuselages." Robert A. Boyer, of the engineering laboratory of the Ford Motor Co. conducted the group through a recently-opened unit of the Rouge plant, and showed them "a material closely resembling wool in color and texture, made of soy bean protein, which is to be spun and woven into upholstery for automobiles."

Governor John W. Bricker of Ohio told the meeting: "Industry is progressively turning to the farm as a source of raw material."

93. Burlison, W.L. 1940. Importance of soybeans to American agriculture (With some notes on soybean research). *Proceedings of the American Soybean Association* p. 27-30, 34-35. 20th annual meeting. Held 18-20 Aug. at Dearborn, Michigan.
• ***Summary:*** Contents: List of 11 things that the future of the soybean as an important Illinois crop is dependent upon– according to G.L. Jordan, Dep. of Agricultural Economics, Univ. of Illinois. Where do we go from here in soybean production? Table 1–Annual production of soybeans in five leading countries from 1925-1939: USA, Manchuria, Chosen [Korea], Japan, Netherland India. Table 2–World production of soybeans in 1,000 bushels (excluding China) from 1925-1939, including percentage increase each year over 1925. These figures include, in addition to the countries shown in Table 1, Kwantung, Taiwan, U.S.S.R., Rumania, Bulgaria, Yugoslavia, and certain other small countries in Europe. U.S. soybean production as a percentage of world production. Why this rapid increase in U.S. soybean production? Rapid increase in U.S. soybean production during the past 6 years. Research leads the way: List of typical research projects at larger corn belt agricultural experiment stations.

Extracts from letters on the future of soybeans in Illinois from thoughtful observers: H.G. Atwood, Allied Mills, Inc., 26 Dec. 1939. G.G. McIlroy, President, American Soybean

Association, 7 Dec. 1939. W.J. O'Brien, The Glidden Co., 8 Dec. 1939 (use of oil in paints). N.P. Noble, Swift and Company Soybean Mill, 8 Dec. 1939 (Swift has now built soybean mills at Cairo, Illinois; Des Moines, Iowa; and Fostoria, Ohio. Swift is using larger quantities of soybean oil in their various products). Edward J. Dies, National Soybean Processors Assn., 14 Dec. 1939. D.F. Christy, Acting Director, USDA Office of Foreign Agricultural Relations, 17 Feb. 1940. E.F. Johnson, Ralston-Purina Company, 21 Dec. 1939. H.P. Rusk, Dean and Director, Illinois Experiment Station, 22 May 1940. J.W. Hayward, Archer-Daniels-Midland Company, 24 May 1940.

Growth in the number of soybean crushing mills in the USA from about 10 in 1925 to approximately 75 in 1939. Increase in soybean yields in Illinois from 13.5 bushels/acre in 1925 to 24.5 bushels/acre in 1939. Growing industrial utilization of soybeans. Conclusion: "The importance of soybeans to American agriculture is bound to be of greater significance as the years go by."

Concerning research: "Our research program on soybeans in this country is nothing less than remarkable. In 1937 a list of soybean projects was published by H.M. Steece, Specialist in Agronomy, Office of Experiment Stations, U.S. Department of Agriculture." In 1937 some 53 agricultural experiment stations were conducting 258 separate investigations on soybeans. "By far the largest number of these have to do with the varieties and methods of production." A photo (p. 29) shows a tractor pulling a combine harvesting soybeans in Indiana.

Note: This is the earliest English-language document seen (March 2003) that uses the term "soybean research" (see subtitle) to refer to research on soybean production. Address: Head, Dep. of Agronomy, Univ. of Illinois.

94. Johnson, E.F. "Soybean". 1940. General review of the domestic soybean situation. *Proceedings of the American Soybean Association* p. 7-18. 20th annual meeting. Held 18-20 Aug. at Dearborn, Michigan.
• ***Summary:*** Contents: Introduction. Growth and progress. Soybean oilmeal. Soybean oilmeal sells at too low a price. Soybean oil. 1940 crop outlook. Present fields of utilization limited. What is the industrial utilization of soybean oilmeal and oil today? Soybean oilmeal used industrially [mostly in glue]. Industrial use of soybean oil. Lard and cottonseed oil vs. soybean oil. Per capita consumption of margarine in 1937 [the top 3 are Denmark, Norway, and Sweden]. 1940 crop export possibilities. Soybeans in Germany. Other sources of soybeans for Europe. Other minor soybean uses. Domestic, economic and political changes [gloomy forecast]. Competitive foreign oils. Enlarging our domestic market for domestic oils. Remove state trade barriers (in 31 states against sale of oleomargarine). Encourage the use of soybean oilmeal in plastics.

This excellent, in-depth analysis begins: "I consider it a distinct honor to have the privilege of opening this discussion on soybeans, for never before were the problems confronting this Association so serious and uncertain." Much of the uncertainty arises from the new war in Europe. "Soybean flour production has continued around 25 million pounds annually."

The conclusion states: "With the harvesting of the crop this fall, I will have rounded out thirty years of experience with soybeans [i.e. he started in 1910]. I feel ridiculous when I think back how badly even I, with all my enthusiasm, have underestimated the possible development of soybeans. Little did I ever dream that I would live to see the day when the United States would become the leading country in the world production of soybeans. Yet the United States may with this 1940-41 crop move to the top position in the world as the producer of soybeans.

"This almost unbelievable increase has been possible in large measure through the friendly, cooperative spirit which has always prevailed between the growers and the processors. May this understanding of each other's problems continue as we enter a new decade and an era of destiny." Address: Ralston Purina Co., St. Louis, Missouri.

95. Ralston Purina Co. 1940. This page is contributed by the world's largest consumer of soybean oilmeal (Ad). *Proceedings of the American Soybean Association* p. 8.
• ***Summary:*** See next page. A full-page ad. A large table gives statistics for soybeans, soybean oil, and soybean meal each year (Oct. 1 to Sept. 30) from 1930-31 to 1940-41. Under "soybeans" are 3 columns (in 1,000 bushels): Harvested for grain, exported, and imported. Under "soybean oil" are 3 columns (in 1,000 lb): Produced, exported, imported. Under "soybean oilmeal" are 3 columns (in 2,000 lb = tons): Produced, exported, imported.

"Contact our processing plants when you have soybeans to sell or soybean oilmeal to buy." St. Louis, Missouri. Lafayette, Indiana. Osceola, Arkansas. Circleville, Ohio. Address: St. Louis, Missouri.

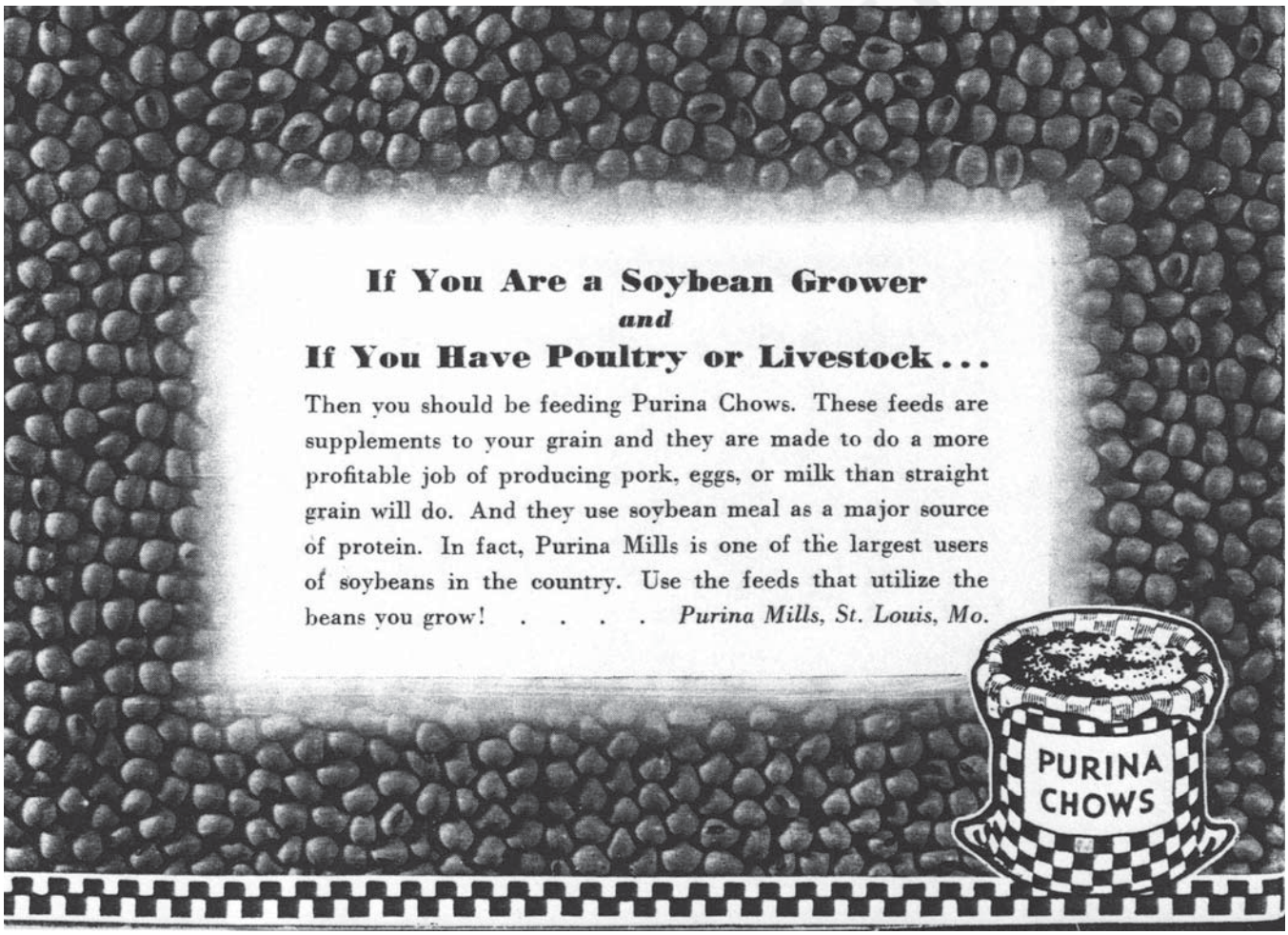
96. Purina Mills. 1940. Purina Chows: If you are a soybean grower and if you have poultry or livestock... (Ad). *Soybean Digest* 1(1):Inside front cover. Nov.
• ***Summary:*** This half-page ad continues: "Then you should be feeding Purina Chows. These feeds are supplements to your grain, and they are made to do a more profitable job of producing pork, eggs, or milk than straight grain will do. And they use soybean meal as a major source of protein. In fact, Purina Mills is the largest user of soybean oilmeal in the country. Use the feeds that utilize the beans you grow!"

A similar ad (with the subtitle: "If you have poultry or livestock and if you are a soybean grower...") appears in the Jan. 1941 issue (inside front cover) and March 1942 issue (p. 11) of this magazine. Address: St. Louis, Missouri.

Oct. 1 to Sept. 30	SOYBEANS 1,000 Bushels			SOYBEAN OIL 1,000 Pounds			SOYBEAN OILMEAL 2,000 Pounds		
	Harvested For Grain	Exported	Imported	Produced	Exported	Imported	Produced	Exported	Imported
1930 - 31	13,471		54	34,688	2,576	2,932	85,000		17,587
1931 - 32	16,733	2,161	49	39,945	1,524	568	100,000		16,562
1932 - 33	14,975	2,450	13	29,078	670	1,381	80,000		28,268
1933 - 34	13,147		6	26,196	879	826	79,989		29,992
1934 - 35	23,095	19	5	78,123	1,905	6,660	216,000		64,301
1935 - 36	44,378	3,490	4	208,965	2,198	4,845	556,879	23,860	20,018
1936 - 37	29,983		17	183,711	2,441	14,319	458,562	3,451	55,778
1937 - 38	45,272	1,368	3	277,779	3,328	2,622	715,777	42,546	15,484
1938 - 39	62,729	4,416	3	414,614	3,670	1,443	1,083,998	36,047	12,315
1939 - 40	87,409	10,948[1]	2[1]	417,245[2]	7,008[1]	2,508[1]	1,103,465[2]	51,438[2]	8,890[1]
1940 - 41	110,000[3]								

[1]—October 1 to May 1
[2]—October 1 to July 1
[3]—Private estimate based on acreage and condition August 1
(Ralston Purina Company does not guarantee the above figures, but believes they are as accurate as possible to secure.)

This Page Is Contributed by the World's Largest Consumer of Soybean Oilmeal



97. Johnson, E.F. "Soybean". 1940. Soybeans as a chemurgic crop for Missouri. In: 1940. Proceedings of First Annual Missouri Conference on Farm Chemurgy. 10 p. Held at Sedalia, Missouri.
• ***Summary:*** During the last 5 years in Missouri, total soybean acreage has decreased almost 50%, while total soybean acreage in the United States has increased by more than 50%, from 6 million to over 9 million acres. "I am quite familiar with the history behind all of these figures, as in 1934 when I started my present position, my major assignment was to cooperate with the various groups in Missouri in promoting the growth of commercial soybeans." Also discusses soybeans as a cash crop, results of recent soybean experiments at the Missouri Experiment Farm at Elsberry, 1940 outlook, influence of the European war [World War II] on soybean outlook, domestic consumption, industrial utilization of soybean meal and oil, and chemurgic possibilities.

In 1938, only about one tenth of 1 percent of the soybean meal produced in America went into industrial non-food uses. "Even in the soybean oil we find 86 percent of the oil from last year's crop going into edible fats and about 14 percent used industrially, the major portion of which was in duco paints." Address: Ralston Purina Co., St. Louis, Missouri.

98. Ralsoy: New U.S. domestic soybean variety. 1940. Seed color: Yellow (straw), hilum brown to dark brown.
• ***Summary:*** Sources: Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 7. "Ralsoy–Ralston-Purina selection."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 15. "Ralsoy–Selection from Arksoy 2913 by G.H. Banks, Ralston Purina Co., Osceola, Arkansas. Maturity, medium late; pubescence, gray; flowers, white; pods, two- to three-seeded; shattering, little; seeds, straw yellow with brown to dark brown hilum, about 3,900 to the pound; germ, yellow; oil, 19.5 percent; protein, 44.4 percent; iodine number, 132."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Ralsoy is in the USDA Germplasm Collection. Maturity group: 13, 14. Year named or released: 1940. Developer or sponsor: G.H. Banks, Purina Mills, Osceola, Arkansas. Literature: 13, 14. Source and other information: Selected from 'Arksoy'. Prior designation: None. Address: USA.

99. Johnson, E.F. "Soybean." 1941. Soybean as a cash crop for the South. *National Farm Chemurgic Council, Chemurgic Paper* No. 111. 4 p. June 18.
• ***Summary:*** Presented "at the Annual Southern Chemurgic Conference, Nashville, Tennessee, June 18, 1941,

"I will confine my discussion entirely to soybeans harvested for grain, as I do not feel that utilization of the crop for hay, plowing down, or interplanting with other crops has any place on a chemurgic program.

"I wish to discuss this very important topic from two viewpoints: (1) Agronomic Problems, and (2) Sale and, Utilization of the Products,

"The agronomic problem could be stated as follows: Can soybeans be produced profitably on a portion of the tillable acreage in the South? There are probably six factors that contribute to a full consideration of this question. Most important of these are: low cost of production; high yields per acre; varieties of high fat content; nearby marketing; effect on following crops; and successful labor utilization.

"Probably the most important problem facing the Southern grower of soybeans is acquiring a fundamental knowledge of the soybean plant and applying it to the growing and harvesting of the crop. The soybean is a quick growing, annual legume with a shallow root system. It is only able to gather nitrogen from the air when properly inoculated. Its manner of growth and habits are such that it is easily adapted to the machinery of those sections which grow small grain. If a cotton farmer is going to use his present cotton equipment and methods for planting and cultivating soybeans, then I can definitely assure him that his results will be unsatisfactory. The ordinary grain drill has been used in most of the commercial sections for planting soybeans, regardless of whether they were seeded solid or in rows twenty-one to twenty-four inches apart. In the last few years there has been a tremendous increase in the acreage planted in rows. This change from solid to row planting is largely the result of the weed problem in solid seeding and partly because of the saving of seed that can be made in row planting. The recent introduction of planting equipment that will plant any width row and can be converted into surface cultivators is doing much to increase the planting of soybeans in rows.

"Varieties for the South: Probably the biggest drawback to the expansion of soybeans in the South today is lack of varieties of proven ability to yield both in bushels per acre and oil per bushel. At the present prices of oil, each change of one per cent in the fat content of soybeans justifies a change of 5 cents a bushel in the price paid for the beans. Most of the southern varieties range from 2 to 5 per cent lower in fat content than do beans grown today in Illinois. No Southern grower can hope to make a profitable operation on his soybeans if he uses a variety in which the low fat content results in a discount of 15 to 25 cents a bushel. The work of Heartsill Banks at the Ralston Purina Company

plant at Osceola, Arkansas during the past six years has, I believe, proven conclusively that it is possible to select or develop varieties which will have a fat yield as high as those grown in the Corn Belt. In our experimental plantings at this Arkansas station, we have developed selections and new strains that during the past three years have consistently shown a fat content equal to the better varieties in Illinois and have averaged three to five per cent higher than the parents from which these varieties originated. This is very encouraging, for if I felt that the South would always be destined to grow soybeans of a low fat content, I would have declined to appear on this program, as I would not be able under those conditions to see any economic possibility for this crop in the South.

"Labor Utilization: Some years ago I felt that the soybean might be almost a 100 per cent solution to the problem of reduced cotton acreage in the South. I realize now that I was badly mistaken in that deduction. I do believe that by the use of right varieties and correct cultural practices, soybeans will solve the farm income problem brought about by decreased cotton acreage. I believe the soybean crop can also solve the problem of the cottonseed mills by increasing their days of operation. I also believe that the fertility of the soil can be increased by using soybeans in the place of cotton. However, I now realize that you cannot replace acreage of a crop that requires the maximum number of man hours per acre with a crop that requires a minimum number of man hours. One man with proper machines can grow and market a hundred acres of soybeans. Each of you can answer better than I how many men would be required to grow and market a hundred acres of cotton.

Sale and Utilization of Soybean Products: I do not think there is anyone in the United States who is more optimistic and hopeful of the future utilization of soybean products in industry than I am. However, we must face facts, and future utilization will not furnish a market for present production.

"It is possible that with the war situation creating a scarcity of some important metals, we may see tremendous strides in the next few months in the utilization of both cotton and soybean protein in the development of a new plastic-like material to replace aluminum and many other of our lighter alloys. Unfortunately, with the natural secrecy that must go with any military operation, it is not possible to secure any accurate information as to the progress on the utilization of plastics or plastic like substances in the construction of war machines. We do know that high-speed investigation and development are under way. But until such time as we actually see sizeable quantities of soybean oilmeal going into industrial utilization, we will have to depend upon poultry, livestock and fertilizer as being the only outlets for this commodity.

"Today soybean oil selling at 9½ cents a pound presents no particular problem as far as the producers of soybeans are concerned. We all realize that this is an artificial situation brought about, in a large measure at least, by diverting to other uses ships normally engaged in moving foreign vegetable oils to the United States. I for one fear to put much dependence upon such artificial conditions on a long-time project. If the Fulmer Bill, which raises the duties on foreign oils approximately 100 per cent, should be enacted, then I would have much more faith in a continuation of high prices on both soybean and cottonseed oil in the future.

"Can Southern Markets Absorb Meal and Oil Produced From Soybean Acreage? The marketing of soybean oil and soybean oilmeal from soybeans produced in the South presents a very complicated problem. For the last few years the South has experienced considerable difficulty in finding a satisfactory market at a satisfactory price for its cottonseed meal and cottonseed oil. Adding a new crop like soybeans to your acreage in the South is going to make this problem even more difficult, as at present cottonseed and soybean oil both find the same outlet in the market. In a similar manner, cottonseed meal and soybean oilmeal are largely interchangeable

"High Meal Yield Per Acre High on Soybeans: Even using ground that will yield a bale of cotton per acre, it requires around six acres of cotton to produce one ton of cottonseed meal. With ordinary yields, six acres of soybeans will yield approximately four tons of soybean oilmeal. Each acre of cotton replaced with soybeans will result in a fourfold increase in the amount of concentrated protein meal to be marketed.

"Soybean Oil: In the last few months considerable progress has been made in the fractional separation of soybean oil into saturated and unsaturated fatty acids. The saturated acids are used in soap production, while the unsaturated offer potential possibilities as a substitute in paint for linseed oil. Last week the University of Minnesota released information which seemed to indicate that they have developed a chemical treatment for soybean oil which shortens the drying time approximately 50 per cent.

"These new processes are only in the experimental stage. How rapidly they will develop is a matter of pure guess-work. In the meantime, the use of soybean oil in paint has decreased due to difficulties in securing tung oil with which to blend it. Without a doubt, some future day will find us using large quantities of soybean oil in paint. However, future progress cannot make a market for this year's crop.

"I feel at the present time that much of the increase in soybean acreage which has taken place this spring in the South will present a real marketing problem to many of the southern mills that will buy these beans in a hope of prolonging their period of operation.

"In concluding, I feel I should call attention to a new utilization that bids fair to gain prominence before plastics and many other fantastical uses reach their goals. I refer to the use of soybeans in the human diet. Although this is not a chemurgic utilization, there is no doubt that canned

soybeans, soybean flour, and soybean milk as a portion of the diet of our most able chemists may be of material aid in quickening their brain action, increasing their endurance, and improving their powers of concentration so they may more quickly arrive at an industrial utilization of not only soybean products but cotton as well." Address: Ralston Purina Co., St. Louis, Missouri.

100. *Soybean Digest.* 1941. To build soybean plant at Iowa Falls. July. p. 7.
• ***Summary:*** "Purina Mills, St. Louis, Missouri, has announced plans for a new soybean processing and feed manufacturing plant to be erected at Iowa Falls, Iowa. The company has purchased a little more than 16 acres of ground at the edge of Iowa Falls, located on the Rock Island Railroad.

"Concrete and steel storage tanks of approximately 250,000 bushels capacity will be erected, and four continuous presses with a crushing capacity of 2,800 to 3,000 bushels per day will be installed."

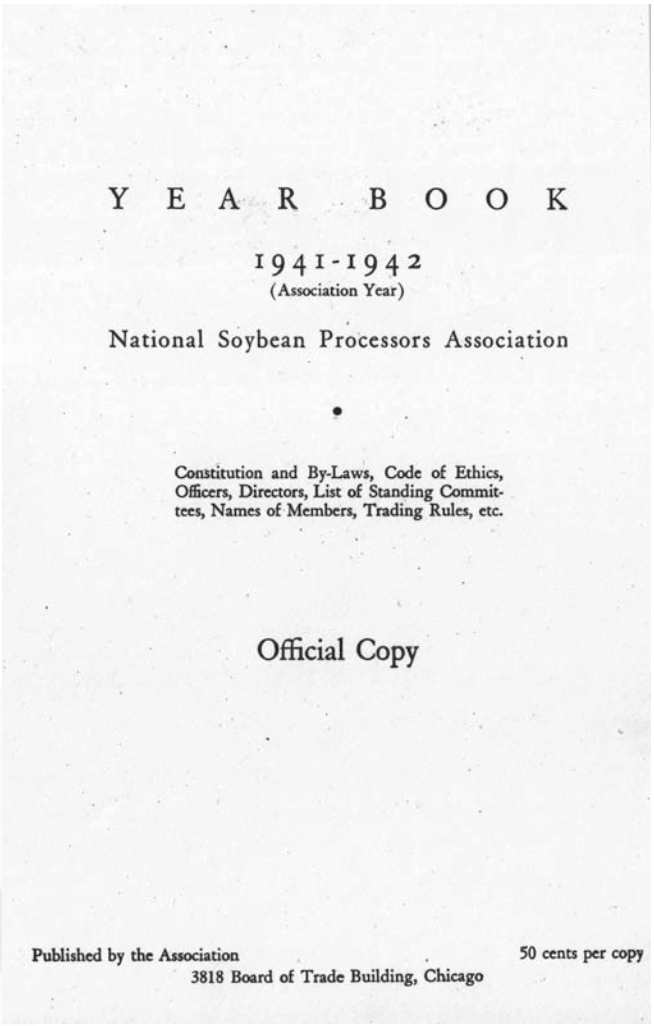
101. National Soybean Processors Association. 1941. Year book, 1941-1942 (Association year). Chicago, Illinois. 53 p.
• ***Summary:*** Contents: Constitution and by-laws (as amended Oct. 13, 1941; incl. committees, code of ethics). Officers, directors and committees for 1941-42. Membership of the National Soybean Processors Association. Trading rules governing the purchase and sale of soybean oil meal (First adopted 18 Oct. 1933). Appendix to trading rules on soybean oil meal. Trading rules on soybean oil. Appendix to trading rules on soybean oil–Official testing methods.

Article IX, Committees, lists and describes each.

The section titled "Officers, directors, and committees" (p. 14-16) states: President: Edward J. Dies. V.P., Chairman Executive Committee: E.K. Scheiter. Secretary: E.D. Funk, Jr. Treasurer: W.G. Dickinson. Ass't. Treasurer: F.G. Duncanson. Executive Committee: E.K. Scheiter, Chairman–J.B. DeHaven, E.D. Funk, Jr., W.H. Knapp, W.G. Dickinson, Roy Hall -> D.J. Bunnell, C.T. Prideville, W.H. Eastman, E.F. Johnson, W.E. Flumerfelt, Howard Kellogg, Jr.

Board of Directors: A.M. Andreas, W.E. Flumerfelt, C.T. Prideville, J.H. Caldwell, E.D. Funk, Jr., E.K. Scheiter, J.B. DeHaven, Roy Hall -> D.J. Bunnell, H.R. Schultz, W.G. Dickinson, Howard Kellogg, Jr., I.D. Sinaiko, Roger Drackett, W.H. Knapp, Ralph Wells, W.H. Eastman, J.H. Mitchell.

Standing committees: For each committee, the names of all members (with the chairman designated), with the company and company address of each are given–Traffic and transportation. Research. Finished materials standards. Soybean grades and contracts. Trading rules–oil. Trading rules–meal. Soy flour. Crop improvement. Soybean nutritional research council. Trade development. Edible soybean.



YEAR BOOK

1941-1942
(Association Year)

National Soybean Processors Association

•

Constitution and By-Laws, Code of Ethics, Officers, Directors, List of Standing Committees, Names of Members, Trading Rules, etc.

Official Copy

Published by the Association
3818 Board of Trade Building, Chicago

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The following companies and organizations are members of NSPA: Allied Mills, Inc., Board of Trade Bldg., Chicago, Illinois (J.B. DeHaven). Archer-Daniels- Midland Co., Box 839, Minneapolis, Minnesota (W.H. Eastman). Berea Milling Co. (The), Berea, Ohio (H.E. Carpenter). Buckeye Cotton Oil Co. (The), Cincinnati, Ohio (W.H. Knapp). Cairo Meal & Cake Co., Cairo, Illinois (A.T. Madra). Central Soya Co., Inc., Fort Wayne, Indiana (Roy Hall). Clinton Co., Clinton, Iowa (E.W. Meyers). Drackett Co. (The), Cincinnati, Ohio (Roger Drackett). Durkee Famous Foods, Chicago. Elevators & Mills, Inc., Windfall, Indiana (J.H. Mitchell). Funk Bros. Seed Co., Bloomington, Illinois (E.D. Funk, Jr.). Glidden Co. (The), Chicago, Illinois (W.G. Dickinson). Honeymead Products Co., Cedar Rapids, Iowa (A.M. Andreas). Illinois Soy Products Co., Springfield, Illinois (I.D. Sinaiko). Iowa Milling Co., Cedar Rapids, Iowa (Jos. Sinaiko). Laucks (I.F.), Inc., Portsmouth, Virginia (H.F. Armstrong). Old Fort Mills, Inc., Marion, Ohio (P. Turner -> Hugo Melo). Plymouth Processing Mills, Fort Dodge, Iowa (C.J. Simmons). Quincy Soybean Products Co., Quincy, Illinois (Irving Rosen). Ralston Purina Co., St. Louis, Missouri (J.H. Caldwell). Simonsen Brothers, Quimby, Iowa

(W.E. Simonsen). Southern Cotton Oil Co. (The), Goldsboro, North Carolina (C.S. Ragan). Soya Processing Co., Wooster, Ohio (H.H. Heeman). Soy Bean Processing Co., Waterloo, Iowa (W.E. Flumerfelt). Spencer Kellogg & Sons, Buffalo, New York (Howard Kellogg, Jr.). Staley (A.E.) Mfg. Co., Decatur, Illinois (E.K. Scheiter). Standard Soy Bean Mills, Centerville, Iowa (H.R. Schultz). Swift & Co., Chicago, Illinois (C.T. Prindeville). Terminal Oil Mill Co., Oklahoma City, Oklahoma (S.T. Davenport -> O.K. Winterringer). Wells (Ralph) & Co., Monmouth, Illinois (Ralph Wells).

Organizations represented on committees: American Soybean Association, Hudson, Iowa (George Strayer, D.G. Wing). Illinois College of Agriculture, Urbana, Illinois (Dr. W.L. Burlison, J.W. Lloyd). U.S. Regional Soybean Laboratory, Urbana, Illinois (Dr. H.T. Hopper, Donald H. Wheeler).

Insert: New members added since publication of the Trading Rules Book–Bell (Wilbur) Mill, Fayette, Iowa (Wilbur Bell). Central Iowa Bean Mill, Gladbrook, Iowa (Paul K. Klinefelter). Dannen Grain and Milling Co., St. Joseph, Missouri (Dwight L. Dannen). Decatur Soy Products Co., Decatur, Illinois (Joseph Giovanna). Galesburg Soy Products Co., Galesburg, Illinois (Max Albert). Hoosier Soybean Mills, Marion, Indiana (J.H. Caldwell, Jr.). Mankato Soybean Products, Inc., Mankato, Minnesota (Frank J. Berman). Marr (Pete) Soybean Mills, Fremont, Nebraska (Pete Marr). Toledo Soybean Products, Toledo, Ohio (J.H. Brown).

Note 1. This is the earliest document seen (July 2005) that mentions Honeymead in Iowa.

Note 2. This is the earliest document seen (Sept. 2005) that mentions Quincy Soybean Products Co. (Quincy, Illinois) or Irving Rosen. Address: 3818 Board of Trade Building, Chicago, Illinois.

102. *Year Book and Trading Rules.* 1941-1988. Serial/periodical. National Soybean Processors Association. Annual. First volume titled Year Book, 1947-48. 68 pages. Published in Chicago. Later published in Washington, DC.
• ***Summary:*** Succeeded by Yearbook and Trading Rules. The first issue of this periodical, for 1941-42, was titled "Year Book." Issued annually to all members of the association in about October of each year. The 1981-82 Yearbook, for example, was spiral bound and 23 cm high. Address: 1800 M. St., N.W., Washington, DC 20036.

103. Kishlar, Lamar. 1942. A view of soybean America. *Soybean Digest.* Jan. p. 7.
• ***Summary:*** A graphic overview of where soybeans are grown and crushed in America, and how they are used. An astonishing 96% of all soybean oil meal produced in the USA is fed to livestock, pet stock [pets], and poultry. Two percent of that soybean oil meal is milled and refined to soybean flour, less than 1% is used as fertilizer, and about 3/4 of one percent is used for such industrial purposes as waterproof glue, plastics, foundry core binders, and the like.

A photo shows Lamar Kishlar. Maps show: (1) 95% of the soybeans harvested for beans in the USA "this year will be harvested in seven states (Iowa, Missouri, Illinois, Indiana, Ohio, Michigan and Virginia). Watch the lower Mississippi Valley." (2) "Since Illinois produces about 50% of the soybeans harvested for seed, it is natural to expect that central Illinois should do the bulk of the crushing. The size of discs indicates the crushing capacity of the 50 most important soybean crushing centers. The total estimated capacity of all these mills is 82 million bushels. Because actual production [sic, crushing] figures are usually confidential, the exact bushels crushed in each city cannot be shown.

Pie charts show: (1) More than 82.5% of all soybean oil produced in the United States is consumed in food products. Shortening takes 52%, margarine 21%, and other edible products such as salad oil consume nearly 10%. Paint uses a mere 7.25% of the soybean oil made, and linoleum, soap and other technical purposes 10.75%. (2) Soybean oil now takes 17.8% of the shortening market, 34% of the margarine market, 8.3% of other edible products such as salad oils, 6.8% of the paint market, and 6.5% of the linoleum market. Address: Research Director, Ralston Purina.

104. *Chemurgic Digest.* 1942. Introducing–More of the Eighth Annual Chemurgic Conference speakers. Feb. 28. p. 27.
• ***Summary:*** Individual portrait photos (2 by 2¼ inches) of seven speakers are shown. One of these speakers is "E.F. (Soybean) Johnson, Manager, Soybean Dept., Ralston Purina Company."

105. Dies, Edward J. 1942. Soybeans: Gold from the soil. New York, NY: The Macmillan Co. 122 p. April. Index. 21 cm. Revised ed. March 1943. 122 p. Includes index, Illust., 22 cm. [205 ref]
• ***Summary:*** A landmark popular book and a good description of the pioneering period of soybean production and processing in the United States.

Contents: 1. A certain man of science (William Morse and Dr. C.V. Piper). 2. Vignette from antiquity (how the soybean vine saved a caravan in China besieged by bandits). 3. Birth of an industry (U.S. soybean crushing). 4. The big drive starts (A.E. Staley, Glidden, Central Soya, Buckeye Cotton Oil Co., Drackett Co., ADM, Allied Mills, Ralston Purina, Spencer Kellogg and Sons, Swift & Co., Shellabarger Grain Products Co. Standard Soybean Mills, Iowa Milling Co.). 5. Breeding new types (Burlison, Hackleman). 6. Scientists commend product (oil and meal). 7. Lakes of oil. 8. In the field of industry (U.S. Regional Soybean Industrial Products Laboratory, and Henry Ford). 9. Listening post for soy (NRRL at Peoria). 10. Whims and price turmoil. 11.

Milk for the tots of China (Dr. Harry Miller). 12. Soys in the home garden ("the vegetable soybean for table use," "garden varieties of soybeans," "green soybeans," "green vegetable soys," "vegetable type soybeans," "edible varieties"). 12. Americanizing soy foods (mainly about soy flour and improving its taste for use during World War II). 14. Little bean, what now? Appendix: Chronology of the soybean (27 entries). Bibliography. Dies was born in 1891.

Illustrations and diagrams show: (1) Principal centers of U.S. soybean production (p. 19, map). "Almost 90 per cent of all soybeans are harvested in Illinois, Iowa, Indiana, and Ohio. If three other states are included as shown on the map–Missouri, Michigan, and Virginia–the total is 97 per cent. (2) Principal centers of U.S. soybean processing (p. 20, map). Discs of different size show the various centers. Since Illinois produces 52% of the harvested soybeans, central Illinois is the center of soybean processing [crushing] in the USA. "Total processing capacity in late 1942 exceeded 100 million bushels for the regularly established soybean processing plants." (3) Diagram of uses of the soybean (p. 68).

Chapter 2, "Vignette from antiquity" begins: "Even when the Pyramids were being built, three hundred years before the Tower of Babel, and twelve centuries before Solomon fashioned his temple, the soybean was hoary with age. The earliest writings on the subject go back to the period of the Pyramids.

"But of the science of soybean growing you will find no recorded beginnings in the musty tones [sic, tomes] of oriental history. No book reveals the name of the inquisitive oriental who in the misty long ago began sowing the seeds, harvesting the beans, pounding them into a mash for cooking and eating, and probably boring his friends no end with tales of their merit. There is no record depicting this unsung hero's foresight in saving the seed of the magic plant against next year's hunger. Likely as not he was a crude dreamer who fumbled his hunches and accomplished little in a lifetime of wrestling with the problem of proper cultivation.

"Oriental literature of a later date contains much about the plant but of its origin as a food product again there are only legends.

"A choice vignette from antiquity on the initial use of soybeans runs something in this fashion. Long, long ago, far back in the dim past, a caravan pulled out of an eastern China town. It consisted of a number of merchants and their servants... The caravan was bound for a distant inland settlement intent upon disposing of its valuable wares." After trading in the north, the caravan headed home, "now laden with gold, silver, and choice furs received in payment for the merchandise. Suddenly at dusk on a day when the caravan was still far from home it was surrounded by bandits who had learned of the rich prize at hand. Merchants and servants took quick refuge in a rocky defile easy of defense. Here they were besieged day on day until their scanty provisions ran low and starvation seemed inevitable. At length a servant whispered to his master and pointed to a vinelike plant bearing some sort of legume. No one could recall having seen such a plant before but all were touched with the pinch of hunger. So with grave doubts the men pounded the beans into a thick flour, mixed it with water, and made coarse cakes. Upon these cakes the caravan survived, and with renewed strength fought off the foe until help arrived. And, so the legend goes, from that day forth the miracle bean became the staff of life in China." Note 1. This story of the caravan besieged by bandits in China is a longer and embellished version of the tale first dreamed up and told by H.W. Galley in *Soybean Digest* (Dec. 1940).

"True or false, the story has lived through the ages.

"For the first written record of the soybean one must turn to 'Materia Medica,' written by Emperor Shen-nung in 2838 B.C. It describes many plants of China including that of the soybean, but even the name is clouded with antiquity. In the early Chinese history the name 'Shi-yu' [sic] and the 'Ta-tou' were applied to the soybean. These names probably antedate the first authoritative records of the plant."

Dies then discusses Engelbert Kaempfer, Linnaeus, and Moench.

"Then in 1804 a Yankee Clipper ship in full sail glided down the coast of China searching for ports for a return cargo. Not sure of the length of the return journey, the captain ordered several bags of soybeans tossed into the hold as a reserve food supply. And thus did the first soybeans enter America. Little was done about the soybeans then.

Note 2. This is the earliest document seen (June 2003) that further embellishes the myth of the "clipper ship" with phrases like "glided down the coast of China" or "ordered several bags of soybeans tossed into the hold"–all supposedly in connection with the introduction of the soybean to the United States. This is also the earliest document seen (Aug. 2000) that compares the age of the soybean with that of the pyramids (in Egypt; the oldest and largest was built for Khufu at Giza in the 26th century B.C.), the Tower of Babel (in Babylon [today's Iraq]), or Solomon's Temple (in today's Israel), arguing that the soybean was much older than all of them.

"James Mease of Pennsylvania first mentioned in American literature shortly after this importation that the soybean was adaptable to Pennsylvania and should be cultivated" (p. 9).

In Chapter 3 (p. 14) Dies notes: "The first soybeans processed in this country were imported from Manchuria in 1911 and sold to Herman Meyer who had a small crushing plant in Seattle, later called the Pacific Oil Mills. From the raw material he produced the two chief products–soybean oil meal for livestock feed and soybean oil, selling the latter locally for industrial use. The meal was advertised and sold as 'Proteina,' a high-protein feed. The venture did not last for any considerable period; a few years later Meyer passed

away." Note 3. This is the earliest document seen (May 2010) that mentions Herman Meyer.

"Soybeans grown in this country were first processed by the Elizabeth City Oil and Fertilizer Company at Elizabeth City, North Carolina. W.T. Culpepper, now postmaster at Elizabeth City, was manager of the new mill, started in 1912. The first domestic soybeans were crushed for commercial purposes there in the late fall of 1915. It was a small operation."

Note 4. This is the earliest document seen (May 2010) that mentions W.T. Culpepper.

"At that time, most of the soybeans were grown in North Carolina, and the Winterville Cotton Oil Company at Winterville, North Carolina, purchased expellers for processing purposes, and these operated on soybeans for a limited period. Still another mill, operated by Havens Oil Company at Washington, North Carolina, crushed thirty thousand bushels of beans as an experiment in 1916"

"'My uncle, Jonathan Havens,' says J. Havens Moss, 'was the first to plant soybeans in this section, devoting considerable acreage to the mammoth yellow [Mammoth Yellow] type which grew and matured splendidly from the very start. Its value to the land was obvious'" (p. 14-15).

Note 5. This is the earliest document seen (Aug. 2016) which mentions that Havens Oil Co. crushed soybeans as early as 1916.

Note 6. On the first page of the copy owned by Soyfoods Center is a signed inscription, in dark blue ink, which reads: "With kind regards to Russell East, who has done much on behalf of the soybean–Edward Jerome Dies."

Note 7. Only minor changes were made on about 13 pages of the revised edition published in March 1943. None of the statistics in the many tables were been updated, and the bibliography was not changed. Address: USA.

106. Dies, Edward J. 1942. Soybeans: Gold from the soil (Statistical tables and charts). New York, NY: The Macmillan Co. 122 p. April. Index. 21 cm. Revised ed. March 1943. 122 p. Includes index, Illust., 22 cm. [205 ref]

• ***Summary:*** Page 5: Soybean acreage and production, 1924-1941. United States crop. Soybean harvested for beans. Each crop year extends from Oct. 1 to Sept. 30. Acreage increased from 448,000 acres in 1924 to 5,855,000 acres in 1941. Yield per acre rose from 11.0 bushels in 1924 to a peak of 20.7 bushels in 1939. Production increased from 4,947,000 bushels in 1924 to 106,712,000 bushels in 1941. Sources: (1) Crops and Markets, USDA. (2) Illinois Crop Statistics, Circular 440-441. (3) Latest government reports, 18 Dec. 1941.

Page 10: Soybeans: production in specified countries, and estimated world total, in thousand bushels, excluding China. Estimated world production rose from 163.000 million bushels in 1922 to 266.700 million bushels in 1940. China production rose from 210.038 million bu in 1931 to 231.302 million bu in 1937. Manchuria production rose from 113.469 million bu in 1922 to a peak of 196.949 million bu in 1930, falling to 149.435 million bu in 1939. United States production rose from 4.947 bu in 1924 to 106.712 million bu in 1941. Chosen [Korea] production rose from 13.017 million bu in 1910 to 18.333 million bu in 1938. Japan production decreased from 17.855 million bu in 1909 to 13.473 million bu in 1937. Netherlands India [today's Indonesia] rose from 2.603 million bu in 1917 to 9.873 million bu in 1938. Kwantung production rose from 375 thousand bu in 1911 (with a gap between 1919 and 1924) to 650 thousand bu in 1937. Taiwan production decreased from 280 thousand bu in 1921 to 159 thousand bu in 1937. USSR rose from 2.060 million bu in 1936 to a peak of 10.384 million bu in 1932 falling to 2.504 million bu in 1934. Rumania production rose from 26,000 bu in 1934 to 2.572 million in 1939. Bulgaria production rose from 77,000 bu in 1934 to 827,000 bu in 1939. Yugoslavia production rose from 26,000 bu in 1934 to 213,000 bu in 1939. 1909-1941. Other European (Poland, Czechoslovakia, Austria) rose from 55,000 bu in 1932 to 60,000 bu in 1935. With many footnotes.

Page 19: Principal centers of soybean production in the USA. "Almost 90 per cent of all soybeans [in the USA] are harvested in Illinois, Iowa, Indiana, and Ohio. If three other states are included as shown on the map–Missouri, Michigan and Virginia–the total is 97 per cent. The size of the baskets is proportional to the volume produced.

Page 20: Principal centers of soybean processing [crushing] in the USA. "As Illinois produces about 52 per cent of the soybeans harvested for seed, Central Illinois is the center of soybean processing as shown on this map. The discs indicate relative importance of the processing centers. Total processing capacity in late 1941 probably exceeded 90 million bushels.

Page 25: Illinois acreage and production of soybeans for beans, 1919-1941. Acreage harvested increased from 3,000 acres in 1919 to 2.285 million acres in 1941. Yield, in bushels per acre, rose from 10.0 in 1919 to 21.5 in 1941. Production increased from 30,000 bu in 1919 to 49.128 million bu in 1941.

Pages 38-47: Soybeans: Origin and varietal characteristics. This excellent table contains 18 columns. Variety. Origin (introduction from what country, selection, or cross). Year. Days to mature. Flower color. Pubescence color. Seed characteristics: coat color, germ color, hilum color, seed per pad (range), seed per pound, percent oil, percent protein. Use (green vegetable, grain, forage). The varieties are: Agate, A.K., Aksarben, Aoda, Arisoy, Arksoy, Avoyelles, Bansei, Barchet, Biloxi, Black Eyebrow, Cayuga, Chame, Charlee, Chief, Chernie, Chestnut, Chiquita, Chusei, Clemson, Columbia, Creole, Delnoshat, Delsta, Dixie, Dunfield, Easycook, Ebony, Elton, Emperor, Etum, Fuji, Funk Delicious, George Washington, Georgian, Giant Green,

Goku, Habaro, Haberlandt, Hahto, Hakote, Harbinsoy, Hayseed, Herman, Higan, Hiro, Hokkaido, Hollybrook, Hong Kong, Hoosier, Hurrelbrink, Illini, Ilsoy, Imperial, Ito San, Jogun, Kanro, Kanum, Kingwa, Kura, Laredo, Lexington, Macoupin, Magnolia, Mamloxi, Mammoth Brown, Mammoth Yellow, Mamredo, Manchu, Mandarin, Mandell, Mansoy, Medium Green, Midwest, Mingo, Minsoy, Missoy, Monetta, Morse, Mount Carmel, Mukden, Nanda, Nanking, Norredo, Ogemaw, Old Dominion, Oloxi, Ontario, Osaya, Otootan, Ozark, Palmetto, Patoka, Pee Dee, Peking, Pine Dell Perfection, Pinpu, Richland, Rokusun, Sato, Scioto, Seminole, Seneca, Shiro, Sioux, Sooty, Sousei, Southern Green, Southern Prolific, Soysota, Suru, Tarheel Black, Tastee, Toku, Tokyo, Virginia, Waseda, Wea, White Biloxi, Willomi, Wilson, Wilson Five, Wisconsin Black, Wood's Yellow, Yelredo, Yokoten. Note: This long table "Specially prepared by the Division of Forage Crops and Diseases, Bureau of Plant Industry, U.S.D.A.

Page 53: "United States crop production of soybean oil meal and soybean oil, 1924-1940." This valuable table is poorly titled. It has 5 columns: (1) Year. (2) Production of soybeans. Increased from 4,947 bu in 1924 to 106.712 million bu in 1941. (3) Crushings [crushed]. Increased from 307,000 bu in 1924 to 64.180 million bu in 1941. (4) Production of meal. Increased from 7,400 tons in 1924 to 1.5369 million tons in 1941. (5) Production of oil. Increased from 2.269 million pounds in 1924 to 565.169 million pounds in 1941.

Page 58: Soybean oil imported and exported, 1912-1940. Imports rose from 24.959 million lb in 1912 to a peak of 335.984 million lb in 1918, decreasing to 4.848 million lb in 1940. Domestic and foreign oil exported decreased from 34.803 million lb in 1919 (For 6 months beginning July 1) to 15.953 million lb in 1940.

Page 61: Soybean oil: factory consumption by classes of products, 1931-1940. Compounds [shortening] and vegetable cooking fats rose from 10,869 lb in 1931 to 212.317 million lb in 1940. Oleomargarine rose from 623,000 lb in 1931 to 87.106 million lb in 1940. Other edible products rose from 180,000 lb in 1932 to 39.980 million lb in 1940. Soap rose from 3.816 million lb in 1931 to 17.612 million lb in 1940. Paint and varnish rose from 6.256 million lb in 1931 to 29.828 million lb. Linoleum and oilcoth rose from 2.612 million lb in 1931 to 29.828 million lb in 1940. Printing ink rose from 33,000 lb in 1931 to 82,000 lb in 1940. Miscellaneous rose from 2.051 million lb in 1931 to 16.538 million lb in 1940. Foots and loss rose from 1.625 million lb in 1931 to 20.924 million lb in 1940. The total of these uses for soybean oil rose from 27.885 million lb in 1931 to 431.641 million lb in 1940.

Page 68: Diagram of uses of the soybean. The major categories are: Green soybeans, used as fresh vegetables or in canned vegetable salads. Dry soybeans, used for seed or to make bean sprouts, soup, soy sauce, roasted soybeans, boiled soybeans, stock feeds, vegetable milk [soymilk] (used to make liquid milk products, dry soy milk products, bean curds, soy cheese), debittered soybeans (used to make full fat soy flour, soy coffee, soy butter, soy cereal). Soybean oil meal, soybean flour, soy lecithin, crude soybean oil (used to make fatty acids, alkyd resins. glycerine, core oils, soft soaps, hard soaps, insecticides, and many non-food products mentioned above). Refined soybean oil (used to make food products–vegetable shortening, margarine, salad dressing, edible oils, frying oils). Address: USA.

107. Ralston Purina Co. 1942. Extends greetings to soybean growers and handlers... (Ad). *Soybean Digest.* Sept. p. 26.
• ***Summary:*** "... who attended the Annual Meeting of the American Soybean Association, September 15-16-17, at Lafayette, Indiana. When you are at home visit any of our plants at St Louis, Missouri; Lafayette, Indiana; Circleville, Ohio; Iowa Falls, Iowa."

A one-third page square ad, in red, black and white.

108. **Product Name:** Soybean Oil, and Soybean Oil Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Iowa Falls, Iowa.
Date of Introduction: 1942 December.
Ingredients: Soybeans.
How Stored: Shelf stable.
New Product–Documentation: *Soybean Digest.* 1943. "Iowa Falls Purina mill." Jan. p. 4. A photo shows the "new soybean processing plant of the Ralston-Purina Company, which began operations December 1 [1942] at Iowa Falls, Iowa."

USDA Northern Regional Research Laboratory. 1943. "Soybean processing mills in the United States." *USDA Bureau of Agricultural and Industrial Chemistry.* AIC-26. 10 p. Nov. See p. 2. Iowa Falls, Iowa: "Ralston Purina Company." (Medium = capacity between 50 and 200 tons/day of soybeans).

Soybean Digest. 1949. July. p. 44. "To open new plant." "The new soybean solvent processing plant at Iowa Falls, Iowa, is scheduled to begin its operations about July 15."

109. U.S. War Department. 1942. World War II draft registration card for Donald Beach. Washington, DC.
• ***Summary:*** This government record (Serial No. 1867, Order No. 11293) shows:

(1) Name (print): Donald Danforth (middle initial none).

(2) Place of residence: 17 West Brentmoor, Clayton, St, Louis, Mo.

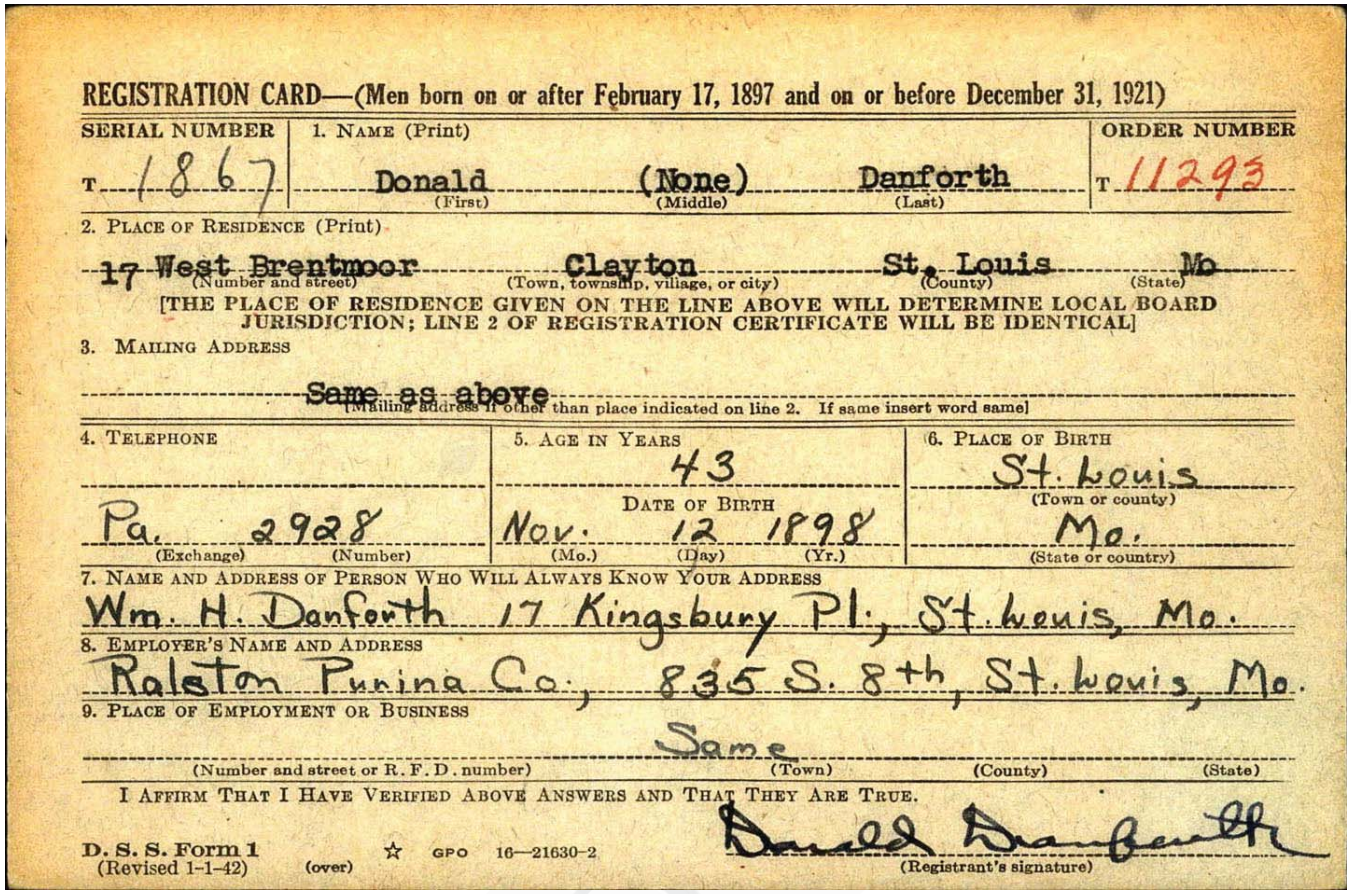
(3) Mailing address: Same as above.

(4) Telephone: Pa. 2928.

(5) Age in years: 43. Date of birth: Nov. 12, 1898.

(6) Place of birth: St. Louis. Mo

(7) Name and address of person who will always know your address: Wm. H. Danforth, 17 Kingsbury Pl., St. Louis,



REGISTRATION CARD—(Men born on or after February 17, 1897 and on or before December 31, 1921)

SERIAL NUMBER T 1867 | 1. NAME (Print) Donald (First) (None) (Middle) Danforth (Last) | ORDER NUMBER T 11293

2. PLACE OF RESIDENCE (Print)
17 West Brentmoor (Number and street) Clayton (Town, township, village, or city) St. Louis (County) Mo (State)
[THE PLACE OF RESIDENCE GIVEN ON THE LINE ABOVE WILL DETERMINE LOCAL BOARD JURISDICTION; LINE 2 OF REGISTRATION CERTIFICATE WILL BE IDENTICAL]

3. MAILING ADDRESS
Same as above (Mailing address if other than place indicated on line 2. If same insert word same)

4. TELEPHONE Pa. (Exchange) 2928 (Number)

5. AGE IN YEARS 43
DATE OF BIRTH Nov. (Mo.) 12 (Day) 1898 (Yr.)

6. PLACE OF BIRTH St. Louis (Town or county) Mo. (State or country)

7. NAME AND ADDRESS OF PERSON WHO WILL ALWAYS KNOW YOUR ADDRESS
Wm. H. Danforth 17 Kingsbury Pl., St. Louis, Mo.

8. EMPLOYER'S NAME AND ADDRESS
Ralston Purina Co., 835 S. 8th, St. Louis, Mo.

9. PLACE OF EMPLOYMENT OR BUSINESS
Same (Number and street or R. F. D. number) (Town) (County) (State)

I AFFIRM THAT I HAVE VERIFIED ABOVE ANSWERS AND THAT THEY ARE TRUE.
Donald Danforth (Registrant's signature)

D. S. S. Form 1 (Revised 1-1-42) (over) ☆ GPO 16—21630-2

Mo.

(8) Employer's name and address: Ralston Purina Co., 835 S. 8th, St. Louis, Mo.

(9) Place of employment or business: Same.

I affirm that I have verified above answers and that they are true. [Registrants signature]: Donald Danforth.

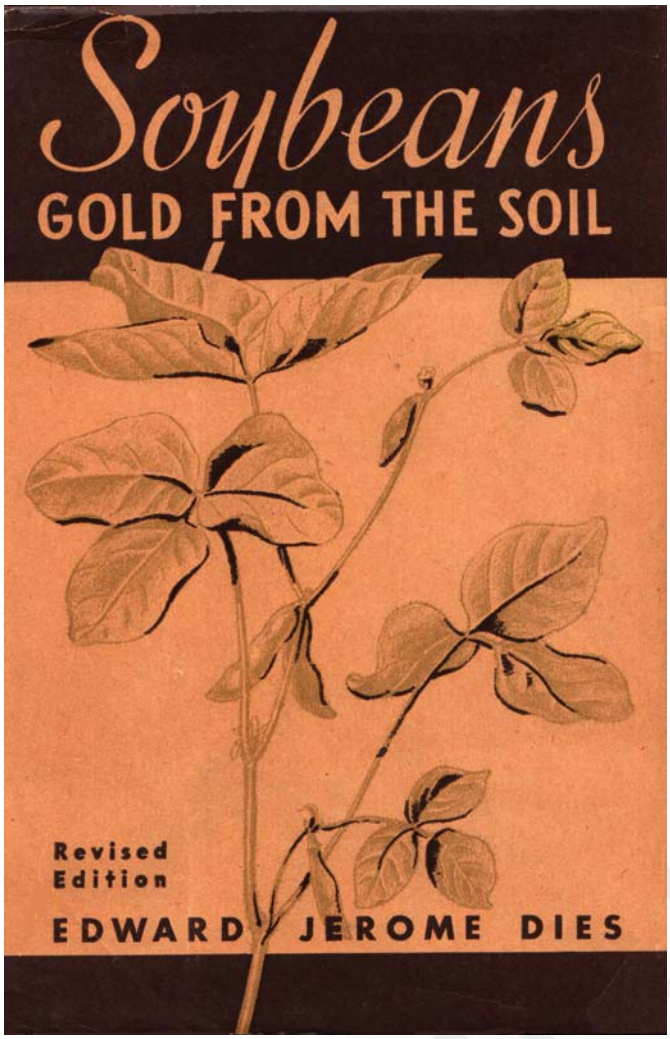
110. *Soybean Digest.* 1943. Iowa Falls Purina mill. Jan. p. 4.
• ***Summary:*** A photo shows the "new soybean processing plant of the Ralston-Purina Company, which began operations December 1 [1942] at Iowa Falls, Iowa." The plant is equipped with "six French presses, and has a daily processing capacity of 4,000 bushels. Plans are to produce 100 tons of soybean meal and over 4,000 gallons of oil daily. Grain storage capacity is 500,000 bushels; oil capacity 80,000 gallons. A feed mixing unit for the Purina line will be maintained in conjunction with the processing plant." There is a photo and biographical sketch of Donald B. Walker, the plant's manager. He went to Iowa Falls this summer from Circleville, Ohio.

111. Dies, Edward J. 1943. Soybeans: Gold from the soil. Rev. ed. New York, NY: The Macmillan Co. 122 p. March. Index. 21 cm. First published in April 1942. [205 ref]
• ***Summary:*** See next page. This revised edition is very similar to the first edition published in April 1942. Minor changes have been made on the following pages: 20, 28, 70-73, 84-85, 90-94, 121-22. None of the statistics in the many tables have been updated, and the bibliography is unchanged. Address: USA.

112. *Soybean Digest.* 1943. Kishlar heads oil chemists. June. p. 4.
• ***Summary:*** "At the annual meeting of the American Oil Chemists' Society in New Orleans [Louisiana], Lamar Kishlar, St. Louis, was elected President for the coming year. Dr. Kishlar is Manager of Research for the Ralston Purina Company. He has been identified with research on soybean products since the pioneer days of the soybean's American Development... Dr. Kishlar is... Chairman of the Soybean Nutritional Research Council."

113. *RSLM* (*U.S. Regional Soybean Laboratory Mimeograph, Urbana, Illinois*). 1943. Edible soybean producers and distributors*. No. 101. Nov. 15. 3 p. Not for publication.
• ***Summary:*** Varieties: Aoda (5 producers and distributors). Bansei (19). Easycook (8). Emperor (2). Etum (4). Funk Delicious (3). Giant Green (4). Higan (1). Hokkaido (10). Imperial (1). Jogun (5). Kanro (1). Kanum (1). Rokusun (4). Sac (1). Sonsei [sic, Sousei] (4). Toku (1). Willomi (1).

Growers include:



Associated Seed Growers, Inc., 301 Kentucky Ave., Indianapolis, Indiana or New Haven, Connecticut (handles Bansei {wholesale only}, Emperor, Giant Green, Jogun, Toku, and Willomi).

Charles Siner, Route 2, Terre Haute, Indiana.

Charles V. Holderman, 458 N. Hartmen St., Napanee, Indiana.

Charlton-Davis Co., Inc., Norfolk, Virginia.

Corneli Seed Co., 101 Chouteau Ave., St. Louis, Missouri.

Donald Walker, c/o Ralston Purina Co., Circleville, Ohio.

E.F. Johnson, 1151 Claytonia Terrace, Richmond Heights, Missouri.

Farmer Seed & Nursery Co., Faribault, Minnesota.

Fred H. Scholl, Memphis, Indiana.

George A. Mitchell, Vineland, New Jersey.

G.G. McIlroy, Irwin, Ohio (wholesale only).

Holmes Seed Co., 224 Cleveland Ave., Canton, Ohio.

International Nutrition Laboratory, Mt. Vernon, Ohio.

J.B. Lucas, Franklin, Kentucky.

Lee Chambers, Route 1, Kokomo, Indiana.

Muntz-McLaughlin Co., Holgate, Indiana.

O.M. Scott & Sons, Marysville, Ohio.

Ray Monier, Carrollton, Missouri.

Rufus Gillett, Mazomanie, Wisconsin.

Russell-Heckle Seed Co., 16 S. Trout Street, Memphis, Tennessee.

Strayer Seed Farms, Hudson, Iowa.

The Marsh Foundation, Van Wert, Ohio.

T.W. Wood and Sons, Richmond, Virginia.

W. Atlee Burpee Co., Clinton, Iowa.

Footnote: *"This partial list is furnished for your convenience, with no discrimination intended and no guarantee of seed quality, varietal purity, or any other factors involved in the purchase or distribution of seed implied. Additions to this list will be welcomed."

114. Purina Mills. 1943. Purina's soybean processing plants are in the "Food for Victory" crusade (Ad). *Soybean Digest.* Nov. Inside front cover.

• ***Summary:*** This half-page ad states that the crusade is to "help the farmers of America produce efficiently the most meat, milk, and eggs from the supplies of feed now available. Purina's four soybean processing plants–every man and every machine–are in this crusade producing to capacity."

These plants are located at St Louis, Missouri; Iowa Falls, Iowa; Lafayette, Indiana; Circleville, Ohio.

"Food will win the war and write the peace!"

Illustrations show: (1) A sack of Purina Chows, with a checkerboard design on it. (2) A farmer standing next to small a "Food for Victory Crusade" sign with the words "Meat," "Milk," and "Eggs" each on its own line below the sign

Note: This ad also appeared in the Sept. 1944 issue (p. 76) and in the Nov. 1944 issue (p. 17). By Sept. 1944 Purina had five processing plants, the newest one located in Kansas City, Missouri.

115. USDA Northern Regional Research Laboratory. 1943. Soybean processing mills in the United States. *USDA Bureau of Agricultural and Industrial Chemistry.* AIC-26. 10 p. Nov. Revised edition, 1948. CA-5, 14 p.

• ***Summary:*** "The following list of soybean processing mills is divided into three parts: (1) mills in which soybeans regularly constitute the bulk of the throughput, (2) mills which are currently under construction or whose construction is being seriously considered, and (3) mills which are engaged in soybean processing temporarily or part time, or which have otherwise participated in the soybean program by signing a soybean processor contract. It must be realized that changes are occurring very rapidly at the present time, throughout the entire soybean processing industry.

"Solvent extraction plants in group No. 1 are designated with an asterisk (*). Many of the solvent type mills also

contain expellers and screw presses. After the name of each mill in group No. 1, the letter S, M, or L is used to designate whether it is a small, medium, or large installation. These ratings are only approximate and divide mills into three capacity groups: S (small), capacities less than 50 tons of soybeans per day; M (medium), capacities between 50 and 200 tons per day; and L (large), capacities over 200 tons per day."

(1) Mills specializing in soybeans:

Arkansas: West Memphis–Arkansas Mills, Inc. (S). Wilson–Wilson Seed and Feed Company (S).

California: Oakland–Albers Brothers Milling Company (S).

Illinois: Bloomington–Funk Brothers Seed Company (M). Cairo–Swift and Company (M). Champaign–Swift and Company (L). Chicago–Archer-Daniels-Midland Company (M)*; The Glidden Company (L)*; Norris Grain Company (S); Spencer Kellogg and Sons (L). Decatur–Archer-Daniels-Midland Company (L)*; Decatur Soy Products Company (M); Spencer Kellogg and Sons (L)*; A.E. Staley Manufacturing Company (L). Galesburg–Galesburg Soya Products Company (M). Gibson City–Central Soya Company, Inc. (L). Monmouth–Ralph Wells and Company (S). Peoria–Allied Mills, Inc. (L). Quincy–Quincy Soybean Products Company (M). Springfield–Illinois Soy Products Company (M). Taylorville–Allied Mills, Inc. (M).

Indiana: Decatur–Central Soya Company, Inc. (L)*. Indianapolis–Evans Milling Company (M). Lafayette–Ralston Purina Company (M). Marion–Hoosier Soybean Mills, Inc. (M). Windfall–Elevators and Mills, Inc. (S).

Iowa: Cedar Rapids–Honeymead Products Company (M)*; Iowa Milling Company (M). Centerville–Standard Soybean Mills (M). Clinton–Clinton Company (M)*. Des Moines–Spencer Kellogg and Sons (M); Swift and Company (M). Fayette–Wilbur Bell, Inc. (S). Fort Dodge–Plymouth Processing Mills (M [co-op]). Gladbrook–Central Iowa Soybean Mill (S). Iowa Falls–Ralston Purina Company (M). Quimby–Simonsen Soybean Mill (M). Sioux City–Sioux Soya Company (S). Waterloo–Soy Bean Processing Company (M)

Kansas: Emporia–Kansas Soy Bean Mills, Inc. (M).

Kentucky: Henderson–Ohio Valley Soy Bean Cooperative Association (M). Louisville–Buckeye Cotton Oil Company (L)*. Owensboro–Owensboro Grain Company (S).

Michigan: Dearborn–Ford Motor Company (M)*. Milan–Ford Motor Company (S)*. Saline–Ford Motor Company (S)*.

Minnesota: Mankato–Mankato Soya Products Company (S). Minneapolis–Archer-Daniels-Midland Company (S).

Missouri: Galesburg–Spring River Mill (S). St. Joseph–Dannen Mills (M). St. Louis–Ralston Purina Company (M).

Nebraska: Fremont–Pete Marr Soybean Processing Company (S). Omaha–Allied Mills, Inc. (M).

New York: Buffalo–Spencer Kellogg and Sons (M). Oswego–Oswego Soybean Products Corporation (M).

Ohio: Berea–Berea Milling Company (M). Cincinnati–Drackett Company (M)*. Circleville–John W. Eshelman and Sons (M); Ralston Purina Company (M). Fostoria–Swift and Company (M). Marion–Old Fort Mills, Inc. (M). New Washington–Ohio Soya Company (S). Painesville–A.E. Staley Manufacturing Company (L). Toledo–Archer-Daniels-Midland Company (L); Toledo Soybean Products Company (M). Wooster: Soya Processing Company (M).

Pennsylvania: Jersey Shore–Pennsylvania Soy Bean Cooperative Association (S).

Tennessee: Memphis–Buckeye Cotton Oil Company (M).

Virginia: Norfolk–Davis Milling Company (S). Portsmouth–Allied Mills, Inc. (M); I.F. Laucks, Inc. (S).

Wisconsin: Milwaukee–Archer-Daniels-Midland Company (M).

Note 1. This is the earliest document seen (Dec. 2005) that mentions Dannen Mills (St. Joseph, Missouri) in connection with soybeans.

Note 2. This is the earliest English-language document seen (Sept. 2003) that contains the term "screw presses" (or "screw press") in connection with mechanical pressing of soybeans to give oil and meal (one of two documents).

116. Univ. of Illinois, College of Agriculture. ed. 1944. Report of the First Soybean Processors' Conference. Urbana, Illinois: University of Illinois and Soybean Processors Cooperating. 51 p. Held 24 Feb. 1944 at Univ. of Illinois, Urbana. [26 ref]

• ***Summary:*** "The First Soybean Processors' Conference was held in the Illini Union, University of Illinois, Urbana, Illinois, February 24, 1944. The suggestion for the conference originated with the processors and the program was arranged by the Department of Agronomy, University of Illinois, in consultation and cooperation with the processors and the U.S. Regional Soybean Laboratory."

Program. Chairman: W.L. Burlison. Opening the conference, by Edward J. Dies, President, National Soybean Processors' Association, Chicago, Illinois. How soybean varieties behave, by R.F. Fuelleman, Dep. of Agronomy, Univ. of Illinois (UI). Creating new kinds of soybeans, by C.M. Woodworth, Dep. of Agronomy, UI. Soybeans do have serious diseases, by W.B. Allington, U.S. Regional Soybean Laboratory, U.S. Dep. of Agric (USDA). The place of soybeans in the rotation, by M.D. Appleman, Dep. of Agronomy, UI. Does fertilizing soybeans pay?, by A.L. Lang, Dep. of Agronomy, UI. What does it cost to produce soybeans, by R.H. Wilcox, Dep. of Agric. Economics, UI. Luncheon–Gothic and Federal Room. Illini Union.

Afternoon: Chairman–W.L. Burlison. Soybeans in Illinois–Review and Preview, by J.C. Hackleman, Dep. of Agronomy, UI. The work of the U.S. Regional Soybean

Laboratory–Jackson L. Cartter, U.S. Regional Soybean Lab., USDA. The soybean in the postwar World, by Lamar Kishlar, Ralston-Purina Co., St. Louis, Missouri. Practical problems of the soybean processor, by D.J. Bunnell, Central Soya Co., Chicago, Illinois. Other soybean investigations in progress (informal), by W.L. Burlison, Dep. of Agronomy, and E.W. Lehmann and D.G. Carter, Dep. of Agric. Engineering, UI.

On pages 50-51 is list of the name, address, and organization of the conference attendees. Address: Urbana, Illinois.

117. Kishlar, Lamar. 1944. The soybean in the postwar world. *National Farm Chemurgic Council, Chemurgic Paper* No. 304. 5 p. March 31. [2 ref]

• ***Summary:*** "Before the Tenth Annual Chemurgic Conference, St. Louis, Missouri. March 31, 1944.

"The production and preservation of food is man's oldest and greatest problem. Wars have been lost, nations destroyed, because the food supplies failed. In the global wars which we are now fighting more lives have been lost, more people maimed through lack of proper food than because of all the bullets and bombs and all the other destructive machines of Mars combined. What is more tragic, for a generation after peace is restored in this warring world this terrible toll of death and impairment will continue to be collected.

"Food will be the world's dominant problem not only in 1944 but also for the decade after bombers have been converted into transport and jeeps into tractors. Even if victory comes in 1944 we will still have the problem of a hungry world. In the years from 1918 through 1924 there was greater misery and suffering in Europe than during World War I itself.

"The most outstanding contributions toward food production and preservation have always been made in periods of war. The development of canning, which has done more to distribute our food wealth equitably than any other development, was the result of the Napoleonic conquests. Napoleon, hard-pressed to feed his sailors and soldiers during his Egyptian campaigns, offered a prize of 12,000 francs, equivalent to about $35,000, to the one who could find a better way to preserve food. Nicolas Appert, a Paris confectioner, won the prize by being the first to preserve food by sealing it in large glass bottles. Thus war was the cause of a development in food technology which has revolutionized the food habits of the civilized world.

"In a similar way a war has given the soybean its big opportunity. With the entrance of the United States into World War II both our fats and our protein situations were transformed from a condition of plenty to one of scarcity.

"It was most fortunate that the soybean had secured a firm position in the domestic economy before war clouds appeared and that its production had grown from a mere 5 million bushels in 1924 to 107 million bushels in 1941. Within a few days after Pearl Harbor the farmers of America were asked to increase their soybean acreage by a large margin over 1941. They responded by raising a crop of about 187 million bushels which would have been even larger if weather and the shortage of manpower had not reduced the net return. The 1943 crop was another big one, estimated at 196 million bushels. In 1943, the weather man helped the farmer so that the quantity of the beans harvested and the quality of both the oil and the protein made from the beans probably will considerably exceed the value which would be indicated by a comparison of the acreage figures alone. In only 20 years the soybean has multiplied itself nearly 40 times–an astonishing record. But it does not indicate what the soybean can do in the postwar-world.

"Soybean oil does not directly substitute for coconut or palm oils which have been cut off by the war, because coconut and palm oils have some unique properties not found in domestic oils. Under emergency conditions there is a shifting of all oils and fats so that, in general, any good oil finds a place for itself in the national economy and helps take up the impact caused by supplies which have been curtailed. If soybean oil could take the place of all the fats and oils which have been cut off by the war it would require about 166 million bushels of soys each year to do the job. The total domestic crush last year was only 132½ million bushels, or only eighty percent enough to do the replacement job alone. In recent weeks 150 million pounds of lard were consigned to the soap kettle. It will require the oil from 18 million bushels of beans, which is 16 percent of last years crush, to produce enough shortening to replace the lard so used.

"On the protein side of the ledger we are equally far from the saturation point. It is generally agreed that for efficient production of livestock and poultry, high protein concentrates should be fed with carbohydrate feeds in a ratio of about 1 to 6. On the basis of December 1st crop report, supplies of the four principal feed grains, corn, oats, barley and grain sorghums, are expected to total about 106 million tons. More wheat and rye will be fed to livestock in this crop year than in previous years and the supply of wheat millfeeds will be somewhat larger. Thus the supplies of all carbohydrate feeds may be about 117¼ million tons. (1)

"At a ratio of 1 to 6 it would require 20 million tons of high protein feeds (oil meal equivalent) to adequately balance the carbohydrate feed available for efficient livestock and poultry production. Supplies of high protein feeds are now estimated at 10.6 million (1) tons (oil meal equivalent). Simple arithmetic shows that there is a shortage of 9.4 million tons of high protein concentrates which, if it could be supplied by the soybean, would require 376 million bushels or nearly three times our present crush to supply the protein shortage alone. Thus, although we sometimes reach temporary man-made saturation points in our climb toward a greater industry, we are far from the point where the soybean will fill the total theoretical demand for either oil or protein

concentrates. The reason we sometimes reach temporary saturation points in peacetime years is because of man's inability to equitably distribute the bounty of the land so that our livestock and poultry is adequately fed in times of peace.

"Even in normal peacetime years the livestock and poultry of the United States are not fed on an average on a desirable or efficient protein level. The Feed Industry Council have estimated that if all the livestock and poultry being fed in 1944 were fed a protein level equal to the average figures on protein consumption during normal years, when the stock had to be fed on the stock pile of homegrown and purchased feed alone with roughage, it would require 14.1 million tons of high protein feeds exclusive of alfalfa meals. This is an increase of 3.5 million tons over our present high protein concentrate supplies. It would require twice our record crush of soybeans of this year to make up the deficit. Thus the United States has always been short of protein concentrates for economical and efficient meat, milk and egg production.

"This year a large part of the vegetable oils produced will be made into edible products such as shortening, oleomargarine and salad oil. Today and tomorrow the demand is for food and more food.

"One day peace will return to this war-torn world and such things as ceiling prices and trade restrictions will be lifted. Then soyoil must compete on its own merits in a world full of other fats and oils. Keen men, far-seeing corporations and progressive associations are planning their postwar program right now to meet competition of a postwar world.

"If we study the consumption of primary vegetable oils in 1943 we find that 98½ percent of the soyoil found its way into food products where it commanded the best price. The remaining 1½ percent found, its way into soaps, paints, linoleum, printing inks, core oils and similar mechanical uses where, in general, it competes with the cheaper oils such as fish oil and inedible animal greases. In 1941, a more normal year, the ratio between food and technical uses was about 3½ to 1. We must plan our campaign so that in normal years we secure a larger share for food uses.

"Soyoil is very versatile. It has many properties which make it desirable as food oil. At the same time, it has many qualities which recommend it for technical uses. Chemists have a test for evaluating the drying properties of an oil; it is called the iodine number of the oil. The higher the iodine number of the oil the better it is for technical purposes where quick-drying properties are desired. On the other hand, for edible uses an oil with low iodine value is prized, because low iodine number indicates better keeping qualities. Cottonseed oil has an iodine number of about 100-108, soyoil has an iodine value of about 123-143, while linseed oil has a high iodine value of about 195-200" (Continued). Address: Ralston-Purina Company, St. Louis, Missouri.

118. Kishlar, Lamar. 1944. The soybean in the postwar world (Continued–Document part II). *National Farm Chemurgic Council, Chemurgic Paper* No. 304. 5 p. March 31. [2 ref]
• ***Summary:*** (Continued): "In the early days of the soybean's domestication large quantities of cottonseed oil and animal fats were available at low prices. Partly because of the price situation then existing and partly because of the romantic attraction of creating new industrial uses, most of the creative thinking was devoted to developing soybeans with high iodine number oil, and greater progress was made along this line.

"In 1933, just ten years ago, less than one million pounds of soyoil were used for all edible purposes while 22 times that amount were used for soap, paint, linoleum and in similar mechanical products. Today, the figures are reversed and nearly 1-1/5 billion pounds are used for food while less than 1/60 that amount finds its way into mechanical industry. Thus the soybean finds its greatest opportunity in the postwar world in the food field. If the soybean is to retain its share of the edible oil market, soybean varieties yielding light-colored, bland-flavored oils with low iodine numbers are desired. It is no longer enough to evaluate a soybean variety by its yield of seed alone. The quality of the protein and oil produced from the seed must also be evaluated if the soybean is to retain its dominant position. The grower of the soybean will be a most important factor in the campaign of the soybean to capture its rightful place in the food field of the postwar world. Each year many beans become impaired; some become damaged by nature's causes, others become injured because of the frailty of man, and many become needlessly harmed because the producer of the beans did not realize what became of his raw material and how greatly a little damage can affect the final quality of his product. Tremendous advancement has been made in the science of refining fats and oils in the last forty years. It was not until 1902 that Norman, an English chemist, made the first commercial application of hydrogenation, which is the combining of hydrogen gas with vegetable oils to harden the liquid oils into solid or semi-solid fats. At about the same time, David Wesson, an American, was developing his epoch-making process for the vacuum deodorization of edible fats and oils. Without this, hydrogenation would have been impractical for food, because the hydrogenation process produced a strong unpleasant flavor which had to be removed. It was not until the first World War that shortenings which had a neutral flavor, odor, and color were produced solely from vegetable oils. In more recent years, manufacturing methods have been further improved by processing molten oils through special machines. These quickly chill and plasticize the mixture until it has special physical properties highly prized by the baker. The incorporation of inert gas instead of air has given additional improvement to the flavor and keeping quality of the product until now the supremacy of lard is threatened.

"Within a few short years, the oil technologist has created new man-made products from vegetable oils which, on their own merits, have crowded many animal fats formerly used into the soap kettle. The oil chemist needs the continued help of the grower of vegetable oil seeds so that the products which the chemist makes may continue to hold this supremacy. The modern oil chemist has a whole bag of tricks for decoloring dark oils and for removing unpleasant odors and flavors. But these modern refining methods are relatively costly, require special handling of the oil, and reduce the manufacturing capacity. The excessive treatment which many dark oils require removes some of nature's protective substances from the oil so that the resulting product may have a poorer keeping quality. In too many cases, the chemist fails to remove all of the odor and color and the resulting refined oil must be diverted into a product of lower quality than intended.

"Thirty-six percent of all the soybeans grown in the United States last year were harvested in Illinois. Eighty-five percent of all soybeans harvested for seed in 1943 were grown in the four states of Illinois, Iowa, Indiana and Ohio. (2) The reason that the soybean is concentrated in these states is not entirely because these states pioneered in the growing of this crop nor that the farmers in this area are more experienced in its cultivation. Part of the cause of the phenomenal growth of the soybean in this section is due to the soil and the climate.

"Ohio, Illinois, Iowa and Indiana have a potential yield over 1,000 pounds of soybean oil meal per acre. This figure is based on the average yield of soybeans per acre for 1942 and 1943. (2) Missouri and the lower half of Michigan and Wisconsin have a potential yield of from 750 to 1,000 pounds of soybean oil meal per acre. The other states bordering this area have a potential yield of only 500 to 750 pounds per acre, or only about half the average yield of the four leading states while the remaining states have slim possibilities except for isolated areas.

"As new varieties of soybeans are developed which yield better on southern soil in southern climate and as the farmers in the states where soybean culture is still new become experienced the states in the low yielding areas may advance into higher yielding areas. It was not until 1944 that Ohio, Indiana and Iowa took their place beside Illinois in the top yield group.

"The soybean grower can no longer be satisfied with bushels per acre alone. The soybean crusher must broaden his horizon to think beyond goals measured in terms of tons of oil meal and pounds of oil. The soybean technologist of the postwar world must think as much about color, odor, flavor and keeping quality of this oil as he does about high yields and low refining losses. Moreover, the soybean technologist must think as much about proper cooking and extraction to give better flavor, better uniformity, and better growth in oil meal as he does about percent nutrients printed on the tag. It is final results–not printing on the label–which will count in this postwar world.

"If the soybean is to retain its leadership in the world of tomorrow, the grower, the processor and the refiner must think more about Mr. Boss, the man who uses the final product. If the soybean is to move into the postwar world without serious repercussions, we who are helping to guide its destiny must see in each bushel of soybeans not just 60 pounds of seeds–we must adjust our vision to see in each bushel 10½ pounds of margarine or 8.4 pounds of shortening or 8.4 pounds of salad oil which will, in turn, produce from 13 to 25 pounds of salad dressing depending on the kind. We must not only see in each bushel fifty pounds of soybean oil meal. We must also see in each bushel fifty pounds of the highest quality protein which when properly balanced with the right amounts of carbohydrates, vitamins, and trace minerals will help produce more milk, more butter, more beef, more pork or more chicken to feed a hungry world.

"1. Feed Supplies and Needs. Feed Industry Council, January 1944. (based on January 1, 1944 Crop Report)

"2. United States Department of Agriculture Crop Report, December 19, 1943." Address: Ralston-Purina Company, St. Louis, Missouri.

119. *Soybean Digest.* 1944. Iowa processors hold forth at Ames. March. p. 10.

• ***Summary:*** "About 40 soybean processors of Iowa and surrounding states and others connected with the processing industry attended the first annual Iowa Soybean Processors' Conference held at Iowa State College March 9. Dr. H.D. Hughes, head of the Farm Crops Department of the college, was chairman of the conference. Papers presented

by members of the college staff covered studies of the agronomic and economic phases and work with the solvent extraction process. Speakers included Dr. Hughes; I.J. Johnson, crop breeding; C.R. Weber, assistant agronomist, United States Department of Agriculture; A.I. Englehorn, soils; W.H. Pierre, professor of agronomy; L.K. Arnold, chemical engineering department; E.L. Barger, agricultural engineering research; and C.E. Malone, farm management specialist.

"Other speakers included Edward J. Dies, president of the National Soybean Processors Association, Chicago; Lamar Kishlar, president of the Oil Chemists' Association, St. Louis; and Howard Roach, vice president of the American Soybean Association, Plainfield, Iowa.

"Some of the papers presented at the Iowa conference are published in this issue. It is hoped to carry more of them in later issues.

"The processors 'kicked off' with a dinner at the Sheldon-Munn hotel the evening before the conference, and organized the Iowa Soybean Processors Association. The 31 soybean processors in the state are members. Donald B. Walker, manager of the Iowa Falls plant of the Ralston Purina Co., was elected president of the Association. It is planned to make the conference an annual affair to enable the industry to keep in close touch with the work being conducted at the college.

"Those present: Representatives of processing companies who attended the meeting included: Don Edison, Farmers Grain Dealers Association, Fort Dodge, Iowa; Ralph Wells, Ralph Wells and Co., Monmouth, Illinois; H.R. Straight, Iowa Soya Co., Redfield; Howard L. Roach, J. Roach Sons, Inc., Plainfield; L.O. Hauskins, Cargill, Inc., Cedar Rapids;

"R.W. Jurgins, West Bend Elevator Co., West Bend; C.K. Gordon, Farmers Co-op Elevator Co., Martelle; Glen Pogeler, North Iowa Cooperative Processing Association, Manly; E.O. Woodard, Western Soybean Mills, Sioux Falls, S.D.; J.L. Parmenter, Big 4 Co-op, Sheldon; Harry Grubs, Farmers Co-op. Elevator Co., Hubbard; Edward J. Dies, National Soybean Processors Association, Chicago; Walt Flumerfelt, General Mills, Inc., Minneapolis [Minnesota]; Karl Nolin, Farmers Co-op Association, Ralston; C.M. Gregory, Farmers Co-op Co., Dike; Eugene E. Woolley, General Mills, Inc., Belmond; Hjalmar N. Johnson, Ralston Purina Co., Iowa Falls; Bob Scroggs, Sioux Soya Co., Sioux City; Clark A. Cooley, Spencer Kellogg and Sons, Des Moines; Hugh Sanders, Spencer Kellogg and Sons, Des Moines;

"Victor Claude, Boone Valley Co-op, Eagle Grove; A.F. Leathers, Swift and Co., Des Moines; Art Kliever, Sioux Soya Co., Sioux City; M.R. Eighmy, Cooch Mill and Elevator Co., Lincoln; H.E. Schroeder, Muscatine Processing Corporation, Muscatine; C.F. Marshall, Allied Mills, Inc., Chicago; L.J. Murphy, Allied Mills, Inc., Omaha [Nebraska]; Ernie Lyster, Iowa Soya Co., Redfield; H.R. Schultz, Pillsbury Flour Mills Co., Centerville; Donald B. Walker, Ralston Purina Co., Iowa Falls; Odell Simonsen, Simonsen Mill Rendering Plant, Quimby; W.E. Simonsen, Simonsen Mill Rendering Plant, Quimby;

"Ed O`Connor, Soy Bean Processing Co., Waterloo; E.L. Dutcher, Swift & Co., Des Moines; Hjalmer Johnson, Ralston Purina Co., Iowa Falls; A.J. Monach, Dannen Grain & Milling Co., St. Joseph, Missouri; Charles E. Nelson, Thomson's Soya Mill, Hiawatha, Kansas; A.G. Thomson, Thomson's Soya Mill, Hiawatha, Kans.; J.J. Thomson, Thomson's Soya Mill, Hiawatha, Kans.; and J. Morgan Wilson, Honeymead Products Co., Spencer."

120. *Soybean Digest.* 1944. Purina builds new plant at Kansas City [Missouri]. April. p. 10.
• ***Summary:*** "The Ralston-Purina Co. on March 17 began the construction of a large soybean processing plant in the industrial area of North Kansas City [Missouri]. It will be the largest in the Kansas City area and will further fortify it as a major soybean market. The plant is scheduled for completion by Oct. 1, and will have a capacity of 4,000 bushels a day. The property adjoins Purina's feed mill in Kansas City."

Mr. G.H. Banks will be in charge of the new plant. For 7 years Mr. Banks has been head of the company's experiments at its plant in Osceola, Arkansas. Before that, he was head of the Arkansas Experiment Station at Stuttgart.

"The company has embarked on a program of soybean education and development as a pay crop as it did in Arkansas."

121. *Soybean Digest.* 1944. Grits and flakes from the industry: Purina Mills taps Kishlar. June. p. 17.
• ***Summary:*** "Pointing toward post-war action, Purina Mills, St. Louis [Missouri], has announced the establishment of a new division designed to work on post-war problems. A commodity development division has been formed with Lamar M. Kishlar, former manager of Purina research laboratories, as director." H.C. Schaefer has been named to manage the company's research laboratory.

122. *Soybean Digest.* 1944. Grits and flakes from the industry: Ralston Purina promotes Donald Walker. July. p. 20.
• ***Summary:*** "Donald B. Walker, manager of the Ralston Purina soybean processing plant in Iowa Falls, Iowa, since its opening in the fall [Dec. 1] of 1942, will become assistant manager of the grain division of the Ralston Purina Co. in St. Louis, Missouri, about Aug. 1. Hjalmar Johnson, assistant manager of the Iowa Falls plant, will succeed Walker."

123. National Soybean Processors Association. 1944. Year book, 1944-1945 (Association year). Chicago, Illinois. 71 p.
• ***Summary:*** Contents: Constitution and by-laws (incl.

committees, code of ethics). Officers, directors and committees for 1944-45. Membership of the National Soybean Processors Association. Trading rules governing the purchase and sale of soybean oil meal. Appendix to trading rules on soybean oil meal: Official methods of analysis (moisture, protein, oil, crude fiber–official). Trading rules on soybean oil. Appendix to trading rules on soybean oil: Uniform sales contract, refining loss method (cup refining test, tentative official centrifugal refining test), soybean oil bleach test–refined oils, free fatty acids, tentative method of grading soybean oil for green color, official method for oil sampling, standard specifications for crude soybean oil for technical uses, moisture and volatile matter (vacuum oven method, hot plate method), modified Gardner break test, iodine number–Wijs method, unsaponifiable matter, official chemists and samplers for oil.

Article IX, Committees, lists and describes each.

The section titled "Officers, directors, and committees" (p. 13-20) states: President: Edward J. Dies. V.P., Chairman Executive Committee: E.K. Scheiter. Secretary: C.E. Butler. Treasurer: E.F. Johnson. Ass't. Treasurer: F.G. Duncanson. Executive Committee: E.K. Scheiter, Chairman, D.J. Bunnell, C.E. Butler, Edward J. Dies, Jasper Giovanna, S.F. Johnson, Mr. June S. Mitchell, H.R. Scroggs.

Board of Directors (Term expiring Sept. 1945): C.E. Butler, H.L. Dannen, Roger Drackett, Howard Kellogg, Jr., W.H. Knapp, H.R. Scroggs. (Term expiring Sept. 1946): H.A. Abbott, D.J. Bunnell, H.E. Carpenter, J.B. DeHaven, Philip S. Duff, P.M. Jarvis. (Term expiring Sept. 1947): J.H. Caldwell, Jasper Giovanna, Mr. June S. Mitchell, E.K. Scheiter, H.R. Schulze, P.E. Sprague.

Standing committees: For each committee, the names of all members (with the chairman designated), with the company and company address of each are given–Traffic and transportation. Research. Technical. Soybean grades and contracts. Oil trading rules. Meal trading rules. Soy flour. Crop improvement. Soybean research council. Trade development. Edible soybean. Handwritten on blank facing pages: Contract. Margarine. Wartime exports (11 March 1945). Soybean oil meal industry advisory committee. Nominating committee (16 July 1945). Uniform rules and standards committee for soybean oil meal (14 Sept. 1945). Urea yield committee (14 Sept. 1945).

The following organizations, and individuals are members of NSPA: Albers Milling Co., Seattle, Washington (W.P. Kyle). Allied Mills, Inc., Board of Trade Bldg., Chicago, Illinois (6 members). Archer-Daniels-Midland Co., Box 839, Minneapolis, Minnesota; Chicago, Illinois; Decatur, Illinois; Toledo, Ohio (5 members). Berea Milling Co. (The), Lexington, Ohio. Blanton Mill (The), St. Louis, Missouri. Boone Valley Cooperative, Eagle Grove, Iowa. Buckeye Cotton Oil Co. (The), Cincinnati, Ohio; Louisville, Kentucky; Memphis, Tennessee. Cairo Meal & Cake Co., Cairo, Illinois. Cargill, Inc., Minneapolis, Minnesota (Julius Hendel); Springfield, Illinois (Eric Nadel); Cedar Rapids, Iowa (L.O. Hauskins); Fort Dodge, Iowa (H.E. Marxhausen). Central Iowa Bean Mill, Gladbrook, Iowa. Central Soya Co., Inc., Chicago, Illinois; Gibson City, Illinois; Decatur, Indiana (3 members). Clinton Co., Clinton, Iowa (E.W. Myers). Concord Soya Corporation, Concord, Michigan (W.C. Whittecar). Dannen Grain & Milling Co., St. Joseph, Missouri. Decatur Soy Products Co., Decatur, Illinois (Jasper Giovanna). Drackett Co. (The), Cincinnati 32, Ohio (Roger Drackett). Elevators & Mills, Inc., Windfall, Indiana (Mr. June S. Mitchell). Fairfield Soy Mill, Fairfield, Iowa (Jos. Sinaiko). Farmers Cooperative Assn., Ralston, Iowa (Karl Nolin). Farmers Cooperative Co., Dike, Iowa (C.M. Gregory). Farmers Cooperative Elevator, Martelle, Iowa (C.K. Gordon -> H.B. Lovig). Fayette Soy Bean Mill, Fayette, Iowa (J.M. Durfey -> W.V. Clark). Funk Bros. Seed Co., Bloomington, Illinois (H.A. Abbott). Galesburg Soy Products Co., Galesburg, Illinois (Max Albert). General Mills, Inc., Vegetable Oil and Protein Div., Minneapolis, Minnesota (W.H. Eastman); Belmond, Iowa (W.E. Flumerfelt). Glidden Co. (The), Cleveland, Ohio (P.E. Sprague); Chicago, Illinois (A.A. Levinson -> R.R. Stegler). Gooch Milling & Elevator Co., Lincoln, Nebraska (M.R. Eighmy). Hemphill Soy Products Co., Kennett, Missouri (W.A. Hemphill). Hiawatha Soybean Mill, Hiawatha, Kansas (A.G. Thomson). Honeymead Products Co., Cedar Rapids, Iowa (D.O. Andreas -> Osborn Andreas); Spencer, Iowa (J.M. Wilson -> Steve Burke); Washington, Iowa (Hugo Lensch). Hoosier Soybean Mills, Marion, Indiana (J.H. Caldwell, Jr.). Huegely Elevator Co., Nashville, Illinois (J.W. Huegely). Hulcher Soy Products, Virden, Illinois (Norman E. Hulcher). Iowa Soy Co., Redfield, Iowa (E. Lyster -> H.R. Straight). Kansas Soybean Mills, Inc. (The), Emporia, Kansas (Ted W. Lord). Laucks (I.F.), Inc., Portsmouth, Virginia (H.F. Armstrong). Mankato Soybean Products Inc., Mankato, Minnesota (Frank J. Bergman -> W.A. Berge). Marr (Pete) Soybean Mills, Fremont, Nebraska (Pete Marr). Mellott Grain Co., Mellott, Indiana (Milford Knowles). Muscatine Processing Corp., Muscatine, Iowa (G.A. Kent). Old Fort Mills, Inc., Marion, Ohio (Ralph Kail). Owensboro Grain Co., Owensboro, Kentucky (William M. O'Bryan). Pillsbury Soy Mills, Clinton, Iowa (Raymond C. Ilstrup); Centerville, Iowa (H.R. Schultz). Procter & Gamble Distributing Co., Cincinnati, Ohio. Procter & Gamble, Ivorydale, Ohio (W.H. Knapp). Producers Cooperative Oil Mill, Oklahoma City, Oklahoma (O.K. Winterringer). Quincy Soybean Products Co., Quincy, Illinois (Irving Rosen). Ralston Purina Co., St. Louis, Missouri (E.F. Johnson); Kansas City, Missouri (G.H. Banks); Lafayette, Indiana (Ralph Guenther); Iowa Falls, Iowa (H.N. Johnson); Circleville, Ohio (Hal Dean). Shellabarger Soybean Mills, Decatur, Illinois (W.L. Shellabarger). Simonsen Brothers, Quimby, Iowa (W.E. Simonsen). Sioux Soya Co., Sioux City, Iowa (H.R. Scroggs). Southern Cotton Oil Co. (The),

Goldsboro, North Carolina (C.S. Ragan); Tarboro, North Carolina (W.A. Moore). Soya Processing Co., Wooster, Ohio (H.H. Heeman). Soy Bean Processing Co., Waterloo, Iowa (C.E. Butler). Soy-Rich Products, Inc., Wichita, Kansas (B.S. Brooks). Spencer Kellogg & Sons, Buffalo, New York; Chicago, Illinois; Decatur, Illinois; Des Moines, Iowa (Howard Kellogg, Jr.). Staley (A.E.) Mfg. Co., Decatur, Illinois (E.K. Scheiter); Painesville, Ohio (H.D. Egly -> Thomas Longbons). Swift & Co., Chicago, Illinois (P.M. Jarvis). Swift & Company Oil Mill, Cairo, Illinois (W.B. Stone). Swift & Company Soybean Mill, Champaign, Illinois (N.P. Noble). Swift & Company Soybean Mill, Des Moines, Iowa (A.F. Leathers). Swift & Company Soybean Mill, Fostoria, Ohio (S.D. Hollett -> H.S. Byrd). Toledo Soybean Products Co., Toledo, Ohio (J.H. Brown). Wells (Ralph) & Co., Monmouth, Illinois (Ralph Wells). West Bend Elevator Co., West Bend, Iowa (R.W. Jurgens). Western Soybean Mills, Sioux Falls, South Dakota (E.A. Woodward). Williams Milling Co., Sac City, Iowa (Leo W. Williams).

Organizations represented on committees: American Soybean Association, Hudson, Iowa (George Strayer, Howard Roach). Illinois College of Agriculture, Urbana, Illinois (Dr. W.L. Burlison, J.W. Lloyd). U.S. Regional Soybean Laboratory, Urbana, Illinois (Dr. R.T. Milner).

Handwritten: New members added since publication of the Trading Rules Book–Big 4 Cooperative Processing Assn., Sheldon, Iowa (Morel M. Stientjes, Mgr., April 1945). Delphos Grain & Milling Co., Delphos, Ohio (Floyd E. Hiegel, Pres., Aug. 1945). Haynes Soy Products Inc., Portland, Indiana (W.V. Helfiker, Office Mgr., May 1945). Holland Pioneer Mills Inc., Ohio City, Ohio (G.A. Holland, Pres., March 1945). Jamesville Mills, Inc., Jamesville, Wisconsin (A. Roger Hook, Mgr., Oct. 1945). Kansas Soya Products Inc. (The), Kansas City, Kansas (Richard Lord, V.P. & Treas., Oct. 1943). North Iowa Cooperative Processing Association, Manly, Iowa (Glenn Pogeler, Mgr., Nov. 1944). Honeymead plant in Spencer, Iowa, bought Doughboy Mills, Inc., New Richmond, Wisconsin (4 Dec. 1945). Washington Soy Mill: Name changed by Joe Sinaiko from Honeymead's plant in Washington, Iowa (19 Dec. 1945).

Note: This is the earliest document seen (March 2008) that uses the name "North Iowa Cooperative Processing Association." The word "Cooperative" is spelled without a hyphen. Address: 3818 Board of Trade Building, Chicago 4, Illinois.

124. *Soybean Digest.* 1944. Agronomy field day at Ames. Oct. p. 8.

• ***Summary:*** "Visitors at Agronomy Field Day at Iowa State College, Ames, September 16, were taken on a conducted tour of the corn and soybean test plots. The groups were shown demonstration material consisting of about 40 varieties of soybeans grown throughout the Central region. Yield, lodging resistance, plant height, seed quality and desirable chemical characteristics were discussed.

"Dr. H.D. Hughes, head of the Iowa State College Department of Agronomy, I.J. Johnson of the college agronomy staff, and R.R. Kalton of the U.S.D.A. Bureau of Plant Industry, conducted the soybean tour.

"The new Lincoln soybean variety, seed for which was released only to certified growers this year, has been hybridized with Richland in an experiment at the Agronomy farm in an attempt to improve its lodging resistance.

"Other hybridization work on soybeans involves crossing vegetable types with the field type to try to give the former the height and yield of the latter. No conclusive results have been obtained in this experiment to date.

"Last year an experiment was begun in which hail damage was simulated in soybeans to test its effect on lodging, maturity and yield.

"Variety yield test plots have been established at Kanawha, Cherokee, Cresco, Hudson and Ottumwa.

"Processors Meet: The Iowa and Western Soybean Processors Association met at the Sheldon-Munn Hotel at Ames from 10 a.m. to 12 on the same day, holding a round-table discussion of the various problems confronting the processing industry.

"H.N. Johnson, manager of the Ralston Purina Co.'s Iowa Falls, Iowa, processing plant, was in charge of the meeting. As the organization is rotating chairmen with a new one at each meeting, Mr. Johnson appointed Clark Cooley, Spencer Kellogg & Sons, Inc., Des Moines, as chairman of the next meeting.

"After a noon luncheon the group took part in the Field Day at the college."

A photo shows a group of men in white hats and white shirts standing in a field of soybeans: "One of three groups at the Iowa State College Agronomy Field Day September 16. I.J. Johnson discusses the objectives of the soybean breeding program."

125. Markley, Klare S.; Goss, Warren H. 1944. Soybean chemistry and technology (Continued–Document part II). Brooklyn, New York: Chemical Publishing Co. vii + 261 p. Foreword by Edward Jerome Dies, President, Soybean Nutritional Research Council. [684 ref]

• ***Summary:*** (Continued): Page 207-216: Table 20: Soybean processing [crushing] mills in the United States. These mills are divided into 3 types: (1) Mills specializing in soybeans (p. 207-10; 73 such mills). (2) Soybean mills under construction or contemplated (p. 210-11; 39 such mills). (3) Temporary and part time soybean mills (p. 211-16; 222 such mills). Solvent extraction plants in group 1 are designated with an asterisk (*). These mills are organized in a 3-column table: alphabetically by state, and with each state alphabetically by city, and with each city, alphabetically by company name. Here we will list only type 1, "Mills specializing in soybeans."

"Arkansas: West Memphis: Arkansas Mills, Inc. (S). Wilson: Wilson Seed and Feed Company (S).

"California: Oakland: Albers Brothers Milling Company (S).

"Illinois: Bloomington: Funk Brothers Seed Company (M). Cairo: Swift and Company (M). Champaign: Swift and Company (L) Chicago: Archer-Daniels-Midland Company (M)* Chicago: The Glidden Company (L)*. Chicago: Norris Grain Company (S). Chicago: Spencer Kellogg and Sons (L). Decatur: Archer-Daniels-Midland Company (L)*. Decatur: Decatur Soy Products Company (M). Decatur: Spencer Kellogg and Sons (L). Decatur: A.E. Staley Manufacturing Company (L). Galesburg: Galesburg Soya Products Company (M). Gibson City: Central Soya Company, Inc. (L). Monmouth: Ralph Wells and Company (S). Peoria: Allied Mills, Inc. (L). Quincy: Quincy Soybean Products Company (M). Springfield: Illinois Soy Products Company (M). Taylorville: Allied Mills, Inc. (M).

"Indiana: Decatur: Central Soya Company, Inc. (L)*. Indianapolis: Evans Milling Company (M). Lafayette: Ralston Purina Company (M). Marion: Hoosier Soybean Mills, Inc. (M). Mellott: Knowles and Sons, Processors (S). Windfall: Elevators and Mills, Inc. (S).

"Iowa: Cedar Rapids: Honeymead Products Company (M)*. Cedar Rapids: Iowa Milling Company (M). Centerville: Standard Soybean Mills (M). Clinton: Clinton Company (M)*. Des Moines: Spencer Kellogg and Sons (M). Des Moines: Swift and Company (M). Fayette: Wilbur Bell, Inc. (S). Fort Dodge: Plymouth Processing Mills (M). Gladbrook: Central Iowa Soybean Mill (S). Iowa Falls: Ralston Purina Company (M). Quimby: Simonsen Soybean Mill (M). Sioux City: Sioux Soya Company (S). Waterloo: Soy Bean Processing Company (M).

Kansas: Emporia: Kansas Soy Bean Mills, Inc. (M).

"Kentucky: Henderson: Ohio Valley Soy Bean Cooperative Association (M). Louisville: Buckeye Cotton Oil Company (L)*. Owensboro: Owensboro Grain Company (S).

"Michigan: Dearborn: Ford Motor Company (M)*. Milan: Ford Motor Company (S)*. Saline: Ford Motor Company (S)*.

Minnesota: Mankato: Mankato Soya Products Company (S). Minneapolis: Archer-Daniels-Midland Company (S).

"Missouri: Galesburg: Spring River Mill (S). St. Joseph: Dannen Mills (M). St. Louis: Ralston Purina Company (M). Fremont: Pete Marr Soybean Processing Company (S). Omaha: Allied Mills, Inc. (M).

"New York: Buffalo: Spencer Kellogg and Sons (M). Oswego: Oswego Soybean Products Corporation (M).

"Ohio: Cincinnati: Drackett Company (M)*. Circleville: John W. Eshelman and Sons (M). Circleville: Ralston Purina Company (M). Fostoria: Swift and Company (M). Lexington: Berea Milling Company (M). Marion: Old Fort Mills, Inc. (M). New Washington: Ohio Soya Company (S). Painesville: A.E. Staley Manufacturing Company (L). Toledo: Archer-Daniels-Midland Company (L). Toledo: Toledo Soybean Products Company (M). Wooster: Soya Processing Company (M).

"Pennsylvania: Jersey Shore: Pennsylvania Soy Bean Cooperative Association (S).

Tennessee: Memphis: Buckeye Cotton Oil Company (M).

Virginia: Norfolk: Davis Milling Company (S). Portsmouth: Allied Mills, Inc. (M). Portsmouth: I.F. Laucks, Inc. (S).

"Wisconsin: Milwaukee: Archer-Daniels-Midland Company (M)." Address: 1. Principal Chemist, Southern Regional Research Lab., New Orleans; Northern Regional Research Lab.; 2. Senior Chemical Engineer, Northern Regional Research Lab., Peoria, Illinois.

126. Bunnell, D.J. 1945. Birth and development of a new industry. *Soybean Digest.* March. p. 8-10.

• ***Summary:*** European companies pioneered the manufacture of solvent extraction plants for soybeans. In the mid-1930s, the first complete plants of this type were imported to the USA from Germany. It took only a few years for the U.S. soybean processing industry to recognize the basic advantages of the solvent extraction process. Today solvent extraction equipment comprises about 22% of U.S. soybean processing capacity.

In 1934, Central Soya Company started with six expellers which had a capacity of 2,400 bushels per day. In 1937, we imported from Germany an extraction unit having a capacity of 9,000 bushels per day. By this time we had also added four expellers to the original six. Our operation was carried on at one location, namely, Decatur, Indiana. Today we have three plants; one in Illinois, the original, one in Indiana, and one in Ohio. We are operating 38 expellers; the extraction unit has been improved and its capacity increased until now our company has a total daily crushing capacity of 44,000 bushels per day. This is a growth of about 1,800 percent in one decade."

Note: This is the earliest document seen (Jan. 2009) concerning soybean crushing statistics in the United States.

"The reasons for the many interests to enter the field of soybean processing were divergent in accordance with the special activities of these firms. Old, oil seed processors who dominated the technical [industrial] oil field–such as Archer-Daniels-Midland Co. and Spencer Kellogg & Sons–approached soybeans to round out their complete line of technical oils. Another group which included Central Soya Company, Ralston Purina and Allied Mills had faith in soy protein as an important ingredient to round out their mixed feed manufacturing operations. A third group was made up of edible oil refiners and included A.E. Staley Mfg. Co., Swift & Co., Procter & Gamble, and Durkee Famous Foods, all of whom led the research which opened new uses for soybean

oil for edible purposes.

"The last important group to have entered the soybean field have been large flour millers such as General Mills and Pillsbury Flour Mills who were drawn to soybeans now that soy flour is being accepted more generally by the bakery trade. Success in such a short period of time can be attributed to the fact that laboratory research was conducted from so many different viewpoints at the same time."

The more that soybean processors got to know the soybean, the more products they realized could be made from it: lecithin for many uses; soy flour for bakers, the candy trade, meat packers, U.S. retail stores, and Lend-Lease overseas. In short, companies began to diversify. "Staley, originally oil refiners and corn processors, advertises soy flour in your New York subways. Archer-Daniels and The Glidden Co. find themselves in the mixed feed business, while Spencer Kellogg, technical oil specialists, now distribute shortening to the bakery trade. These are but a few examples of the different avenues into which soybean processors have been led."

Photos show: (1) Portrait of D.J. Bunnell. (2) Indiana Farm Bureau Cooperative Association extraction plant at Danville, Indiana, constructed during 1944 in a large Quonset hut. Address: Until recently vice president of Central Soya, Inc.

127. *Soybean Digest.* 1945. Ralston Purina sells Osceola, Ark., plant. Developed Ralsoy strain. May. p. 7.
• ***Summary:*** "The cottonseed processing mill and dehydrating plant of the Ralston Purina Co., at Osceola, Arkansas, has been sold to Lee Wilson & Co., of Wilson Arkansas, at a sale price of $175,000, it is announced by E.F. Johnson, manager of the soybean and oil meal division of the Purina Co. It is understood that Wilson & Co., will continue operating the Osceola mill.

"Ralston Purina Co. purchased the plant 10 years ago with the plan of developing it into a major soybean processing location. Realizing that no processing plant can operate unless the farmers in the area can produce the needed raw material at a profit, the firm spent between $10,000 and $15,000 in research and experimental work."

G.H. Banks, who was manager of the Arkansas plant until his recent transfer to take charge of the firm's new processing plant at Kansas City, Missouri, "developed the Ralsoy strain which, in addition to outyielding the parent stock some 4 to 6 bushels to the acre, showed an oil content around 19 percent as compared to 16 to 17 percent for the Arksoy.

"However, after four or five years of crushing soybeans at Osceola failure to show profits resulted in a careful analysis of the whole operation. It was discovered that it required from eight to 10 times as much manpower to produce a ton of soybean oil meal at the firm's Osceola hydraulic plant as compared with its expeller plant at St. Louis. At a time when southern labor could be hired at 20 cents an hour this was not so serious a problem as now when labor costs 45 to 55 cents an hour."

128. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Kansas City, Missouri.
Date of Introduction: 1945 June.
Ingredients: Soybeans.
New Product–Documentation: *Soybean Digest.* 1945. "Purina opens new plant at Kansas City" [Missouri]. June. p. 14. "A new soybean processing plant with four super-expellers having an annual capacity of 1,000,000 bushels opened June 1 in Kansas City, Missouri, as the fifth soybean plant of Purina Mills..."

Soybean Digest. 1946. Sept. p. 12. "Ralston Purina Company's 5 soybean processing plants or cash markets for soybean growers." One of the five plants is in Kansas City, Missouri.

129. *Soybean Digest.* 1945. Purina opens new plant at Kansas City [Missouri]. June. p. 14.
• ***Summary:*** "A new soybean processing plant with four super-expellers having an annual capacity of 1,000,000 bushels opened June 1 in Kansas City, Missouri, as the fifth soybean plant of Purina Mills...

"John C. Skaggs, manager of Purina's Kansas City operations, William H. Kamp, superintendent, and Hartzell S. Banks [sic, George Heartsill Banks] supervisor of soybean operations, are in charge of the new plant which is the fifth soybean unit for Purina...

"To stimulate soybean acreage, approximately 15,000 bushels of adapted high-yielding seed varieties have been distributed by Purina through county agents and other agricultural agencies to farmers in western Missouri and northeast Kansas."

130. Johnson, E.F. "Soybean". 1945. Soybeans in the postwar world. *Soybean Digest.* Sept. p. 19, 20, 31.
• ***Summary:*** Editor's introduction: "Whither the miracle bean? A thousand and one factors, from the tariff to the acreage of King Cotton, bear on the answer to that question. The author, one of the most experienced men in the soybean industry–he has been associated with it as grower or processor, since 1911–leads off with a highly stimulating discussion."

"Since I am not a prophet, not endowed with any peculiar visionary aptitude, my acceptance of assignment, 'Soybeans in the Postwar World', must come under the old adage–'Fools rush in where angels fear to tread!' Such a status naturally gives me unlimited rights in selecting the method of treatment of the subject.

"Rather than be guilty of the error of many prognosticators in trying to convince the audience (readers

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in this case) of the logic of their deductions, I prefer to cite as completely as time and space will permit, the factors that will in the end determine the place of soybeans in any era. In such an approach a few fundamental questions must be considered: (1) Why do farmers grow soybeans? (2) Why are plants built for processing soybeans and soybean oil? (3) Why do consumers buy soybean products? A correct and complete analysis of these three questions will give any analyst the answer to the major issue, 'Soybeans in the Postwar World.'

"In spite of all camouflage as to why people do things; why laborers work in a mill, why farmers plow fields, why money is invested in enterprise, why soybean oil meal is fed in place of something else, the final answer in the end always pivots around 'money', or in a nicer phrase we all like better, 'profit'. Some would interpret this as 'better living standards', 'higher plane of civilization', or even 'better world conditions'. Regardless of what you call it, all are thinking of money to be received, or profit.

"Price of Soybeans: The price of soybeans is the major issue. To the grower the price of soybeans means price per bushel, times bushels per acre, less cost of producing, plus any beneficial soil effects. To the processor the price of soybeans means what he can afford to pay for a bushel of soybeans. This price will always be the value of the products produced, less the cost of producing and marketing these products, less a reasonable profit. To the consumer of soybean products the price of soybeans means what he is willing to pay for these commodities as compared to the cost of similar competitive products. Strange as it may seem, but in a free economy the last five words in the preceding sentence determine price per bushel of soybeans. In other words, 'Cost of similar competitive products' will in the end determine the price the grower will receive for the soybeans he grows. With this brief review of our basic economics, we can now consider some of the uncertain factors that will determine the place of soybeans in postwar era.

"Governmental Regulations: An emergency factor that nullifies many of the basic economic influences, is governmental control of all oilseeds and a law requiring the government to guarantee 90 percent of parity prices for a 2 year period following termination of war with Japan. During this 2 year period the future of soybeans through subsidy to growers and others, might easily be expanded to a pinnacle of mythical size that would collapse like the well known bubble. On the other hand, soybean utilization might suffer untold damage by drastic penny-pinching whims. The parity price, or any governmental price established, is by itself of little importance. The issue becomes, 'What is the relationship of any such established price to prices of other farm commodities?' The net return per acre as compared to that of other crops will determine the acreage of soybeans, not only in the 2-year postwar era, but always. If ceiling and floor prices are continued on soybean products their relationship to prices of all other similar products is the issue. Many of us doubt if a correct relationship between such commodities can ever be determined without the constant aid of free and unhampered markets and a return of normal distribution methods.

"Reciprocal Trade Agreements: The new reciprocal trade agreement gives the president power to reduce the existing duties of vegetable oils and meals by 50 percent. The story of the growth of soybeans in the U. S. has many chapters dealing with the serious threat of cheap foreign, oils and meals. Older members of the American Soybean Association are only too well aware of the battle of existence resulting from the flood of these products. A 50 percent reduction in duties and tariffs on foreign vegetable oils and meals could reduce the present 200 million bushel yearly crop to a few million and bankrupt every processing plant in the U.S. Will efforts to appease political relationship with neighboring nations sacrifice the soybean grower and industry?

"Competitive Crops: The major competitor of soybeans is King Cotton. Many proposals are under consideration for a solution of the cotton problem, and although these proposals differ widely, they are all predicted on a drastic reduction of cotton acreage. Such a reduction will naturally reduce supplies of cottonseed oil and meal thereby increasing the outlet and demand for soybean oil and oil meal. Will the South replace much of this cotton acreage with soybeans and by so doing actually increase the total supply of vegetable oil and vegetable oil meals?

"Better Livestock Feeding: Some energetic and possibly ambitious animal nutrition expert has worked out data to prove that if all livestock and poultry were fed correct rations, it would require eight or ten times as much total protein as is used today.

"There can be no question but that conditions the past 3 years have developed much improved feeding of livestock and poultry. Will that improvement continue? Will we hold gains already made if prices drop to even favorable pre-war levels?

"Personally, the question perplexes me. Everything I read proves that a balanced ration–one with all the required protein–results not only in cheaper gains or production, but invariably these cheaper gains are the direct result of consuming less total feed. So I am bothered–if everybody incur the wrath of every livestock lover in the nation.

"Plastic, glues, synthetic rubber–these products represent another very difficult group of compounds as these would replace wood, natural rubber, steel and other metals. The possibilities are there. But can soybean products be produced at a competitive cost?

"Constant improvement takes place in equipment and methods for removing the oil from soybeans as well as in the preparation of final products. These costs are already very low, so low that even a 50 percent saving would make only a few cents per bushel change in the price of soybeans. War time stimulation has expanded the soybean crushing industry beyond a probably stable soybean production.

"This is some of the evidence. Much more could be added and some of the above expanded. Each of you may add your bit to the above and answer the major question. As you weigh each particle of evidence you will gradually become more and more thankful that the American Soybean Association is on hand to constantly watch and direct these new developments and keep you advised through the *Soybean Digest.* From the processors I bring you a sincere request that you always remember that we only exist because you soybean growers made our existence necessary."

A large portrait photo (p. 20) shows 'Soybean' Johnson. Address: Manager, Soybean and Oil Meal Div., Ralston Purina Co., St. Louis, Missouri.

131. Purina Mills. 1945. Right on the buckle of the Soybean Belt! (Ad). *Soybean Digest.* Sept. p. 87.
• ***Summary:*** See next page. A full-page ad. "Purina Mills now has 5 soybean processing plants or cash markets for soybean growers. With the addition of its Kansas City plant this year, Purina Mills provides another in a chain of strategically located markets for you soybean growers."

These plants are located at: Iowa Falls, Iowa; Circleville, Ohio; Lafayette, Indiana; Kansas City, Missouri; St. Louis, Missouri. "Buy the feeds that use the soybean. Buy Purina Chows." Illustrations show: (1) A belt with buckle wrapped around a white outline map of the United States. The belt is made of soybeans and a sort of display screen in the buckle shows the location of the 5 Purina Mills soybean crushing plants. (2) An open bag of Purina Chows, with a checkerboard design on it.

132. *Soybean Digest.* 1945. Quarter century with Purina Co. Oct. p. 23.
• ***Summary:*** "Donald Danforth, president of the Ralston Purina Co., St. Louis, Mo., marked his 25th anniversary with

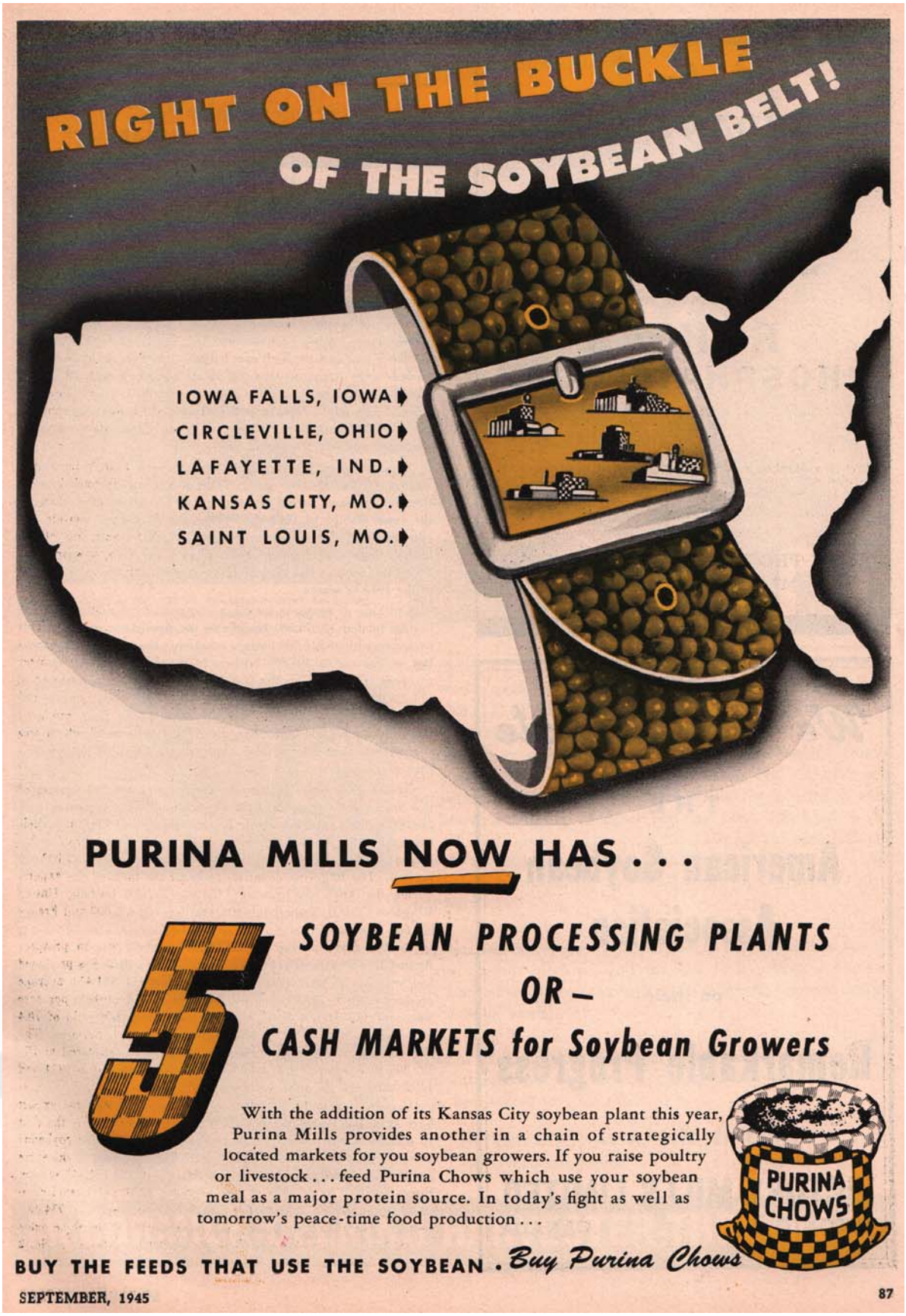
the company recently.

"Danforth is a secretary of the American Youth Foundation, secretary-treasurer of the Danforth Foundation, a trustee of Princeton University and Berea (Ky.) College, a member of the board of governors of the Automobile Club of Missouri, and director of the St. Louis Chamber of Commerce, Y.M.C.A., and the First Bank of East Prairie, Missouri.

A large portrait photo shows Donald Danforth.

133. Massey, George F. 1945. Contribution of power machinery. *Soybean Digest.* Nov. p. 18-19.
• ***Summary:*** Today only one-fifth as much labor is required to produce a bushel of soybeans as was required in 1920, thanks to ever-improving farm machines–especially the combine, which resulted from the marriage of the grain harvester and the grain thresher. "It was fortunate for the American soybean industry that the combination of the grain harvester and thresher into one field-operating unit, known as the combine, came along when it did. Without such a machine the soybean could never have advanced by such leaps and bounds into the very middle of our agricultural picture."

"Certainly the soybean belt could never have been served by the combine without the tractor. Now the self-propelled combine, in all its up-to-date array of rubber tires and expert design, has entered the scene and, with the war behind us, will effect even larger economies with adequate factory production.



"Essentially it is a one-man outfit built around a tractor. It short-cuts the whole harvesting operation. Many soybean growers hail it and are eager to use it when the time comes, perhaps a season or so after V-J Day."

G. Heartsill Banks was the first American to demonstrate that the narrow-row method of planting and cultivating soybeans had great merit. He did this in about 1915 at Colton College, a few miles outside Memphis, Tennessee, planting the soybeans in rows 16 inches apart. Today Banks is superintendent of the new Ralston-Purina soybean mill in Kansas City, Missouri.

134. Purina Mills. 1945. You know what these are! But what is this? (Ad). *Soybean Digest.* Nov. p. 29.
• ***Summary:*** A half-page ad. At the end of the sentence "You know what these are!" are two bold black arrows pointing to an illustration of a group of 8 soybeans. Below this sentence in small print: "They're beans from the plant the Chinese call 'little honorable plant.' Sure, the rich, tremendously valuable and important Soybean!"

At the end of the sentence "But what is this?" are two more bold black arrows pointing to an abstract illustration of a soybean crushing mill. Below this in small print: "It's the new Purina Mills Soybean processing plant at Kansas City–the 5th in the chain of Purina plants spotted around the soy belt at St. Louis, Missouri; Circleville, Ohio; Lafayette, Indiana; Iowa Falls, Iowa; and, now, Kansas City, Missouri. Five strategically located cash markets for soybean farmers.

A third, long, wide black arrow, on which is written (in white) "and this" points to an illustration of bag of Purina Chows, with a checkerboard design on it. Below this lower wide arrow, in small print, we read: "That's easy. Of course, it's that famous Purina Checkerboard bag–symbol of Purina's feed-making reputation built in a half century in the business."

Below the bag, in the lower right corner of the ad is a bold black box, inside of which is written: "Soybean growers know when they feed their livestock or poultry good Purina Chows they're using a feed that uses the product they raise. They know, too, that the feed in the Checkerboard bag is always top quality."

135. *Soybean Digest.* 1945. Dies to head processor, soy flour boards. Nov. p. 32-33.
• ***Summary:*** "Edward J. Dies, Chicago [Illinois], was elected chairman of the board of the National Soybean Processors Association at a recent meeting of the directors and will represent the industry in Washington [DC]. He is succeeded as president of the Association by his assistant, R.G. Houghtlin, formerly of Ralston Purina Co.

"Mr. Dies has also been elected chairman of the board of the Soy Flour Association for which he will likewise continue to direct policy. R.G. Brierley, Minneapolis [Minnesota], will succeed him as president, and A.E. Leger, Chicago, will become executive secretary November 1.

Mr. Dies has been head of the two organizations for nearly 10 years. During that decade "the soybean industry has risen from a 30 million dollar a year business to a 500 million dollar a year business. Members of the National Soybean Processors Association represent 95 percent of the total regular soybean processing capacity, and range from various small cooperative units to some of the largest corporations in their respective fields. The Soy Flour Association represents more than 90 percent of total production."

Officers point with pride to the fact that under the leadership of Mr. Dies there has never been conflict with any government agency, "and relations have been uniformly harmonious with competitive industries despite the great expansion of the soybean industry. The same industry policies, it was stated, will be retained."

136. *Soybean Digest.* 1945. "Soybean" Johnson leaves Purina Co. Dec. p. 24.
• ***Summary:*** "E.F. (Soybean) Johnson, manager of the soybean and oil meal division of Ralston Purina Co., St. Louis, and one of the old-timers in the soybean business, resigned Nov. 9. He has been succeeded by Donald B. Walker, former manager of Ralston Purina soybean plants at Circleville, Ohio and Iowa Falls, Iowa, and for the past two years grain buyers for Purina Mills at St. Louis.

"'Soybean' has announced no plans for the present beyond a long vacation, the first in 41 years." A photo shows E.F. Johnson.

137. *Soybean Digest.* 1946. Purina Mills' new Kansas City unit. Jan. p. 28.
• ***Summary:*** The new soybean processing unit, added to the Kansas City, Missouri, plant of Purina Mills, started operation on 27 May 1945. It has been working 7 days a week, 24 hours a day. The new unit employs the latest cooker type expellers made by the French Oil Mill Machinery Co. Approximately 1,000 bushels of soybeans are handled through each expeller per day. Photos show the outside and inside of the mill. On the outside, in huge letters inside a checkerboard outline, is written "Purina Mills. Purina Chows. Horses. Cows. Hogs. Poultry. Checkerboard bags."

138. *Soybean Digest.* 1946. "Meet me in St. Louis." At ASA's 26th annual convention, Aug. 29-31. July. p. 8-10.
• ***Summary:*** The American Soybean Association's 26th Annual Convention will be held on August 29-31 in St. Louis, Missouri, at the Hotel Jefferson. The theme: Industrial utilization of soybeans. The preliminary program is shown on p. 10.

"Convention visitors who make the trip Aug. 31 to the Ralston Purina Co., research farm near Gray Summit, Missouri, will find a 712-acre place conducted like any

modern American farm.

"The farm and laboratories are staffed by almost 200 scientifically trained and practical research workers... Over 3,000 head of livestock and 45,000 poultry are handled annually.

"The Ralston Purina Co. was founded in 1893 by Wm. H. Danforth. Chief product at first was horse and mule feed. The research farm was set up 20 years ago to test under actual farm conditions all ingredients and formulas for a business that was then rapidly expanding to serve all parts of the nation."

"Realizing the value of soybean oil meal, the Ralston Purina Co. established one of first soybean processing plants in the United States at Lafayette, Indiana. A little later a processing unit was installed at the St. Louis plant. Following these two, a processing unit was built at Circleville, Ohio, which was the first soybean processing plant in Ohio. In 1942, a processing plant was built at Iowa Falls, Iowa and in 1944, a unit installed at Kansas City" [Missouri].

A large aerial photo shows the 712-acre Ralston Purina Co. research farm at Gray Summit, Missouri.

139. Ralston Purina Co. 1946. Ralston Purina Company's 5 soybean processing plants or cash markets for soybean growers (Ad). *Soybean Digest.* Sept. p. 12.
• ***Summary:*** A full page ad. The 5 processing plants are in: St. Louis, Missouri; Kansas City, Missouri; Lafayette, Indiana; Iowa Falls, Iowa; and Circleville, Ohio.

An isolated photo shows each of the five mills. Across the bottom of the ad: "Buy the feeds that use the soybean. Buy Purina Chows." An illustration shows an opened sack of "Purina Chows" with a checkerboard pattern on it.

140. *Soybean Digest.* 1946. Heartsill Banks goes to Korea. Sept. p. 78.
• ***Summary:*** "Heartsill Banks, for the past 2 years manager of the soybean division for the Kansas City [Missouri] plant of Ralston Purina Co., has resigned to accept a position in charge of rice experimentation and breeding work for the War Department in the American occupied territory in Korea. Mr. Banks embarked for Korea September 3. He will be stationed at Seoul."

"Mr. Banks has been well known in the soybean industry for many years. Prior to his assignment in Kansas City, he was in charge of agronomy operations for Ralston Purina at Osceola, Arkansas. He was instrumental in developing the Ralsoy" soybean variety.

A photo shows Mr. Banks.

141. McIntosh, Otis. 1946. Purina Research Farm. *Chemurgic Digest.* Oct. 31. p. 347-49.
• ***Summary:*** "In 1893 when the country was traveling on bicycles and four-legged horsepower, there was a little business down near the riverfront in St. Louis whose main product was a horse and mule feed sold locally. Even though the company was small and had limited resources, its founder, William H. Danforth, was a man of boundless vision, courage, and ability. From this small company has grown the Ralston Purina Company, which is today one of the largest producers of commercial feeds." Note: This is the only document seen which implies that Ralston Purina was established in 1893.

"In 1926, a research farm was set up for proving and testing, under actual farm conditions, all ingredients in laboratory-developed formulas. This Research Farm consisting of 712 acres, is located near Gray Summit, Missouri..." 43 miles southwest of St. Louis.

"The Purina Research Farm has pioneered in the development and use of many new ingredients used in commercial feeds... Purina research work with soybean oil [meal] dates back to when this meal had to be imported from Manchuria. The few soybeans grown in the United States at that time were for feed. When the value of soybean oil meal was proven, the company began to establish soybean processing plants in different sections of the United States. Today, Purina has five soybean processing plants and yet these plants are able to produce only approximately one half the soybean meal needed, which means that much of the meal used must be purchased from other processors.

"Almost in every place where Purina established a soybean crushing plant, the crushing capacity at the time far exceeded the supply of soybeans in the immediate territory. However, as soon as the plants were built, soybean acreage increased rapidly in the vicinity as farmers had a ready market for their crops."

Photos show an aerial view of the research farm, a portrait of William H. Danforth, founder of Ralston Purina Company, and various parts of the farm.

Note: By 1934-1936 soybean meal made by Ralston Purina Co. was first used in the company's feeds.

142. Ralston Purina Company. 1946. Annual report. St. Louis 2, Missouri. 12 p.
• ***Summary:*** Although the Ralston Purina Co. was founded in 1898, this is the earliest annual report owned by the company's library (as of Nov. 1998).

Contents: Plants of the Ralston Purina Company (shown on a map of the United States and Canada). President's letter to the stockholders, from Donald Danforth, dated 20 Dec. 1946. Ralston Purina Company and domestic subsidiaries consolidated statement of profit and loss: Year ended Sept. 30, 1946. Ralston Purina Company and domestic subsidiaries balance sheet as of Sept. 30, 1946 (2 pages). Notes to financial statements. Accountant's report, by Peat, Marwick, Mitchell & Co., Certified Public Accountants, St. Louis, Missouri, dated 6 Dec. 1946.

Products of the Ralston Purina Company: Ralston

Cereals (Ralston wheat cereal, Instant Ralston for quick cooking, Shredded Ralston, Bite size ready-to-eat, Ry-Krisp whole rye wafers); Purina Chows–Balanced rations for livestock and poultry (for chickens, turkeys, ducks, dairy cows, calves, beef cattle, sheep, hogs, horses, dogs, rabbits, laboratory and fur animals). A personal message to stockholders from the chairman of the board of directors, by William H. Danforth." Illustrations show of a bag of Purina Chows and a box of Ralston Cereals, each with the checkerboard design.

The company has 29 plants in the USA–stretching from coast to coast, and from Houston, Texas, to Minneapolis [Minnesota]–plus one in Montreal, Canada. In St. Louis is the Purina Research Farm, a plant, and the company's general offices. The lifting of government controls and restrictions provides great challenges and opportunities for the company.

For the fiscal year ended 30 Sept. 1946, net sales were $160.2 million, net income was $161.4 million, and net profit was $4.053 million. Total current assets are $35.5 million.

William Henry Danforth, born in 1870 and now age 76, was the founder of Ralston Purina Co. His plan of four-fold personal development, became the company's famous checkerboard logo. His "Personal Message to Stockholders" states: "While this is a financial statement, it must be evident to all that there is far more to a successful company than merely dollars and cents. Since I have been active in our company from it's founding, I would like the privilege of adding a very personal word to this report.

"Our company stands Foursquare before the world represented by our famous Checker trademark.

"Our people stand Foursquare. They are physically strong, mentally alert, socially adjusted to their fellow men, and grounded in character, honesty and religion.

"Our products stand Foursquare, and return full value to those who purchase them. Our cereals–Ralston, Shredded Ralston and Ry-Krisp–add to the good health of our nation. Farming has been raised to a higher and more profitable level because of results from the use of our Purina Chows and Purina Sanitation Products. You can use and boost our whole line with confidence–and as a stockholder like you should.

"A message like this at the end of a financial statement may be a bit unusual, but I wanted to say to you in a personal way that with superior products, with right living and high ideals, we can have confidence in the days ahead.

"My appreciation goes to our Purina Family, both employees and stockholders, for service well done. Daringly yours, William H. Danforth." Address: St. Louis, Missouri.

143. *Soybean Blue Book.* 1947. Processors of soybeans [USA and Canada]. p. 44-64.

• ***Summary:*** Processors are listed by state (alphabetically), and within each state alphabetically by city. For each firm is given the officers, brand names, type of processing equipment, processing capacity, and storage capacity. "Information was obtained through questionnaires sent directly to the processing companies.

Arkansas–Blytheville: Swift & Co. Little Rock: Rose City Cotton Oil Mill. West Memphis: Arkansas Mills.

California–Fresno: Oil Seed Products Co. Oakland: Albers Milling Co.

Illinois–Alhambra: Alhambra Grain & Feed Co. Bloomington: Funk Bros. Seed Co. Cairo: Cairo Meal and Cake Milling Co. Cairo: Swift & Co. Champaign: Swift & Co. Chicago: Allied Mills, Inc. Chicago: Central Soya Co., Inc. Chicago: The Glidden Co. Chicago: Spencer Kellogg & Sons. Chicago: Swift & Co. Decatur: Decatur Soy Products. Decatur: Spencer Kellogg & Sons. Decatur: A.E. Staley Mfg. Co. Galesburg: Galesburg Soy Products Co. Gibson City: McMillen Feed Mills. Kankakee: Bordens Soy Bean Products Co. Mascoutah: Ph.H. Postel Milling Co. Monmouth: Ralph Wells & Co. Nashville: Huegely Elevator Co. Pana: Shellabarger Soybean Mills. Peoria: Allied Mills, Inc. Quincy: Quincy Soybean Products Co. Roanoke: Eureka Milling Co. Rock Falls: Sterling Soybean Co. Springfield: Cargill, Inc. Taylorville: Allied Mills, Inc. Virden: Hulcher Soya Products.

Indiana–Bunker Hill: Ladd Soya Co. Danville: Hendricks County Farm Bureau Co-op. Assn. Decatur: Central Soya Co. Ft. Wayne: Central Soya Co. Frankfort: Swift & Co. Lafayette: Ralston Purina Co. Marion: Hoosier Soybean Mills. Portland: Haynes Soy Products. Rushville: Rush County Farm Bureau Co-op. Assn.

Iowa–Belmond: General Mills, Inc., Chemical Div. Cedar Rapids: Cargill, Inc. Centerville: Pillsbury Mills, Inc. Clinton: Pillsbury Mills, Inc. Des Moines: Spencer Kellogg & Sons, Inc. Des Moines: Swift & Co. Dike: Farmers Cooperative Co. Dubuque: E.E. Frith Co. Eagle Grove: Boone Valley Cooperative Processing Assn. Fairfield: Doughboy Industries. Fort Dodge: Borden's Soybean Processing Co. Fort Dodge: Cargill, Inc. Gladbrook: Central Iowa Bean Mill. Hubbard: Hubbard Soybean Mill, Inc. Iowa Falls: Ralston Purina Co. Manly: North Iowa Cooperative Processing Assn. Marshalltown: Marshall Mills, Inc. Martelle: Farmers Cooperative Elevator. Muscatine: Hawkeye Soy Products. Muscatine: Muscatine Processing Corp. Plainfield: Roach Soybean Mills. Quimby: Simonsen Mill–Rendering Plant. Ralston: Farmers Cooperative Assn. Redfield: Iowa Soya Co. Sac City: Williams Milling Co. Sheldon: Big 4 Cooperative Processing Assn. Sioux City: Sioux Soya Co. Spencer: Cargill, Inc. Washington: Cargill, Inc. Waterloo: Borden's Soy Bean Processing Co. West Bend: West Bend Elevator Co.

Kansas: Coffeeville [Coffeyville]: Consumers Cooperative Assn. Soybean Mill. Emporia: Kansas Soybean Mills, Inc. Girard: Farmers Union Jobbing Assn. Hiawatha: Thomson Soy Mill. Kansas City: Kansas Soya Products Inc. Wichita: Soy-Rich Products, Inc.

Kentucky–Henderson: Ohio Valley Soybean Cooperative. Louisville: Buckeye Cotton Oil. Co. Owensboro: Owensboro Grain Co.

Louisiana–Alexandria: Red River Cotton Oil Co.

Michigan–Concord: Concord Soya Corp. Saline: Soybrands, Inc.

Minnesota–Mankato: Mankato Soybean Products, Inc. Minneapolis: Archer Daniels Midland Co. Minneapolis: Cargill, Inc. Minneapolis: General Mills, Inc. Minneapolis: Spencer Kellogg & Sons, Inc. Preston: Hubbard Milling Co.

Missouri–Kansas City: Ralston Purina Co. Kennett: Hemphill Soy Products Co. Mexico: M.F.A. Cooperative Grain & Feed Co. St. Joseph: Dannen Grain & Milling Co. St. Louis: Blanton Mill, Inc. St. Louis: Ralston Purina Co. Trenton: Central Farm Products Co.

Nebraska–Fremont: Fremont Cake & Meal Co. Lincoln: Gooch Milling & Elevator Co. Omaha: Allied Mills, Inc.

New York–Buffalo: Spencer Kellogg & Sons, Inc. Oswego: Oswego Soy Products Corp.

North Carolina–Clayton: Central Oil & Milling Co. Farmville: Farmville Oil & Fertilizer Co. Hartford: Southern Cotton Oil Co. New Bern: New Bern Oil & Fertilizer Co.

North Dakota–Grand Forks: North Dakota Mill & Elevator.

Ohio–Bellevue–Spencer Kellogg & Sons, Inc. Circleville: John W. Eshelman & Sons. Circleville: Ralston Purina Co. Cortland: Richards Milling Co. Delphos: Delphos Grain & Milling Co. Fostoria: Swift & Co. Lexington: Lexington Soy Products Co. Marion: McMillen Feed Mills, Inc. Ohio City: Holland Pioneer Mills, Inc. Painesville: A.E. Staley Mfg. Co. Springfield: Farm Bureau Cooperative Assn. Toledo: Toledo Soybean Products Co. Wooster: Soya Processing Co.

Oklahoma–Oklahoma City: Producers Cooperative Oil Mill.

Pennsylvania–Jersey Shore: Penna Soy Bean Co.

South Dakota–Sioux Falls: Western Soybean Mills.

Tennessee–Memphis: Buckeye Cotton Oil Co. Tiptonville: West Tennessee Soya Mill, Inc.

Virginia–Norfolk: Davis Milling Co., Portsmouth: Allied Mills, Inc. Portsmouth: Monsanto Chemical Co.

Wisconsin–Janesville: Janesville Mills, Inc.

Canada–Toronto: Dominion Linseed Oil Co. Toronto: Toronto Elevators Ltd. Toronto: Victory Mills, Ltd.

Note: This is the earliest document seen (Nov. 2007) which appears to show clearly that M.F.A. [MFA; Missouri Farmers Association] is now processing soybeans in Mexico, Missouri.

144. *Soybean Digest.* 1947. E.F. Johnson joins Louisville firm. July. p. 30.
• ***Summary:*** "After a year's rest from processing and contract problems, E.F. 'Soybean' Johnson has joined Louisville Soy Products Corp., Louisville, Kentucky, as manager of the oilseeds and oil meals departments... Johnson's work in Arkansas where he developed the Ralsoy variety, will be remembered–it completely changed the soybean outlook there... 'Soybean' is a graduate of Indiana University and holds BS and MS degrees from Purdue... He was formerly in charge of soybean operations for Ralston Purina Co., at St. Louis." A photo shows Johnson.

145. Kimbrough, Mary. 1947. 10,000 witness gay pageantry at veiled prophet ball: another rich chapter in St Louis history. *St. Louis Star and Times* (*St. Louis, Missouri*). Oct. 9. p. 22.
• ***Summary:*** The veiled prophet queen is Dorothy Claggett Danforth. "Chosen by His Mysterious Majesty, the Veiled Prophet, as 'the fairest maid of his beloved city, Miss Dorothy Claggett Danforth today reigns as St. Louis' new Queen of Love and Beauty."

Her paternal grandfather, William Henry Danforth, "launched the now nationally-known Ralston Purina Co. in 1893 at the age of 22, just one year after his graduation from Washington University with a degree in mechanical engineering.

"After serving as the president of the company for 36 years, the elder Danforth relinquished that post in 1932 to his son Donald, father of Queen Dorothy, who then was 12 years out of Princeton University..." Address: Star-Times Women's Editor.

146. *Soybean Digest.* 1947. New laboratory. Oct. p. 24.
• ***Summary:*** "Consolidation of all research laboratory facilities by the Ralston Purina Co., in a new modern 4-story building, which provides approximately 30,000 square feet of floor space, has been announced by Donald Danforth, president. The building includes 35 individual laboratory units engaged in research in human foods, animal feeds, sanitation products, agricultural chemicals, and farm supplies."

A photo shows the new laboratory. Its location is not given, but it is probably in Missouri.

147. *Chicago Daily Tribune.* 1947. List 771 'big' grain dealers: Midwest area men are named. Tell Lindheimer, Rice holdings. Dec. 23. p. 1.
• ***Summary:*** "A [partial] list of 711 names of 'big traders' in commodity markets was made public in Washington [DC] yesterday by Agriculture Secretary Anderson." The names listed were mainly those of professional market operators, brokers, food processors and other commercial interests. The nature of the interests of each individual or company on the list was classified by Anderson as either "long" or "short," and as either "hedging," "speculative" or "spreading." A long interest is one in which a trader contracts to buy a commodity (such as wheat or soybeans) at a certain price in the future. A short trader is one who contracts to deliver a

commodity in the future at an agreed price.

Companies listed included: Cargill, Inc. (Minneapolis [Minnesota]). Continental Grain Co. (Chicago, Illinois). Honeymead Products Co. (Cedar Rapids, Iowa). Ralston Purina Co. (St. Louis, Missouri).

148. Wherry, Larry. 1947. The golden anniversary of scientific feeding. Milwaukee, Wisconsin: Business Press. 120 p. No index. 22 cm.

• ***Summary:*** American Mfgrs. Assoc. calls it the only history of feed manufacturing in the U.S. Scientific feeding was built on an understanding of the importance of protein and a realization that protein was often the limiting factor in the production of meat, milk and eggs. Early sources of protein were often by-products, such as corn gluten and cottonseed meal.

Appendix I, titled "Chronological history of feed manufacturing," covers the period 1875-1945 in the USA. Some important dates:

1864–Emil Wolff, a German chemist, publishes his first feeding standards. Known as the Wolff-Lehmann standards, they indicated the amount of crude protein needed by different classes of animals; however they were not widely used.

1875–John W. Barwell of Leicester, England, brings a feed manufacturing business to the USA, locating in Chicago and Waukegan, Illinois.

1886–Albers Milling Co. is founded by Bernard Albers at Seattle, Washington. In 1895 they began manufacturing feeds. In 1929 this company merged with the Carnation Company. By 1947 Albers operated five feed mills: Seattle, Washington; Portland, Oregon; Oakland, California; Los Angeles, California; and Peoria, Illinois.

1894–Robinson-Danforth Commission Company, St. Louis, Missouri, begins making mixed feeds. In 1898 the brand name "Purina" is adopted, and Purina Mills become part of the new corporation, Ralston Purina Co., headed by William H. Danforth. By 1947 they operated more than 30 feed mills.

1896–Dr. C. Lehmann, of the Berlin Agricultural High School, modifies Wolff's feeding standards to create the Wolff-Lehmann standards, which soon become widely used in Europe and the United States in computing livestock rations; they emphasized that protein was often the limiting factor in the production of meat, milk, and eggs. One of the first protein supplements was corn gluten feed. The American Glucose Co. in Buffalo, New York, sold a feed called "Buffalo Feed." After about 1900 cottonseed meal, and tankage and meat scraps from packing houses, started to be widely used.

1898–American Milling Company organized as a consolidation of Marsden Company and American Milling Company, by Colonel A.G. Winter. Plants at Owensboro, Kentucky; Peoria, Illinois; Linden, Indiana. Note: American Milling Co. later became part of Allied Mills, which crushed soybeans in the plant at Peoria, Illinois.

1904–Northrup King Co. begins manufacturing feeds at Minneapolis, Minnesota. Founded by J.E. Northrup, Preston King, and C.C. Massie.

1920–Nutrena Mills, Kansas City, Kansas, founded by Van Roy Miller. Note: in Oct. 1945 Cargill purchased (for $1.6 million) the three Nutrena feed mills at Kansas City, Kansas; Coffeyville, Kansas, and Sioux City, Iowa.

1920–Pillsbury Flour Mills Co., Minneapolis, Minnesota, begins manufacturing livestock and poultry feeds. Name in 1947: Pillsbury Mills, Inc.

1925–Purina Experimental Farm established by Ralston Purina Co. at Grays Summit, Missouri.

1928–General Mills, Inc. is organized, including Washburn Crosby Company, Red Star Milling Company, Royal Milling Company, Kalispell Flour Mills Company and Rocky Mountain Elevator Company.

1929–Allied Mills, Inc., is formed as a result of the merger of American Milling Company and the McMillen Company. The principal brand names of these predecessor companies, namely "Amco" and "Wayne" were continued after the merger. Now (probably meaning in 1947) operates 7 major feed plants: Peoria, Illinois; Omaha, Nebraska; Fort Wayne, Indiana; East St. Louis, Illinois; Buffalo, New York; Memphis, Tennessee; and Portsmouth, Virginia.

1932–Honeymead Products Company, Cedar Rapids, Iowa, founded by R.P. Andreas. Operating 3 mills... one at Cedar Rapids, one at Spencer, and one at Washington, Iowa. The firm name was originally "Andy's Feeds, Inc.," changed to "Honeymead" in 1936. Note: In 1938 the Honeymead name was first used; the family-owned Honeymead plant began operating in Cedar Rapids in Oct. 1938. In 1944 the Honeymead plant in Spencer, Iowa, began operation, followed in early 1945 by the plant in Washington, Iowa.

1933–Archer Daniels Midland Company [feed mill], Minneapolis, Minnesota, founded by George A. Archer and John W. Daniels.

1935–McMillen Feed Mills, Inc., Division of Central Soya Company, Inc., founded by D.W. McMillen, Sr. Operates 4 feed mills: Decatur, Indiana; Gibson City, Illinois; Harrisburg, Pennsylvania; and Marion, Ohio.

1936–The Glidden Company of Cleveland, Ohio, began manufacturing feeds under the name of Holland Mills, at Piqua, Ohio. This plant was later destroyed by fire, but feed operations were reestablished at Indianapolis as the Glidden Co. Feed Mill Division with brand names of Glidden and Capitol.

1938–Cargill, Inc., of Minneapolis, Minnesota, founded in 1865 by W.W. Cargill, begins manufacturing feeds. In 1945 they bought the Honeymead plant in Cedar Rapids. As of 1947 they operate feed plants at: Minneapolis; Cedar Rapids, Iowa (two plants); Fort Dodge, Iowa; Spencer, Iowa. Address: Chicago, Illinois.

149. *Fortune.* 1948. Cow chows–and wow: The story of Ralston Purina, biggest producer of feed in the land. 37(1):84-91, 146, 149, 151-52, 154, 156. Jan.
• ***Summary:*** An excellent history of the Ralston Purina Co. of St. Louis, Missouri, the largest producer of animal feeds in America. The company traces its origins back to 1893 when it was known as the Robinson Commission Co. It sold mule and horse feed (a mixture of corn, oats, and molasses) to planters along the Mississippi River. Thanks to some money given to him by his father, young William Danforth acquired control of the business and began to make chicken and dairy feeds, and Purina, a whole-wheat cereal.

For more than 50 years it has made animal feeds based on scientific research that lead to 100 different complex formulas–different for each animal at each stage in its growth.

The goal is to help farmers raise livestock and poultry as efficiently and inexpensively as possible. Today Ralston Purina is the leader–by far–in America's $2.5 billion mixed feed industry.

The company is known to consumers mainly for the breakfast cereals and Ry-Krisp it makes, yet the company is basically a feed manufacturer–known to farmers as Purina Mills. Last year (ended 30 Sept. 1947) the company's sales of breakfast cereals and Ry-Krisp crackers accounted for only $10-12 million of the company's total sales of $208.5 million. On the other hand, sales of Purina Chows (feeds) accounted for about $190 million or roughly 91% of total sales. Chicken feed accounted for more than half of Purina's feed volume and one chicken feed formula, Broiler Chow, accounted for about one-sixth of the chicken feed volume, In 1947 profits were $7.6 million.

As large as it may seem, Purina does only 6% of the U.S. commercial feed business today of 30 million tons. Still, it is the giant of the industry, Second largest producer is the Cooperative Grange League Federation Exchange of Ithaca, New York. Of the roughly 6,000 smaller U.S. mixed feed companies, only about 30 make as much as 100,000 tons a year.

Each year, Purina crushes about 8 million bushels of soybeans for their meal, and sells of the 8 million gallons of oil which it views as a byproduct.

Except when he is away on hunting trips or flies east to attend Board meetings of the New York Life Insurance Co., "he shows up at the office every day. A wispy-haired and frail-boned man, he still stands erect and has retained much of the vitality of his youth." He likes others to share his views. Purina employees are not allowed to smoke in their offices. "Men who once worked for the company insist that a man cannot expect far at Purina unless he is active in the church, moderate in smoking and drinking, and agrees with everything the Danforths say." There are apparently many who do share his views, "for of the company's 107 top managers and sales employees, 77 have been with Purina virtually all of their working lives."

Donald Danforth, son of the founder graduated from Princeton in 1920, He then served a 12-year apprenticeship, learning every aspect of the family business. In 1932 he replaced his father as president. Now age 49, he runs the company and has increased Purina's sales tenfold since taking office. His father likes to say that Donald has an executive mind whereas he has a pioneer mind.

In 1945 Ralston-Purina became a corporation, even though it had a net worth of $27.7 million. It needed more money for growth than it could finance from earnings. This initial public stock offering (IPO) increased the company's net worth by 36%.

Purina's chows are tested under real-life situations at its 738-acre experimental farm at Gray Summit, about 40 miles southwest of St, Louis.

Color photos show: (1) William H. Danforth (founder and chairman of the board). (2) Donald Danforth, president. (3) Queen Dorothy C. Danforth. (4) Grand Ole Opry, and Tom Mix, sponsored by Purina. (5) Purina's biggest and best feed mill at Buffalo, New York. The red and white checkerboard is everywhere.

150. *Soybean Digest.* 1948. Grits and flakes... from the world of soy: Ralston Purina Co. plant in Iowa Falls, Iowa. May. p. 42.
• ***Summary:*** "Work is expected to start soon on construction of two additions which will double the processing capacity of the Ralston Purina Co. plant in Iowa Falls. Contract has been let to Blaw-Knox Co., Pittsburgh, Pennsylvania.

Note: Blaw-Knox makes solvent extractors.

151. *Soybean Digest.* 1948. Purina's new Iowa elevator (Photo caption). May. p. 38.
• ***Summary:*** Below a large aerial photo with the very large words "Purina Chows" on a checkerboard background visible on two faces, the caption reads:

"This new elevator providing storage capacity for 820,000 bushels of grains in addition to previous facilities has been put into operation at Iowa Falls, Iowa, by the Ralston Purina Co., manufacturers of Purina Chows, Manager H.N. Johnson reports. The new structure is 296 feet long and 177½ feet high and includes 26 tanks, star bins and a head house. Bins are 120 feet high and 20 feet in diameter. Unloading facilities include a concrete hopper with carload capacity for rail car and two truck dumps of 30-ton capacity each. Iowa Falls is one of five Purina plants specially equipped for soybean processing."

152. *Pantagraph* (*The*) (*Bloomington, Illinois*). 1948. Ralston-Purina buys local site: construction of $2,000,000 plant started. June 15. p. 3.
• ***Summary:*** "The Ralston-Purina company of St. Louis

[Missouri] Tuesday began construction of a 2 million dollar soybean solvent extraction plant in Bloomington. A check for $15,000 in payment for a nine acre site on the city's west side closed negotiations.

"Tuesday morning contractors began excavating for the plant located in a triangle bounded by West Olive street, Euclid avenue and the Jacksonville branch of the GM&O [Gulf, Mobile and Ohio] railroad.

"Problems settled: The St. Louis firm Monday night told the board of directors of the Bloomington Association of Commerce that it would exercise its option to purchase the ground. A Tuesday morning meeting completed negotiations which have been carried on since April 16. Conferences between owners of the property, Ralston-Purina and the A of C, and company surveys settled problems concerning water supply, sewage disposal and soil bearing qualities.

"Crosby Construction company of Chicago has the job of building the 33 concrete grain storage tanks which will have a capacity of more than 2,000,000 bushels. In addition to the operation of a soybean solvent extraction plant, the company will manufacture livestock and poultry feeds.

"The soybean plant will have a capacity of 250 tons of soybeans a day while the Chow (feed) manufacturing unit which will also be built here will have a capacity of 600 tons a day.

"May Employ 150: Ray Rowland, vice president in charge of operations for Ralston, said Bloomington was selected as the plant site primarily because it is located in the center of a soybean and corn producing area.

"The company officials predicted that soybean and feed operations would employ about 150 men.

"Upon completion of negotiations that brought the plant to Bloomington, Ned E. Dolman, chairman of the A and C new industries committee expressed his gratitude for the co-operation his group has received. 'At no time has the Association of Commerce had better co-operation from all parties concerned in an industrial development matter,' Mr. Dolan declared.

"According to M.E. Crosby, president of the construction firm which will build the plant, grain storage tanks will be ready to receive soybeans grown in this area by Oct. 15."

A large photo on this page bears this caption: "Ralston Here–Sale of the site of Ralston-Purina's plant was completed by this group Tuesday morning. Left to right, seated, Walter Yoder, local counsel for Ralston; Mrs. Tom Moore, trustee and individual owner of the property; Bernard Grimes, Mrs. Moore's attorney; Robert P. Tate, A of C representative; standing, Donald K. English, Ralston's chief engineer; Dr. Tom Moore; Cottrell Fox, Ralston counsel; P.A. Washburn, A of C president."

153. *Soybean Digest.* 1948. Grits and flakes... from the world of soy: Ralston Purina Co. has purchased the site for a Chow manufacturing and soybean solvent extraction plant... July. p. 32.
• ***Summary:*** "... at Bloomington, Illinois. Storage capacity will be in excess of 2 million bushels. Processing plant will have a capacity of 250 tons per day, the Chow plant 200 tons on an 8-hour basis. The plant will employ about 150 people."

154. USDA Northern Regional Research Laboratory. 1948. Soybean processing mills in the United States. *USDA Bureau of Agricultural and Industrial Chemistry.* CA-5. 14 p. Sept.
• ***Summary:*** Footnote: "This is a revision of AIC-26 [Nov. 1943]–Revised June 1946 under the same title."

"The following list of soybean processing mills is divided into three parts: (1) Mills specializing in soybeans. (2) Mills processing soybeans on part-time basis. (3) Distribution of soybeans processed by solvent extraction, screw press, and hydraulic press methods (Estimates based on data compiled by Bureau of the Census in cooperation with the Northern Regional Research Laboratory). A year by year table from crop year 1936-37 to 1946-47 (Oct. to Oct.) shows the number of tons processed and the percentage of the total processed by each of the three processes. The percentage processed by solvent extraction doubled from 13.2% to 26.6% while the percentage processed by hydraulic press dropped by half from 18.4% to 9.5%. The total tons of soybeans processed rose 8.2 fold from 619 to 5,107 during the 11 year period.

Processors are listed by state (alphabetically), and within each state alphabetically by city. Three symbols are used (in parentheses) to express each plant's processing capacity in tons of soybeans per day: S = Small–less than 50. M = Medium–50 to 200. L = Large–more than 200. Three other symbols are used to express the type of soybean processing equipment used: X = Extraction (solvent). P = Screw press [or expeller]. H = Hydraulic press.

"1. Mills specializing in soybeans. Arkansas–West Memphis: Arkansas Mills, Inc. (MX). Wilson: Wilson Soya Corporation (MXP). Delaware–Laurel: Laurel Processing Co. (SX).

"Illinois–Alhambra: Alhambra Grain and Feed Co. (SP). Bartonville: Allied Mills, Inc. (LP). Bloomington: Funk Brothers Seed Co. (MP). Ralston Purina Co. (LX). Champaign: Swift and Co. (LXP). Chicago: Archer-Daniels-Midland Co. (MX). The Glidden Co. (LXP). Spencer Kellogg and Sons, Inc. (LP). Colchester: Colchester Processing Co. (SP). Decatur: Archer-Daniels-Midland Co. (LXP). Decatur Soy Products Co. (MP). Spencer Kellogg and Sons, Inc. (LXP). A.E. Staley Manufacturing Co. (LXP). Galesburg: Galesburg Soy Products Co. (MP). Gibson City: Central Soya Co., Inc. (LXP). Kankakee: Borden's Soy Processing Co. (MX). Mascoutah: Phillip H. Postel Milling Co. (SP). Monmouth: Ralph Wells and Co. (SP). Nashville: Huegly Elevator Co. (SP). Norris City: Norris City Milling Co. (SP). Pana: Shellabarger Soybean Mills (MP). Poplar

Grove: Northern Illinois Processing Corporation (SP). Quincy: Quincy Soybean Products Co. (MP). Roanoke: Eureka Milling Co. (SP). Rock Falls: Sterling Soybean Co. (SP). Springfield: Cargill, Inc (MP). Taylorville: Allied Mills, Inc. (MX). Virden: Hulcher Soy Products Co. (SP).

"Indiana–Bunker Hill: Ladd Soya, Inc. (MP). Danville: Hendricks County Farm Bureau Cooperative Association (SX). Decatur: Central Soya Co., Inc. (LXP). Frankfort: Swift and Co. (MX). Indianapolis: The Glidden Co. (LX). Lafayette: Ralston Purina Co. (MP). Marion: Hoosier Soybean Mills (MP). Oaktown: Knox County Farm Bureau Cooperative Association (SP). Portland: Haynes Soy Products, Inc. (MP). Rockport: Martin Serrin Co., Inc. (SP). Rushville: Rush County Farm Bureau Cooperative Association (SP). Wabash: Wabash County Farm Bureau Cooperative Association (SP).

"Iowa–Belmond: General Mills, Inc. (LX). Cedar Rapids: Cargill, Inc. (MX). Iowa Milling Co. (MP). Centerville: Pillsbury Mills, Inc. (MP). Clinton: Pillsbury Mills, Inc. (MX). Des Moines: Spencer Kellogg and Sons, Inc. (LX). Swift and Co. (MP). Dike: Farmers Cooperative Association (SP). Dubuque: E.E. Frith Co. (SP). Eagle Grove: Boone Valley Cooperative Processing Association (SP). Fairfield: Doughboy Industries, Inc. (MP). Fayette: Fayette Soybean Mill (SP). Fort Dodge: Cargill, Inc. (LXP). Gladbrook: Central Iowa Soybean Mill (MP). Hubbard: Boone Valley [Cooperative] Processing Association (SP). Iowa Falls: Ralston Purina Co. (LXP). Manly: North Iowa Cooperative Processing Association (SP). Marshalltown: Marshall Mills, Inc. (SP). Martelle: Farmers Cooperative Elevator (SP). Muscatine: Hawkeye Soy Products Co. (SP). Muscatine Processing Corporation (MX). New Hampton: Eastern Iowa Milling Co. (SP). Plainfield: Roach Mills (SX). Quimby: Simonsen Mill Rendering Plant (MP). Ralston: Farmers Cooperative Association (SP). Redfield: Iowa Soya Co. (MX). Sac City: Williams Milling Co. (MP). Sheldon: Big Four Cooperative Processing Association (MP). Sioux City: Sioux Soya Co. (MP). Spencer: Cargill, Inc. (SX). Washington: Cargill, Inc. (MX). Waterloo: Borden's Soy Processing Co. (LXP). West Bend: West Bend Elevator Co. (SP).

"Kansas–Coffeyville: Consumers Cooperative Association Soybean Mill (MP). Emporia: Kansas Soya Products Co., Inc. (MXP). Girard: Farmers Union Jobbers Association (SP). Hiawatha: Thomson Soy Mill (SX). Kansas City: Kansas Soya Products Co., Inc. (MP). Wichita: Soy-Rich Products, Inc. (MXP). Kentucky–Henderson: Ohio Valley Soybean Cooperative (MXP). Louisville: Buckeye Cotton Oil Co. (LXP). Louisville Soy Products Corporation (MX). Owensboro: Owensboro Grain Co. (MXP).

"Maryland–Baltimore: Soya Corporation of America (MP). Michigan–Concord: Concord Soya Corporation (SP). Saline: Soybrands, Inc. (SX). Minnesota: Lakeville: Consumers Soybean Mills, Inc. (MP). Mankato: Honeymead Mankato, Inc. (LXP). Minneapolis: Crown Iron Works Co. (SX). Preston: Hubbard Milling Co. (SP).

"Missouri–Kansas City: Ralston Purina Co. (MP). Kennett: Hemphill Soy Products Co. (MP). Mexico: MFA Cooperative Grain and Feed Co. (MP). New Madrid: Buckeye Cotton Oil Co. (MX). St. Joseph: Dannen Mills, Inc. (MXP). St. Louis: Blanton Mill, Inc. (MP). Ralston Purina Co. (MP). Pennsylvania–Jersey Shore: Pennsylvania Soybean Cooperative Association (SP). Rossmoyne Processing Co. (?). Paoli: The Great Valley Mills (?). South Dakota–Sioux Falls: Western Soybean Mills (MP).

"Tennessee–Tiptonville: West Tennessee Soya Mill, Inc. (LXP). Virginia–Harrisonburg: Central Chemical Corporation of Virginia (SP). Norfolk: Davis Milling Co. (SP). Portsmouth: Allied Mills, Inc. (MP). Wisconsin–Janesville: Janesville Mills, Inc. (SP). Menomonie: Northwest Cooperative Mills (SP).

"Mills processing soybeans on part-time basis." Alabama (6 mills), Arkansas (13), California (7), Florida (1), Georgia (7), Illinois (2), Iowa (2), Kansas (1), Louisiana (9), Minnesota (2), Mississippi (13), Missouri (1), New York (2), North Carolina (14), North Dakota (1), Ohio (2), Oklahoma (13), Pennsylvania (2), South Carolina (4), Tennessee (4), Texas (27), Wisconsin (1).

Note: This is the earliest document seen (June 2018) that mentions Crown Iron Works Co. in connection with soybeans or with solvent extraction plants.

155. Banks, George Heartsill. 1948. South goes east [to Korea]. *Soybean Digest.* Oct. p. 16-18.

• ***Summary:*** Mr. Banks, formerly associated with Ralston Purina Co., recently returned from a governmental mission of almost 2 years in Korea. In this paper, presented at the American Soybean Convention in Memphis, Tennessee, he tells of soybeans in Korea, where there is no national debt, no income tax, and where women do all the work. South Korea is about the size of Arkansas. 75% of the land is steep and mountainous, and thus entirely unsuited for crops. On the remaining small area of arable soil struggle about 20 million Koreans. The farms are small; in some provinces they average less than 2.5 acres. In South Korea every farmer grows some soybeans but one has "to look hard and long to find even a small field of soybeans. They are grown in gardens, on the dikes in the rice-paddies, and among the trees. The most widely grown varieties are large-seeded yellow beans with a short, stiff stalk. Almost all of the beans are consumed at home. Soybean processing [i.e., crushing] plants as we know them do not exist... The Koreans eat soybeans in many ways, including soysauce, soy sprouts, soy curd, and green soybeans. They press out some oil in the home or farm village and use the oil for cooking and the meal for feeding farm animals." Rice is the predominant crop. "Korea, along with its neighbors in the Orient, is definitely a 'have-not' nation." They waste nothing, recycle

everything, and use human wastes (night soil) for fertilizer. Agriculture is run by hand-power.

A portrait photo shows George H. Banks.

156. *Chemurgic Digest.* 1948. New plant for soybeans. Oct. p. 18..
• ***Summary:*** "Ralston Purina Co. has contracted for construction of a new soybean solvent extraction plant, to be built by Blaw-Knox Co., at Bloomington, Illinois. It will have a daily capacity of 200 tons. The same two companies also are in a contract for construction of a similar plant at Iowa Falls, Iowa."

157. *Soybean Digest.* 1948. Johnson to Delphos. Oct. p. 34.
• ***Summary:*** "Delphos Grain and Soya Processing Co., Delphos, Ohio, have added E.F. "Soybean" Johnson to their staff, as assistant manager in charge of soybean operations.

"'Soybean' Johnson is well known to the soybean and feed trade, having been with Ralston Purina Co. at St. Louis [Missouri] for many years.

"He is a graduate of Indiana State University and Purdue University. He taught at Ohio State University.

"Johnson's interest in soybeans is well known in the soy belt and especially in northwestern Ohio where he owns and operates several farms. Some of his farms have had 40 percent of the acreage in soybeans for over 30 years."

158. *Soybean Digest.* 1948. Grits and flakes... from the world of soy: William H. Danforth, president of Ralston Purina Co.,... Dec. p. 32.
• ***Summary:*** "... was honored on the anniversary of his 55th year as a member of the St. Louis Merchants Exchange with a reception on the floor of the Exchange November 15. He has been a member longer than any other living person."

159. National Soybean Processors Association. 1948. Year book, 1947-1948 (Association year). Chicago, Illinois. 71 p.
• ***Summary:*** The section titled "Officers, directors, and committees" (p. 12-15) lists the following standing committees and the companies and individuals that are members of each: Traffic and Transportation, Research, Technical, Soybeans Grades and Contracts, Oil Trading Rules, Meal Trading Rules, Crop Improvement, Soybean Research Council, Trade Development, Edible Soybean, Uniform Rules and Standards for Soybean Oil Meal, Fire Insurance Committee.

The following organizations and individuals are members of NSPA: Allied Mills, American Soybean Association (George M. Strayer), Archer-Daniels-Midland Co., Borden's Soy Processing Co., Buckeye Cotton Oil Co., Cargill, Inc., Central Soya Co., Clinton Industries, Inc., Decatur Soy Products Co. Drackett Co., Durkee Famous Foods, Funk Bros. Seed Co. (E.D. Funk, Jr.), General Mills, Inc., Glidden Co., Gooch Milling and Elevator Co., Hoosier Soybean Mills, Inc., Iowa Milling Co., Louisville Soy Products Corp. (E.F. Johnson), Northern Regional Research Laboratory, Pillsbury Feed Mills, Ralph Wells and Company, Ralston Purina Co., Roach Soybean Mills (Howard L. Roach), Shellabarger Soybean Mills, Simonsen Mill-Rendering Plant, Sioux Soya Co., Southland Cotton Oil Co., Soya Processing Co., Spencer Kellogg Co., Swift & Company, Toledo Soybean Products Co. Address: 3818 Board of Trade Building, Chicago 4, Illinois.

160. Ralston Purina Co. 1949. Ralston Purina Company's 5 soybean processing plants or cash markets for soybean growers (Ad). *Soybean Digest.* May. p. 50.
• ***Summary:*** A half-page ad. The 5 processing plants are in: St. Louis, Missouri; Kansas City, Missouri; Lafayette, Indiana; Iowa Falls, Iowa; and Circleville, Ohio.

An isolated photo shows each of the five mills. Across the bottom of the ad: "Buy the feeds that use the soybean. Buy Purina Chows." An illustration shows an opened sack of "Purina Chows" with a checkerboard pattern on it.

161. *Pantagraph* (*The*) (*Bloomington, Illinois*). 1949. Crosby boss, worker fight–250 laid off: Ralston-Purina work stalled after scuffle. Aug. 12. p. 3.
• ***Summary:*** "A fight between a hoisting engineer and the superintendent of the Crosby Construction company Thursday put 250 men off the construction job at the Ralston Purina Company, it was learned. A clash between Vern Creemens, the engineer, and Ray Fransham, the construction company boss occurred Tuesday, and was an outgrowth, it was said, of continued disagreement between the Crosby company and the engineers." The conflict is discussed at length.

Note: These ongoing problems will cause a delay in the completion of Ralston Purina the plant.

162. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Bloomington, Illinois.
Date of Introduction: 1949 August.
Ingredients: Soybeans.
New Product–Documentation: Pantagraph (The) (Bloomington, Illinois). 1948. "Ralston-Purina buys local site: construction of $2,000,000 plant started." June 15. p. 3. "According to M.E. Crosby, president of the construction firm which will build the plant, grain storage tanks will be ready to receive soybeans grown in this area by Oct. 15."

Pantagraph (The) (Bloomington, Illinois). 1949. "Crosby boss, worker fight–250 laid off: Ralston-Purina work stalled after scuffle." Aug. 12. p. 3. Note: These ongoing problems will cause a delay in the completion of Ralston Purina the plant.

Soybean Digest. 1949. July. p. 44. "To open new plant." "Construction on the new Ralston Purina plant at

Bloomington, Illinois, has progressed to such an extent that the company will begin processing soybeans and grains there on August 15, according to Donald Danforth, president.

"On July 1 Nat B. Morey, present assistant manager of Purina's Buffalo, New York mill, will take over the management of the new Bloomington plant. Jay Clark will be the superintendent, and John O'Connor will be manager of the grain department.

"Formal opening at Bloomington is tentatively scheduled for early fall. When the plant is in full operation, total personnel will be about 150 people. The new soybean solvent processing plant at Iowa Falls, Iowa, is scheduled to begin its operations about July 15." A portrait photo shows Nat B. Morey.

McCubbin, K.; Ritz, G.J.; Barnebey, H.L. 1950. "Purina's new Iowa Falls plant." *Soybean Digest.* March. p. 24, 27. The new plant at Iowa Falls, Iowa, is a soybean solvent extraction plant built by Blaw-Knox Co. Ralston Purina Co. is opening an almost identical unit at Bloomington, Illinois.

Soybean Digest. 1950. April. p. 36. "Grits and flakes... Ralston Purina Co. will hold the grand opening of the new Purina mill at Bloomington, Illington, April 12. Governor Adlai Stevenson will cut the ribbon that officially starts the company's newest mill."

163. National Soybean Processors Association. 1949. Year book, 1949-1950 (Association year). Chicago, Illinois. 73 p. • ***Summary:*** On the cover (but not the title page) is written: "Year Book and Trading Rules, 1949-1950." Contents: Constitution and by-laws (incl. committees, code of ethics). Officers, directors and committees for 1949-50. Membership of the National Soybean Processors Association. Trading rules governing the purchase and sale of soybean oil meal. Appendix to trading rules on soybean oil meal: Official methods of analysis (moisture, protein, oil, crude fiber–official, sampling of soybean oil meal). Trading rules on soybean oil. Appendix to trading rules on soybean oil: Uniform sales contract, standard specifications for crude soybean oil for technical uses, methods of analysis (A.O.C.S. official methods): Refining loss (expeller and hydraulic soybean oil)–Ca 9a-41, refining loss (extracted soybean oil)–Ca 9b-46, refining loss (degummed hydraulic and extracted types soybean oil)–Ca 9c-49, refining loss (degummed expeller type soybean oil)–Ca 9d-49, bleaching test (refined soybean oil)–Cc 8b-49, grading soybean oil for color (N.S.P.A. tentative method), color–Wesson method using Lovibond glasses–Cc 13b-45, sampling–C 1-47, flash point (A.O.C.S. tentative method–Cc 9b-48). Moisture and volatile matter: Vacuum oven method–Ca 2d-25. Break test–Modified Gardner method–Ca 10-40. Iodine value–Wijs method–Cd 1-25. Unsaponifiable matter–Ca 6a-40.

Handwritten: *Soybean Farming* is now available; prices are given for non-members and members, for 100 to 1,000 copies. Assessments: Regular $.0004 per bushel, 40 cents per 1,000, $400 per million. Max. $3,200 per year. Min. $100 per year. July 6 meeting decreases the regular assessment to $0.0003 per bushel.

The section titled "Officers, directors, and committees" (p. 12-15) states: President: R.G. Houghtlin. V.P., Chairman Executive Committee: G.G. Golseth. Secretary: W.L. Shellabarger. Treasurer: H.E. Carpenter. Executive Committee: R.G. Golseth, Chairman, H.E. Carpenter, E.A. Cayce, Philip S. Duff, W.H. Eastman, Jasper Giovanna, R.G. Houghtlin, W.L. Shellabarger.

Board of Directors (Term expiring Sept. 1950): D.O. Andreas, E.A. Cayce, Jasper Giovanna, R.G. Golseth, H.R. Schultz, H.R. Scroggs. (Term expiring Sept. 1951): Dwight Dannen, Roger Drackett, W.H. Eastman, R.B. Jude, W.H. Knapp, Karl Nolin. (Term expiring Sept. 1952): S.E. Kramer, Philip S. Duff, D.W. McMillen, Jr., Clarence E. Peters, J.J. Quinlan, Ralph Wells.

Standing committees: For each committee, the names of all members (with the chairman designated), with the company and company address of each are given–Traffic and transportation. Technical. Soybean grades and contracts. Oil trading rules. Meal trading rules. Crop improvement. Soybean research council. Uniform rules and standards for soybean oil meal. Safety and insurance. Lecithin. Regional: Ohio, Michigan, and East; Illinois, Indiana, Kentucky, Wisconsin; Iowa, Minnesota, Nebraska, South Dakota; Missouri, Kansas, and Mississippi River Delta Sections. Handwritten on blank facing pages: Nominating committee. Reception committee. Official weights committee. Crop Improvement steering committee. Two new members (people; Francis E. Calvert, The Drackett Co., Oct. 1949).

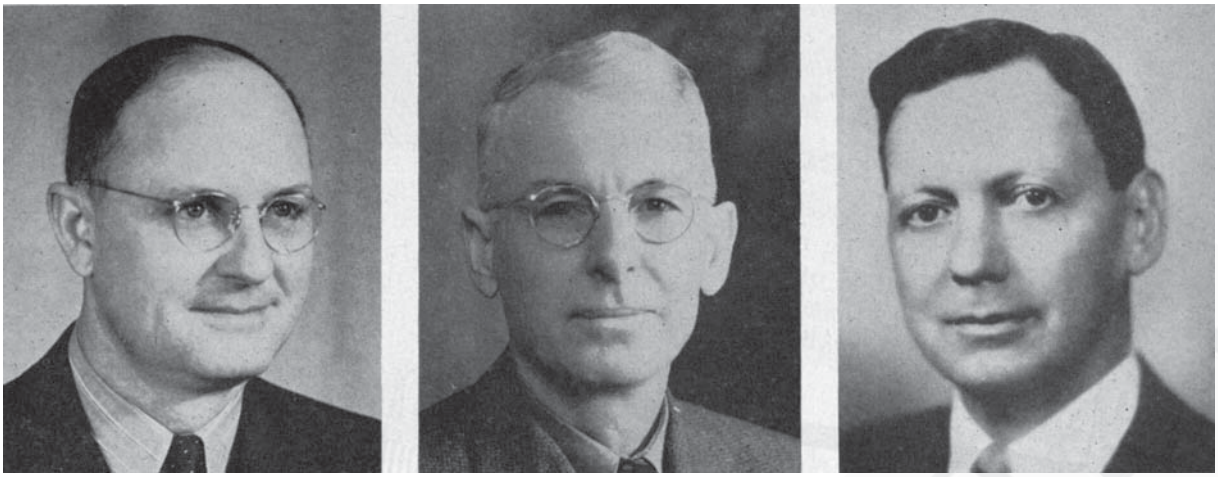
The following organizations, and individuals are members of NSPA: Albers Milling Co., Los Angeles, California (W.P. Kyle). Allied Mills, Inc., Board of Trade Bldg., Chicago, Illinois; Peoria, Illinois; Taylorville, Illinois; Omaha, Nebraska; Portsmouth, Virginia. Archer-Daniels-Midland Co., Box 839, Minneapolis 2, Minnesota; Chicago, Illinois; Decatur, Illinois; Fredonia, Kansas. Big 4 Cooperative Processing Assn., Sheldon, Iowa (Chas. W. Hanson). Blanton Mill, Inc., St. Louis, Missouri (Ross A. Woolsey, Jr.). Boone Valley Cooperative Processing Assn. Eagle Grove, Iowa (Edward Olson); Hubbard, Iowa (D.E. Weld). Borden's Soy Processing Co., Chicago 4, Illinois (C.E. Butler -> J.R. Pentis); Kankakee, Illinois; Waterloo, Iowa. Buckeye Cotton Oil Co. (The), Cincinnati, Ohio (W.H. Knapp); Louisville, Kentucky; New Madrid, Missouri; Raleigh, North Carolina; Memphis, Tennessee. Cargill, Inc., Minneapolis, Minnesota (D.O. Andreas); Springfield, Illinois (Eric Nadel); Cedar Rapids, Iowa (C.W. Bohlander); Fort Dodge, Iowa (H.E. Marxhausen -> R.F. Hubbard); Spencer, Iowa (W.J. Wheeler); Washington, Iowa (Hugo Lensch). Central Iowa Bean Mill, Gladbrook, Iowa (Paul H. Klinefelter). Central Soya Co., Inc., Fort Wayne

2, Indiana (E.W. McMillen, Jr.); Gibson City, Illinois (T.H. Allwein); Decatur, Indiana (C.I. Finlayson); Marion, Ohio (R.W. Fay). Clinton Industries, Inc., Clinton, Iowa (E.W. Myers). Colchester Processing Co., E. St. Louis, Illinois (E.L. McKee). Concord Soya Corporation, Concord, Michigan (Harold K. Rapp; crossed out). Consumers Co-op Assn., Kansas City 13, Missouri (F. Dean McCammon). Consumers Soybean Mills, Minneapolis 15, Minnesota (Riley W. Lewis). Dannen Grain & Milling Co., St. Joseph, Missouri (Dwight L. Dannen). Decatur Soy Products Co., Decatur, Illinois (Jasper Giovanna). Delphos Grain and Soya Products Co., Delphos, Ohio (Floyd E. Hiegel). Doughboy Industries, Inc., Fairfield, Iowa. Drackett Co. (The), Cincinnati 32, Ohio (Roger Drackett). Eastern Iowa Milling Co., New Hampton, Iowa (G.A. Ward). Farmers Cooperative Assn., Ralston, Iowa (Karl Nolin). Farmers Cooperative Co., Dike, Iowa (C.M. Gregory). Farmers Cooperative Elevator, Martelle, Iowa (H.B. Lovig). Fayette Soybean Mill, Fayette, Iowa (L.A. Rose). Fremont Cake and Meal Corp., Fremont, Nebraska (Harry E. Wiysel). Frith (E.E.) Company Inc., Dubuque, Iowa (E.M. Weicher). Funk Bros. Seed Co., Bloomington, Illinois (H.A. Abbott). Galesburg Soy Products Co., Galesburg, Illinois (Max Albert). General Mills, Inc., Chem. Div., Minneapolis 1, Minnesota (W.H. Eastman); Belmond, Iowa (E.E. Woolley). Glidden Co. (The), Chicago 39, Illinois (R.G. Golseth). Gooch Milling & Elevator Co., Lincoln 1, Nebraska (M.R. Eighmy). Haynes Soy Products Inc., Portland, Indiana (Clarence E. Peters). Hemphill Soy Products Co., Kennett, Missouri (W.A. Hemphill). Holland Pioneer Mills, Inc., Ohio City, Ohio (G.A. Holland). Honeymead Products Co., Mankato, Minnesota (L.W. Andreas); Hoosier Soybean Mills, Inc., Marion, Indiana (J.H. Caldwell, Jr.). Huegely Elevator Co., Nashville, Illinois (J.W. Huegely). Hulcher Soy Products, Virden, Illinois (Norman E. Hulcher). Iowa Milling Co., Cedar Rapids, Iowa (Jos. Sinaiko). Iowa Soy Co., Redfield, Iowa (H.R. Straight). Ipava Farmers Processing Co., Ipava, Illinois (F.P. Brown). Janesville Mills, Inc., Janesville, Wisconsin (A. Roger Hook). Kansas Soya Products Co. (The), Emporia, Kansas (Ted W. Lord); Kansas City 3, Kansas (Richard W. Lord). Ladd Soya, Inc., Bunker Hill, Indiana (Wayne Ladd). Lexington Soy Products Co. (The), Lexington, Ohio (H.E. Carpenter). Louisville Soy Products Corp., Louisville, Kentucky (H.A. Miller). Marshall Mills Inc., Marshalltown, Iowa (J.I. Johnson). Muscatine Processing Corp., Muscatine, Iowa (G.A. Kent). North Iowa Cooperative Processing Association, Manly, Iowa (Glenn Pogeler). Northwest Cooperative Mills, St. Paul, Minnesota (Anthony H. Roffers). Ohio Valley Soybean Co-op, Henderson, Kentucky (G.W. Allen). Owensboro Grain Co., Owensboro, Kentucky (William M. O'Bryan). Pacific Vegetable Oil Corp., San Francisco 7, California (B.T. Rocca, Jr.). Pillsbury Soy Mills, Clinton, Iowa (H.R. Schultz); Centerville, Iowa (H.R. Schultz). Postel (Ph. H.) Milling Co., Mascoutah, Illinois (A.S. Lee). Quincy Soybean Products Co., Quincy, Illinois (Irving Rosen). Ralston Purina Co., St. Louis 2, Missouri (D.B. Walker); Kansas City, Missouri (F.G. Franze); Lafayette, Indiana (Ralph Guenther); Iowa Falls, Iowa (H.N. Johnson); Circleville, Ohio (A.V. Couch); Champaign, Illinois -> Bloomington, Illinois (N.B. Morey). Roach Soybean Mills, Plainfield, Ohio (Howard L. Roach). Shellabarger Soybean Mills, Inc., Decatur 30, Illinois (W.L. Shellabarger). Simonsen Mill Rendering Plant, Quimby, Iowa (W.E. Simonsen). Sioux Soya Co., Sioux City 2, Iowa (J.L. Ward). Southern Cotton Oil Co. (The), Goldsboro, North Carolina (W.V. Westmoreland); Tarboro, North Carolina (W.A. Moore). Southland Cotton Oil Co., Paris, Texas (Richard H. Blyth). Soya Processing Co., Wooster, Ohio (H.H. Heeman). Soya Extraction Div., Continental Grain Co., Columbus 9, Ohio (D.H. Wilson–company crossed out). Soy-Rich Products, Inc., Wichita, Kansas (Ralph S. Moore). Spencer Kellogg and Sons, Inc., Buffalo 5, New York (Robert B. Jude); Chicago, Illinois; Decatur, Illinois; Des Moines, Iowa; Bellevue, Ohio (Harry Stokely). Sterling Soybean Co., Inc., Rock Falls, Illinois (Edward J. McGinn). Swift & Co., Union Stock Yards, Chicago 9, Illinois (S.E. Cramer). Thomson Soya Products, Hiawatha, Kansas (A.G. Thomson). Toledo Soybean Products Co., Toledo, Ohio (J.H. Brown). Wells (Ralph) & Co., Monmouth, Illinois (Ralph Wells). West Bend Elevator Co., West Bend, Iowa (R.W. Jurgens). Western Soybean Mills, Sioux Falls, South Dakota (E.A. Woodward). Williams Milling Co., Sac City, Iowa (Leo W. Williams).

Organizations represented on committees: U.S. Regional Soybean Laboratory, Urbana, Illinois (John C. Cowan, R.T. Milner).

Handwritten: New members added since publication of the Trading Rules Book–1949. Falk & Co., Pittsburgh, Pennsylvania (Willard Lighter, Jan. 1950). Minnesota Linseed Oil Co., Minneapolis 21, Minnesota (R.J. Lundquist, May 1950). Farmers & Merchants Milling Co., Glencoe, Minnesota (L.H. Patten, Mgr., May 1950). Riverside Oil Mill, Marks, Mississippi (William King Self, Aug. 1950). Planters Manufacturing Co., Clarksdale, Mississippi (A.K. Shaefer, Sept. 1950).

Associate Members: Arcady Farms Milling Co., Chicago 6, Illinois. Armour & Co., Chicago 9, Illinois (John H. Noble). Aubrey & Co., Louisville, Kentucky. Best Foods, Inc., New York, NY. Capital City Products Co., Columbus, Ohio. Cooperative Mills Inc., Baltimore 30, Maryland. Cox (Chas. M.) Co., Boston, Massachusetts. Foxbilt Inc., Des Moines, Iowa. Humco Co. (The), Memphis 1, Tennessee. Kraft Foods Co., Chicago, Illinois. Lever Bros Co., Lever House, Cambridge, Massachusetts. Pittsburgh Plate Glass Co., Paint Div., Pittsburgh, PA. Procter & Gamble Co., Cincinnati, Ohio. Spartan Grain & Mill Co., Inc., Spartanburgh, South Carolina. Tuckers (Mrs.) Foods, Inc., Sherman, Texas. Wilson & Co., Chicago, Illinois.



Handwritten: New Associate Members: Clark Mills Inc., Minneapolis 15, Minnesota.

Note: Apparently Continental Grain Co. was not a member this year. They were a member by 1975. Address: 3818 Board of Trade Building, Chicago 4, Illinois.

164. *Soybean Digest.* 1949. Honorary life members [American Soybean Assoc.]: Keller E. Beeson, Jacob Hartz Sr., E.F. ("Soybean") Johnson. Sept. p. 36, 85, 86.
• ***Summary:*** Keller E. Beeson, extension agronomist at Purdue University and former president of ASA, was born on March 18, 1894 at Columbia City, Indiana. Now deceased, he had been an extension agronomist at Purdue beginning in 1924. He cooperated with the railroads in running the educational "Soybean Special" trains through Indiana. Before the days of the Soybean Digest, Mr. Beeson pioneered the preparation of the printed report of the annual meeting, which was ready for distribution at the meeting. He also started the mimeographed circular letters that went out at intervals to the membership. These were forerunners of the Digest.

"Jacob Hartz, Sr., Arkansas farm and seed leader, and onetime president of ASA, was born at Racine, Wisconsin, on April 4, 1888 the son of German immigrants. He was one of eight children. Because of his father's poor health he was forced to leave school after completing the eighth grade.

"At the age of 20 he went to work as a traveling salesman for the P & O Plow Co. and spent several years in Arkansas.

"In 1917 Mr. Hartz moved to Wheatley, Arkansas, and went into the hardware business. In 1924, he moved to Stuttgart, Arkansas, his present home. There he joined his father and A.R. Thorell in the Hartz-Thorell Supply Co. which grew and prospered and became the leading farm machinery business in the state.

"It was early in this business that Mr. Hartz became interested in soybeans and started on the journey that was to make him one of the soybean pioneers and leaders of the South. Hartz was looking for a soil building crop to save the rice farmers of the Grand Prairie section of Arkansas who were driving themselves to ruin with a one-crop program of rice. Rice takes a tremendous amount of nitrogen from the soil and nothing was being done to replace this needed element.

"In conjunction with the Peoples National Bank of Stuttgart [in about 1925] the Hartz-Thorell Co. bought 25 bushels of Laredo soybeans. These beans were put out with key farmers over the Grand Prairie in small quantities and were planted on land that had been in rice the previous year. When the beneficial results that followed were noted [the rice farmers used the soybeans as a hay crop], a never ending search for the most suitable varieties was begun. Mr. Hartz and his partner soon found themselves in the seed business [starting about 1926] where the former has remained ever since.

"Mr. Hartz had a manifold job, the chief of which his boys have always referred to as 'Pop's Preaching the Soybean Gospel' to farmers and agricultural leaders in Arkansas and the South. In their contacts and travels many years later they are continually running into men who say that Mr. Hartz started them in the soybean business. He found a market for the farmer's bean crop and was instrumental in having favorable freight rates established for soybeans and other Arkansas farm products.

"In 1936 the Hartz-Thorell Supply Co. designed and constructed what remains the most modern and efficient seed cleaning processing plant in the South. "The Hartz-Thorell partnership was dissolved in June, 1942. Mr. Hartz and his two older sons, B.J. and Jake, Jr., acquired the seed end of the business which they operate under the title Jacob Hartz Seed Co.

"Mr. Hartz worked diligently in several seed organizations such as the Arkansas Seed Growers Association, the Arkansas Seed Dealers' Association, and the Southern Seedsmen Association. He was elected president of the first two and first vice-president of the third, a South-wide seed dealers association. In all of the organizations he has fostered the soybean and guided its progress. He

served many years on the Arkansas State Plant Board. In this capacity he helped in the first certification of soybean seed in the state.

"There is one other organization that he has helped to build, one that is dear to his heart, the American Soybean Association. He was elected the first Southern director and has served in that capacity until the present. He is a former vice president of the Association.

"The above are some of the things that long ago earned for Mr. Hartz the deserved title of 'Soybean King of Arkansas.'"

"E.F. Johnson, affectionately known as 'Soybean' by an entire industry, ha been a real pioneer and has made a contribution both as a grower and processor. He was born at Stryker, Ohio, 59 years ago [ca. Oct. 1889]. He received his education at the University of Indiana, Purdue University, and Ohio State University. He started his first soybean plots in the spring of 1912 and has been a grower ever since. At present, he is a producer of edible varieties. He was a teacher of extension work for 7 years and an assistant professor for 2 years. For a time he was agricultural director for the Soo Line. He is now affiliated with the Delphos Grain & Soya Products Co., Inc., at Delphos, Ohio. He served as president of both the American Soybean Association and the National Soybean Processors Association, and as treasurer of the latter organization. He has been actively interested in the National Farm Chemurgic Council since its inception. Mr. Johnson has always been very active in the work of the American Soybean Association, serving on programs and committees. One of the early annual meetings of the Association was held on his farm. He was one of those whose efforts and encouragement brought about the founding of the *Soybean Digest.*"

Photos show: (1-3) Individual portraits of Keller Beeson, Jacob Hartz, Sr., and E.F. Johnson. (4) Three U.S. Regional Soybean Laboratory agronomists at the ASA convention: Dr. Lewis Saboe, Columbus, Ohio; Leonard F. Williams, Urbana, Illinois; Albert H. Probst, Lafayette, Indiana.

Note 1. Concerning E.F. "Soybean" Johnson: There are many published lists of the presidents, officers, and directors of the American Soybean Association (ASA). E.F. Johnson is never listed as a president, or as an officer, or as a director of the ASA. In 1937-38 he was elected president, chairman of the executive committee, and chairman of the statistical committee of the National Soybean Processors Association (NSPA). Strangely enough, one E.C. Johnson of Stryker, Ohio (the same small town in which E.F. Johnson was born and raised and lived until the 1930s) was vice-president of the ASA in 1924 and 1925, yet several extensive searches by experts in Stryker, Ohio, can find no evidence that a person named E.C. Johnson ever lived in Stryker (See 1999 letter from Jane Anderson of Stryker). Her theory is that E.F. and E.C. were one and the same person.

Note 2. This is the earliest article seen that mentions the Delphos Grain & Soya Products Co.

165. *Soybean Digest.* 1950. Purina's newest soybean market (Ad). Jan. p. 42.

• ***Summary:*** See next page. A half-page ad. "New Bloomington, Illinois, plant will process 250,000 bushels a month!

"One of the world's best customers for the soybean–the Ralston Purina Company–announces a new market–the just-completed 250,000-bushels-a-month plant at Bloomington, Illinois. This makes six cash markets serving you who have soybeans to sell."

Across the top of the ad are small aerial photos of Ralston Purina's soybean solvent plants at (1) Circleville, Ohio; (1) Lafayette, Indiana; (3) Kansas City, Missouri; (4) St. Louis, Missouri; Iowa Falls, Iowa. In the center is the new plant at Bloomington, Illinois. In the lower right is a distinctive bag of Purina Chows.

This ad also appeared in the Sept. issue (p. 98).

166. McCubbin, K.; Ritz, G.J.; Barnebey, H.L. 1950. Purina's new Iowa Falls plant. *Soybean Digest.* March. p. 24, 27.

• ***Summary:*** In late 1949 the Ralston Purina Co. began operation of a new solvent extraction plant, with a capacity of 200 tons/day of soybeans, built by Blaw-Knox Construction Co., at Iowa Falls, Iowa. The new extraction plant adjoins an existing installation which consists of an expeller plant, storage silos, a meal blending and bagging unit, and a mixed feed plant. Ralston is opening an almost identical unit at Bloomington, Illinois.

"The new extraction plant adjoins an existing installation which consists of an expeller plant, storage silos, a meal blending and bagging unit, and a mixed feed plant. The expeller plant has a capacity of 140 tons of soybeans per day. The silos have a capacity of about 1,300,000 bushels of beans and will serve as a storage supply for both plants.

"The Blaw-Knox solvent extraction unit is designed to process soybeans containing 19 to 22 percent oil by weight and 9 to 14 percent moisture; it will produce about 9,000 gallons of soybean oil and 160 tons of meal per day when operating at designed capacity.

"Hexane recovery from the oil and meal is essentially complete, but small normal losses through the vent system are guaranteed to be less than 0.7 percent of the weight of beans processed, or. in this case, 1.4 tons per day. The new plant has been operating well within all the guaranteed performance requirements.

"The processing of beans is divided for convenience into two parts: the preparation of the beans for the extraction process, and the extraction itself. For complete safety, each part is carried out in a separate building. In the preparation building the beans are first broken up by cracking mills, and are then run through a steam heated conditioner which

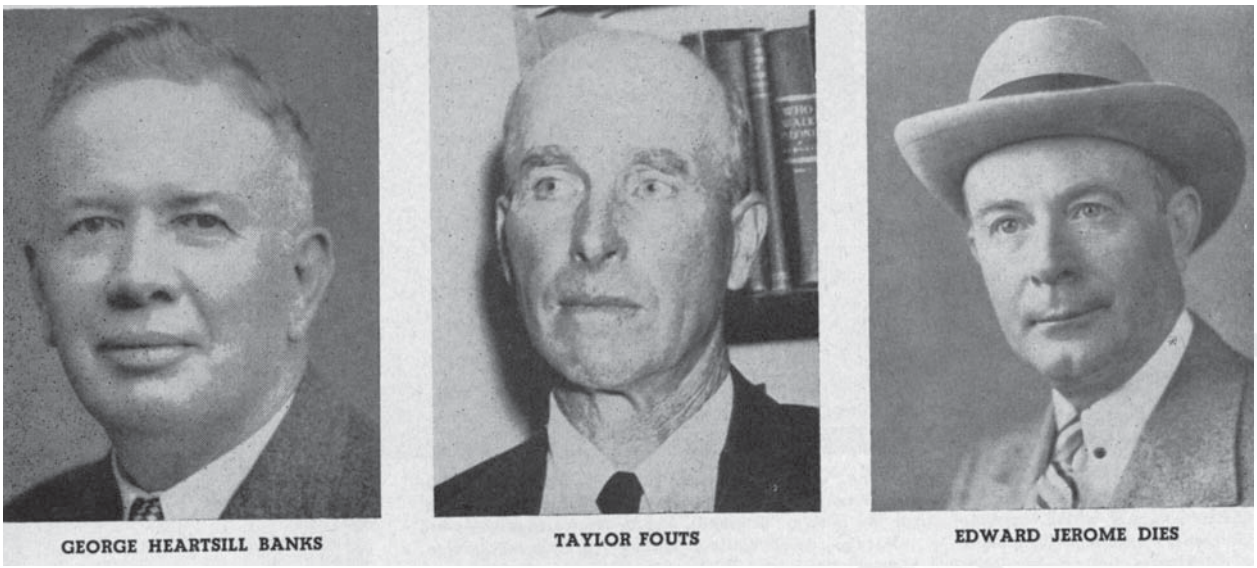
regulates the moisture content to around 11 percent and heats the beans to plastic state. The thermo-plastic beans are then passed through flaking rolls which flake the bean particles to a thickness of about 8 to 10 thousandths of an inch. The preparation of the beans, as the name implies, serves to condition the beans in order to permit more complete extraction of the oil in the process.

"The flaked beans are then conveyed to the extraction building by a system of conveyors and elevators. The extractor used in this plant is an improved vertical unit which provides co-current and multiple step counter-current extraction. The flakes are fed through the top of the extractor to downward moving baskets. As the baskets move downward, the flakes are sprayed with 'half-miscella' (which is a mixture of soybean oil and hexane, rich in hexane) producing full miscella, which consists of about 25 percent oil and 75 percent solvent. The baskets, after traveling downward in the half-miscella spray, then move upward counter-current to a spray of clear hexane producing the half-miscella used in the other part of the extractor. The combined co-current and counter-current flow results in a low residual oil content in the flakes, because the low oil content flakes are extracted with clear fresh hexane which removes all but traces of the oil. As the baskets return to the top of the extractor, they are drained, automatically dumped, and the extracted flakes are conveyed to the desolventizing system for hexane recovery.

"The flakes pass through a desolventizer which evaporates most of the hexane by means of recirculated superheated hexane vapor. The solvent vapor produced is condensed and piped to a decanter. The flakes then pass to a deodorizer where the last trace of solvent is removed by treatment with a small quantity of live steam.

"The next step is the toasting operation in which the meal is uniformly cooked at about 15 psig in a Blaw-Knox 'Pressure Toaster.' The toasting operation is very important in the processing of the soybean meal since it breaks down the complex protein molecules which cannot be assimilated by some animals. The toaster is designed so that the variables of time, temperature, and moisture can be controlled independently to give the exact degree and type of cooking desired. After toasting, the meal is cooled and returned to the preparation building for further processing including pulverizing and sifting. It is then conveyed to the mixing plant where it is blended into the various Purina 'Chows' which are fed to everything on the farm from chickens to cattle.

"Returning to the extraction step, the hexane must be



GEORGE HEARTSILL BANKS TAYLOR FOUTS EDWARD JEROME DIES

recovered from the oil to complete the process. The full miscella is pumped from the bottom of the extractor through bag filters to remove any solid particles which might clog the heat exchangers and evaporators. The miscella is then run to a rising film evaporator operating at atmospheric pressure which removes the major portion of the hexane, then passes through a flash tank to a falling film evaporator operating under vacuum. This removes all but a trace of the hexane which is then completely removed in a packed column by stripping with superheated steam. The finished oil is pumped to one of several large rail siding storage tanks. Complete oil handling facilities at the site include a tank carloading station for bulk shipment of the oil.

"This solvent extraction plant was sold on a 'turn-key' basis. Chemical plants division designed the process, furnished all the equipment. designed and constructed the buildings, installed the equipment in the buildings, and placed the plant in operation. A staff of Blaw-Knox trained engineers took charge of initial operation of the plant."

Three photos show the plant and its equipment. Address: Chemical Plants Div., Blaw-Knox Co.

167. *Soybean Digest.* 1950. Grits and flakes... from the world of soy: Ralston Purina Co. will hold the grand opening of the new Purina mill at Bloomington, Illinois, April 12... April. p. 36.
• ***Summary:*** "Governor Adlai Stevenson will cut the ribbon that officially starts the company's newest mill."

168. *Soybean Digest.* 1950. Open new Purina plant at Bloomington, Illinois. May. p. 32.
• ***Summary:*** "More than 600 feeders, dealers and others interested in agriculture attended dedication ceremonies for the new Ralston Purina Co. solvent extraction plant at Bloomington, Illinois, April 12.

"Governor of Illinois Adlai Steven. son cut the ribbon that officially placed the mill in operation and congratulated the city of Bloomington on securing the huge modern plant that "represents an important expansion of an old and honorable company."

"Others taking part in the ceremonies were Donald Danforth, Purina president; Cecil R. Cone, mayor of Bloomington; Nat Morey, manager of the new plant; and E.H. Hamel, sales manager for Purina's Grainbelt-Western region.

"The plant has an annual capacity of 2½ million bushels of soybeans. Storage facilities of the elevators total 2 million bushels. Unloading and transfer capacity is approximately 15,000 bushels an hour."

A photo shows Adlai Stevenson as he cuts the ribbon. Looking on, left to right: Bloomington mayor Cecil Cone; Nat Morey, manager of the Bloomington Plant; and Donald Danforth, president of the company.

169. *Soybean Digest.* 1950. Honorary life members [American Soybean Assoc.]: George Heartsill Banks, Taylor Fouts, Edward Jerome Dies. Sept. p. 18, 81.
• ***Summary:*** George Heartsill Banks, age 57, was born at Raines, Tennessee. He graduated with a BSc degree from the University of Missouri in 1914. "He was director of field service for the Arkansas Cotton Growers Cooperative Association from 1921 to 1926 in Little Rock, Arkansas. He was Director in Charge of the Rice Branch Experiment Station at Stuttgart, Arkansas, from 1926 to 1937. He was with Ralston Purina Co. at Osceola, Arkansas and Kansas City, Missouri, from 1937-1946. While at Osceola, Mr. Banks did the selection work on Ralsoy, which became one of the most popular soybean varieties in the South." In 1946 he discontinued his work with soybeans and began to work with rice experimentation and breeding, largely in Korea. In Jan. 1950 he became ill while on a trip to Asia (Japan). He died in a Los Angeles, California, hospital on 10 Aug. 1950.

Taylor Fouts, native of Camden, Indiana, pioneer soybean grower, and the first president of the ASA, went to college at Purdue University. Mr. Fouts has been one of the true soybean pioneers. His father first procured free soybean seed from the U.S. Department of Agriculture in 1896 or 1898. Fouts began growing soybeans in 1904, after he graduated from college. "Soybean days in cooperation with Purdue University were held in 1910 and 1916 at the Fouts farm, which became known as Soyland." These soybean meetings helped to create widespread interest in the crop. It was Fouts' intense enthusiasm that helped to attract to the crop many other leaders who became nationally known later. "And in 1920 a Cornbelt soybean conference was held at Soyland. At this conference, the National Soybean Growers Association was formed." The name was later changed to the American Soybean Association. "Fouts was elected president at this meeting, and so became the first president of the American Soybean Association. He was elected president of the Association again in 1928."

Edward Jerome Dies, formerly the president of the National Soybean Processors Association, was a staff correspondent of the Associated Press and a magazine writer before launching his Chicago public relations bureau. In 1936, when the soybean crop was only 33 million bushels, his agency was engaged by the National Soybean Processors Association to correct certain adverse publicity. Soon he became president of the expanding trade group, and continued in office until 1945, when he resigned and went to live in Washington [DC]. He has retained a connection with the soy flour industry as director of the Soya Food Research Council. Mr. Dies is the author of 8 books, one of them on soybeans–"Gold from the Soil". Photos show Banks, Fouts, and Edward Jerome Dies.

170. *Soybean Digest.* 1950. New unit by Purina. Oct. p. 32, 34.
• ***Summary:*** "Donald Danforth, president of the Ralston Purina Co., has announced that his company plans to install a complete new soybean solvent extraction unit at its present Lafayette, Indiana, location. The new unit, when completed, will materially increase the soybean crushing facilities of the company at Lafayette.

"The contract for furnishing all equipment, engineering and services in connection with the complete new plant has been awarded the French Oil Mill Machinery Co. of Piqua, Ohio, who will act as engineers, general contractor and equipment suppliers.

"The construction of the building, structures and foundations, setting of machinery and conveyors, piping and plumbing, electrical wiring (insulation, painting and other work involved in the project) will be subcontracted by the French Oil Mill Machinery Co."

171. *Decatur Daily Review* (*Illinois*). 1952. Sale negotiations on Shellabarger mill announced: Ralston Purina Co. would buy processing plant, 9 elevators. Feb. 23. p. 10.
• ***Summary:*** "The Ralston Purina Co. is negotiating to buy the new Shellabarger Mills, Inc., soybean plant at 2200 North Twenty-second street and nine grain elevators owned by the Shellabarger company, Donald Danforth, president of Ralston Purina, announced today in St. Louis [Missouri].

William L. Shellabarger, president of Shellabarger Mills, Inc., confirmed reports that negotiations are in progress.

"Both men labeled as 'premature' reports that the deal has already been closed.

"The nine grain elevators involved in the negotiations are owned by the Shellabarger company and are located at:

"Warrensburg,
"Elwin,
"Pana,
"Raymond,
"Craig,
"Ospur,
"Dunkel,
"Westervelt,
"Ohlman,

"Mr. Shellabarger and Mr. Danforth declined to disclose the amount of money involved.

"Mr. Shellabarger said the expected change in ownership will result in no changes of personnel or policies at the elevators.

"Simultaneously with the announcement of the negotiations for the Shellabarger property, the Ralston company announced plans to build a new solvent processing soybean plant in Kansas City, Missouri.

"Mr. Danforth said the Ralston company is switching from the expeller to the solvent process in producing soybean meal.

"The Shellabarger plant here has a capacity of 10,000 bushels of soybeans daily. It employs the solvent process.

"When construction of the plant was announced in September 1950, the building cost was listed at $500,000."

Note: The sale to Ralston Purina was completed on May 1.

172. *Soybean Digest.* 1952. The cover picture: Funk opens new solvent unit. Feb. p. 9 + cover.
• ***Summary:*** At the beginning of this year, the Funk Bros. Seed Co. began operation of a new 200-ton-capacity solvent extraction unit in Bloomington, Illinois. They make "Funk's" soybean oil meal and "Minrol Soy." In addition to being a soybean processor, Funk Bros. also produces soybeans and other farm seeds, and the famous "Funk's G Hybrid" seed corn. The new plant, which increases Funk's processing capacity by more than one third, is a horizontal hexane solvent extraction unit made by French Oil Mill Machinery Co. Eugene D. Funk is president of the firm. Harold A. Abbott is manager of the soybean division. A large cover

photo shows Funk's new solvent unit next to a railroad siding. In the left background is another solvent extraction plant operated by Ralston Purina Co. in Bloomington.

173. *Soybean Digest.* 1952. Purina adds two solvent plants. March. p. 26.
• ***Summary:*** "Donald Danforth, president of Ralston Purina Co., St. Louis, Missouri, announced Feb. 23 that his firm will construct a new soybean solvent processing plant at Kansas City, Missouri, according to the Associated Press.

"At the same time Danforth announced the purchase by his firm of Shellabarger Mills, Inc., which he said owns a newly constructed solvent plant at Decatur, Illinois.

"The Kansas City installation will be built at the site of the firm's present expeller plant which is a part of the company's Kansas City chow mill."

174. *Decatur Herald* (*Illinois*). 1952. Ralston Purina officers honored (Photo caption). May 2. p. 10.
• ***Summary:*** The caption below the photo reads: "William H. Danforth, left, chairman of the board of Ralston Purina Co., talks with Russell Baer, center, and Dr. J. Walter Malone, president of Millikin university. Mr. Baer has been named general manager and vice president of the Shellabarger Mills, Inc., plant taken over yesterday by Ralston Purina. The plant has been named the Checkerboard Soybean Co. Mr. Danforth and other officers of the company were guests at a luncheon in the Decatur Club yesterday."

Note: This is the earliest document seen (Sept. 2016) that contains the term "Checkerboard Soybean Co."

175. *Herald and Review* (*Decatur, Illinois*). 1952. Shellabarger gets citation. May 2. p. 3.
• ***Summary:*** "William L. Shellabarger, president of Shellabarger Mills, Inc. yesterday received a grain industry citation at a luncheon in honor of the Ralston Purina Co. The Ralston Purina Co. took over the Shellabarger Mills Inc., plant here officially yesterday.

"It was presented by Jasper Di Giovanna who was present in Chicago recently when it was announced by the National Soybean Processors association. Mr. Di Giovanna is president of Decatur Soy Products.

"The resolution, from the association board, recognized Mr. Shellabarger's years of service and contributions to the growth and welfare of the soybean processing industry.

"William Huge of Central Soya Co., Decatur, Indiana, was elected association secretary in Mr. Shellabarger's place in the Chicago meeting.

"Yesterday meeting in honor of Ralston Purina featured the appearance of top company executives including William H. Danforth, chairman of the board.

"The board also met in the Citizen's National bank to give final approval to the transfer.

"Dr. J. Walter Malone, Association of Commerce meetings committee chairman, presided at the luncheon in the Decatur Club building."

176. *Decatur Herald* (*The*) (*Decatur, Illinois*). 1952. Plant closes for repairs. May 24. p. 3.
• ***Summary:*** "The Checkerboard Soybean Co., formerly Shellabarger Mills, Inc., will shut down its plant today for a four or five week repair program.

Russell Baer, general manager and vice president of the plant, announced the shut down yesterday. He said the closing was ordered so that all the plant machinery and facilities might be overhauled.

"Thirty-two men employed in the plant have been asked to take their annual vacations during the shut-down period, Mr. Baer Said.

"'We will attempt to find work in the plant repair project for those men who are not on vacation,' he said.

"The sale of the Shellabarger plant to the Ralston Purina Co. was completed here May 1."

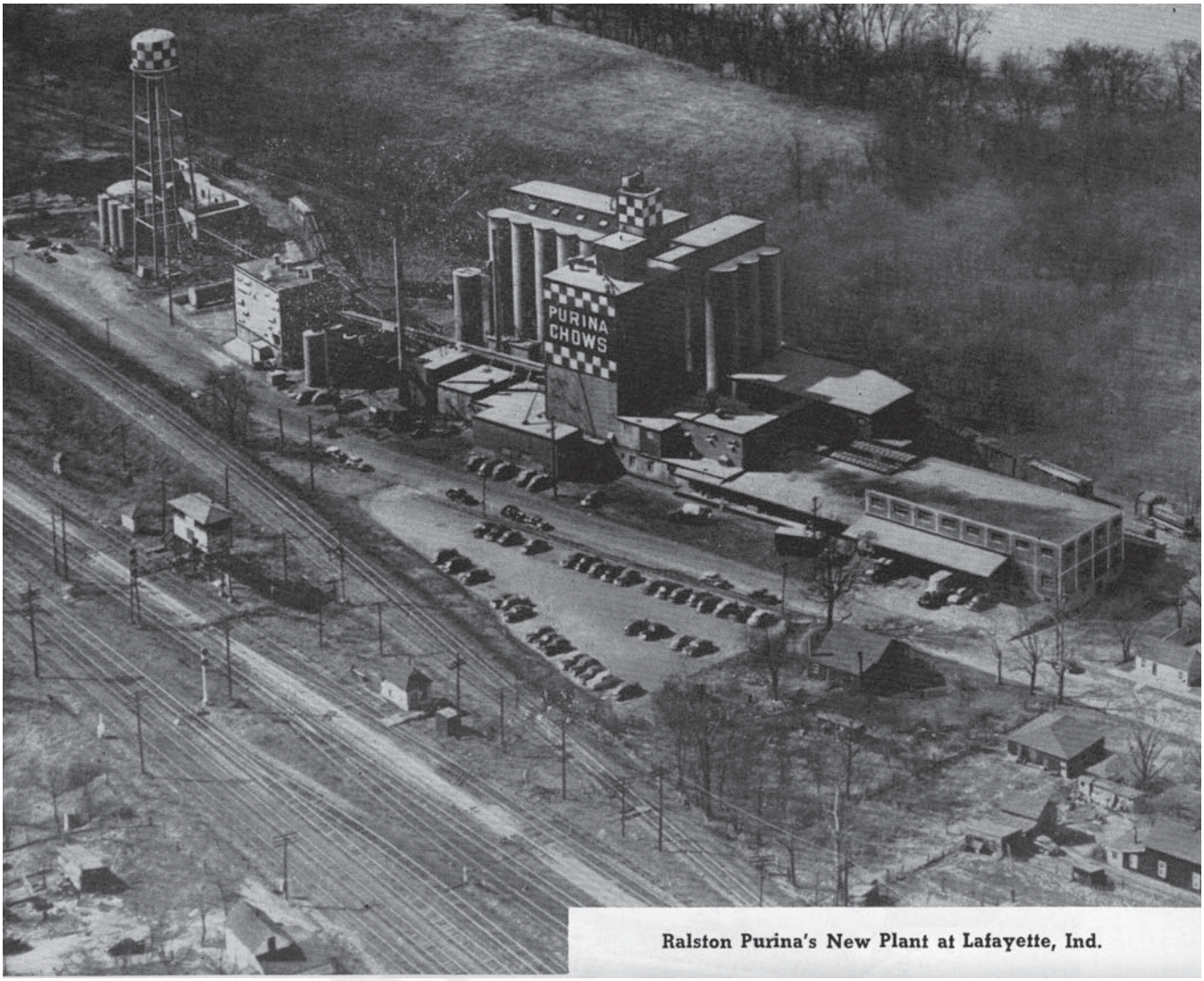
177. *Soybean Digest.* 1952. The cover picture [Ralston Purina's new plant at Lafayette, Indiana]. July. p. 8.
• ***Summary:*** See next page. "The view shown on the cover is one that will be afforded to the people who attend the American Soybean Association convention at Lafayette, Indiana, Sept. 9 to 11.

"The photo shows Ralston Purina Co.'s new solvent extraction plant [which crushes soybeans giving soy oil and soybean meal] and Chow mill at Lafayette. The new solvent soybean unit replaces the old, less efficient mechanical Expeller unit that had been in continuous operation for a number of years.

"In announcing the new unit at Lafayette, Donald Danforth, president of Purina, stated that soybean oil meal is one of the most important ingredients used in Purina Chows. He said, 'Since the Expeller process of producing soybean oil meal was fast becoming obsolete, it seemed necessary to replace the Expeller facilities at Lafayette with a solvent plant in order to best serve the interest of Purina's customers.'

"Elaborate safety devices have been built into this plant. It's equipped with automatic, deluge fire fighting protection, and the best equipment find operating safety rules are used to prevent sparks or flames."

178. Bethke, R.M. 1952. How much soybean oil meal can we use? *Soybean Digest.* Sept. p. 49.
• ***Summary:*** "It has been estimated that between 1940 and 1950 there was a 20 percent increase in the use of concentrated feeds. If we make similar progress in the efficient production of meat, milk and eggs in the 1950 and 1960 periods as we did in the preceding decade and provide our increased population with comparable living standard, then all concentrate feeds used will probably increase 17%.



Ralston Purina's New Plant at Lafayette, Ind.

To take care of this increase, we could easily use 17% more–about 1 million tons–of soybean meal or its equivalent in 1960 than in the year 1950-51."

A table shows the production of oilseed meals, meat scraps, tankage and fish meal in the USA from 1925-26 to 1950-51 (thousands of tons). Soybean meal has increased at by far the fastest rate, from 8.6 to 5887.6. Cottonseed meal has decreased from 2564 to 1719. Linseed meal has remained unchanged. Copra has increased slightly from 66 to 143. Peanut meal has increased significantly from 10.7 to 151.3. Total oilseed meal and cake has more than doubled from 3373 to 8631. Soybean as a percentage of total oilseed meals has skyrocketed from 0.3% to 68.2%.

Meat scraps and tankage has increased about 50% from 550 to 785. Fish cake and meal has increased from 69 to 215. Total high protein supplements has increased from 3993 to 9631.

Soybean as a percentage of total protein supplements has skyrocketed from 0.2% to 61.1%.

A portrait photo shows R.M. Bethke. Address: Ralston Purina Co.

179. Burlison, W.L. 1952? Looking ahead with soybeans. Urbana, Illinois. 14 p. Undated. Unpublished manuscript. • ***Summary:*** Dr. Burlison, who had retired in June 1951, prepared this undated, handwritten manuscript for a talk on soybeans he gave or intended to give in about 1954. Contents: Introduction. 1. The challenge of the past: Publications, research, extension work, early soybean farmers (Stoddard of Carlinville), American Soybean Association, soybean processors in the USA and Illinois, Illinois Farm Advisers Assoc., H.G. Atwood and the Peoria Plan, establishment of Regional Soybean Laboratory 1936 is most significant recent event in soybean history (part is located in Peoria, headquarters in Urbana, Illinois), the challenge, Illinois still leads in soybean production.

2. The facts of the present: Strong interest by the university, researchers, farmers, and processors, average

yield has more than doubled.

3. The promise of the future: Industrialists predicted needs for the future (See *Soybean Digest*, Sept. 1952. R.M. Bethke of Ralston Purina Co., H.C. Black of Swift & Co., J.C. Konen of Archer Daniels Midland Co., Ward Calland of National Crop Improvement Council, Mitsuo Hirano, president of Association of Oil and Fats Manufacturers of Japan, J.C.A. Faure of International Association of Seed Crushers, E.M. Learmonth of British Soya Products Ltd. (London), USDA Office of Agricultural Experiment Stations, George Strayer of American Soybean Association).

As early as 1897 in Illinois, "the soybean showed great future promise. To date our College of Agriculture has published 32 bulletins and 42 circulars and many hundreds of journal articles and pamphlets of various kinds. This is truly a fine record."

Today in the United States there are 260 plants which process soybeans; 37 of these are in Illinois.

"It should be noted that the first recorded effort to find an outlet for surplus [soybeans] was in 1921 when the president of the Illinois Farm Advisers Association contacted the industry for the purpose of finding a possible outlet in Illinois to handle our soybeans. Our soybean production was just getting under way which meant some uncertainty in soybean supplies.

"This uncertainty continued until 1928 when, because of heavy abandonment of winter wheat in Illinois, it seemed necessary to turn to soybeans for a part of the acreage if some assurance could be given that a sudden increase in production would not result in ruinous prices. After some negotiations with the late H.G. Atwood a price was set for soybeans as far as his company was concerned. So far as we know, this is the first instance of a case where the price was fixed before that crop was produced. This was a very important move in giving soybeans considerable stability.

"The most significant recent event in soybean history was the establishment in 1936 of the Regional Soybean Laboratory a part of which is now located in Peoria, Illinois, and a section devoted to soybean breeding with headquarters at this university."

"Illinois is still by long odds the leading soybean-producing state. Of the state's 102 counties, 41 produced from 1- to almost 4 million bushels in 1951. Outside of Illinois there are only 21 counties in the nation that produced 1 million bushels of soybeans last year. Four Illinois counties grew between 3 and 4 million bushels in 1951." Champaign County leads the nation with almost 4 million bushels. Address: Univ. of Illinois.

180. *Soybean Digest.* 1953. Changes by Checkerboard Soybean Co. May. p. 18.

• ***Summary:*** "Substantial changes have recently been completed at the Checkerboard Soybean Co., to step up production of hexane processed meal. Russell E. Baer, manager of the Decatur, Illinois, firm, reports that a marked gain in production has been made through additions to the plant, changes in machinery, and modifications in processing. Also, in conformance to strict safety policy, complete deluge and sprinkling fire control systems have been installed.

"A subsidiary of Ralston Purina, the Checkerboard Soybean Co. was formerly Shellabarger Mills. The property, which includes country elevators, was purchased in February last year to replace Purina's older Expeller operations."

A large aerial photo shows the former Shellabarger Mills in Decatur, Illinois.

181. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: 2200 North 22nd St., Decatur, Illinois.
Date of Introduction: 1953 September.
Ingredients: Soybeans.
New Product–Documentation: *Decatur Daily Review* (Illinois). 1952. Sale negotiations on Shellabarger mill announced: Ralston Purina Co. would by processing plant, 9 elevators. Feb. 23. p. 10. Note: The sale of the plant to Ralston Purina was completed on May 1.

Soybean Blue Book. 1953. "Processors of soybeans–Illinois. Decatur–Checkerboard Soybean Co." Plant at Pana. Affiliate of Ralston Purina Co., St. Louis [Missouri]. Head soybean buyer and plant manager: R.E. Baer. Plant superintendent: Ira Abbott. Hexane solvent. Processing capacity: 250 tons/day. Storage capacity: 1 million bushels. Served by IC, WAB, ITC, NYC RR.

182. **Product Name:** Buckeye Protein (Industrial Soy Protein Isolate).
Manufacturer's Name: Buckeye Cotton Oil Co.
Manufacturer's Address: Louisville, Kentucky.
Date of Introduction: 1953.
Wt/Vol., Packaging, Price: 50 lb multiwall paper bags.
How Stored: Shelf stable.
New Product–Documentation: Buckeye Cotton Oil Co. 1953. "Buckeye Protein Technical Bulletin." This isolated soy protein is manufactured in Louisville, Kentucky.

B.J. Gantt. 1959. Aug. "Buckeye Manufacturing history." "Soybean Protein: In the fall of 1946, Proctor & Gamble needed a raw material to use in the new formula of Spic and Span. It was found that a protein product that could be made from soybeans at Louisville would supply this demand. As a result, a protein unit [for making industrial-grade isolated soy protein] was erected at the Louisville Mill and adequately took care of the Proctor & Gamble needs. After a few years, the Spic and Span formula was changed again so there was less need for this protein product and it was necessary to develop outside markets where it was used largely as a substitute for casein in the paper trade."

Talk with Ed Rider, corporate archivist, Procter

& Gamble Co. 1993. July 8. In 1953 Buckeye started manufacturing industrial soy protein isolates for sale to other companies at its plant in Louisville, Kentucky. A technical bulletin dated 1953 states that the isolates were used for paper coatings, sizings, fire-fighting foam, adhesives, water-dispersible paints, etc. This plant was purchased by Ralston Purina Co. in Dec. 1958.

183. Danforth, William H. 1953. I dare you. Four-fold development: Think tall, stand tall, smile tall, live tall. 15th ed. St. Louis: Privately printed. xi + 134 p. 18 cm. * Address: Ralston Purina.

184. Terrill, R.L. 1954. The soybean research council: Information gathered by processor group benefits entire soybean industry. *Soybean Digest.* July. p. 18-20.
• ***Summary:*** Contents: Introduction. Annual meeting. Meal in feeds. A good overview of the goals and activities of the SRC which "is officially a standing committee of the National Soybean Processors Association."

Its "work is of considerable indirect benefit to soybean growers because the information it develops concerning many of the technical aspects of the soybean industry basically serves to increase the utilization of soybean products. Its activities range from studies relating to breeding and cultural practices on soybeans to the utilization of the multitudinous soybean-containing products of today's market. In virtually no other American industry do the processors involved maintain entirely at their expense a group of technical experts whose basic purpose is to gather, evaluate, and distribute technical information for the benefit of the entire industry."

Total membership now stands at 14. Membership is made up not only of men from various member firms but may also include members of outside organizations, for example Dr. J.C. Cowan, head of the oil and protein division of the Northern Regional Research Laboratory at Peoria, Illinois.

The chairman of the council is elected by vote and generally by custom serves for at least 2 years. Dr. Howard C. Black (of Swift & Co., Chicago) is the current chairman. The council maintains a survey (library) of literature pertaining to the soybean. "For the past nine years, the Soybean Research Council has sponsored an Annual Flavor Stability Symposium, and much of the progress in bringing soybean oil to its present status as the major edible oil of the United States can be traced to material sponsored, encouraged, and presented at these meetings. These papers are later presented at the appropriate technical society, but the symposium method is such as to encourage free and frank discussion and interchange of information..." "The most recent symposium was conducted in October 1953 at Chicago, with Harry L. Craig as chairman. Deodorization techniques, objective methods of grading flavor and flavor stability, and a panel discussion of factors limiting the utilization of soybean oil were among the items on the program."

"Present members of the Soybean Research Council: H.C. Black, Chairman, Swift & Co., Chicago, Illinois. M.L. Brinegar, Allied Mills, Inc., Libertyville, Illinois. J.W. Hayward, Archer-Daniels-Midland Co., Minneapolis, Minnesota. Albert C. Groschke, The Borden Co., New York, NY. H.L. Craig, The Buckeye Cotton Oil Co., Cincinnati, Ohio. W.W. Cravens, Central Soya Co., Inc., Decatur, Indiana. Stuart Bauer, The Drackett Co., Cincinnati, Ohio. Fred H. Hafner, General Mills, Inc., Chemical Div., Minneapolis, Minnesota. Max A. Jeter, The Glidden Co., Indianapolis, Indiana. J. Wesley Nelson, Cargill, Inc., Minneapolis, Minnesota. Everett Blasing, Pillsbury Mills, Inc., Clinton, Iowa. Harold L. Wilcke, Ralston Purina Co., St. Louis, Missouri. Robert L. Terrill, Spencer Kellogg & Sons, Inc., Buffalo, New York. John C, Cowan, Northern Regional Research Laboratory, Peoria, Illinois.

In 1952 the SRC conducted a "broad program of study with regard to the position of soybean oil meal in animal feedstuffs. It was attempted to establish two broad principles: one, the effect of various types of processing (expeller vs. solvent, etc.) on the nutritional quality of soybean oil meal, and two, whether or not this nutritional quality could be predicted on the basis of chemical tests." Soon all manufacturers were invited to submit samples for evaluation.

In 1953 another soybean oil meal survey, even more ambitious than the first, was undertaken. Address: Spencer Kellogg & Sons, Inc., Buffalo, New York.

185. *Soybean Digest.* 1954. Grits and flakes... from the world of soy: George E. Pierce, vice-president of Ralston Purina Co. of Canada, Ltd.,... Nov. p. 30.
• ***Summary:*** "... and manager of the Purina plant in Woodstock, Ontario, has announced purchase by his company of a tract of land near Toronto for expansion. A mill will be built some time in the future on the eight-acre tract to manufacture the full line of Purina feeds for livestock and poultry."

186. *Soybean Digest.* 1955. The Ralston Purina Co., St. Louis, Missouri, will build a new feed mill at Springdale, Arkansas. Feb. p. 28.
• ***Summary:*** "The new mill will have a capacity of about 75,000 tons of broiler and turkey feeds annually."

187. Wilcke, H.L. 1955. A report on soybean oil meal–A primary source of amino acids. *Soybean Digest.* Feb. p. 20-21.
• ***Summary:*** "Soybean oil meal oil meal as it is produced today is actually the ground, toasted soybean from which the oil has been extracted. From each bushel of soybeans weighing 60 pounds, approximately 11 pounds of oil and 48

pounds of soybean oil meal are obtained. This leaves a one pound or 1.67 percent shrink.

"The soybean oil meal as produced under normal conditions today is made up of the entire bean, minus the oil, but with no other additives. While the composition of the various strains of soybeans will vary somewhat, the average percent of hulls on the beans and which are included in the meal is only about 4 percent. No attempt is made to adjust protein levels and none are necessary because of the fairly uniform protein content when the oil is extracted to a given level. Actually, the composition of the solvent process soybean oil meal, which makes up more than 95 percent of the total soybean oil meal produced today, is approximately 45 percent protein, ½ to 1.3 percent fat, and 6 percent of fiber.

"In table I we have listed the total amount of non-roughage feeds estimated to be needed for the various classes of livestock in the United States during the year 1953-54. It will be noted in this table that swine, poultry, and dairy cattle consumed by far the major part of the high protein feeds.

"It will also be noted that the ratio of high protein feeds to the carbohydrate carrying feed is rather low. Because of this it is important to utilize our supplies of oil meals in the most efficient manner.

"Actually our high protein feeds serve as a means of providing the amino acids lacking in the cereal grains consumed by our farm animals. This is the primary function of soybean oil meal. It is not, generally speaking, a good source of some of the vitamin factors which we find in some of the animal protein supplements, but it does provide good quality protein.

"In table II we have listed the lysine, tryptophane, and methionine content of several of the high protein supplements and in some of the grains. These are three of the essential amino acids which are most likely to be lacking in grain, and it will be noted that soybean oil meal is a relatively good source of lysine, although not as good as fish meal or meat scrap. Lysine is usually the first limiting amino acid deficiency in the cereal grains when they are used as sources of protein for young growing animals.

"In table III we have listed the amino acid requirements of weaning pigs and young poultry. From this it may be seen that the requirements of these young animals for lysine, methionine, and tryptophane are higher than we would expect to find in the grains. For that reason they must be supplemented with high protein supplements such as the oil meals and animal protein supplements.

"Since the supply of animal protein supplements is definitely limited, it is necessary that we obtain the bulk of our supplementary proteins from the oil meals in order that grains may be used efficiently and in order to support normal growth in young, growing animals.

Processing Needed: This function cannot be accomplished by the ground raw soybean, but the bean must be processed to make it the most effective protein supplement. This is not due to the fat content of the bean, but there are several factors involved in the improvement of the quality of the protein supplement of the soybean by heating.

"First of all, there seems to be some factor in soybeans which functions as an inhibitor, making the lysine of the raw soybean unavailable to the pig and to the chick, particularly. Fortunately, this inhibiting factor is destroyed by heat, and when the soybean oil meal is toasted, this factor disappears and the young growing animal may utilize the protein satisfactorily.

"It was the discovery that heating improved the quality of the protein in soybean oil meal that really accounted for the rapid growth of the soybean industry in this country. Since that discovery, the soybean industry has been working constantly to discover the best combination of heat, moisture, and time which will produce the best quality meal and at the same time avoid overheating in the product that is produced.

"When soybean oil meal is overheated certain of the amino acids, particularly lysine and probably methionine, become unavailable to the young, growing animal. Therefore, there is an optimum method of processing, below which an inhibiting factor operates, and above which the amino acids are not available to the young, growing animal.

"Much work has been done in attempting to devise rapid chemical tests which will evaluate the biological value of soybean oil meals. Unfortunately, no such simple test has been developed as of this date. One of the tests that is used most frequently, and which receives the most publicity, is the modified Caskey-Knapp urease test.

"Urease Test: In the raw soybean there is an enzyme, urease, which is inactivated by the application of heat. Therefore, a measure of the urease content of the resulting meal provides some measure of the heat that has been applied to that soybean oil meal in processing.

"It may be seen readily that this test breaks down when meals are overheated because when all of the urease has been inactivated, obviously it can no longer serve to measure the amount of heat that has been applied beyond the point of destruction of the total amount of urease. Therefore, the urease test as used in plant control operations today in many plants is a means of measuring the degree of processing and evaluating the point at which the heating has been completed.

"Unfortunately, there is not a high degree of correlation between the urease readings and the biological value of the soybean oil meal produced. Within limits, it serves its purpose but its functions are limited.

"There is hardly any product on the market which does not have problems of one type or another. Every industry must recognize its problems and do its best to correct them. I feel that the soybean industry has done a very fine job in this respect. We must have continued vigilance and efforts to improve the product in order that we may meet the

requirements of the vastly increased numbers of livestock and poultry necessary to produce the foods for our growing population in this country."

A small portrait photo shows Dr. Harold L. Wilcke.

Note: This is the earliest English-language document seen (Dec. 2017) that contains the term "first limiting amino acid" (related to protein quality) in connection with soy. Address: PhD, Ralston Purina Co., St. Louis, Missouri.

188. National Soybean Processors Association. 1955. Year book, 1955-1956 (Association year). Chicago, Illinois. 48 p. • ***Summary:*** On the cover (but not the title page) is written: "Year Book and Trading Rules, 1955-1956." Contents: Constitution and by-laws and code of ethics. Officers, directors and committees for 1955-56. Membership of the National Soybean Processors Association. Trading rules on soybean oil meal. Appendix to trading rules on soybean oil meal: Official methods of analysis (moisture, protein, oil, crude fiber {only method numbers listed}, sampling of soybean oil meal). Trading rules on soybean oil: Tentative refined oil specifications. Appendix to trading rules on soybean oil: Uniform sales contract, standard specifications for crude soybean oil for technical uses, grading soybean oil for color (N.S.P.A. tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed).

The section titled "Officers, directors, and committees" (p. 12-15) states: President: R.G. Houghtlin. V.P., Chairman Executive Committee: Dwight L. Dannen. Secretary: E.A. Cayce. Treasurer: H.A. Abbott. Executive Committee: Dwight L. Dannen, Chairman, D.O. Andreas, H.A. Abbott, R.G. Golseth (term ending Sept. 1956). E.A. Cayce, A.C. Hoehne, R.G. Houghtlin, W.E. Huge (term ending Sept. 1957).

Board of Directors (Term expiring Sept. 1956): E.A. Cayce, Jasper Giovanna, Willard C. Lighter, M.D. McVay, Ralph S. Moore, Clark Yager. Term expiring Sept. 1957: D.O. Andreas, Earl J. Brubaker, Dwight L. Dannen, R.B. Jude, W.H. Knap, Glenn Pogeler. Term expiring Sept. 1958: S.D. Andrews, Jr., S.E. Cramer, A.C. Hoehne, W.E. Huge, Donald C. Ogg, J.J. Quinlan.

Standing committees: For each committee, the names of all members (with the chairman designated), with the company and company address of each are given–Traffic and transportation. Technical. Soybean grades and contracts. Oil trading rules. Meal trading rules. Crop improvement council. Soybean research council. Uniform rules and standards for soybean oil meal. Safety and insurance. Lecithin. Regional: Ohio and East; Illinois, Indiana, Kentucky, Wisconsin and Northwestern Missouri; Iowa, Minnesota, Nebraska, South Dakota; Kansas, and Western Missouri; Southeastern Missouri and the Mississippi River Delta Sections.

The following organizations, and individuals are members of NSPA: Albers Milling Co., Los Angeles, California (W.P. Kyle). Allied Mills, Inc., Board of Trade Bldg., Chicago, Illinois; Peoria, Illinois; Taylorville, Illinois; Omaha, Nebraska. Archer-Daniels-Midland Co., Box 839, Minneapolis 2, Minnesota; Mankato, Minnesota; Decatur, Illinois; Baldwin Oil Mill, Inc., Foley, Alabama (W.H. Sessions). Belzoni Oil Works, Belzoni, Mississippi (Irby Turner). Big 4 Co-op. Processing Assn., Sheldon, Iowa (Chas. W. Hanson). Boone Valley Co-op. Processing Assn., Eagle Grove, Iowa (Edward Olson). Borden's Soy Processing Co., New York 17, New York (E.J. Brubaker); Waterloo, Iowa; Chicago 4, Illinois (James R. Pentis); Kankakee, Illinois. Buckeye Cotton Oil Co. (The), Cincinnati 1, Ohio (W.H. Knapp, R.B. Williams); Little Rock, Arkansas; Wilson, Arkansas; Louisville, Kentucky; Greenwood, Mississippi; New Madrid, Missouri; Raleigh, North Carolina; Memphis, Tennessee. Cargill, Inc., Minneapolis 15, Minnesota (M.D. McVay, Jay Haymaker); Chicago 3, Illinois (W.B. Saunders); Cedar Rapids, Iowa (C.W. Bohlander); Fort Dodge, Iowa (W.J. Wheeler); Washington, Iowa (Hugo Lensch); Philadelphia, Pennsylvania (R.F. Hubbard). Central Iowa Bean Mill, Gladbrook, Iowa (Paul H. Klinefelter). Central Soya Co., Inc., Fort Wayne 2, Indiana (W.E. Huge); Gibson City, Illinois (Newell Wright); Decatur, Indiana (T.H. Alwein); Marion, Ohio (W.E. Mann); Chattanooga, Tennessee (R.W. Fay). Checkerboard Soybean Co., Decatur 30, Illinois (R.E. Baer). Colchester Processing Co., E. St. Louis, Illinois (E.L. McKee). Consumer's Soybean Mills, Inc., Minneapolis 15, Minnesota (Riley W. Lewis). Dannen Grain and Milling Co., St. Joseph 1, Missouri (Dwight L. Dannen). Delphos Grain and Soya Products Co., Delphos, Ohio (Floyd E. Hiegel). Delta Cotton Oil and Fertilizer Co., Jackson, Mississippi (Alfred Jenkins). Drackett Co. (The), Cincinnati 32, Ohio (Roger Drackett). Farmers Cooperative Assn., Ralston, Iowa (Karl Nolin). Farmers Cooperative Co., Dike, Iowa (C.M. Gregory). Fremont Cake and Meal Co., Fremont, Nebraska (Harry E. Wiysel). Funk Bros. Seed Co., Bloomington, Illinois (H.A. Abbott). Galesburg Soy Products Co., Galesburg, Illinois (Max Albert). General Mills, Inc., Chem. Div., Minneapolis 1, Minnesota (Sewal D. Andrews, Jr.); Belmond, Iowa (Walter B. Hotvet); Rossford, Ohio (Glenn W. Martin). Glidden Co. (The), Chicago 39, Illinois (Willard C. Lighter). Gooch Milling & Elevator Co., Lincoln 1, Nebraska (M.R. Eighmy). Haynes Milling Co., Inc., Portland, Indiana (Clarence E. Peters). Holland Pioneer Mills, Ohio City, Ohio (G.A. Holland). Honeymead Products Co., Mankato, Minnesota (D.O. Andreas, L.W. Andreas); Huegely Elevator Co., Nashville, Illinois (J.W. Huegely). Illinois Soy Products, Springfield, Illinois (Jasper Giovanna, Eric Nadel). Iowa Milling Co., Cedar Rapids, Iowa (Joe Sinaiko, Bob Scroggs). Iowa Soy Co., Redfield, Iowa (Donald C. Ogg). Ipava Farmers Processing Co., Ipava, Illinois (Phil. Snedeker). Kansas Soya Products

Co. (The), Emporia, Kansas (Elmer L. Buster). Lauhoff Soya Co., Danville, Illinois (R.G. Golseth). Marshall Mills Inc., Marshalltown, Iowa (J.I. Johnson). McKee Feed & Grain Co., Muscatine, Iowa (L.R. McKee). Mid-States Fats and Oils Corp., Peru, Indiana (Oren P. Cochran); Indianapolis, Indiana (Paul J. Sicanoff). Minnesota Linseed Oil Co., Minneapolis 21, Minnesota (R.J. Lindquist, Jr.). Mississippi Cottonseed Prod. Co., Jackson, Mississippi (H.E. Covington). Muscatine Processing Corp., Muscatine, Iowa (G.A. Kent). North Iowa Cooperative Processing Association, Mason City, Iowa (Glenn Pogeler). Ohio Valley Soybean Co-op, Henderson, Kentucky (A.I. Reisz). Owensboro Grain Co., Owensboro, Kentucky (William M. O'Bryan). Pacific Vegetable Oil Corp., San Francisco 7, California (B.T. Rocca, Jr.). Pillsbury Mills, Inc., Clinton, Iowa (Clark Yager, D.B. Long, E.A. Blasing). Planters Manufacturing Co., Clarksdale, Mississippi (A.K. Shaifer). Quaker Oats Co. (The), Chicago 54, Illinois (K.N. Tilden). Quincy Soybean Products Co., Quincy, Illinois (Irving Rosen, Norman Rosen). Ralston Purina Co., St. Louis 2, Missouri (Donald B. Walker); Kansas City, Missouri (F.G. Franze); Bloomington, Illinois (D.D. Rowland); Lafayette, Indiana (Ralph Guenther); Iowa Falls, Iowa (H.N. Johnson). Riverside Oil Mill, Marks, Mississippi (William King Self). Sisketon Cotton Oil Mill, Inc., Sisketon, Missouri (P.B. Bartmess). Sioux Soya Mills, Div. of Sioux Industries, Inc., Sioux City 2, Iowa (John W. Zipoy). Southern Cotton Oil Co. (The), Goldsboro, North Carolina (W.V. Westmoreland); Tarboro, North Carolina (W.A. Moore). Southland Cotton Oil Co., Div. of Anderson Clayton Co., Paris, Texas (James R. Gill). Soy-Rich Products, Inc., Wichita, Kansas (Ralph S. Moore). Spencer Kellogg and Sons, Inc., Buffalo 5, New York (Robert B. Jude); Chicago, Illinois; Decatur, Illinois; Des Moines 6, Iowa; Bellevue, Ohio; El Centro, California. Swift & Co., Union Stock Yards, Chicago 9, Illinois (S.E. Cramer). Tri-County Co-op Soybean Assn., Dawson, Minnesota (J.C. Givens). Wells (Ralph) & Co., Monmouth, Illinois (Ralph Wells). West Bend Elevator Co., West Bend, Iowa (R.W. Jurgens). West Tennessee Soya Mill, Inc., Tiptonville, Tennessee (Peter Frederickson).

Associate Members: American Feed Stores Home Organization (The), Minneapolis, Minnesota. Armour & Co., Chicago 9, Illinois (John H. Noble). Best Foods, Inc. (The), New York 17, NY. Capital City Products Co., Columbus 16, Ohio. Clinton Foods Inc., Clinton, Iowa. Cooperative Mills Inc., Baltimore 30, Maryland. Cox (Chas. M.) Co., Boston, Massachusetts. Humco Co. (The), Memphis 1, Tennessee. Kraft Foods Co., Chicago, Illinois. Lever Bros Co., New York 22, New York. Procter & Gamble Co., Cincinnati 1, Ohio. Spartan Grain & Mill Co., Inc., Spartanburgh, South Carolina. Tuckers (Mrs.) Products, Div. of Anderson Clayton Co., Sherman, Texas. Wilson & Co., Inc., Chicago, Illinois. Address: 3818 Board of Trade Building, Chicago 4, Illinois.

189. *Soybean Digest.* 1955. Soybean Digest is 15 years old. Nov. p. 8-9. See also Dec. 1955, p. 7.

• ***Summary:*** "The *Soybean Digest* is 15 years old this month. The first issue appeared in November 1940.

"Fifteen years ago this past August the American Soybean Association decided to establish an official monthly publication at its annual convention at Dearborn, Michigan. One purpose was to publish the proceedings of Association conventions.

"But some Association leaders foresaw a much larger role for the Digest. They thought it could become the voice of an entire industry. We believe it has.

"This magazine was born in the early days of World War II when a hungry world was beginning to cry for fats and proteins–and offering the comparatively new soybean crop a challenge and an opportunity. And it was pushing the American Soybean Association into broader fields.

"In 1940 the nation had already produced a 90-million-bushel soybean crop, and was soon to produce a 100-million-bushel crop. By the war's end the annual crop was almost 200 million bushels.

"Some men thought the soybean would slip back to a place of minor importance as soon as the war was over. Instead, the really tremendous growth of the crop and industry was about to begin. The 1955 crop of soybeans is almost double the 200 million bushels of 1946, and nobody now believes we have reached the peak!

"There is good evidence that the fact that the soybean has now reached an unchallenged position as the leading producer of the nation's vegetable fats and proteins has been due to the leadership within the Association and the industry. It could have been otherwise.

"The Soybean Digest is proud to have been a part of this growth.

"Plastic Fords were creating a sensation when the Digest was founded. (Editor Strayer was soon to observe soberly that plastics were consuming less than ½% [= half of 1%] of the soybean crop.)

"The Digest carried an article the first year on the use of soy flour by the German fighting forces–Hitler's secret weapon. Hitler's legions have long since descended into dust. But soy flour is an even better food fortifier now than it was in 1940.

"Indiana was starting a soybean yield contest, one of the best and first. Illinois University's G.L. Jordan was predicting a 90¢ average price for 1940-crop soybeans.

"The Ogden and Chief soybean varieties were announced.

"Some of the first year's headlines are reproduced on this month's front cover.

"Growth of the Soybean Digest during its first 15 years is well shown by the accompanying pictures of the increasing staff.

"The Digest was only 16 pages in size the first year.

Since, there have been 72 pages in some regular issues, and up to 132 pages in convention issues.

"The magazine has received heart-warming support over the years. A surprising number of first advertisers are still with us, as shown in the accompanying list. One, Seedburo Equipment Co., has carried its message in each issue of the Digest ever published.

"We do not have a similar list of the early readers who are still with us. Their number also might be a surprise.

"We value equally the subscribers and advertisers who have joined us in recent years. We are deeply grateful to all–oldtimers and newcomers. Without them there could not be a Soybean Digest."

A sidebar shows: "First Year Advertisers Still with the Soybean Digest:

"Ralston Purina Co.
"Urbana Laboratories
"Central Soya Co.
"Nitragin Co.
"Archer-Daniels-Midland Co.
"Glidden Co.
"Spencer Kellogg & Sons, Inc.
"J.I. Case Co.
"Seedburo Equipment Co.
"National Association of Margarine Manufacturers
"Agricultural Laboratories
"V.D. Anderson Co.
"A.E. Staley Manufacturing Co.
"Albert Dickinson Co.
"Quincy Soybean Products Co.
"Iowa Milling Co.
"Skelly Oil Co.
"French Oil Mill Machinery Co.
"Dannen Mills, Inc.
"Allied Mills, Inc.
"John Deere & Co.
"Allis-Chalmers Manufacturing Co.
"William H. Banks Warehouses, Inc."

A large red graph, from 1925 to 1955, across the top of page 9 shows: "Rapid as was the growth of the Soybean crop before the Digest was founded, it has been much more rapid since." However there was a basic problem with this graph. A correction, published in the Dec. 1955 issue (p. 7) stated: "It should have looked like this!" Below that was the correct graph with this caption:

"This is how the graph showing the growth of the soybean crop before and after the founding of the Soybean Digest on page 9 of the November issue should have appeared. The graph line was turned upside down and made it appear that there had been little expansion since 1940 and that production had leveled out since 1947. Gremlins sometimes creep into the best regulated printshops! Above, you see the graph as it should be with the big expansion in the soybean crop coming in the past 15 years."

Photos (p. 8) show: Geo. M. Strayer, editor and founder. G.G. McIlroy [Ohio], former president of the American Soybean Assoc. [ASA] with a letter he wrote on 14 Nov. 1940 that was sent out to members of ASA with the first issue of *Soybean Digest.*

Along the bottom of page 9 is a section titled "Growth of the Staff," with small portrait photos of the following men and a caption for each:

"Kent Pellett–became managing editor in 1942. R.E. Hutchison–became an advertising representative in 1942. E.E. Yeck–became an advertising representative in 1942. Porter M. Hedge–became Washington, DC, correspondent in 1944. George McCulley–became business manager in 1946. D.C. Cobie–became director of circulation in 1952. John Hendrickson–became an advertising representative in 1942."

190. Burial and death record (findagrave) for William H. Danforth; died on 24 Dec. 1955 (aged 85). 1955. Oak Grove Cemetery, Bel-Nor, St. Louis County, Missouri.
• ***Summary:*** Findagrave says: "Birth: 10 Sept. 1870, Charleston, Mississippi County, Missouri.

"Death: 24 Dec. 1955 (aged 85), St. Louis City, Missouri.

"Burial: Oak Grove Cemetery, Bel-Nor, St. Louis County, Missouri. Plot: Cremation.

"Memorial ID: 158344419

"He was Founder of the Ralston Purina Company, later Chairman." Note: There is no photo of his gravestone.

There are links to:

"Father: A.H. Danforth.

"Birth: 12 Sept. 1942.

"Death: 24 Dec. 1900 (aged 58).

"Burial. IOOF Cemetery (also known as Odd Fellows Cemetery), Charleston, Mississippi County, Missouri. A photo shows his gravestone and a very large monument which has Marion Danforth, Sammy Danforth, H.C. Lynn, A.H. Danforth and Rebecca H Danforth all listed.

Mother: Rebecca Hannah Lynn Danforth. Birth: 15 July 1842, Louisville, Jefferson County, Kentucky.

"Death: 8 Dec. 1913 (aged 71), Charleston, Mississippi County, Missouri.

"Burial: IOOF Cemetery, Charleston, Mississippi County, Missouri.

"Spouse: Adda Bush Danforth.

Birth: 24 Oct. 1870, Missouri.

"Married: 1894.

"Death: 2 Sept. 1956 (aged 85 [of cerebral arteriosclerosis, a build-up of plaque in the blood vessels of the brain]), St. Louis City, Missouri.

"Burial: Oak Grove Cemetery, Bel-Nor, St. Louis County, Missouri. Note: Adda's parents were Floyd Bush and Emma Bohn–according to her death certificate

"Brother: Albert Hampton Danforth.

"Birth: 7 Nov. 1876.

"Death: Oct. 1945 (aged 68).

"Burial: Bellefontaine Cemetery, Saint Louis, St. Louis City, Missouri.

Children: Dorothy Danforth Compton.

Birth: July 1895, Missouri.

"Death: 1974 (aged 78-79).

"Burial: Mount Auburn Cemetery, Cambridge, Middlesex County, Massachusetts.

"Plot: Pond Road, Lot 8473, Space 2.

A photo shows the gravestone of Dorothy and her husband Randolph P. Compton (18 March 1892-1987).

Son: Donald Danforth Sr.

"Birth: 12 Nov. 1898, St. Louis City, Missouri.

Death: 14 July 1973 (aged 74). St. Louis City, Missouri.

"Burial: Bellefontaine Cemetery, Saint Louis, St. Louis City, Missouri." Address: Oak Grove Cemetery, Bel-Nor, St. Louis County, Missouri.

191. *St. Louis Globe-Democrat* (*St. Louis, Missouri*). 1955. W.H. Danforth dies; Ralston Purina founder. Dec. 25. p. 3.

• ***Summary:*** William H. Danforth, noted philanthropist and founder and board chairman of the Ralston Purina Company died early last night after suffering a heart attack at his home at 17 Kingsbury pl. He was 85 years old.

"He died as some 50,000 carolers opened Christmas celebrations in St. Louis sponsored by the St. Louis Christmas Carols Association, an organization Mr. Danforth has headed for the past 31 years.

Note: This obituary is completely different from but shorter than that published in the *Post-Dispatch.*

192. *St. Louis Post-Dispatch* (*St. Louis, Missouri*). 1955. W.H. Danforth, Ralston Purina chairman, dies: Dead at 85. Dec. 25. p. 1, 4.

• ***Summary:*** William H. Danforth, noted philanthropist and founder and board chairman of Ralston Purina Co. died last night of a heart attack at his home, 17, Kingsbury place. He was 85 years old.

"The attack came just as Mr. Danforth, founder and president of the National Christmas Carols Association, and his family were awaiting the arrival of Christmas carolers.

"A modest and retiring benefactor of numerous churches, colleges and universities, Mr. Danforth decried publicity about his numerous gifts.

He and his wife, the former Adda Bush, gave money, directly or through the Danforth Foundation, for 13 chapels in many parts of the country.

They included those at Pilgrim Congregational Church, Barnes Hospital, Florida Southern College, Lakeland, Florida; Berea (Kentucky) College, University of Kansas at Lawrence, University of Colorado at Boulder; Kansas State College at Manhattan, University of Arizona at Phoenix and State University of Iowa at Iowa City.

"Last Year he gave Vassar College, Poughkeepsie, New York, $100,000 to further the spiritual growth of Vassar students. He headed the American Youth Foundation, which maintains summer camps for teen-age youth.

"Washington U. Graduate: Mr. Danforth was born [on 10 Sept. 1870] in Charleston, in Southeast Missouri and began his business career in St. Louis soon after his graduation from Washington University in 1892.

"The form he headed now does a gross business of about $400,000,000 annually. This year it ranked seventy-seventh in this respect among the country's biggest concerns. Its plants are in 47 cities.

Ralston Purina has its plants in St. Louis, Buffalo, New York; Nashville, Tennessee Fort Worth, Texas, Kansas City, Iowa Falls, Iowa; Battle Creek, Michigan; Minneapolis, Minnesota; Davenport, Iowa; Bloomington, Illinois; Wichita, Kansas; Denver; St. Johnsbury. Vermont, and other cities in the United States and Canada.

The company manufacturers animal foods and breakfast cereals, a line of products with which Mr. Danforth has been concerned since 1894.

"In that year he was in the Robinson-Danforth Commission Co., with George R. Robinson and Will Andrews. Their mill produced horse and mule fodder.

"Young Danforth built up the business by getting orders from animal owners, the orders to be fulfilled through wholesale grocers. 'Feed' was replaced by the word 'chow' to denote the firm's animal diet product.

"Behind the change lay Mr. Danforth's experience in Europe in World War I, when he noted the tremendous appeal the word 'chow' held for soldiers in the field. Thus was born the term 'Purina Chows,' known to farmers throughout the United States, Canada and other countries.

Tornado Destroyed Mill: When the small mill at Twelfth and Gratiot streets was destroyed by the tornado of 1896, Mr. Danforth obtained a $10,000 bank loan. In its new mill the company started making a granulated whole-wheat product for which the name 'Purina' was coined. Mr. Danforth then became the firm's president and its moving spirit.

"The Ralston Health Club. a popular movement of the time, indorsed [endorsed] the product, which was renamed Ralston-Purina. In 1902 the company was refinanced and took the name Ralston Purina Co., which it has since retained.

"A checkerboard was adopted as the firm's trademark. The company's fame was spread through checkerboard-covered lunchboxes at the 1904 World's Fair [in St. Louis].

"In World War I Mr. Danforth served in France as general secretary of the Y.M.C.A. with the Third Division of the Regular Army. Under shellfire several times, he wore five stars on his service ribbon.

"Expansion of the Ralston Purina firm began in 1913, with purchase or establishment of plants in other cities. An experimental farm of 733 acres was set up at Gray Summit, Franklin county [Missouri], in 1926.

"Through the American Youth Foundation, set up in the 1920s, the Danforths equipped a large summer camp near Shelby, Michigan. About the same time the Danforth Foundation was established to provide scholarship funds for boys and girls in many different kinds of institutions.

"Became Chairman in 1932: In 1932 Mr. Danforth became Ralston Purina's board chairman, but no one in the firm, least of all Mr. Danforth himself, thought of this step as retirement. His son, Donald Danforth, succeeded him as president and the elder Danforth thus was given greater freedom and opportunity to travel.

"There followed a series books by Mr. Danforth, mostly inspirational in theme. Titles include 'Around the World,' 'Fight,' 'Growth,' 'Action,' 'Power,' and 'I Dare You.'

"From the time that William Danforth as a sickly farm youth was dared by a teacher to become 'the healthiest boy in the class,' he built his own life on the proposition that one must take a dare to achieve the greatest goals. His 'I Dare You' is now in its sixteenth edition.

"Messages to Employees: For nearly 40 years he had expressed his buoyant personality to his associates and employees through an inspirational 'Monday Morning Message.'

"In one of these this year he stressed the value of being a 'poor changer' in such matters as marital status, employment, lodge and church membership. In none of these for the last 60 years he said proudly, had he ever made a change.

"Of slender build, he followed and taught his employees his 'Four Square Plan':

"'Physical–Stand Tall! Mental–Think Tall! Social–Smile Tall! Religious–Live Tall!'

"The Congregational Christian churches cited him for 'distinguished service in the fields of Christian leadership and education' seven years ago. The same year he was honored by the Merchants' Exchange on completion of 55 years' membership.

"Honored by Sales Group: Last spring he was given an award for distinguished salesmanship by the Sales Executives Association of St. Louis.

"Last October he established the Danforth Endowment Fund for expansion of Pilgrim Congregational Church work in religious education and community service. Income from this fund will enable the church to employ an additional staff member to direct the vacation church school and other activities.

"He was an honorary director of Washington University and a director of First National Bank in St. Louis, St. Louis Union Trust Co., New York Life Insurance Co. and Illinois Terminal Railroad Co. For many years he was a Berea (Ky.) College trustee. The Danforth home here has frequently housed distinguished visitors to St. Louis.

"Survivors, in addition to his wife and son, include a daughter, Mrs. Randolph P. Compton, Scarsdale, New York; six grandchildren, Joseph Rand Compton, San Jose, California; Mrs. Ellis Stephens, Augsburg, Germany; Lt. Donald Danforth Jr., stationed with armed forces in Germany; Dr. William H. Danforth II, Mrs. Jefferson Lewis Miller, Veiled Prophet Queen of 1947, and John Danforth, all of St. Louis, and five great grandchildren."

Note; Other books by W.H. Danforth: *Russia Under the Hammer and Sickle* (1927). *Random Ramblings in India* (1928, 151 pages).

193. *St. Louis Globe-Democrat* (*St. Louis, Missouri*). 1955. W.H. Danforth funeral service to be private. Dec. 26. p. 3.
• ***Summary:*** "A memorial service for William H. Danforth, who died Saturday, will be held at 3 p.m. Wednesday at Pilgrim Congregational Church. 826 Union bl. Interment will be private.

"Mr Danforth, founder of the Ralston Purina Company, died Saturday after a heart attack at his home, 17 Kingsbury pl.

"The company of which he was chairman of the board, has 45 plants in the United States and Canada and is one of the world's largest manufacturers of 'balanced rations' for livestock and poultry. It is a major manufacturer of breakfast cereals."

"In 1924 he and friends organized the American Youth Foundation with the purpose of training young men in Christian ideals.

"As the first and only president of the Foundation, Mr. Danforth helped establish its Camp Miniwanka [Miniwanca] at Shelby, Michigan, and spent 30 summers there." Note: As of Aug. 2020 the camp is still very active, set on 360 wooded acres and a mile of private Lake Michigan shoreline, and run by the American Youth Foundation.

194. *St. Louis Globe-Democrat* (*St. Louis, Missouri*). 1956. Donald Danforth, president, Ralston Purina Co. Jan. 4. p. 15.
• ***Summary:*** "Donald Danforth, president of Ralston Purina Company, yesterday was elected also chairman of the board to succeed to the position held by the late William H. Danforth, his father.

"At the same time, three vice presidents of the company were elected to the board. They are Eldred A. Cayce, G.M. Philpott and L.C. Stevenson. This expands the board to seven members."

195. *St. Louis Post-Dispatch* (*St. Louis, Missouri*). 1956. $1,725,000 Danforth gift to foundation: $141,000 in charitable bequests also in Ralston Purina executives will. Jan. 11. p. 3.
• ***Summary:*** Mr. Danforth's will was filed in probate court today. The $1,750,000 was a charitable stock bequest, and the $141,000 was a cash bequest to charities.

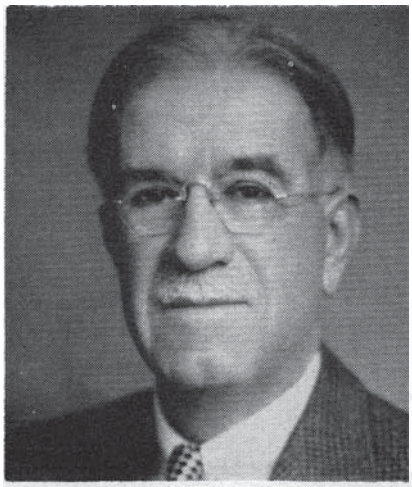
"Stock in Ralston Purina was left to employees and friends. To Gordon AM. Philpott he left 150 shares; 300 shares to Tom Roe; 300 shares to Mrs. Evelyn J. Leatherby,

and 15 shares to Mr. Frieda Gunther."

Mr. Danforth left $25,000 to each of his grandchildren: James Randolph Compton, William Danforth Compton, Ann Danforth Compton, William H. Danforth II, Dorothy Danforth Miller, Donald Danforth Jr., and John Clagett Danforth.

The will explained that there was no provision made for his wife and children since they had been amply provided for during his life. "A codicil, however, directs that his son, Donald Danforth, receive $25,000 and the same amount for his daughter, Mrs. Dorothy D, Compton. In addition he left $500 and $7,500 in trust to Clarence Suggs, a friend."

196. *Soybean Digest.* 1956. Ralston Purina founder is dead [William H. Danforth]. Jan. p. 27.
• ***Summary:*** The "85-year-old founder and chairman of the board of Ralston Purina Co., St. Louis, Missouri, died



Wm. H. Danforth

of a heart attack at his home on Christmas Eve. [24 Dec. 1955] while he and his family were awaiting the arrival of Christmas carolers.

"Danforth was founder and president of the National Christmas Carol Federation.

"He was widely known as a philanthropist, having donated funds for college chapels and founded the Danforth Foundation which provides scholarships for college students in agriculture.

"The firm which he founded is one of the nation's leading feed manufacturers and a major soybean processor, with plants in Missouri, Iowa, Illinois and Indiana."

A photo shows William H. Danforth.

197. *Soybean Digest.* 1956. Heads Ralston Purina: Donald Danforth. Feb. p. 26.
• ***Summary:*** "The board of directors of Ralston Co., St. Louis, elected Donald Danforth, president of the company, to the added responsibility of chairman of the board Jan. 3. He succeeds his father, William H. Danforth, who died Dec. 24."

198. Blaw-Knox Company, Chemical Plants Division. 1956. The majority of all soybean extraction capacity contracted for in this country since 1947 has been built by the Chemical Plants Division of the Blaw-Knox Company (Ad). *Soybean Blue Book.* p. 13.
• ***Summary:*** A full page black-and-white ad. "Each of these plants was designed and erected to incorporate the most advanced processes and equipment; each has exceeded performance guarantees... We welcome the opportunity to work with you."

The top half of the ad shows small photos of seven solvent extraction plants erected by Blaw-Knox and the location of each: Iowa Falls, Iowa [Ralston Purina Co.]. Wichita, Kansas [Soy-Rich Products, Inc.]. Decatur, Illinois. Toronto, Canada. Bloomington, Indiana. Lubbock, Texas. Indianapolis, Indiana [The Glidden Co.]. Address: Chicago 1, Illinois.

199. Schafers, Ted. 1957. World's most unusual diet kitchen. *St. Louis Globe-Democrat* (*St. Louis, Missouri*). March 24. p. 1F, 6F.
• ***Summary:*** Describes the work of Dr. James E. Corbin and Joe Populaire at the Ralston Purina Co. developing feeds for monkeys, dogs, cats, laboratory mice and rats, game birds (pheasants, quail), fish (mountain trout, blue gills, catfish, minnows), and even grey crickets–which were raised for fish bait. Dr. Corbin, a research nutritionist, is head of "special chow research" for Ralston Purina in a large laboratory at 735 Chouteau ave.

Since development of the Salk polio vaccine 3 years ago, vaccine makers have imported more than 30,000 Rhesus monkeys into the USA, mostly for use in research laboratories. Corbin's team is now working to find a new food to replace the messy banana-fruit diet that monkeys usually eat with a factory-made scientific food that incorporates "stabilized vitamin C" into a curly sausage-shaped food. Monkeys now like it and thrive on it. Ralston Purina has established a special factory to make this new "monkey chow."

One of America's fastest growing businesses is commercial fish hatcheries [later call aquaculture] which raise game fish for human consumption. There are now 1,000 fish hatcheries in America. Dr. R.M. Bethke has developed a stabilized food on which trout grow twice as fast as on the old diet of insects, liver, chicken and packing house waste. They are also said to taste better. The USDA is pushing the "farm pond program" as a source of new work and income during periods of spare time. Some farmers charge people to fish in their private ponds.

There are now 14 million licensed hunters in the USA. To serve their need for game birds, "controlled" shooting preserves are springing up across America.

Dr. Harold L. Wilcke, assistant director of research,

points out that these laboratory animals are saving thousands of human lives. Last year, one laboratory produced a million mice. "That is why special laboratory foods are important."

A photo shows Joseph Vandepopulaire offering some of the new "monkey chow" to a monkey, who passes up a banana to grab it. Note: The process for making these feeds [extrusion cooking] is not discussed since Ralston Purina considered it top secret. Address: Staff writer.

200. *Soybean Digest.* 1958. Soybean utilization conference at Peoria. Aug. p. 19.
• ***Summary:*** "The 1958 soybean utilization conference was held recently at the Peoria laboratories of the Northern Utilization Research and Development Division. The conference is an annual meeting of staffs of this division of the Agricultural Research Service, USDA, and the Soybean Research Council of the National Soybean Processors Association.

"Thirty-five attended this year. The Council had held its annual business meeting in Peoria prior to the conference with the division.

"Value of the exchange of information made possible by the meeting was mentioned by W.D. Maclay, director of the Utilization Division, as he welcomed the group to the laboratories. J.C. Cowan, chief of the Oilseed Crops Laboratory of the division, outlined the program in oilseed research, pointing out that emphasis is on industrial utilization of vegetable oils but that work is continuing on flavor stability and meal.

"W.W. Cravens, McMillen Feed Mills representative, speaking about research that is needed, suggested that more be done on the minor components of soybean meal. J.W. Cole, Glidden Co. representative, discussed research needed on soybean oil.

"Others on the program and subjects they discussed were: C.H. VanEtten, amino acids in soybean proteins; F.B. Weakley, the alleged antithiamin factor; C.D. Evans, research in edible soybean oil; L.E. Gast, plasticizer studies; and H.J. Dutton, labeling fatty acids."

A group photo shows those "attending the soybean utilization conference, all standing, left to right: First / Front Row–F.H. Hafner, General Mills, Inc., newly elected chairman of the Soybean Research Council; H.L. Wilcke, Ralston Purina Co., retiring chairman; R.L. Terrill, Spencer Kellogg & Sons, Inc.; W.D. Maclay, director Northern Utilization Research and Development Division [NU]; J.C. Cowan, NU; C.D. Evans, NU; and C.H. VanEtten, NU.

"Second Row–J.W. Cole, Glidden Co.; W.N. McMillen, A.E. Staley Mfg. Co.; W.W. Cravens, McMillen Feed Mills; J.W. Hayward, Archer-Daniels-Midland Co.; K.F. Mattil, Swift & Co.; A.R. Baldwin, Cargill, Inc.; and L.E. Gast, NU.

"Third / Back Row–M. J. Brinegar, Allied Mills; C.M. Wilson, Borden Co.; A.K. Smith, NU; R.W. Jackson, NU; R.G. Houghtlin, president, National Soybean Processors Association; H.J. Dutton, NU; F.B. Weakley, NU; E.L. Griffin, NU; H.M. Teeter, NU; and P.D. Aines, Buckeye Cellulose Corp."

201. *State Times* (*Jackson, Mississippi*). 1958. Buckeye plant to close here. Cotton declines. Nov. 4. p. 5-A.
• ***Summary:*** "The Buckeye Cellulose Corp. will close its plants here and in Macon, Georgia, at the end of the current crushing season, the firm announced Tuesday. President Walter L. Lingle, Jr. said in Cincinnati, Ohio, headquarters of the firm, that the permanent closing of operations of the two plants is due to continuing decline of cotton crops in this part of the South."

"Simultaneous with announcement of the closing here, Buckeye announced plans to sell four soybean crushing mills to Ralston Purina Co., St. Louis, manufacturer of animal feeds. In making this announcement, Lingle said: 'Buckeye entered the soybean crushing business primarily to supply Procter and Gamble with soybean oil for food products. Recently, however, the increasing importance of soybean meal for animal feed has made it desirable for soybean crushers to enter the mixed animal feed business. That's just not Buckeye's or Procter and Gamble's kind of business, so it became sound business policy for us to buy soybean oil on the open market and to dispose of the facilities for crushing soybean seed. Purchase of the mills is logical for Ralston Purina...' The mills are located in New Madrid, Missouri; Louisville, Kentucky; Raleigh, North Carolina; and Memphis (Binghampton), Tennessee."

Note: This is the earliest document seen (Oct. 2005) that mentions "Buckeye Cellulose Corp." in connection with soybean processing. The name "Buckeye Cotton Oil Co." had previously been used.

202. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Louisville, Kentucky.
Date of Introduction: 1958 December.
Ingredients: Soybeans.
New Product–Documentation: *State Times* (Jackson, Mississippi). 1958. "Buckeye plant to close here. Cotton declines." Nov. 4. p. 5-A. "Simultaneous with announcement of the closing here, Buckeye [Cellulose Corp.] announced plans to sell four soybean crushing mills to Ralston Purina Co., St. Louis [Missouri], manufacturer of animal feeds." One of the 4 mills is located at Louisville, Kentucky.

Gantt, B.J. 1959. "Buckeye manufacturing history." [Memphis, Tennessee]. 21 p. Unpublished typescript. Courtesy Procter & Gamble Co. archives. In the fall of 1958, Buckeye decided to sell four of its soybean processing mills to the Ralston-Purina Corporation." A P&G news release describing the sale is quoted at length. These mills are at New Madrid, Missouri; Louisville, Kentucky; Raleigh, North Carolina; and the Binghampton mill at Memphis, Tennessee.

They must be delivered to Ralston-Purina in the middle of an operating season–December 1, 1958.

Ad in *Soybean Digest.* 1959. "Welcome to St. Louis and Checkerboard Square." Aug. p. 5. Ralston Purina Co. has nine soybean processing plants, including one at Louisville, Kentucky.

203. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Memphis (Binghampton), Tennessee.
Date of Introduction: 1958 December.
Ingredients: Soybeans.
New Product–Documentation: *State Times* (Jackson, Mississippi). 1958. "Buckeye plant to close here. Cotton declines." Nov. 4. p. 5-A. "Simultaneous with announcement of the closing here, Buckeye [Cellulose Corp.] announced plans to sell four soybean crushing mills to Ralston Purina Co., St. Louis [Missouri], manufacturer of animal feeds." One of the 4 mills is located at Memphis (Binghampton), Tennessee.

Gantt, B.J. 1959. "Buckeye manufacturing history." [Memphis, Tennessee]. 21 p. Unpublished typescript. Courtesy Procter & Gamble Co. archives. In the fall of 1958, Buckeye decided to sell four of its soybean processing mills to the Ralston-Purina Corporation." A P&G news release describing the sale is quoted at length. These mills are at New Madrid, Missouri; Louisville, Kentucky; Raleigh, North Carolina; and the Binghampton mill at Memphis, Tennessee. They must be delivered to Ralston-Purina in the middle of an operating season–December 1, 1958.

Ad in *Soybean Digest.* 1959. "Welcome to St. Louis and Checkerboard Square." Aug. p. 5. Ralston Purina Co. has nine soybean processing plants, including one at Memphis, Tennessee.

J. of the American Oil Chemists' Soc. 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing facilities from Ralston Purina. A 7th plant owned by Ralston Purina at Memphis, Tennessee, was not offered for sale, but was scheduled to be closed in February.

204. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: New Madrid, Missouri.
Date of Introduction: 1958 December.
Ingredients: Soybeans.
New Product–Documentation: *State Times* (Jackson, Mississippi). 1958. "Buckeye plant to close here. Cotton declines." Nov. 4. p. 5-A. "Simultaneous with announcement of the closing here, Buckeye [Cellulose Corp.] announced plans to sell four soybean crushing mills to Ralston Purina Co., St. Louis, manufacturer of animal feeds." One of the 4 mills is located at New Madrid, Missouri.

Gantt, B.J. 1959. "Buckeye manufacturing history." [Memphis, Tennessee]. 21 p. Unpublished typescript. Courtesy Procter & Gamble Co. archives. In the fall of 1958, Buckeye decided to sell four of its soybean processing mills to the Ralston-Purina Corporation." A P&G news release describing the sale is quoted at length. These mills are at New Madrid, Missouri; Louisville, Kentucky; Raleigh, North Carolina; and the Binghampton mill at Memphis, Tennessee. They must be delivered to Ralston-Purina in the middle of an operating season–December 1, 1958.

Ad in *Soybean Digest.* 1959. "Welcome to St. Louis and Checkerboard Square." Aug. p. 5. Ralston Purina Co. has nine soybean processing plants, including one at New Madrid, Missouri.

205. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Raleigh, North Carolina.
Date of Introduction: 1958 December.
Ingredients: Soybeans.
New Product–Documentation: *State Times* (Jackson, Mississippi). 1958. "Buckeye plant to close here. Cotton declines." Nov. 4. p. 5-A. "Simultaneous with announcement of the closing here, Buckeye [Cellulose Corp.] announced plans to sell four soybean crushing mills to Ralston Purina Co., St. Louis [Missouri], manufacturer of animal feeds." One of the 4 mills is located at Raleigh, North Carolina.

Gantt, B.J. 1959. "Buckeye manufacturing history." [Memphis, Tennessee]. 21 p. Unpublished typescript. Courtesy Procter & Gamble Co. archives. In the fall of 1958, Buckeye decided to sell four of its soybean processing mills to the Ralston-Purina Corporation." A P&G news release describing the sale is quoted at length. These mills are at New Madrid, Missouri; Louisville, Kentucky; Raleigh, North Carolina; and the Binghampton mill at Memphis, Tennessee. They must be delivered to Ralston-Purina in the middle of an operating season–December 1, 1958.

Ad in *Soybean Digest.* 1959. "Welcome to St. Louis and Checkerboard Square." Aug. p. 5. Ralston Purina Co. has nine soybean processing plants, including one at Raleigh, North Carolina.

206. *Decatur Herald and Review* (*Illinois*). 1959. Soybean processing draws national firms; solvent method used, replaces expellers. Oil finds industrial, home uses; meal added to feeds. Jan. 25. p. 76. Sunday.
• ***Summary:*** "Central Illinois has five soybean processing plants."

These five plants employ about 1,250 persons and have combined storage space of about 24 million bushels.

The A.E. Staley Mfg. was the first to start a soybean processing plant in 1922. Next came Allied Mills with the purchase of a plant in Taylorville [Illinois, from Funk Brothers] in 1931.

The Staley company completed a new soybean plant in 1937, and in [Aug.] 1938 Spencer Kellogg & Sons "bought the Shellabarger Grain Products Co, plant at Brush College Road and Faries Parkway."

"In 1939 Archer-Daniels-Midland Co. of Minneapolis opened its plant–a plant which was pioneering the use of solvent extraction to replace the expeller method."

"Ralston Purina entered the scene in central Illinois by buying the newly built Shellabarger Mills Inc. soybean processing plant and country elevators in 1952. This is now Checkerboard Soybean Co.

"Here is a brief history of each of the central Illinois plants.

A.E. Staley Mfg. Co.: In 1922, Staley was the first soybean processor in the area; it is still the largest. "Much of [the company's] 11 million bushel terminal elevator is used for receiving, storing, and readying soybeans for processing. Although the plant uses more corn [than soybeans], the nature of the soybean market generally more advanced buying and storage.

"In one two week period last fall, the Staley elevator took in more than 5 million bushels of soybeans.

"The two initial products, soybean meal and crude soybean oil, are further processed and refined to produce a total of 67 different products used in hundreds of food items, feed and industrial purposes.

"Soybean processing operations employ more than 600 men and women in all phases of business."

Describes the old expeller method and the newer, more efficient solvent extraction process. As a final step, soybean flakes are ground into meal.

"Besides a higher oil yield, the extraction process also allows more exact control and flexibility in determining the content and properties of the products.

Allied Mills, Taylorville: Dec. 1958 was the biggest month, tonnage wise, for Allied Mills' Taylor plant, according to J.B. DeHaven, manager.

"Allied Mills, with headquarters in Chicago, now operates the Taylorville plant as the company's only soybean processing plant. In 1952 Allied Mills centered its soybean operations at Taylorville.

Allied Mills operated soybean processing plants at Peoria, Illinois; Omaha, Nebraska; and Portsmouth, Virginia–in addition to Taylorville.

"In 1952, also, the centering of operations in central Illinois brought about additions to the Taylorville plant. A 250-ton French extractor was installed, an addition was made to the flake preparation building, and an additional one million bushels storage capacity was added. The Taylorville plant, employs about 60 persons in both the plant and office, has a storage capacity of 1,750,000 bushels, and produces soybean oil, and both 44 per cent protein meal and 50 per cent protein meal.

"Allied Mills, which sells its feeds under the name of Wayne Feeds, is the result of a merger in 1929 of American Milling Co. and McMillen Feed Co. of Fort Wayne, Indiana.

"In 1931, Allied Mills bought Funk Bros. plant in downtown Taylorville. In May 1944, a fire destroyed the plant.

"In August 1944, Allied Mills built a million dollar plant on Route 48, northeast of the city. This plant, De Haven [sic, DeHaven] said, became obsolete and too small in 1954.

"Spencer Kellogg & Sons: The Decatur mill of Spencer Kellogg & Sons Inc., is the largest and most important operation of the company.

"The Decatur plant, which has a storage capacity of five million bushels, was purchased by Spencer Kellogg in 1938. It is one of nine grain-processing centers of the company.

"The company, one of the largest processors of vegetable oil seeds, as started in 1824, when Suplina Kellogg, great-great grandfather of the current president of the company, embarked in the linseed oil business.

"Spencer Kellogg & Sons Inc. was incorporated in 1912, and has been constantly expanding, having recently purchased Beacon Milling Co., Cayuga, New York and Staley Milling Co., Kansas City, Missouri.

"Since the purchase of the mill in 1938 from Shellabarger Grain Products Co., Spencer Kellogg has been engaged in soybean crushing at Decatur. The plant produces crude soybean oil, soybean oil meal and soya flour.

"The meal is used in poultry and livestock feeds. Both industrial and edible flours are produced; the industrial flours for use in adhesives and paper coatings, the edible flours for use in bakery products, meal substitutes and dog foods. The oil is sold for use in edible products such as shortening and margarine, and for use in the protective coating field.

"Processing operations are on a 24-hour per day basis, seven days a week, and the company employs about 200 people from the Decatur area, supporting a substantial yearly payroll in the community

"The company started its soybean activities at Decatur. As the crop itself spread outward, the company expanded to Des Moines, Iowa, Bellevue, Ohio, and more recently to the Minnesota area.

"While this expansion went on, the Decatur operation was constantly increased. The plant continues to be the most important operation of Spencer Kellogg & Sons. The company feels this will continue to be so as it modernizes and adds emphasis to the Decatur plant. The future of its operations seems extremely bright with the continued large Illinois production of soybeans and improved products being developed by the Research Laboratories of the company.

"Products are supplied by the Decatur plant to refineries at Long Beach, California; Chicago, Illinois; and Bellevue, Ohio, which specialize in producing a wide variety of up-graded soybean oil products for the so-called industrial user.

"When Archer-Daniels-Midland Co. began processing soybeans on a large scale 20 years ago, Decatur was the

logical location for the company's plant.

"That was in 1939, when ADM erected in Decatur the nation's largest solvent extraction plant. Previously ADM had pioneered in development of the solvent extraction process, now used throughout the soybean industry. Since that time, ADM has doubled the capacity of the Decatur plant, installed a continuous-flow refining unit, added an edible oil refinery and built a plant to produce vinyl plasticizers.

"The addition of a truck dump this month will enable Archer-Daniels-Midland to handle a 50-foot truck every four minutes.

"Since 1939 too, ADM has become one of the nation's three largest processors of soybeans.

"ADM's Decatur operations, headed by Robert S. White, production manager for the company's entire soybean division, now employ 320 persons. ADM also has soybean processing facilities at Minneapolis and Mankato, Minnesota, and Evendale, Ohio.

"Production at the Decatur plant is for both edible and industrial purposes. ADM soybean oils are used as salad and cooking oils, and in the manufacture of margarine and vegetable shortening.

"In the industrial field, soybean oil is used in protective coatings [such as paints], linoleum, foundry core oils, printing inks, synthetic rubbers and plastics. They go [sic, The protein goes] into glues and coatings for fine papers and other products.

"At Decatur, ADM produces 50 per cent soybean oil meal, a high protein supplement widely used by livestock and poultry feeders.

"Soybean processing is only one phase of ADM's operations. Founded in Minneapolis 57 years ago as a flaxseed crushing firm, the company now is a widely diversified corporation with 156 plants and elevators in 21 states and Canada. The president is John H. Daniels, a grandson of the founder.

"Checkerboard Soybean: Checkerboard Soybean Co. not only operates a soybean processing plant in Decatur, but also operates nine country elevators, both as storage facilities and retail outlets for Purina Chows, the company's feeds.

"The Decatur soybean processing plant is one of 10 such plants in the United States and Mexico operated by Ralston Purina Co. of St. Louis.

"Checkerboard Soybean processes soybeans primarily as a source of protein for the Purina Chows manufactured by Ralston Purina, according to Russell Baer, vice president and general manager of Checkerboard Soybean.

"The Checkerboard operation involves more than 100 persons in the plants, office and country elevators. Storage capacity for soy beans includes about 600,000 bushels in Decatur and another 600,000 bushels at the country elevators.

"The elevators are located at Warrensburg, Elwin, Pana, Raymond, Craig, Ospur, Dunkel, Westervelt and Ohlman.

"Checkerboard Soybean Co. was formed in May 1, 1952, when Ralston Purina bought the Decatur plant of Shellabarger Mills Inc. which was built in 1950 and completed for operation by the fall of 1951.

"Baer said Ralston Purina in the future will have in operation seven new bulk stations in Illinois to handle expedite bulk shipments of Purina Chows.

"Ralston Purina was founded in 1894 in a river front feed store in St. Louis. The original product was a feed for horses and mules."

207. *Soybean Digest.* 1959. Purina forms special soy products division. March. p. 34.
• ***Summary:*** "A special soy products division has been formed by Ralston Purina Co. as part of the soybean division with Wayne E. Tjossem as manager. Donald B. Walker is director of the soybean division. Mr. Tjossem comes to Purina from the chemurgy division of Central Soya Co., Inc., Chicago [Illinois], formerly a division of the Glidden Co., where he was assistant to the vice president of that division. Mr. Tjossem... will assume overall marketing responsibility for all Purina soy products other than soybean oil and meal."

208. **Product Name:** ProCote (Industrial Soy Protein for Coating Paper).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Plant: Louisville, Kentucky. Offices: Checkerboard Square, St. Louis, MO 63199.
Date of Introduction: 1959 June.
New Product–Documentation: Letters from Susan W. Vorih, Communications Manager, Protein Technologies International. 1993. June 17 and July 9. Procter & Gamble had a plant in Louisville, Kentucky, that made industrial soy protein isolates used in their Spic & Span house cleaner. "This was not economical for P&G and conversion was made to produce industrial isolated soy proteins for the paper coating industry. This conversion was taking place at the time of the Ralston Purina acquisition, which was finalized on December 10, 1958. At this time, Ralston Purina only had an interest in expanding its soybean solvent extraction processing capacity, but the idle isolate manufacturing facility just acquired became of interest. Ralston Purina decided to modify the Louisville isolate process for paper coating products; the plant began production on June 13, 1959. A series of hydrolyzed and non-hydrolyzed products under the ProCote brand name was produced and sold successfully to the paper coating industry. Under Protein Technologies International management the facilities have been modified and expanded to become the world's leading producer of Industrial Polymer Isolated Soy Protein products today."

"ProCote was Ralston Purina's brand name for soy isolate products for paper coatings in June 1959."

209. Gantt, B.J. 1959. Buckeye manufacturing history. [Memphis, Tennessee]. 21 p. Unpublished manuscript. Corrected by the author in Aug. 1959. 28 cm.

• ***Summary:*** The story began when Procter & Gamble Co. created/established Buckeye. "The Buckeye Cotton Oil Company had its beginning in the year 1901 when its parent company, The Procter & Gamble Company, leased a cotton oil mill at West Point, Mississippi, for one year in order to experiment with getting a steady supply of oil for P&G products. The experiment proved to be a wise one. The Buckeye Cotton Oil Company was incorporated in 1901. William Cooper Procter actively sponsored the business from the beginning. In 1902, The Buckeye Cotton Oil Company bought two six-press mills at Birmingham, Alabama, and Greenwood, Mississippi. With the purchase of these two mills, the first Buckeye General Manager was appointed.

"In 1903, mills were constructed at Augusta and Macon, Georgia; Jackson, Mississippi; Little Rock, Arkansas; and Selma, Alabama. The following year the Greenwood mill was practically rebuilt. The old mill at West Point later burned. In 1910, the press capacity of all the mills, with the exception of Charlotte, was increased to 12. Also during this year, the first mill laboratory was installed in the Birmingham mill. It was later made a division laboratory and moved to Atlanta." In 1929 the company bought the Hollywood Mill in Memphis, Tennessee, and mills in Louisville, Kentucky, and Chattanooga, Tennessee.

"In the fall of 1958, the company decided to sell four of its soybean processing mills to the Ralston-Purina Corporation." A P&G news release describing the sale is quoted at length. "The mills involved in the transaction are at New Madrid, Missouri; Louisville, Kentucky; Raleigh, North Carolina; and the Binghampton mill at Memphis, Tennessee.

"The sale of these mills, which virtually takes the company out of the soybean crushing business in this country, has resulted from changes which have taken place in marketing the end products from the soybean crushing operation.

"Buckeye's principal reason for crushing soybeans has been to supply soybean oil for Procter & Gamble food products... The company will continue to operate its seven crushing mills at Augusta, Georgia; Ft. Worth, Texas, Corinth, Mississippi; Montgomery, Alabama; Little Rock, Arkansas; Memphis, Tennessee (Hollywood Mill) and Toronto, Canada.

"This drastic reduction in the number of operating mills brought about several major problems. First, how to deliver to the Ralston organization the four soybean mills in the middle of an operating season–December 1, 1958."

Note: This news release was reprinted 4 Nov. 1958 issue of the *State Times* (Jackson, Mississippi).

"New Methods of Unloading: Around 1940, truck dumpers were being improved and the first installation was made at one of the mills whereby a load of from 15 to 18 tons could be unloaded within a few minutes... In the rapid increase to soybean usage, a much larger percentage of those were still received at the Louisville Mill by rail. Because of this problem, in 1957 a car vibrator-type unloader was installed at Louisville. This was the latest development for unloading soybeans from rail cars and will unload a 50-ton car in three or four minutes.

"Solvent Extraction Process–First for Soybeans: The solvent extraction process was invented by the Germans to use gasoline, or hexane, to get the oil out of the cottonseed and soybeans. It was the first process to replace the traditional hydraulic pressure in extracting oil. The machine for solvent extraction was patented. This patented unit, bought by Proctor & Gamble from Hans-Muhle was on the docks at Hamburg, Germany, awaiting shipment when the war broke out in 1939. Because of the blockade, it never left Germany. The only way to make-do was to go to the French Oil Mill Machinery Company in Piqua, Ohio, and try to have a similar unit built. As this was designed and built to Buckeye's specifications all of the other features on the solvent extraction tower were worked out by Buckeye including the 'basket on a ferris wheel' for holding the meats. A year's experimental work was done at the Louisville Mill and we finally began processing soybeans by solvent extraction at Louisville in 1941. The experience gained in Louisville permitted us to develop sufficient confidence to proceed with installations of solvent extraction units for cottonseed."

"Many improvements have been made to both equipment and solvent extraction processes for seed and soybeans and in 1958, 95% of all soybeans in Buckeye were processed by the solvent extraction method and 68% of the cottonseed also is processed on this type of equipment.

"Soybean Crushing: Buckeye crushed the first soybeans on expellers at the Louisville Mill in 1931-32. In 1935-36, Binghamton at Memphis also processed a sizable quantity of 28,000 tons of soybeans. Louisville, that same year (1936) crushed about 15,000 tons. Since the 1937-38 season, Binghamton was changed to process soybeans only, with all cottonseed being diverted to the Hollywood Mill in Memphis. The next year, 1938-39, Raleigh started crushing soybeans. Since that time, practically all mills have processed some beans and in 1958 the division of bean and seed crushing is about as follows: Crushing Soybeans Only: Louisville Mill (solvent extraction), Binghamton Mill (solvent), New Madrid, Missouri Mill (solvent). Crushing Soybeans and Cottonseed: Augusta, Georgia Mill (solvent), Little Rock, Arkansas Mill (solvent), Hollywood Mill (solvent), Raleigh, North Carolina Mill (started solvent–4/1/59)... With the advent of soybeans, 1931-32, the per cent of the total crush in soybeans has been increasing every year. In the fiscal year which ended on 30 June 1958, Buckeye processed 240,000 tons cottonseed (this does not

include Traders Oil Mill, Ft. Worth, Texas, which crushed about 44,000 tons of cottonseed). In the same fiscal year, Buckeye processed 522,000 tons of soybeans.

"Soybean Protein: In the fall of 1946, Proctor & Gamble needed a raw material to use in the new formula of Spic and Span. It was found that a protein product that could be made from soybeans at Louisville would supply this demand. As a result, a protein unit [for making industrial-grade isolated soy protein] was erected at the Louisville Mill and adequately took care of the Proctor & Gamble needs.

"After a few years, the Spic and Span formula was changed again so there was less need for this protein product and it was necessary to develop outside markets where it was used largely as a substitute for casein in the paper trade.

"One of the most interesting developments in the processing of soybeans recently has been the advent of 50% protein low-fiber soybean meal. This is a premium product usually selling from $7 to $8 a ton over the regular soybean meal market, and is in great demand by the poultry trade. Buckeye started producing 50% soybean meal at Louisville and Binghamton Mills in 1956-57."

Talk with Ed Rider, corporate archivist, Procter & Gamble Co. (who located and sent this valuable document). 1993. July 15. When B.J. Gantt wrote this history he was probably residing and working in Memphis, Tennessee, which is where P&G's Buckeye subsidiary was headquartered. Address: Vice President and Superintendent of Manufacture, Buckeye [Memphis, Tennessee].

210. Ralston Purina Co. 1959. Welcome to St. Louis and Checkerboard Square (Ad). *Soybean Digest.* Aug. p. 5.
• ***Summary:*** A full-page ad. "Home of the Ralston Purina Company, one of the country's largest users of soybeans and soybean meal for the manufacture of Purina Chows for poultry and livestock.

"With soybean processing plants at Bloomington, Illinois; Decatur, Illinois; Iowa Falls, Iowa; Kansas City, Missouri; Lafayette, Indiana; Louisville, Kentucky; Memphis, Tennessee; New Madrid, Missouri; Raleigh, North Carolina."

This ad welcomes members of the American Soybean Association and the National Soybean Processors Association, who are apparently meeting in St. Louis. Address: General Offices: St. Louis 2, Missouri.

211. *Soybean Digest.* 1959. Grits and flakes... from the world of soy: Ralston Purina elects three vice presidents. Aug. p. 38.
• ***Summary:*** "Three new vice presidents of Ralston Purina Co. have been elected by the board of directors, it has been announced by Donald Danforth, chairman of the board.

"They are John McGinty, vice president and director of sales; C. Alvin Tolin, Jr., vice president and general manager of chow and soybean production; and Donald B. Walker, vice president and director of the soybean division. All were elected also to the company's management committee.

"McGinty has been with the company 15 years, Tolin 33, and Walker 24."

Small portrait photos show Donald B. Walker and C. Alvin Tolin, Jr.

212. Cavanagh, Helen M. 1959. The miracle bean (Document part). In: Helen M. Cavanagh. 1959. Seed, Soil and Science: The Story of Eugene D. Funk. Chicago, Illinois: Lakeside Press, R.R. Donnelley & Sons Co. xii + 544 p. See p. 349-77, 503-05 (Notes). Chap. 26. 22 cm. [92 endnotes]
• ***Summary:*** This chapter is about Funk Bros.'s work with soybeans. "As part of its field seed business, Funk Bros. sold soybeans for feed purposes as early as 1903... Eugene was among the early advocates of increased planting of soybeans in the early nineteen twenties... Eugene Funk watched with growing attention a mill operated by George Brett and I.C. Bradley at Chicago Heights, Illinois. This mill processed soybeans in 1919 with an expeller plant... Through the efforts of Otto Eisenschiml of Chicago four tanks of oil produced in 1921 were sold...

"E.D. Funk, Sr. described the coming of the soybean to the farming system of corn, oats, wheat and clover rotations in the Central Corn Belt as follows: 'Once in a life time! Yes, only once in the annals of crop production has our agronomy experienced anything like the Soybean... Oats fell in acreage before it. Corn and wheat were challenged as cash income crops. Even in the realm of soil building, it threatened established legumes.' At Funk Farms acreages were turned over to producing seed to meet the demand. Over 2,000 bushels of their crop were hand picked in 1921 to obtain every possible pound of pure merchantable beans."

In 1924 Gene Funk, Sr., established a soybean processing plant in Bloomington. It started in the fall of that year, with two expellers and a capacity of 300-350 bushels per day. During its first year, the plant operated for about 5 months and processed approximately 20,000 bushels of soybeans. The company showed a profit in 1925, following a loss during the first year. By 1929 the plant had a capacity of 800 bushels/day. I.C. Bradley came to the Funks as manager of their soybean mill.

Concerning the origins of the Peoria Plan (p. 352): "A second step in the expansion of soybean production was possible because of leadership in central Illinois. There was a need for meal on the part of the Grange League Federation organization of New York. The acquaintanceship of H.G. Atwood of American Milling Company of Peoria with James A. McConnell of G.L.F. on the one hand and with Funk Bros. of Bloomington on the other, facilitated a discussion of the problem. I.C. Bradley stated that he and Eugene Funk interested Atwood in an idea sometimes attributed originally to American Milling Company. It is fair to say that Funk and Bradley did as much to initiate the introduction of a

guaranteed price as anyone. Without Eugene Funk's initiative and knowledge of agricultural conditions a combination of cooperative leadership might not have resulted. H.H. Miller also provided able guidance for this program. It is also fair to say that without Atwood and McConnell the plan would not have succeeded. The American Milling Company placed in operation an unused factory in Peoria where I.C. Bradley helped to install machinery to remove oil and grind soybean cake into meal. The decision of G.L.F. to buy meal for the New York Milkshed created a wide market. A guaranteed price of $1.35 per bushel was offered up to a total of a million bushels in 1928 to 1,500 Illinois farmers for beans by Funk Bros. of Bloomington, by the American Milling Company of Peoria and by Cooperative G.L.F. Incorporated. The *G.L.F. Shareholder* (Jan. 1929, p. 27) stated that their organization realized that prospective supplies would be inadequate, and knew that a protein shortage would be costly to G.L.F. patrons. They, therefore, entered he agreement to secure a supply of protein with the dairy feed market as its primary outlet. The source was the farms of Illinois and the product was soybeans. The Illinois College of Agriculture, the Farm Bureau and the *Prairie Farmer* cooperated.

"The final decision regarding the guarantee for the 1928 crop was made at a meeting in Urbana of fifteen county farm advisors, representatives of Funk Bros. and of the American Milling Company. A committee of three was named to draw up the agreements. I.C. Bradley commented many years later:

"'We solicited the aid of the late Mr. H.G. Atwood, President of American Milling Co., at that time, which later became Allied Mills, Inc. His first reaction was in this response... "The farmers are our customers. His stock needs protein. He should produce it." That was the "Spark Plus" for the beginning of a new and great industry. He said we will take all of the meal your plant can produce.'"

Note: Endnote #22 (p. 519) states that the American Milling Co. received signed contracts for 32,000 acres by May 1, 1928 and 50,000 acres by October, 1928.

"A.E. Wand of Staley's attended the Urbana meeting. He left with word that he would urge them to join but he apparently was not instrumental in gaining this action. However, Staley continued to provide a market for beans and was increasingly interested in the development of this crop.

"The million bushel limit in 1928 was considered adequate. Only one-half that amount was offered to mills in the area during the previous season. The 1927 U.S.A. crop was 2,288,000 bushels. About three-fourths of this amount was used for feed and for purposes other than for milling. The guaranteed price in 1928 of $1.35 per bushel was for No. 2 grade beans and was considered satisfactory by the farmers. Under the agreement, if the farmer negotiated to grow beans he was not compelled to ship to either of the participating companies if others offered higher prices. Agreements for 1928 in order to stimulate production were made in terms of acres instead of bushels. [Endnote #25 (p. 519): "Contracting mills received contract and non contract beans on the same basis. Contract buyers were compelled to take nearly 40 per cent more beans than intended."] Strictly speaking, this announcement was a guarantee, not a contract." J.A. Waring, who came to work for Funk Bros. in 1927 after many years experience in the grain business, handled the paper and contracts for the program in 1928 from the office of Funk Bros. He recalled (Jan. 1956) that most of the contracts of the three companies were mailed from the Funk office.

"The legume project of the University of Illinois during the season 1928 placed its chief emphasis on the soybean. This program was composed of two parts: (1) To standardize better adapted varieties through publicity and field demonstration; (2) To assist in supplying a satisfactory market for surplus seed and for beans of lower quality."

The three companies who used nearly all of the crop were interested for different reasons: (1) Funk Bros. for production of oil and meal from soybeans; (2) The American Milling Company for production of soybean meal and; (3) The G.L.F. Exchange as the largest buyer of soybean meal in the United States. Deliveries reached 650,000 bushels in Peoria and 350,000 at Funk Bros. in December when the million bushels were received.

"Better varieties of beans were used: Manchu, a good yielder with a high oil content and the Illini which stood better than other varieties. Grading also was important. Probably 90 percent of the farmers were satisfied with the agreement."

"The manufacturers were equally pleased."

This chapter also notes: "A new wooden elevator with a capacity of 40,000 bushels was constructed by Funk Bros. near the warehouse during the fall of 1928. On the morning of March 12, 1929 with the elevator about two-thirds full, fire destroyed the structure. Some [soy] beans were destroyed, and many more were water soaked. Arrangements were made with Allied Mills of Peoria to dry the beans... Fortunately the full amount of the insurance was paid. This was indeed a disheartening moment in the development of the soybean business at Funk Bros. Decision to proceed with the construction of a concrete elevator of 140,000 bushel capacity followed almost immediately" (p. 360-61) (Continued). Address: Bloomington, Illinois.

213. Cavanagh, Helen M. 1959. The miracle bean (Document part II). In: Helen M. Cavanagh. 1959. Seed, Soil and Science: The Story of Eugene D. Funk. Chicago, Illinois: Lakeside Press, R.R. Donnelley & Sons Co. xii + 544 p. See p. 349-77, 503-05 (Notes). Chap. 26. 22 cm. [92 endnotes]
• ***Summary:*** (Continued): Also discusses: I.C. Bradley, who became manager of the Funk Mill at Taylorville (p. 361). "A new venture in soybean marketing occurred when the formation of a cooperative became a reality. When

the directors of the newly formed Soybean Marketing Association held their first meeting December 7, 1929, John Armstrong invited Eugene D. Funk, Sr., Messrs. Legge, Atwood, [H.W.] McMillen, Heidrich and Eisenschiml to be present" (p. 361).

Soybean standards, announced by the USDA in 1925 (p. 362). The National Soybean Oil Manufacturers Association, which held its organizational meeting on 21 May 1930 (p. 362-63).

"The contract for processing was in the form of a letter dated October 23, 1931 signed by D.W. McMillen, president of Allied Mills and cosigned for Funk Bros. by H.H. Miller and I.C. Bradley, Allied Mills, Inc., agreed to purchase soybeans to be placed in store at Bloomington and Taylorville and other points to remain the property of Allied Mills. This agreement was the basis for incorporation of Soya Products. Funk Bros. were authorized to process their beans at Bloomington and Taylorville into oil and meal and receive from Soya Products the actual cost for processing not to exceed $5.00 per ton of beans processed. The oil and meal were to be sold by Allied Mills and shipped by Funk Bros. at their direction. The proceeds from the sale were the property of Soya Products. Profits were to be shared on a fifty-fifty basis. Allied Mills reserved right of supervision of process and access to records."

"The board of directors for Soya Products, the company formed to handle this transaction, was composed of Eugene D. Funk, Jr., and from Allied Mills Henry Egly, president of Soya Products, Roy Craig, Vice president, Harold Buist, secretary, and Jack Quinlan. Mr. Quinlan recalled that he never worked with an organization more sincere than Funk Bros. Seed Co., in its efforts to establish and maintain good relations within the industry. Mr. Funk, Sr. would often remark, 'But he is a grand old fellow and an old customer' of someone he knew. This unselfish attitude in merchandising was marked in the program of E.D. Funk, Sr. That desire for the last ten cents was not always uppermost in his thinking.

"The formation of Soya Products enabled Funk Bros. and Allied Mills to cooperate in buying soybeans as well as processing and selling oil meal and soybean oil. The friendly relations between the two companies was thus continued. The agreement proved to be mutually advantageous and gave to Eugene D. Funk, Jr. an opportunity to increase his knowledge of expanding soybean operations" (p. 367).

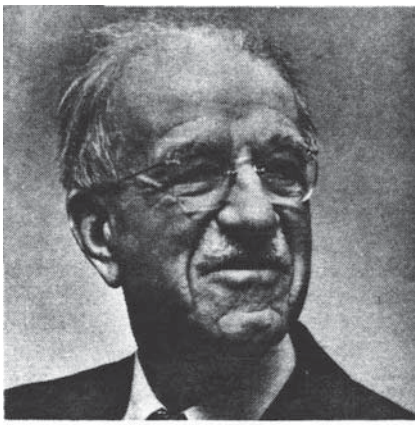
I.F. Laucks Inc., which used soybean flour to produce a waterproof glue (p. 368). Dr. W.L. Burlison (p. 369, 373). Early use of soybean meal in mixed feeds (p. 370). The big 1936 Farm Chemurgic Council meeting in Detroit and Dearborn, Michigan; Eugene Funk, Sr. spoke (p. 370). Henry Ford's work with soybeans (p. 370). E.D. Funk, Jr. is chairman of the Edible Soybean Committee of the National Soybean Processors Association from 1939-1947 (p. 372-73). Dr. Earl Sieveking of Funk Bros. develops "edible soybeans," especially Funk's Delicious (p. 373). Other popular varieties of "vegetable soybeans" were Giant Green, Bansei, and Hokkaido (p. 373-74). Expansion of the Funk Bros. soybean processing plant; capacity reached 4,350 bushels/day in 1944 (p. 374-75). Acquisition of new French solvent extractor, which begins operation in Jan. 1952 (p. 375-76). The largest users of Funk's soybean meal included Ralston Purina, Allied Mills, Arcady Farms, and Hales and Hunter. Major buyers of Funk's crude or unrefined soybean oil included Procter & Gamble, Lever Bros., Glidden, Swift & Co., and Anderson-Clayton (p. 377).

This chapter concludes: "The decision by Funk Bros. to install the soybean mill in 1924 gave greater diversification to the seed business. It is an interesting fact in agricultural history that the sudden rise of the soybean to prominence as a cash crop in the 1920's and 1930's paralleled the spectacular advancement in hybrid corn. Eugene D. Funk was a recognized leader in the expanding development of both crops essential to the well being of many Americans. Again Gene Funk led in an effort to better conditions for the farmers in the Corn Belt." (p. 374-75).

Photos show: (1) Eugene D. Funk, wearing a cowboy hat and necktie, standing tall by tall corn (opposite the title page). (2) Aerial view of the Funk Bros. Seed Co., and side view of the Research Center, both Bloomington, Illinois (p. 324). Address: Bloomington, Illinois.

214. *Soybean Digest.* 1960. William H. Danforth was many-sided man. Dec. p. 12.

• ***Summary:*** "William H. Danforth of St. Louis, who died in 1955 at the age of 85, was the founder of one of America's



William Danforth

great corporations, Ralston Purina Co. At the time of his death the company operated 47 plants in the food and feed fields. Ralston Purina is one of the nation's leading soybean processors with 10 plants in the seven states of Illinois, Indiana, Iowa, Kentucky, Missouri, North Carolina, and Tennessee.

"But William Danforth was far more than a corporation president. He was a many-sided man and the greatest

exponent of the four-square formula for living which he adopted:

"Stand tall (physical)
"Think tall (mental)
"Smile tall (social)
"Live tall (spiritual)

"He preached this philosophy most effectively all his life to his associates in many fields and to the thousands of young people with whom he came in contact. The four-sided checker was not only the symbol of his company but of his life as well.

"To name just a few of Mr. Danforth's activities: He was for years superintendent of Pilgrim Sunday School in St. Louis, general YMCA secretary for the Third Infantry Division in France during World War I, co-founder of the American Youth Foundation, and founder of the Christmas Carols Association in St. Louis.

"William Danforth was a great leader of men. His greatest interest in addition to business was young people. He influenced thousands of them, helped hundreds through college and maintained personal contact with them.

"He gave up the active management of his company to his son, Donald, while he was still in the prime of life to devote his main efforts to the Danforth Foundation, dedicated to the education of youth.

"More than three-quarters of a million copies of this book, *I Dare You*, written as a challenge to people everywhere to dare and achieve more, have been distributed.

"Mr. Danforth's biographer, Gordon M: Philpott, calls him an alltime champion as a correspondent. He wrote to his wife, children, grandchildren, thousands of young people, and a wide circle of friends. His letters ran into the thousands.

"Mr. Philpott, his protege, lifelong friend and business associate, has captured much of his spirit in the book recently published by Random House. *"Daring Venture.* By Gordon M. Philpott. 176 pages illustrated. $3.95. Random House, New York.

An original portrait photo shows William H. Danforth.

215. Philpott, Gordon M. 1960. Daring venture: The life story of William H. Danforth. New York, NY: Random House. xvi + 175 p. Illust. No index. 21 cm.
• ***Summary:*** William Henry Danforth (1870-1955) was the founder of the Ralston Purina Co. "This book is dedicated to the thousands of boys and girls who were dared by William H. Danforth to stand tall, think tall, smile tall and live tall."

Chapters 1 and 2 tell the early history of Ralston Purina. "On January 1, 1894, the Robinson-Danforth Commission Co. was formed with Robinson as president; Andrews, vice-president; and Danforth, secretary-treasurer. The boy was now ready for a man-sized job. Things soon began to hum around the little feed store in St. Louis. Ground corn and crushed oats were dumped in the back room and mixed with hand shovels. The mixture was put into 175-pound burlap bags, which were then sewn by hand. Robinson, who had a flair for promotion, named it Purina Horse Feed. *Purina* was a coined word meaning pure grain... Danforth's first job was to keep the books and he shared the same desk with Robinson... He proved to be a shrewd buyer, too..."

Note: In 1898 Danforth entered the human food market with *Purina Wheat* and a line of whole-wheat breakfast cereals.

Page 10 shows a full-page photo of Albert and Rebecca Danforth, Will's parents. This photo was taken in the fall of 1868.

Pages 36-38: The idea for the famous red and white "checkerboard trademark was born in the mind of a boy in Charleston, Missouri, when he watched farmer brown and his family come to town in gay red and white checker clothing." Mrs. Brown always bought her cloth from the bolt of that distinctive kind of cloth.

A photo (p. 37) shows a book and a page titled The Ralston Health Club. The large text of a membership certificate reads: "Complete membership. With perfect health. Purpose: 'To establish a new race.' Your complete membership number is: 219,405." The caption explains that this club, which now had "several hundred thousand members, recommended Ralston Whole Wheat as the official cereal for all members."

For years, Will Danforth had been working to improve his health. A high school teacher had dared him to build a strong, healthy body. Throughout his life he worked hard to maintain his health through daily exercises, proper diet, and sensible habits. He approached things of the spirit in the same systematic way.

The text (p. 38-39) explains that [in 1902] the company changed its name to Ralston Purina Company at the same time the checkerboard became its trademark. Purina remained the name of the company' horse feed. "The name *Ralston* became part of the company name because of an association with a Dr. Ralston who had organized a national health club that claimed approximately 800,000 members. There was a growing health consciousness in America at the turn of the century. Revolutionary discoveries were being made in the field of human nutrition. People everywhere were beginning to realize that good health and length of life depended very largely on diet and they were eager for information.

"When Danforth read Dr. Ralston's book, entitled *Life Building,* he found that the doctor recommended a whole grain cereal similar to the one he was selling." Hundreds of thousands of copies of the book were sold to members of the Health Club, and these members followed the Doctor's recommendations. "Danforth called on the Ralston Health Club officials in Washington [DC] to see if they would recommend his cereal to their members. This they were willing to do, provided the cereal was called Ralston Wheat

Cereal. It turned out to be a good deal for both parties. Mr. Danforth got national distribution through grocery stores for his Ralston Wheat Cereal because the health club members demanded it, and the health club received additional publicity and revenue. The Ralston Health Club has long since faded into obscurity but the name Ralston is as widely known as Purina." By 1902 a company ad boasted, "In a million homes."

Note: This is the earliest document seen (Sept. 2020) that uses the term "Dr. Ralston" (or "Mr. Ralston") to refer to the leader of the Ralston Health Club. There was no person with the surname Ralston who founded or led this club. The person was invented by the author of this book.

By 1904 the Ralston Purina Company's sales reached almost $1.25 million. To make its checkerboard products better know, the company advertised them vigorously and consistently. In 1904, when the Louisiana Purchase Exposition was held at St. Louis, Missouri, to commemorate the centennial of the purchase of the Louisiana Territory, handy and colorful checkerboard shopping bags were supplied to all the visitors–free of charge.

Photos show: (1) Albert Danforth, Will's father, before joining the Confederate Army (p. 7). (2) Young Will Danforth, taken shortly after he arrived in St. Louis to attend school. (3) Albert and Rebecca Danforth, Will's parents (p. 10). (4) Will Danforth after graduation from Washington University in St. Louis (p. 15). (5) The large Danforth home in Charleston, Missouri–later given to the YMCA.

Page 97: How Will loved to hunt!

Page 112: A letter written to Donald Danforth by his father in 1927.

216. *Soybean Digest.* 1961. Cornelsen heads Purina international division. July. p. 20.

• ***Summary:*** "Paul F. Cornelsen, central division production manager for the Ralston Purina Co., has become a vice president of the company's international division, according to Hal Dean, Purina vice president and president of the international division.

"The division has manufacturing plants in Central America, South America and Europe. Mr. Cornelsen will continue to headquarter in St. Louis. He took up his new duties July 1." A photo shows Cornelsen.

217. *Soybean Digest.* 1961. "Soybean" Johnson passes in Florida. Nov. p. 35.

• ***Summary:*** "E.F. 'Soybean' Johnson, one of the real pioneers of the soybean industry, died at Winter Haven, Florida, Sept. 18. He was 71. Mr. Johnson was active both as a soybean producer and as a processor. He began growing soybeans in 1912 and grew them on his farms in northern Ohio for close to 50 years.

"He was affiliated with three different processing firms, Ralston Purina Co., Louisville (Kentucky) Soy Products Co.,

and Delphos (Ohio) Grain and Soya Products Co.

"Mr. Johnson was always very active in ASA [American Soybean Assoc.] and one of the organization's early annual meetings was held on his farm. He was elected an honorary life member in 1949.

"He was among those whose efforts and encouragement brought about the founding of the *Soybean Digest.*

"He received his education at the University of Indiana, Purdue University, and Ohio State University. He was a teacher of extension for 7 years and an assistant professor at Ohio State University for 2.

"Mr. Johnson is survived by two sons and a daughter." A photo shows E.F. Johnson.

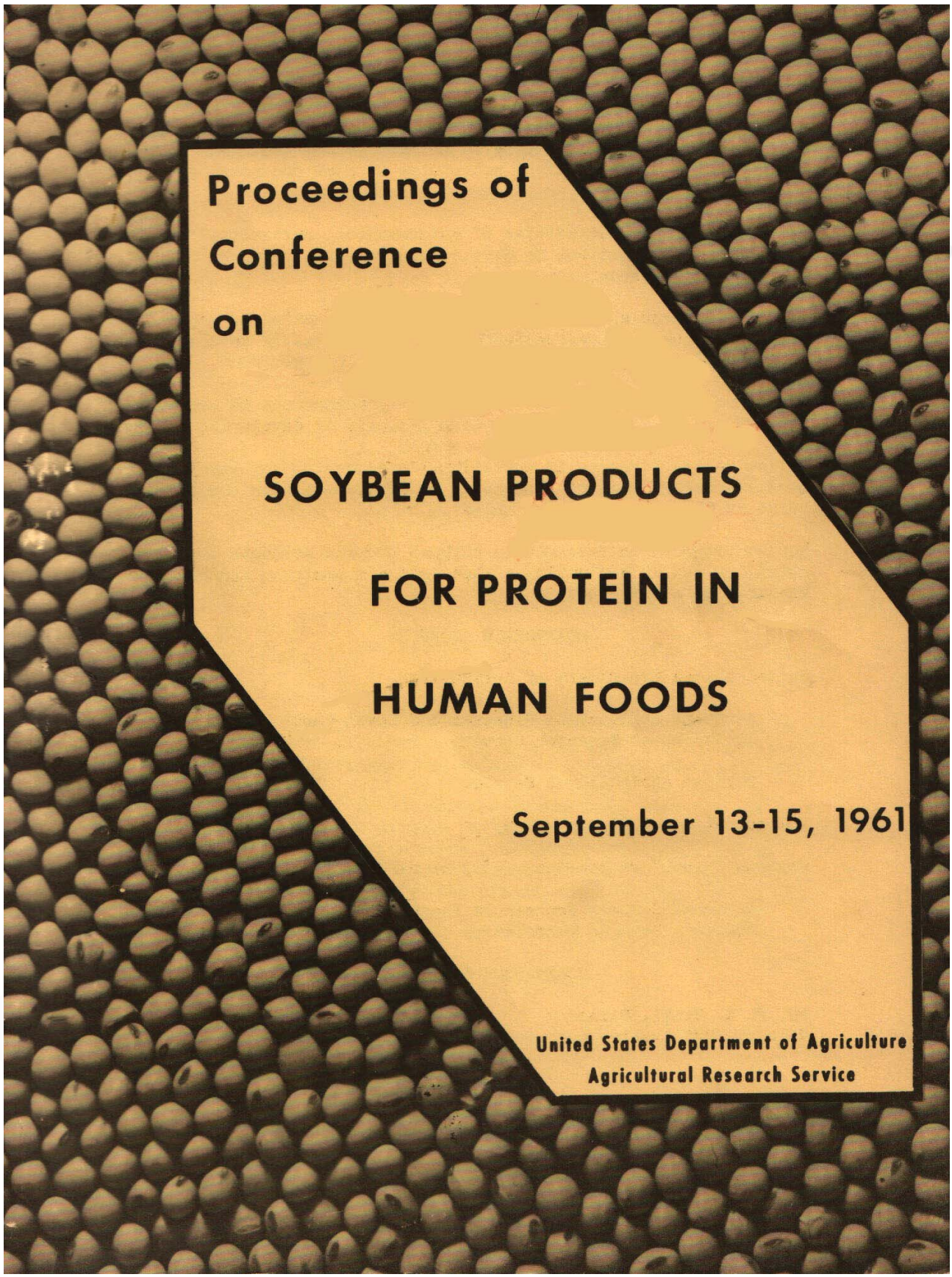
218. USDA Northern Regional Research Laboratory. ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, Illinois. iii + 242 p. Held 13-15 Sept. 1961 at Northern Regional Research Laboratory, Peoria, Illinois. No index. 26 cm.

• ***Summary:*** See next page. The earliest conference on this subject in the USA. A very important document, with many excellent articles by experts in their fields worldwide.

Contents: Introductory remarks. Session I: Nutritional deficiency problems in developing areas of the world. II: World marketing of soybeans and soybean products. III: Research and development on soybean foods. IV: Nutritional and biological studies. V: Processing and feeding value of fluid and dry soy milks. VI: Problems involved in increasing world-wide use of soybean products as foods–panel discussion. VII: Committee on quality and processing guide for edible soy flour and grits. VIII: Summary of conference. List of attendance. Most of the 106 attendees are PhDs or leaders in agriculture, business, government, or scientific research. The complete list follows:

Altschul, A. M. Southern Utilization Research and Development Division, ARS, USDA, New Orleans, Louisiana

Anderson, D. W., Jr. The Borden Company, 350 Madison Avenue, New York 17, New York



Andrews, J. S. General Mills, Inc., 9200 Wayzata Boulevard, Minneapolis 26, Minnesota

Anson, M. L. Consultant, 100 Eaton Square, London, S.W. 1, England

Bailey, E. M. A. E. Staley Manufacturing Company, Decatur, Illinois

Barnes, R. H. Cornell University, Ithaca, New York

Bean, L. H. Food for Peace, The White House, Washington, D. C.

Biddle, C. B. Biddle Farms, Remington, Indiana

Bitting, H. W. Agricultural Research Service, USDA, Washington 25, D. C.

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Milner, Max United Nations Children's Fund, United Nations, New York

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Pellett, Kent The Soybean Digest, Hudson, Iowa

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Trotter, W. K. Northern Utilization Research and Development Division, ERS [USDA's Economic Research Service], USDA, Peoria, Illinois

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Wolff, I. A. Northern Utilization Research and Development Division, ARS, USDA, Peoria, Illinois

Woods, L.C. A.E. Staley Manufacturing Company, Decatur, Illinois. Address: Northern Regional Research Lab., Peoria, Illinois.

219. **Product Name:** Worthington Minute Entrees–Fried Chicken Style (Meatless Chicken–Frozen).

Manufacturer's Name: Worthington Foods, Inc.
Manufacturer's Address: 900 Proprietors Rd., Worthington, Ohio.
Date of Introduction: 1962 July.
Ingredients: Incl. Fibrotein spun soy protein fibers.
Wt/Vol., Packaging, Price: 6 oz. paperboard box. Or 15 lb.
How Stored: Frozen.
New Product–Documentation: Chopletter (Worthington Foods, Worthington, Ohio). 1962. July. p. 1, 3. "A new concept in foods." This product, made with Fibrotein [spun soy protein fibers], is already on the market. A photo shows the product." Note: This is the earliest commercial soy product seen (one of three chicken alternatives introduced this month) in which Fibrotein is used as an ingredient.

Wholesale price list. 1962. Oct. 1. Sold in 6 oz. portions (24 per case for $9.90, or 15 lb bulk for $1.25/lb). Note: No mention is made on this sheet of spun soy protein fibers.

George D. Kyd. 1963. *Food Processing.* May. p. 123-26. "Edible soy protein fibers promise new family of foods." The author, an employee of Ralston Purina Co., states that this product, which contains Textured Edi Pro (spun soy protein fibers made by Ralston Purina) is already on the market. Page 126 describes the product as "frozen fried-chicken style Minute Entree." These "are new but already fast-selling products, distributed largely through health food stores." No photo of the package is shown.

Note: This is one of the world's first three food products to contain a modern textured soy protein product.

220. **Product Name:** Worthington Minute Entrees–Sliced Whitemeat Style (Meatless Chicken White Meat–Frozen).
Manufacturer's Name: Worthington Foods, Inc.
Manufacturer's Address: 900 Proprietors Rd., Worthington, Ohio.
Date of Introduction: 1962 July.
Ingredients: Incl. Fibrotein spun soy protein fibers.
Wt/Vol., Packaging, Price: 6 oz paperboard box.
How Stored: Frozen.
New Product–Documentation: Chopletter (Worthington Foods, Worthington, Ohio). 1962. July. p. 1, 3. "A new concept in foods." This product, made with Fibrotein [spun soy protein fibers], is already on the market. A photo shows the product."

Wholesale price list. 1962. Oct. 1. Sold in 6 oz. portions (24 per case for $9.90 or bulk rolls, frozen, for $1.25/lb). Rolls weigh approximately 8 lb. each and a packed 6 rolls per box. Note: No mention is made on this sheet of spun soy protein fibers.

George D. Kyd. 1963. *Food Processing.* May. p. 123-26. "Edible soy protein fibers promise new family of foods." The author, an employee of Ralston Purina Co., states that this product, which contains Textured Edi Pro (spun soy protein fibers made by Ralston Purina) is already on the market. A photo shows the package–a thin paperboard box about 8 by 10 by 3/4 inch thick. The label states: "New frozen food concept. Serve hot or cold. Contains no meat." A photo shows three meatlike slices on a plate. These "are new but already fast-selling products, distributed largely through health food stores."

Soybean Blue Book. 1965. p. 112. "White Meat Style."

Note: This is one of the world's first three food products to contain a modern textured soy protein product.

221. **Product Name:** Soyameat–Fried Chicken Style (Canned).
Manufacturer's Name: Worthington Foods, Inc.
Manufacturer's Address: 900 Proprietors Rd., Worthington, Ohio.
Date of Introduction: 1962 July.
Ingredients: In 1965: Specially processed soybean protein (Fibrotein), corn oil, [egg] albumen, isolated soybean protein, salt, monosodium glutamate, vegetable gum, starch, hydrolyzed vegetable proteins, seasonings.
Wt/Vol., Packaging, Price: 9½ oz can. After 1965: 13 oz can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Chopletter (Worthington Foods, Worthington, Ohio). 1962. July. p. 1, 3. "A new concept in foods." This product, made with Fibrotein [spun soy protein fibers], is already on the market. A photo shows the product."

George D. Kyd. 1963. *Food Processing.* May. p. 123-26. "Edible soy protein fibers promise new family of foods." The author, an employee of Ralston Purina Co., states that this product, which contains Textured Edi Pro (spun soy protein fibers made by Ralston Purina) is already on the market. A photo shows the can. The label states: "Worthington Soyameat. Vegetarian. 9¼ ozs. avd." A photo, above the photo of the can, shows chunks of the chicken-like product on a plate. The caption below this photo reads: "Fried-chicken style shown above has realistic texture; it came from the can shown below." These "are new but already fast-selling products, distributed largely through health food stores."

Soybean Blue Book. 1963. p. 98. Wholesale price list. 1966. Dec. 1. Hartman. 1966. Food Technology. 20(1):39-40. "Vegetarian protein foods." "The first textured soybean protein fiber product marketed in the U.S. is Worthington's frozen 'Fri-Chik,' an extruded formulation simulating a small fried portion of white chicken meat. This same formulation was next canned in a light gravy and called 'Soyameat–Fried Chicken Style,' and was also later marketed as frozen and canned 'White-Chik' in large rolls for slicing, dicing, etc. The approximate analysis of these simulated chicken products: protein 20-26%, fat 18-25%, and carbohydrate 2-3%."

Ziemba. 1966. Food Engineering. May. p. 82-93. "Let soy proteins work wonders for you." Photo of 6 cans.

It's Your World Vegetarian Cookbook. 1973. Glendale, California: Seventh-Day Adventist Church. p. 118. "Soyameat–Fried Chicken-like flavor" is a canned chicken-like product based on spun soy protein fiber.

Note: This is one of the world's first three food products to contain a modern textured soy protein product.

Label sent by Dr. Walter Wolf. 2000. July. Since the first ingredient is Fibrotein (spun soy protein fibers), this label is probably from about 1965. Red, dark blue, and light blue on white. A small color photo shows two pieces surrounded by sprigs of parsley on a blue dish. "Vegetarian. The quick and easy dish with a chicken-like flavor and texture. A new concept in foods."

222. *Chemical and Engineering News.* 1962. People: Robert A. Boyer. Sept. 3. Part 1. p. 63.
• ***Summary:*** Boyer has been named technical director in protein products sales, Soybean Div., Ralston Purina Co., St. Louis, Missouri.

223. *Soybean Digest.* 1962. Boyer heads Ralston protein products sales. Sept. p. 72.
• ***Summary:*** "Robert A. Boyer has been named technical director, protein products sales, in the soybean division of the Ralston Purina Co., it has been announced by Donald B. Walker, Purina vice president in charge of the soybean division.

"Mr. Boyer will headquarter at the company's general office in St. Louis. For the past 2½ years he has been serving as consultant to Purina on a full-time basis. His work has been in product development and technical sales in the special soy products department. He will continue in that field, working with Wayne E. Tjossem, manager of the special soy products department.

"Mr. Boyer has been a consultant in the edible protein field since 1949, serving a number of large food manufacturers both in the United States and Europe. He developed and patented the technique for producing man-made edible protein fibers to be used in the fabrication of food products. The process developed by Mr. Boyer has far reaching implications in the food field. For the first time it makes possible the fabrication of food products to specifications, since now protein is prepared in a form that can be engineered into any desired form of human food.

"Mr. Boyer's career in research and product development goes back 35 years... In 1930 Mr. Boyer joined the Ford Motor Co... From 1943 to 1949 he was research director for The Drackett Co., Cincinnati, Ohio. Mr. Boyer and his wife and family have moved their home from Cincinnati to St. Louis [Missouri]."

224. *Soybean Digest.* 1962. [National Soybean] Crop Improvement Council meets. Sept. p. 78.
• ***Summary:*** "The 13th annual meeting of the National Soybean Crop Improvement Council was held at St. Louis, Missouri, July 23-24, with R.W. Judd, managing director, Urbana, Illinois, in charge. About 80 agronomists and processors were in attendance.

"Two panels and a speech by Glenn Pogeler, past chairman of the board of the National Soybean Processors Association, closed the sessions.

"Processor panel members maintained that processors want high oil content in the soybeans they buy and do not wish the protein content to be increased at the expense of oil. Lowell Andreas, Honeymead Products Co., Mankato, Minnesota, said there is still a serious world shortage of fats and oils, 'a tremendous vacuum of fats and oils in world markets.'

"Mr. Pogeler in his closing speech noted that fat consumption in northern Europe is among the highest in the world, and that we in the United States can get our share of that market only if we are competitive pricewise. He called the Soybean Council of America a tremendous tool for market development work.

"Mr. Pogeler said that for the short run we may have some problems with the European Common Market, but he hoped that for the long run the Common Market will work to the advantage of everybody. In a panel discussion on areas of hope for a yield-barrier breakthrough on soybeans, D.A. Hinkle, University of Arkansas, mentioned the possibility of getting a higher pod set on soybeans that might produce 100 or more bushels per acre. Herbert W. Johnson, USDA research agronomist, Beltsville, Maryland, said the No. 1 spot where yield limitation in soybeans may occur is in the nitrogen nutrition of the plant. 'If we could induce the soybean to take up more nitrogen we would get a higher yield. The soybean is as inefficient in the utilization of nitrogen as any plant you can imagine. Since the dawn of history the soybean has depended on its nodules for its protein.'

"H.W. Mederski, Ohio Agricultural Experiment Station, said there is a close correlation between yield and the supply of moisture from year to year. 'To me, the hope for higher yields is to develop chemical means for stopping the water loss from plants, or to chemically adjust the plant to fit within its environment.'

"Charles V. Simpson, president of the American Soybean Association, Waterville, Minnesota, said that controlling weeds is a big factor in increasing yields, and that he is cutting costs materially through the use of herbicides on his farms.

"Agronomists who appeared on the program included: W.H. Pierre, Iowa; E.J. Kamprath, North Carolina; H.L. Musen, South Carolina; J.B. Hanson, Illinois; K.L. Athow, Indiana; and R.B. Musgrave, New York.

"F.R. Senti, Northern Regional Research Laboratory, Peoria, Illinois, spoke on, 'Soybeans' Future as a Food and Feed Crop.'

"The National Soybean Crop Improvement Council was organized in 1950. It was the outgrowth of several annual tri-state meetings of processors and agronomists, which were held in Iowa, Minnesota, and Missouri; and Illinois, Indiana, and Ohio."

Photos show: (1) NSCIC Director R.W. Judd, behind a podium, with microphone.

(2) "Yield panel, left to right: H.W. Johnson, Beltsville; ASA's Charles V. Simpson, Waterville, Minnesota; H.J. Mederski, Ohio; and D.A. Hinkle, Arkansas.

(3) Processor panel, l to r: Glenn Pogeler, North Iowa Cooperative Processing Association, Mason City; Donald B. Walker, Ralston Purina Co., St. Louis; and L.W. Andreas, Honeymead Products Co., Mankato, Minnesota.

225. **Product Name:** Textured Edi-Pro (Spun Soy Protein Fibers).
Manufacturer's Name: Ralston Purina Co. Special Soy Products Dept.
Manufacturer's Address: Plant: Louisville, Kentucky. Offices: Checkerboard Square, St. Louis, MO 63102.
Date of Introduction: 1962 October.
New Product–Documentation: G.H. Kyd. 1963. Food Processing (Chicago). May. p. 123-26, 138. "Edible soy protein fibers promise new family of foods." Ralston Purina makes "Textured Edi Pro," an edible spun soy protein fiber. Products amazingly like meat can be made from these fibers.

Soybean Blue Book. 1966. p. 111. "Textured Edi-Pro, spun edible isolated protein fibers as a basis for unique and novel human foods. Provides both texture and excellent protein nutrition."

Soybean Digest. 1969. Nov. p. 43. "Ralston Purina Co." A photo (p. 40) shows "Chiplike products made from Ralston Purina's textured Edi-Pro." A chart of "Edible grade food ingredients" indicates that Ralston Purina makes only soy protein isolates and spun fibers.

W.Z. Gottschall. 1969. "Ralston Purina Yesterday and Today." Nov. p. 15. "Textured Edi-Pro is purified, isolated soy protein which has been converted into continuous filament or fiber form by a patented process."

Horan, Odell & Forman. 1971. PAG Bulletin No. 13. p. 25. Textured Edi-Pro was "in commercial production beginning in 1967."

Letter from C.M. Betts, Manager, Textured Protein Products, Ralston Purina Co., Protein Division. 1972, May 31. "Textured Edi-Pro is a frozen protein product."

Shurtleff & Aoyagi. 1983. History of Worthington Foods. p. 7.

Worthington Foods. 1989. "The Tradition of Healthy Foods" (50th anniversary booklet). p. 21. "Worthington was too small to go into the business of crushing soybeans and disposing of the oil, or of purchasing the protein extrusion or spinning equipment. So [Robert] Boyer negotiated with Ralston-Purina to set up a pilot plant to make the protein for Worthington. As it turned out, Ralston-Purina made the protein, did the spinning, and Worthington bought the output and put it into new products. When the new Ralston-Purina plant was operational, it had the capacity of 10,000 pounds a day. Worthington was not ready for this kind of volume, but working out these difficulties involved Jim Hagle in further negotiations with executives of a large corporation. Finally, Worthington agreed to take all the production, and sales took off."

Talk with Ed Meyer of Central Soya. 1993. April 3. Ralston Purina went into a joint venture (for a short time) selling frozen spun soy protein fiber with National Can Co., which had a small protein division, with they called National Protein.

Letter from Susan W. Vorih, Communications Manager, Protein Technologies International. 1993. June 17. A semi-works plant to produce edible soy proteins was erected in 1961 at Louisville, and both spray-dried and spun fiber proteins began to be produced and sold in October 1962.

226. **Product Name:** Edi-Pro (Isolated Soy Proteins; powdered, spray-dried) [N = neutral, or A = isoelectric].
Manufacturer's Name: Ralston Purina Co. Special Soy Products Dept.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63102.
Date of Introduction: 1962 October.
New Product–Documentation: Ziemba. 1966. Food Engineering. May. p. 82-91. "Let soy proteins work wonders for you." "Available in powder form is Ralston's Edi-Pro that is derived from purified isolated protein (95%). Product is light in color, bland in flavor, and available in a neutral product and an isoelectric protein (at pH 4.5). Neutral product is water dispersible. Isoelectric one is water dispersed with aid of food-grade alkalis." In addition to protein enrichment, it provides functional properties: emulsifying, thickening, gelling, film-forming, and water binding.

Soybean Blue Book. 1966. p. 112. Under "Industrial Soy Proteins" we read: "St. Louis, Missouri 63102–Ralston Purina Co., special soy products dept., Checkerboard Square. 'Edi-Pro,' isolated soy proteins, powdered, spray dried for protein fortification and thickening, emulsification, fat and water binding, gelling, etc."

Soybean Digest Blue Book. 1969. p. 115. W.Z. Gottschall. 1969. "Ralston Purina Yesterday and Today." Nov. p. 14. "Edi-Pro A & N" are chemically isolated soy protein powders.

Ralston Purina Co. 1976 July 1. "Edi-Pro N Soy Protein Isolate: General Product Description. This one-sided leaflet gives physical properties, microbiological data, packaging, manufacturing ("by Ralcon Foods, a licensee of Ralston Purina Company"). Amino acid composition. Typical [nutritional] analysis.

Ralston Purina Co. 1979. Purina Proteins: Product information. "Edi-Pro A–An isoelectric isolated soy protein (pH 4.5) for use in retorted applications such as infant foods and other heat treated products." Produced at the isoelectric point of isolated soy protein, it is easily dispersed in water. "When neutralized to pH 6.5 to 7.5 it is capable of emulsifying, thickening, and water binding." Note: Edi-Pro N is not listed.

Letter from Susan W. Vorih, Communications Manager, Protein Technologies International. 1993. June 17. A semi-works plant to produce edible soy proteins was erected in 1961 at Louisville, Kentucky, and both spray-dried and spun fiber proteins began to be produced and sold in October 1962. The spray-dried edible isolates, brand-named Edi-Pro A and Edi-Pro N, were sold to food processors.

227. *Soybean Digest.* 1962. Francis Calvert joins Ralston Purina staff. Dec. p. 11.
• ***Summary:*** "Francis E. Calvert, nationally known chemist in the industrial protein field, has joined the staff of the special products research laboratories for the Ralston Purina Co. Mr. Calvert will headquarter in the company's research laboratories in St. Louis and will work with W.B. Brew, manager of the special products research laboratories. He will be concerned with research in the utilization and production of isolated soy protein for industrial and edible purposes. He will also engage in customer service work. He assumed his new duties Nov. 5.

"Since 1957, Mr. Calvert has been technical director, Evendale operations, for Archer Daniels Midland Co. at Evendale, Ohio. Prior to that he was research director for the Drackett Co. in Cincinnati. His principal fields of research have been organic and polymer chemistry."

228. *Soybean Digest.* 1963. Ralston Purina feed operations in Spain. April. p. 29.
• ***Summary:*** "Ralston Purina Co. has joined with an existing company in Spain to form a feed manufacturing company known as Gallina Blanca Purina, S.A., it has been announced in St. Louis, Missouri, by Raymond E. Rowland, president of Ralston Purina. The main office of the organization will be in Barcelona. The company will manufacture and distribute Purina Chows for livestock and poultry in Spain and Portugal."

229. Kyd, George H. 1963. Edible soy-protein fibers promise new family of foods. *Food Processing* (*Chicago*) 24(5):122-26, 138. May.
• ***Summary:*** "Products amazingly like meat such as the ham-like product shown below and the chicken-style products shown on page 124 can be fabricated from protein fibers shown opposite" (in a full-page photo), magnified slightly more than two times. Ralston Purina now makes "Textured Edi Pro," an edible spun soy protein fiber made from "an isolated edible soy protein that is almost pure protein. It contains no fat."

Page 124 has the heading: "Is the web of spun soy-protein fibers first of the modern superfoods? Meat-like production. These Textured Edi Pro foods–already on the market–look, taste, and chew amazingly like the meat item they so closely resemble, yet they may have a fat content as low as a fraction of one per cent, and a protein content of almost any level desired." Photos show packages and labels of Chicken Style Roll (Minute Entrees, refrigerated roll), Worthington Soyameat Fried-Chicken Style (canned), Worthington Sliced Whitemeat Style (Frozen Minute Entrees). Shown without a package or label are is a ham-shaped, ham-like product [Wham].

Page 126 states: "Tons of the textured product [Textured Edi Pro] each week go into the following products made by Worthington Foods: canned 'Soyameat': refrigerated Chicken-Style Roll; frozen fried-chicken style Minute Entree; and frozen chicken whitemeat style Minute Entree. These products resemble chicken meat in taste and texture. They are new but already fast-selling products, distributed largely through health food stores."

"The edible soy protein work is being carried on under the direction of Dr. H.L. Wilcke, Purina Research Vice President, and D.B. Walker, Vice President in charge of the Soybean Division. Two nationally known scientists who have pioneered soy development have performed much of the development work. They are Robert A. Boyer and Francis E. Calvert. Both at one time were associated with Henry Ford, and, through him, with Thomas A. Edison.

"The work has been coordinated under supervision of W.E. Tjossem, Manager of Purina's Special Soy Products Department, and W.B. Brew, Manager of Special Products Research. Ralston Purina is the largest manufacturer of animal rations, and one of the principal processors of soybeans in this country [USA]. Textured Edi Pro and Edi Pro are developments of Ralston Purina Company, Checkerboard Square, St. Louis 2, Missouri."

"Fifty million people in the U.S... are not able to eat the meat of animal or fowl some or all of the time by reason of their religions, restrictions of their doctors, or by personal preferences. For these many millions who for one reason or another cannot eat meats, the Textured Edi Pro meat-like products will supplement the supply of food items which they approximate... The versatility and adaptability of these new edible soy products make them 'the most exciting and most promising group of new foods of this decade,' says Purina vice president D. B. Walker. 'They are so characteristic of present health theories that they are likely to establish themselves in diets of the future. And the meat- like products will find an eager market among those 50 million who can't eat real meat."

Note 1. This is the earliest English-language document seen (Oct. 2015) that mentions Textured Edi Pro, made from

spun soy protein fiber.

Note 2. This is the earliest English-language document seen (Oct. 2015) that uses the term "spun soy-protein fibers" (with or without a hyphen) to refer to spun soy protein fiber. Address: Ralston Purina Co., St. Louis, Missouri.

230. **Product Name:** Chicken Style Roll–Worthington Minute Entrees (Meatless; Resembles White Chicken Meat).
Manufacturer's Name: Worthington Foods, Inc.
Manufacturer's Address: 900 Proprietors Rd., Worthington, OH 43085.
Date of Introduction: 1963 May.
Ingredients: 1990: Textured vegetable protein (soy protein isolate and concentrate), egg whites, soybean and/or corn oil, salt, flavorings (hydrolyzed vegetable protein, onion powder, turmeric, spice extractives), monosodium glutamate, carrageenan, niacinamide, iron (as ferrous sulfate), vitamin B-1 (thiamine mononitrate), vitamin B-6 (pyridoxine hydrochloride), artificial color, vitamin B-2 (riboflavin), vitamin B-12.
How Stored: Frozen.
New Product–Documentation: George D. Kyd. 1963. *Food Processing.* May. p. 123-26. "Edible soy protein fibers promise new family of foods." The author, an employee of Ralston Purina Co., states that this product, which contains Textured Edi Pro (spun soy protein fibers made by Ralston Purina) is already on the market. A photo shows the product–a cylindrical roll about 2½ inches in diameter and 10 inches long. The label states: "Chicken Style Roll–Worthington Minute Entrees." One end of the roll has been sliced, slivered, and diced. Page 126 describes the product as "refrigerated Chicken-Style Roll." These "are new but already fast-selling products, distributed largely through health food stores."

It's Your World Vegetarian Cookbook. 1973. Glendale, California: Seventh-Day Adventist Church. p. 118. Chicken Roll is a frozen product based on spun soy protein fiber. Each roll weighs 72 oz.

Manufacturer's catalog. 1984, undated. Frozen Products.

Seventh-day Adventist Dietetic Assoc. 1990. *Diet Manual, Including a Vegetarian Meal Plan. 7th ed.* Appendix A.6-27.

Note: This product was introduced in May 1963, but textured soy protein concentrates were added later (in about 1968-70), as an ingredient.

231. Potts, T.J. 1963. A comparison of the cup refining loss and neutral oil determinations for evaluating crude soybean oil. *J. of the American Oil Chemists' Society* 40(10):535-37. Oct. [5 ref]
• ***Summary:*** Roughly 42 years ago a group of cottonseed crushers and oil refiners, operating through an association of the Interstate Cottonseed Crushers, set a series of specifications for crude cottonseed oil. The average kettle refining loss at that time was 9%. "Oils having a loss of 9% or less were considered prime." Address: Ralston Purina Co., St. Louis, Missouri.

232. **Product Name:** Pro-Dell Protein Loaf: A Ham Flavored Protein Food (Meatless & Ready to Use).
Manufacturer's Name: Brown's Frosted Foods.
Manufacturer's Address: Philadelphia, Pennsylvania.
Date of Introduction: 1964 January.
Ingredients: Soy bean protein (spun soy protein isolate), dried egg white, skim milk powder, sugar, hydrolyzed vegetable protein, dried yeast, salt, water, carrageenan, vegetable mono and diglycerides, monosodium glutamate, sodium phosphate, artificial coloring and flavoring, propylparaben (added as a preservative).
How Stored: Refrigerated.
New Product–Documentation: *Quick Frozen Foods.* 1964. "Protein controlled simulated meat concept opens unlimited frozen potential: Food of tomorrow, today." Jan. A black-and-white photo shows two large loaves of the refrigerated product based on spun soy protein fiber, which is produced under a license from Ralston Purina Co. The Label is clearly visible but the list of ingredients is not legible. However the article lists the product's ingredients.

233. Di Giorgio, A.L. 1964. Partners in progress with our Italian cooperators. *Soybean Digest.* May. p. 56.
• ***Summary:*** "Meet the Italian Cooperators of the Soybean Council of America:

"ASSOLIOSEMI, National Association of Seed Oil Millers, made up of all seed oil refiners, wholesalers and some crushers, accounting for 85% of the seed oil consumed in Italy.

"ASSALZOO. Italian National Association of Animal Feed Producers accounting for 70% of the commercial feed produced and sold. The Italian subsidiaries of two American firms–Ralston Purina and Central Soya–belong to Assalzoo as do all Italian processors of soybeans.

"FEDERCONSORZI. National Federation of Farm Cooperatives, accounting for 30% of the commercial feed sold and 15% of seed oils consumed in Italy.

"The Italian office of the Soybean Council of America signs yearly cooperative agreements with these organizations, but the agreements are only the 'formal' basis of working together. The confidence and trust with which our Italian cooperators view the SBC are based on the quality of the products which we represent and our identity in the business community of Italy. They know we are American but do not regard us as 'outsiders.' By being integrated in the economic and commercial life of the country we have taken on the moral strength that most private organizations could not have, solely because we are accepted.

"Since our cooperators represent, besides ours, other commodities also, we promote all seed oils, confident that if

people use more seed oils soybean oil will get its usual major share of this market. Likewise, we have everything to gain from the use of compound feeds because soybean meal is the best protein source and will certainly be blended in.

"Why do we work with these cooperators?

"Italy's population is 51 million. With a budget of not over five figures and a staff of only six–just a shade over one person for every 10 million–we cover Italy through our cooperators by the technique of the 'multiplying point.' Our 'communication potential' with the consumer is enormously magnified through these organizations.

"For instance, a single communication to Federconsorzi alone assures that it will be passed on through their 5,000 outlets to their many times more thousands of customers.

"These organizations spend their own money in joint activities proposed and planned by the Soybean Council. From the beginning of the current Italian project Jan. 28, 1960, to Dec. 31, 1963, Italian cooperators have contributed as their part about 135 million lire ($216,000) which matches almost dollar for dollar the FAS [USDA's Foreign Agricultural Service] expenditure of 150 million lire ($240,000). With U.S. industry's share, it practically balances out. They give us advice on how to adapt promotional ideas to the local situation and they help us to implement these ideas. In return, we supply them with high caliber technical help, usually top American scientists in all pertinent branches.

"One of our 1964 joint activities will be participation at the Milan Trade Fair in the USA exhibit. There we will hand out to visitors small cans of oil, prominently carrying the stamp of the Assoliosemi. To avoid possible friction with some of the public which might arise from handing out samples of pure American soybean oil, it will be a blend of the most popular seed oils in Italy, the label noting the soybean oil content. This is adapting to the local situation and in so doing we and our cooperators are 'scratching one another's backs.'

"SBC belongs. Warm personal relations with the heads of these organizations guarantee SBC ready access and friendly cooperation. Even government, realizing the degree of our integration into the economic life of the country and the extent of our contribution to Italy's progress, looks sympathetically at our operations. It considers us a part of the country as well as a link between American and Italian industries.

"This makes us Partners in Progress."

At the bottom of this article is a small map of Italy (including Sicily /Sicilia, and Sardinia / Sardegna) with a white star marking the capital city, Rome. Address: PhD, Director for Italy, Soybean Council of America.

234. *Soybean Digest.* 1964. Executive changes by Ralston Purina Co. Sept. p. 84.
• ***Summary:*** "R. Hal Dean was elected president of the Ralston Purina Co., St. Louis, it has been announced by Raymond E. Rowland, chairman of the board of directors. Mr. Rowland will continue as chairman of the board and chief executive officer. Mr. Dean, as president, will be the chief operating officer. A.J. O'Brien, executive vice president, will be in charge of administration, finance and poultry products.

"Mr. Dean, 48, joined the Ralston Purina Co. in 1938 as a clerk in the grain department at company headquarters in St. Louis. In 1958 Mr. Dean was elected vice president of the company and president of the international division. In 1961 he was elected executive vice president. Later the same year he was elected a director of the company.

"Vice President D.B. Walker, director of the soybean division, has been named director of purchasing and traffic. He will continue to report to Eldred A. Cayce, executive vice president. Mr. Walker, 52, was born in Rapid City, South Dakota, and joined the Ralston Purina Co. in 1935. He was named director of the soybean division in 1958. In June 1959 he was elected a vice president of the company.

"Succeeding Mr. Walker as director of the soybean division and reporting to him is W.L. Golden. Mr. Golden joined the company as an assistant buyer at the Bloomington, Illinois, plant and as manager at the Louisville [Kentucky] soybean plant. He became manager of vegetable oil sales at company headquarters in March 1960 and assistant manager of the soybean division in March 1963."

A photo shows W.L. Golden.

235. Bocksch, W. 1965. Isoliertes Sojaeiweiss, ein moeglicher Hilfstoff fuer lang zu lagernde Bruehwurstkonserven [Isolated soy protein, a possible aid in the manufacture of canned Frankfurter-type sausages, of long storage stability]. *Fleischwirtschaft* (*Die*) 45(7):779-84. July. [Ger; eng; fre; spa]
• ***Summary:*** Promine D, isolated soya protein, was tested for its suitability in making canned Frankfurter-type sausages made from raw meat of low water-binding capacity, and in making luncheon meat. It was found that Promine D made it possible to achieve a considerable reduction in fat and jelly deposits, and therefore to improve binding.

Note: Some formulations in this article give the incorrect impression that soya products are of equal value from the nutritional and physiological point of view to protein isolated from milk and, particularly, to hydrolyzed milk protein.

Note 1. This is the earliest German-language document seen (Aug. 2003) that uses the term *Isoliertes Sojaeiweiss* to refer to isolated soy protein. Address: PhD, Bundesanstalt fuer Fleischforschung, Kulmbach, West Germany.

236. Buller, Allan R.; Klis, John B. 1965. Spun soy protein foods get supermarket sales test: Duplicating meat fibers, protein value. Improved meat substitutes, recently established in health food stores, win chain-store distribution.

Food Processing (*Chicago*) 26(9):115-17, 120. Sept.
• ***Summary:*** "Health food stores have been the traditional outlets for meat-alternate products, but Worthington Foods, Inc. Worthington, Ohio, has taken the initial steps toward moving these products into general distribution.

"Using spun soy protein fiber as the basic ingredient, Worthington Foods has developed a full line of products that look, taste, and chew like chicken, pork and beef products. Test marketing of two items is being done in three chains in Columbus, Ohio–Alber's, Big Bear, and Kroger. The two spun soy protein foods, Wham, a ham-like product, and White-Chik, simulated white meat chicken, are both being well received by consumers in these marketing tests... Use of the fibers in foods is subject to a patent owned by Ralston Purina Company. In Columbus, both Wham and White-Chik are priced at $0.69 for an 8-oz package. New foreign distribution, principally in Norway and Sweden, has already added some volume."

A large photo bears the caption "Worthington's line of spun soy protein meat-like products are packed in canned, frozen, and dehydrated forms." Frozen products in thin paperboard boxes include White-Chik, Fri-Chik, Prime, and Wham. Canned moist products include Veja-Links, Soyameat (many flavors), Saucettes. Meat Loaf Mix is a dry canned product. Prime is in a plastic pouch.

A newspaper ad for frozen Wham stresses the product's low fat content ("65% less fat than cured ham"), convenience, and the fact that it contains no meat." A photo shows a rack of meatless Prosage, which resembles a pork sausage made by Worthington, ready for quick freezing. Prosage does not shrink when fried.

"Edible spun soy protein fibers, sold under the trademark Fibrotein, are supplied in fresh frozen and dehydrated forms to the food processing industry by Worthington Foods, Inc., 900 Proprietors Rd., Worthington, Ohio 43085. The company also supplies imitation meats made from Fibrotein in fresh, frozen and dehydrated forms. The imitation meats are available in slices, cubes, chips, granules, round rolls, square logs and in other shapes and sizes."

Note: This is the earliest English-language document seen (Nov. 2014) that contains the term "imitation meats" (with any combination of quotation marks). Address: 1. General Manager, Worthington Foods, Inc; 2. Assoc. Editor.

237. National Soybean Processors Association. 1965. Year book, 1965-1966 (Association year). Chicago, Illinois. 63 p.
• ***Summary:*** On the cover (but not the title page) is written: "Year Book and Trading Rules, 1965-1966." Contents: Constitution and by-laws and code of ethics. Officers, directors and committees for 1965-66. Membership of the National Soybean Processors Association. Trading rules on soybean meal. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}, sampling of soybean meal {automatic sampler, probe sampler}). Trading rules on soybean oil. Definitions of grade and quality of export oils. Tentative soybean lecithin specifications. Appendix to trading rules on soybean oil: Uniform sales contract, grading soybean oil for color (N.S.P.A. tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed).

The section titled "Officers, directors, and committees" (p. 12-15) states: President: Robert G. Houghtlin. Secretary: J.W. Moore. Treasurer: R.E. Fiedler. Executive Committee: L.W. Andreas, Chairman, Wilfred F. Carle, T.W. Bean, B.A. Townsend (term ending Sept. 1966). J.W. Moore, M.D. McVay, R.E. Fiedler, E.B. Copeland (term ending Sept. 1967). R.G. Houghtlin.

Board of Directors: Chairman of the board: L.W. Andreas. Vice chairman of the board: T.W. Bean. Immediate past chairman of the board: S.E. Cramer. (Term expiring Sept. 1966): R.A. Denman, Joe C. Givens, R.G. Golseth, Floyd E. Hiegel, H.D. Rissler, R.B. Williams. Term expiring Sept. 1967: T.J. Barlow, Elmer L. Buster, Elster B. Copeland, F.L. Morgan, H.R. Scroggs, B.A. Townsend. Term expiring Sept. 1968: Donald B. Walker -> Win Golden, Wilfred Carle, Arthur Frank, M.D. McVay, William King Self, Harry E. Wiysel. General counsel: Raymond, Mayer, Jenner & Block, Chicago, Illinois. Washington counsel: Sellers, Conner & Cuneo, DC. Washington representative: George L. Prichard, DC. Managing director, National Soybean Crop Improvement Council: Robert W. Judd, Urbana, Illinois.

Standing committees: For each committee, the names of all members (with the chairman designated), with the company and company address of each are given–Traffic and transportation. Technical. Oil trading rules. Industrial oil. Lecithin. Meal trading rules. Uniform rules and standards for soybean meal. Crop improvement council. Soybean research council. Soybean grades and contracts. Safety and insurance. Regional: Illinois, Indiana, Ohio, Kentucky, and eastern Missouri; Iowa, Minnesota, Nebraska, the Dakotas, Kansas, and Western Missouri; Mississippi River Delta Sections.

The following organizations, and individuals are members of NSPA: Allied Mills, Inc., Chicago, Illinois; Taylorville, Illinois; Guntersville, Alabama. Archer-Daniels-Midland Co., Minneapolis, Minnesota; Decatur, Illinois; Mankato, Minnesota; Fredonia, Kansas; Bloomington, Illinois. Arkansas Grain Corp., Soybean Division, Stuttgart, Arkansas (Wilfred F. Carle); Helena, Arkansas (W.E. Higginbotham). Big 4 Co-op. Processing Assn., Sheldon, Iowa (Kenneth J. McQueen). Buckeye Cotton Oil Div. of, The Buckeye Cellulose Corp., Cincinnati Ohio (R.B. Williams); Little Rock, Arkansas; Augusta, Georgia; Memphis, Tennessee. Cargill, Inc., Minneapolis, Minnesota (M.D. McVay, Jay Haymaker); Chicago, Illinois (Robert Cournoyer); Cedar Rapids, Iowa (C.W. Bohlander); Des

Moines, Iowa (W.J. Wheeler); Fort Dodge, Iowa (George J. Cox); Sioux City, Iowa (A.L. Peterson), Washington, Iowa (William R. Matson); Wichita, Kansas (Ralph S. Moore); Memphis, Tennessee (Philip St. Clair); Norfolk, Virginia (D.H. Leavenworth). Central Soya Co., Inc., Fort Wayne, Indiana (B.A. Townsend); Decatur, Indiana (T.H. Alwein); Indianapolis, Indiana (R.E. Syster); Chicago, Illinois (Willard C. Lighter); Gibson City, Illinois (George R. Walter); Belmond, Iowa (J.R. Wright); Bellevue, Ohio (Harry Stokely); Marion, Ohio (Leroy Rich); Chattanooga, Tennessee (Jack Rosenberger). Delphos Soya Products Co., Delphos, Ohio (Floyd E. Hiegel). Delta Cotton Oil and Fertilizer Co., Jackson, Mississippi (Alfred Jenkins). Farmers Grain Dealers Assn. of Iowa (Cooperative) Soybean Processing Division, Mason City, Iowa (H.D. Rissler). Farmers Union C.M.A. [CMA], St. Joseph, Missouri (Arthur E. Frank). Fremont Cake & Meal Co., Fremont, Nebraska (Harry E. Wiysel). Galesburg Soy Products Co., Galesburg, Illinois (Max Albert & Regi Simon -> Elnathan Anderson, Box 711). General Vegetable Oil Co., Fort Worth, Texas (J.D. Morton). Gooch Milling & Elevator Co., Lincoln, Nebraska (M.R. Eighmy). Grain Processing Corp., Muscatine, Iowa (G.A. Kent, F.J. Prochaska, H.P. Woodstra). Honeymead Products Co., Mankato, Minnesota (L.W. Andreas, W.B. Cox, J.I. Maslon, C.T. Mullan, L.K. Rasmussen); Huegely Iowa Milling Co., Cedar Rapids, Iowa (Joe Sinaiko, Bob Scroggs, Les Liabo). Kansas Soya Products Co. (The), Emporia, Kansas (Elmer L. Buster). Lauhoff Grain Co., Danville, Illinois (Ralph G. Golseth, Loren R. Larrick, Laurie J. Slocum). Marshall Mills Co., Marshalltown, Iowa (J.B. Saccaro). Minnesota Linseed Oil Co., Minneapolis, Minnesota (R.J. Lindquist, Jr.). Mississippi Cottonseed Products Co., Jackson, Mississippi (H.E. Covington). Missouri Farmers Assn., Grain Div., Mexico, Missouri (Kermit F. Head). Owensboro Grain Co., Owensboro, Kentucky (William M. O'Bryan). Paymaster Oil Mill Co., Houston, Texas (T.J. Barlow, C.R. Bergstrom); Phoenix, Arizona (O.C. Harris); Jackson, Mississippi (John Bookhart). Perdue (A.W.) & Son, Salisbury, Maryland (Robert L. Brodey). Planters Industries, Inc., Rocky Mount, North Carolina (W.T. Melvin). Planters Manufacturing Co., Clarksdale, Mississippi (A.K. Shaifer). Quincy Soybean Products Co., Quincy, Illinois (Theodore W. Bean, John Franks). Ralston Purina Co., St. Louis, Missouri (Donald B. Walker, W.L. Golden); Kansas City, Missouri (A.V. Couch); Bloomington, Illinois (R.C. Witte); Decatur, Illinois (R.E. Baer); Lafayette, Indiana (A. Hardy); Iowa Falls, Iowa (W. Bower); Louisville, Kentucky (J. Gardner); Raleigh, North Carolina (J.L. Bumgardner); Memphis, Tennessee (J.K. Sartain). Riverside Oil Mill, Marks, Mississippi (William King Self). Sisketon, Missouri (P.B. Bartmess). Southern Cotton Oil Div., Hunt Foods and Industries, Inc., New Orleans, Louisiana (F.L. Morgan); Newport, Arkansas (Jerry Jeffrey); Macon, Georgia (M.S. Long); Greenville, Mississippi (M.D. Kolb); Goldsboro, North Carolina (W.W. Davis). Southern Soy Corp., Estill, South Carolina (R.A. Denman). Southern Soya Corp. of Cameron, Cameron, South Carolina (Charles Everett Bullard). Staley (A.E.) Manufacturing Co., Decatur, Illinois (J.W. Moore, E.C. Lane, H.E. Lents); Painesville, Ohio (D.J. Hopkins). Swift & Co., Chicago, Illinois (Scott E. Cramer, W.W. Moore). Townsends, Inc., Millsboro, Delaware (P.C. Townsend). Tri-County Co-op Soybean Assn., Dawson, Minnesota (Joe C. Givens). West Tennessee Soya Mill, Inc., Tiptonville, Tennessee (Tyler Terrett). Yazoo Valley Oil Mill, Inc., Greenwood, Mississippi (N.F. Howard).

Associate Members: American Feed Stores Home Organization, Inc., Minneapolis, Minnesota. Anderson Clayton & Co., Foods Div., Dallas, Texas. Armour & Co., Chicago, Illinois (Harry K. Bean [crossed out]). Capital City Products Co., Div. of Stokely-Van Camp, Inc., Columbus, Ohio. Cereales y Concentrados, Mexico City, Mexico (Francis Tovar [crossed out]). Colchester Processing Co., East St. Louis, Illinois [crossed out]. Cooperative Mills Inc., Baltimore, Maryland. Corn Products Co., New York City, New York (R.W. List). General Mills, Inc., Kankakee, Illinois (Gerald G. Wilson) [handwritten in]. Grasas Vegetales, S.A., Guadalajara, Jalisco, Mexico (Mr. Collighon) [handwritten in]. Greendale Soy Products, Inc., Kinmundy, Illinois (Elwin G. Ingram) [handwritten in]. Glidden Co. (The), Durkee Famous Foods, Div., Chicago, Illinois (Gerald J. Daleiden). Hartsville Oil Mill, Hartsville, South Carolina (Edgar H. Lawton, Jr.). Huegely Elevator Co., Nashville, Illinois (J.W. Huegely). HumKo Products–Div. of National Dairy Products Co., Memphis, Tennessee (Sam Cooper). Kraft Foods Div. of National Dairy Products Corp., Chicago, Illinois (G.M. Gibson). Lever Bros Co., New York City, New York. Maple Leaf Mills Ltd., Toronto, Ontario, Canada (W.G. Milliken) [handwritten in]. Nebraska Consolidated Mills Co., Omaha, Nebraska [crossed out]. Pacific Vegetable Oil Corp., San Francisco, California. Procter & Gamble Co. (The), Cincinnati, Ohio. Quaker Oats Co. (The), Chicago, Illinois. Spencer Kellogg Div. of Textron Inc., Buffalo, New York. Supersweet Foods Div., International Milling Co., Minneapolis, Minnesota. Valley Mills, Vicksburg, Mississippi. Wesson Div., Hunt Foods and Industries, Inc., Fullerton, California. Ralph Wells & Co., Monmouth, Illinois (Willis H. Wells). Address: 3818 Board of Trade Building, Chicago 4, Illinois.

238. **Product Name:** Fibrotein (Spun Soy Protein Fibers) [Fresh, Frozen, or Dehydrated].
Manufacturer's Name: Worthington Foods, Inc.
Manufacturer's Address: 900 Proprietors Rd., Worthington, OH 43085. Phone: 614-885-9511.
Date of Introduction: 1965 September.
New Product–Documentation: Buller & Klis. 1965. Food Processing. Sept. p. 117. "Edible spun soy protein fibers, sold

under the trademark Fibrotein, are supplied in fresh frozen and dehydrated forms to the food processing industry by Worthington Foods, Inc., 900 Proprietors Rd., Worthington, Ohio 43085. The company also supplies imitation meats made from Fibrotein in fresh, frozen and dehydrated forms. The imitation meats are available in slices, cubes, chips, granules, round rolls, square logs and in other shapes and sizes."

Ziemba. 1966. Food Engineering. May. p. 91. "Let soy proteins work wonders for you." "Worthington's simulated meats made from spun soy protein fibers (Fibrotein) come in cubes, slices, chips, granules, rolls, square logs, or other shapes and sizes. They are in fresh, frozen, or dehydrated forms."

Soybean Digest. 1969. Nov. p. 44. "Since 1966, Worthington Foods has manufactured its own spun protein, which it formerly purchased from Ralston Purina Co., for its meatless meats."

Shurtleff & Aoyagi. 1983. History of Worthington Foods. p. 8.

239. *National Provisioner.* 1965. New foods from spun protein. 153(15):15-18. Oct. 9. [13 ref]

• ***Summary:*** "Will emerging food technology's version of a protein spinning wheel, actually more like the nylon factory's counterpart of the spinneret in the head of a silkworm, send livestock the way of the silk stocking?

"Is there danger that new structured food products which can be made from many varieties of spun vegetable protein, and are being made from soy protein isolates, will make meat animals, eat and meat packers obsolete?"

Dr. Arthur D. Odell and W.W. Thulin, both of the James Ford Bell Research Center, General Mills, Inc., Minneapolis, feel that spun protein fibers, rather than being a competitive threat, "can improve the market for natural meat while serving special dietary needs, adding variety to menus and helping to close the widening world food gap."

Last month Odell gave a "talk on the new structured foods at the Minnesota Nutrition Conference in St. Paul," where samples of the new foods made of "spun fibrils" were also served.

"The first edible fiber was made in 1949 under the direction of Robert A. Boyer at a Connecticut factory where vegetable protein was being spun for textiles. Boyer obtained a patent on the process (U.S. 2,682,466) in 1954. Originally, five companies were licensed to manufacture edible fiber under this patent but only two, General Mills and Ralston Purina, have continued using the process." Development of the first undenatured, edible soy protein [isolate, Promine] by Central Soya Co. in 1958 stimulated other firms to engage in similar research for a widely available protein product. Details of the process for making spun soy protein fibers are given; a flow chart is also given. "Smoky Bits" simulating bacon are being test marketed in peanut butter. Complete citations for 13 patents issued in connection with the new spun protein foods are given.

A photo shows a kit distributed by General Mills; it contains spun soy fibrils in the middle compartment and dehydrated foods made from the fibrils in six other compartments.

Note 1. This is the earliest English-language document seen (Oct. 2015) that uses the word "structured" to refer to soy protein products, or specifically to new "spun protein foods analogous to meat."

Note 2. This is the earliest English-language document seen (Oct. 2015) that uses the word "fibrils" or the term "spun fibrils" to refer to edible spun soy protein fibers.

240. **Product Name:** Purina Protein, and Purina Pro-Cote.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Factory: Soybean Division, 2441 S. Floyd St., Louisville, Kentucky. Offices: 835 S. 8th St., St. Louis, Missouri.
Date of Introduction: 1965.
New Product–Documentation: Soybean Blue Book. 1965. p. 112. These products are listed under the category "Protein Isolates." It is not clear which are edible and which are industrial products.

Business card and envelope. 1965. Aug. "Purina Pro-Cote" is made by the Soybean Division, 2441 S. Floyd St., Louisville, Kentucky. J.B. Dore is manager, Industrial Protein Research, Soybean Division, Ralston Purina Co., Checkerboard Square, St. Louis. Missouri. Phone: CHestnut 1-3600.

Soybean Blue Book. 1966. p. 112. Under "Coated Papers, Leather Dressing," we read: "St. Louis, Missouri 63102–Ralston Purina Co., special soy products dept., Checkerboard Square. 'Pro-Cote' proteins for board, wallpaper and paper coatings, on and off machine at all solids levels, sizing, calendar and size press; paints pigment dispersants; printing inks; joint cements and water putties; general coatings and adhesives."

241. Boyer, Robert A.; Schulz, A.A.; Schatzman, E.A. Assignors to Ralston Purina Company. 1966. Method of manufacturing a protein food product. *Canadian Patent* 727,064. Feb. 1. 10 p.

• ***Summary:*** Describes production of soy protein fiber.

"This invention relates to a method of manufacturing a protein food product and more specifically to the preparation of a product which is an improvement over those disclosed in U.S. patents 2,682,466, 2,730,2447 and 2,730,448.

"Briefly, the present invention prepares an improved product by mixing a sulfite with an edible protein to improve the physical characteristics of the product and to facilitate its preparation.

"Among the several objects of this invention are the preparation of an edible protein product in filament form

having improved flavor; the preparation of such a product which is lighter in color; the preparation of such a product which breaks without rubberyness; and a product of the type indicated which can be more easily prepared. Other objects will be in part apparent and in part pointed out hereinafter.

"The invention accordingly comprises the methods hereinafter described, the scope of the invention being indicated in the following claims.

"While valuable edible protein products can be prepared utilizing the teachings of U.S. patents 2,682,466, 2,730,447 and 2,730,448, these products may be darker in color than desired, may possess sufficient rubberyness so that they cannot be masticated in the same way that natural meat products are masticated, for example, and the flavor thereof often possesses undesired characteristics. In addition, the spinning solution possesses a higher viscosity in operation than is preferred."

242. Wolf, Walter J. 1966. Re: Visit of R.L. Hawley, Ralston Purina Company. Letter to OC (Oilseed Crops Lab.) Files, NRRL, Peoria, Illinois, April 4. 1 p. Typed, without signature (carbon copy).

• ***Summary:*** Mr. Robert L. Hawley, Manager, Supro Products Development Division, Ralston Purina Co., St. Louis, Missouri (see attached business card) spent most of the morning of March 28 with A.C. Eldridge and Dr. Wolf discussing research and technology of soybeans and soybean protein.

A food technologist, he joined Ralston 3 months ago to head up the Supro Products Development Division who responsibility is to develop food products for the retail market from soybeans or soybean products, such as isolated protein. The name of the division is a contraction of "super protein." Hawley said his major problems are (1) flavor, and (2) variability in physical properties such as texture, viscosity and color. He has repeated some of the NRRC's work on alcohol washing of soybean proteins and their foaming properties. Address: Principal Chemist, Meal Products Investigations, Oilseed Crops Lab., Northern Regional Research Lab., Peoria, Illinois.

243. Ziemba, John V. 1966. Let soy proteins work wonders for you. *Food Engineering* 38(5):82-84, 87-90, 93. May.

• ***Summary:*** The subtitle reads: "With far better quality and functional properties, soy proteins are finding ever-increasing uses in foods. You can 'engineer' new foods or improve your current products–at more profit, too."

Contents: Introduction to soy proteins–flours, concentrates, and isolates. Soy flours and grits. Who's supplying what. Benefits in quality, cost. Values of soy concentrates. Varieties of concentrates. Highest protein: Isolates. Soy proteins added to egg albumen. Versatility of isolates. Foams and gels. Fiber technique emerges: Worthington's accomplishments ("First textured soy protein fiber product marketed as Worthington's frozen Fri-Chik–an extruded formulation simulating a fried portion of white chicken meat"), problems ahead. Texturizing in other ways.

"New process techniques have been 'engineered' into making soy proteins better so far as quality and function are concerned... Last year about 250 to 300 million lb of soy flours and grits went into formulating food products. About 7 million lb of concentrates and 9 million lb of isolates were used. Present estimates indicate that flours and grits are increasing at a 5% per year rate, concentrates and isolates at about 10% each." Who supplies what? Soy flours and grits: ADM, Central Soya, Crest Products, Staley. Soy protein concentrates: ADM, Central Soya, Crest, Griffith, Gunther Products, Ranell Labs., Swift & Co. Isolated Soy Proteins: Central Soya, Crest, Gunther, Ralston Purina. Spun isolate fibers: ADM, General Mills, Ralston Purina, Worthington Foods. Textured Soy Proteins (extruded grit-type): ADM, H.B. Taylor.

"Archer Daniels Midland is currently researching with a patent-applied-for extrusion process. Product (about 50% protein) can be shaped into many fibrous, textured forms Ä chips, chunks, flakes, slabs, wafers, or puffs. But whole meat-resembling pieces can't be formed.

"Company's selling product-development lots in various sizes, shapes and flavors. Customers are planning or test-marketing ADM's 'fabricated protein' in stews, chili, and casserole products. Potential market for chunky, ground or snack-type products is likely to be much greater than the one for simulated whole meats." Note: This is the earliest document seen (Sept. 2003) that mentions textured soy flour or grits produced by an extrusion process–later widely known by its ADM trademark as TVP.

"Worthington's simulated meats made from spun soy protein fibers (Fibrotein) come in cubes, slices, chips, granules, rolls, square logs, or other shapes and sizes. They are in fresh, frozen, or dehydrated forms" (p. 93).

Photos show: (1) Soy protein fibers, plus chunks and cubes made from fibers. The caption reads: "Simulated meats can be 'engineered' readily from soy protein fiber shown in the center of these General Mills products." At lower left, going clockwise: 'bacon' chips, 'beef' granules, 'chicken, 'beef' chunks, 'ham,' and 'seafood.' (2) Many of Worthington Foods' packaged meatless foods made from textured soy protein fiber; they are canned, frozen, smoked, diced, sliced, or formed into rolls or sausages. (3) Spun soy protein fiber coming out of a spinnerette head (in a glass beaker). (4) Joseph Rakosky operating an electrophoresis apparatus at USDA's Northern Regional Laboratory (NRRL, in Peoria, Illinois). (5) Edible soy protein foam on a meringue pie, developed by USDA at NRRL. (6) A.K. Smith watching Tokuji Watanabe making "tofu cake" by an improved process at NRRL. Address: Senior Assoc. Editor, Food Engineering magazine, Chicago.

244. *Time.* 1966. Commotion in the bean pit. 88:77-78. July 8.
• ***Summary:*** The soybean is now "the hottest item in the seething U.S. commodities market. Last week futures for soybeans, soybean oil and soybean meal set seasonal records after a month of wild trading." Prices tripled during the month.

"Introduced to the U.S. from Asia in 1804, the soybean did not become a significant agricultural product until World War II cut off normal U.S. imports of fats and oil. From a crop of 193 million bu. in 1945, output rose to 843.7 million bu., worth nearly $2.5 billion last fall. Soybeans are the U.S.'s most valuable agricultural export, ranking ahead of wheat and corn...

"Worthington Foods Inc. takes edible soybean fiber produced by Ralston Purina, turns it into meatless frankfurters, roast beef and fried chicken, sells them to Seventh-day Adventists and vegetarians. Archer-Daniels-Midland Co. is testing a soy beverage to be sold in powder form, and Central Soya has developed an ice cream-like frozen dessert made of soybeans.

"What interests researchers the most about the soybean is its high protein content (up to 50%), and this month Central Soya will begin mass production of Promine, an isolated soybean protein, at a new Chicago plant. Promine binds and emulsifies pulverized meats, such as sausages, meat loaf and bologna."

245. *Business Week.* 1966. Soybeans move up on the menu. July 23. p. 82, 84, 87.
• ***Summary:*** "General Mills, under its Betty Crocker Red Spoon trademark (A.D. Odell in charge), is test marketing the first of a series of projected foods spun out of a protein isolated from soy. Called Bac*Os, it is designed as a condiment and looks and tastes like lean, crumbled, cooked bacon. Priced at $0.69 for 3.25 ounces, the jar is equal to 1 lb of cooked bacon." Corn Products' (CPC) Best Foods Div. is marketing Skippy peanut butter containing the product. "Thomas J. Lipton, Inc., a Unilever subsidiary, recently launched four dried gourmet main dish meals including beef stroganoff and chicken la scala. Lipton has patented a process to use isolated soy protein (ISP) as a binder for dried meats... Ralston Purina has developed a series of spun soy protein foods resembling ham, chicken, and turkey out of ISP. It is selling its spun ISP base, Edi-Pro, to Worthington Foods Inc. Worthington has developed its own line of chicken and ham-like products for sale to religious groups.

"Central Soya makes an isolated soy protein binder called Promine, which goes into sausage and other processed meats. Sales of the binder at $0.35/lb–twice the cost of the binder it is replacing–are so promising that production will be doubled to 2.5 million lb monthly when a new plant opens in Chicago next month... In addition the company this fall hopes to start exporting a frozen soy dessert to tropical countries with no dairy industries." General Mills, Ralston, ADM, Central Soya, and Worthington combined spend some $4 million annually on research. Half of this sum is going into basic research and half into product development. ADM recently shipped 3 million lb of a new protein rich soy beverage to Latin America and the East Asia under a USDA program.

246. Bowen, William; Shook, Edgar. 1966. Why they call those soybeans "golden." *Fortune* 74:126-29, 186, 191. Aug.
• ***Summary:*** Soybeans have become a $2.5-billion crop in the U.S., a major U.S. export, and the basis of a hefty domestic processing industry. In the futures market, soybeans have outdistanced all other commodities in dollar volume of transactions. At Chicago's Board of Trade soybean futures are bought and sold in the largest of the seven commodity pits–*the* pit, the famous arena formerly occupied by the old-time champion, wheat...

"The U.S. produces about 70 percent of the world's soybeans, and is the only nation with a substantial surplus for export. The only other big producer of soybeans, Red China, consumes most of its crop at home...

"Last fall's crop was four times as big as 1945's, and about 170 times as big as that first officially recorded crop in 1924...

"Since the early 1950's, demand for meat, and hence for soybean meal, has grown faster in Western Europe and Japan than in the U.S., and as a result U.S. soybean exports have expanded at an average annual rate of 16 percent since 1953... In dollar earnings, soybeans and soybean products now rank as the U.S.'s No. 1 agricultural export...

"In recent years margins have tended to be uncomfortably narrow...For a big, efficient crusher, the breakeven crushing margin comes to about 17 cents a bushel. During the past several years average industry-wide crushing margins... have tended to run considerably below that breakeven level...

"Intense competition and meager margins have driven many companies out of soybean processing. The number of companies in the business has shrunk from about ninety in 1946 to sixty-five or so today. Some big companies have dropped out, including Spencer Kellogg and General Mills. The companies still in soybean processing include six giants, all headquartered in the Midwest. Among them they have something like 60 percent of the industry's total crushing capacity. The biggest are Central Soya Co. of Fort Wayne, Indiana, with a capacity of 84 million bushels a year, and Cargill, Inc., of Minneapolis [Minnesota]. Cargill claims to have about the same capacity as Central Soya. The other four members of the Big Six all have capacities on the order of 50 million to 60 million bushels a year: Archer Daniels Midland Co. (Minneapolis), Ralston Purina Co. (St. Louis), Swift & Co. (Chicago), A.E. Staley Manufacturing Co. (Decatur, Illinois).

"These companies all have large interests apart from soybeans, Archer Daniels, Cargill, Ralston, and Staley in grains, and Swift in meats. Even Central Soya, despite its name, gets less than half its revenues from soybean processing; the company has spread out on a grand scale into other fields, including feed manufacturing and grain merchandising...

"Soybean futures work like other commodity futures. The future bought or sold constitutes an enforceable contract to take delivery of, or deliver, a specified quantity at a specified price in a specified month at a specified place. But at any time prior to the delivery month the buyer or seller can cancel out the contract at will (though not always, of course, without loss), simply by taking an equal action in the opposite direction. The trader who bought sells, or the trader who sold buys, and, lo, everything washes out. The earlier and later transactions offset each other. Most futures contracts are offset in this way, prior to maturity; at the Board of Trade only 1 percent or so are settled by actual delivery of the commodities.

"Basically, the commodity-futures market enables holders of large inventories to hedge against inventory losses resulting from price declines."

Contains a detailed discussion of hedging and its complexities and uncertainties. "Hedging is more sophisticated than crushing."

247. Odell, A.D. 1966. Meat analogues: A new food concept. *Cornell Hotel and Restaurant Administration Quarterly* 7:20-24. Aug.

• ***Summary:*** "Despite spectacular increases in food production, the stupendous growth in total world population spells drastic food shortages ahead." Food science is focusing efforts on the development of new solutions to the food dilemma. The conversion of "feedstuffs by animals into meat is often less than, and seldom better than, 10 percent." We can shorten the food chain by developing new man-made protein sources. "One such candidate is the new class of textured, high-protein foods which has been made possible by the application of textile technology to the purified proteins which may be extracted and isolated from soybean meal, for example."

"The name Bontrae has been coined for General Mills' spun specialties." A diagram shows how Bontrae granules, cubes, bits, and slices are made from "protein spinning dope" by spinning to give "protein fibrils." Photos show: (1) A "tow" or "tissue" of "16,000 individual, endless monofilaments, spun from soy protein through a spinneret with holes of 0.003 inch diameter" [by General Mills]. (2-4). Smoky Chips (a soy product tasting like crisp bacon), ham, chicken, and fish analogs, Sloppy Joe, etc. A product closely similar to General Mills' Smoky Chips "is being supplied to the Best Foods Division of Corn Products as 'Smoky Crisps' for inclusion in a new version of Skippy Peanut Butter."

"The Isolated Protein Program of General Mills represents a major research effort involving nearly fifty people, which is dedicated to the above objectives. Although currently still in the research phase, various Bontrae items are now emerging into the commercial test market. Full scale commercialization, if warranted, will probably not be achieved before early 1968. Other commercial firms, notably Ralston-Purina Company and Worthington Foods, are engaged in similar programs."

Note 1. This is the earliest English-language document seen (Nov. 2014) that uses the term "meat analogues" (or "meat analogs") in the title.

Note 2. This is the earliest English-language document seen (Dec. 2015) that uses the word "monofilaments" to refer to edible spun soy protein fibers. Address: PhD, Manager, Isolated Protein Program, General Mills, Inc., Minneapolis, Minnesota.

248. *British Vegetarian.* 1966. "Soya Steaks." Sept/Oct. p. 411. [1 ref]

• ***Summary:*** This article is excerpted from *SCATS Sentinel, Journal of the Southern Counties Agriculture Trading Society,* June 1966.

A recent technical report from Trouw & Co., N.V., of Amsterdam, states that products resembling steaks, chickens, and ham are now being made from soya, using spun soy protein fibers. In the USA, General Mills, Ralston Purina Co., and Worthington Foods (Ohio) are working on spinning, and in England Unilever is reported to be interested. Worthington Foods has developed a full line of products that look, taste, and chew like chicken, beef, and pork products. Wham is a ham-like product and White Chic is simulated chicken. A photo shows a label of Worthington Soyameat Salisbury Steak Style.

249. Randolph, Chet. 1966. New vegetable protein foods are now available: International Protein Conference [at Peoria]. *Soybean Digest.* Dec. p. 9-10.

• ***Summary:*** "Over 250 people attended the International Conference on Soybean Protein Foods at Peoria, Illinois, Oct. 17-19. They came from many states, nine countries, and the United Nations.

"At a similar conference 5 years ago many questions were raised as to how we might meet the protein needs of the world and whether or not the necessary foods could be developed and marketed successfully. At this conference it became clear that scientists have developed the formulas and techniques and that foods are now available from vegetable protein sources. How to distribute or market the foods is not so clear.

"Orville G. Bentley, dean of the College of Agriculture at the University of Illinois, who opened the conference, referred to the soybean as the golden nugget of the Orient that is now recognized worldwide as the efficient producer of

high-quality protein and oil. The United States produces 71% of the world soybean supply.

"The need for protein in the underdeveloped countries was clearly reestablished at the conference. Dr. Ricardo Bressani, of the division of agricultural and food chemistry in Guatemala, Dr. Fred T. Sai of the University of Ghana Medical School, and Dr. Kamaluddin Ahinad of the University of Dacca in East Pakistan all reported graphically the need for protein, especially for children and in particular those just weaned. In the underdeveloped areas the infant is taken from the mother's breast and abruptly placed on a starch gruel which may be made from corn, casava [cassava], or rice. At the very time when they need the greatest protection against childhood diseases they are given a strange gruel, in many cases with only half the protein requirements.

"Several men in the medical profession reported on experimental work proving that vegetable sources can supply the needed protein where milk is not available or is too high priced. Dr. George C. Graham of Baltimore City Hospitals [Maryland] reported on a detailed study of undernourished infants who responded to vegetable proteins. Dr. Po-Chao Huang of the Massachusetts Institute of Technology had returned to his native Formosa where he had an experiment with 57 babies that averaged 3 months of age. He compared cow's milk, soy beverage, and some soy flour and rice formulas. In all cases he found that the growth rate, skin texture and smile of the babies were equal whether the protein was from vegetable or milk protein sources. He even had two sets of identical twins which added to the study.

"Sales of Incaparina: John W. Money with Quaker Oats Co., working in Colombia in South America, reported that Incaparina was beyond the experimental stage and they were actually selling it. This high-protein formula is supplying the protein needs of children in that area to the equivalent of 5 million glasses of milk a month. They have priced their product just below the second staple food, rice.

"We had reports of the many uses of soy flour and soy grits and beverages that can come in an almost infinite variety of forms. One type of soy flour is used in baked goods, another in doughnuts. Soy grits are widely used in dog food, with another type of soy flour finding increased use as a calf milk replacer. Different companies are prepared to sell soy fiber foods with flavors similar to those of fish, ham, chicken, or pizza. Dr. Arthur D. Odell of General Mills, Inc., reported on the techniques and sales of their meat-like products made from modified vegetable tissues. such items as their bacon chips are on the market and beyond the research stage.

"Others reported on sales of the modified vegetable proteins to hotels and restaurants. This is the sophisticated type of food that goes with a suitable income. People enjoy it as a convenience item.

"We had a report on several formulations of very basic foods primarily for nutrition to sell at the lowest possible cost. General Mills, Archer Daniels Midland Co., Central Soya, and Ralston Purina Co. have highly specialized machinery and equipment for spinning the fibers or preparing the foods.

"Gus C. Mustakas of the Northern Regional Research Laboratory at Peoria, Ill., reported on his work to develop a simple technique that can be used in any village in India or Ghana. This involved soaking the soybeans in a sack, boiling on an open fire and running through a small hand grinder. He reported that with such simple equipment they could make 300 pounds a day to provide half the daily protein needs of 1,600 people.

"It was agreed that one of the big needs is for more know-how in marketing in many areas of the world where cultural, ethnic, and religious backgrounds and tastes vary so widely. Dale W. Johnson, executive vice president of Crest Products, Inc., and Hugh Robinson of Foreign Agricultural Service, Washington, D.C., among others, reported on the complexities of the problems that must be overcome, including the tariffs and government restrictions, as well as such things as the taste habits and advertising patterns in the many different countries.

"Dr. Sai told of Ghana farmers who were quite pleased with the new soybeans they were taught to raise. There was a celebration at harvest time. But they will never raise soybeans again in that area. The reason is that it took so long to cook the soybeans that all of the fuel in that area was used up before the winter was over.

"Soybeans in India: Stories were told of planting soybeans in India. But at harvest time there was no place to sell them because of the lack of processing facilities. The University of Illinois indicated they will cooperate with India to use soybeans as a teaching tool, in which they are stressing the interdependence of the experiment stations, extension, and teaching. This is the basis of our Land Grant Colleges, but it is something new in other parts of the world. They feel that even if soybeans are not successful in India the teaching techniques will be worthwhile. They plan to approach the problem on a team basis, taking into account not only production but also processing, distribution, and food uses and tastes.

"Dr. Joseph J. Rackis of the Northern Laboratory and Dr. Frederic R. Steggerda of the University of Illinois reported considerable progress in overcoming the flavor and flatulence (gas) problems in soybeans.

"Dr. Edwin W. Meyer of Central Soya predicted that some day, when the volume is high enough, a 70%-protein product can be sold as low as 130 per pound. Some companies reported success in the products that will go through freezing and then heating, such as added chunks in frozen corn that is then heated for food for the table.

"Dr. Odell reported that two University of Iowa men, working with prisoners, found an excellent response in adult

human volunteers who subsisted on a strictly vegetable source of protein. After 6 months they were in excellent health.

"Other nutrition studies by the Wisconsin Alumni Association, as well as those in Guatemala, indicate that enough is known now about soy protein so that it can be utilized as the sole source of protein, with no adverse effects on any species of animal on which it is tested. Dr. Odell indicated that it need not cost more than one-half low-quality hamburger per unit of protein. However, again soy foods in this country are expected to find their way into new markets mostly as convenience foods.

"Dr. Clifford W. Hesseltine of the Northern Laboratory reported a former worker is now in Indonesia supplying low-cost protein foods at cost to students and faculty at his university.

"Dr. Lester J. Teply of UNICEF reported that while the soybean is native to the Orient and has been known for centuries, it has not been generally substituted for milk, contrary to popular belief. That is why this is a new area. The familiarity of the Orientals with soybeans may make it easier to introduce soy beverage to provide children with needed protein after weaning. (Some soy milk has been available in the Orient due to the efforts of such men as Harry W. Miller and K.S. Lo.)

"Dr. George L. Mehren, Assistant Secretary of Agriculture, said if we can add protein to the rice, corn, and casava [cassava] already in the diet and get it to the children we can make a dent in the serious problems of malnutrition. He added his official voice to the call for immediate action.

"It was made clear at the conference that the need is there. Scientists have developed the foods and the techniques. There is no doubt now as to the direction we must take. The question now is how do we move in specific areas and how soon are we prepared to move."

Across the top of the first page is a portrait photo of 7 of the conference speakers. Address: Field Director, American Soybean Assoc.

250. Hartman, Warren E. 1966. Research and development in synthetic foods. *New York State Association of Milk and Food Sanitarians, Annual Report* [19 ref]
• ***Summary:*** "Research and development in synthetic foods is no longer a skeptical venture. Today it is fast becoming an alarming necessity! Two most basic and major problems face the world today (1) The world population explosion accompanied by (2) The skyrocketing need for food. Synthetic foods are already a part of big business."

"Worthington Foods has been in the vegetarian protein food business for some 25 years. Primarily, the business was concerned with supplying such foods to consumers who had medical, philosophical, or religious reasons for wanting them. Early products were based on wheat proteins or 'gluten.' Worthington had accumulated considerable flavoring 'know-how' by the time soy products such as flakes, toasted grits and isolated protein became available. One of the first Worthington products based on soy protein was a powdered milk-like product, Soyamel, which was designed primarily as a hypoallergenic formula for infants and children who were allergic to milk... Perhaps one of the first companies to explore the protein spinning technique developed by Robert Boyer (U.S. Pat. # 2,682,466) was Worthington Foods. For the past ten years Worthington has pioneered in the field of vegetarian protein foods; seeking suitable protein isolates for spinning, developing spinning technology, formulating and adapting these spun protein fibers to acceptable consumer end-products."

"The present technology of spinning as practiced by Worthington Foods, uses as a raw material relatively pure soy protein isolate as obtained from Ralston Purina, Central Soya or other suppliers of protein isolates."

A photo shows Hartman, who has been with Worthington Foods since 1947. "His academic training was acquired at Andrews University, Berrien Springs, Michigan; University of Michigan, Ann Arbor; and at Massachusetts Institute of Technology. Dr. Hartman was employed as a biochemist- bacteriologist for four years by the Michigan State Department of Health Laboratories in Lansing, Michigan, and was a consultant-instructor for a year for the U.S. Public Health Service." Address: Director of Research and Development, Worthington Foods, Inc., Worthington, Ohio.

251. **Product Name:** Pur-A-Lec Lecithins [Standard Plastic, and Fluid Grades; Bleached and Unbleached].
Manufacturer's Name: Ralston Purina Co. Special Soy Products Dept.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63102.
Date of Introduction: 1966.
New Product–Documentation: Soybean Blue Book. 1966. p. 106. Used as emulsifiers and dispersants.

252. Ralston Purina Co. 1966. Fire or explosion in solvent extraction plant. Decatur, Illinois.
• ***Summary:*** Kingsbaker, C. Louis. 2005. "List of fires and explosions in extraction plants." Atlanta, Georgia. 3 p. Aug. 4. Unpublished manuscript. Address: Decatur, Illinois.

253. Thulin, W.W.; Kuramoto, S. 1967. "Bontrae"–A new meat-like ingredient for convenience foods. *Food Technology* 21(2):64-67. Feb. [14 ref]
• ***Summary:*** Bontrae is made from spun soy protein fibers. "Although regeneration of oriented protein systems had been studied earlier (Lundgren, 1949), techniques for spinning protein were reduced to practice in the early 1930s by a group at the Ford Motor Company led by Robert A. Boyer. The Ford efforts were directed toward textile applications."

In 1954 Boyer was granted a patent for using spun protein fibers to create edible structures. Research directed to this end has been undertaken by a number of food processors including Swift & Co., Unilever, General Foods, National Biscuit Co., Worthington Foods, Ralston Purina, and General Mills.

A photo shows two hands holding a "protein ribbon expanded to display individual filaments." A note at the end of the article states: "Presented at IFT 25th Annual Meeting."

Note: The 25th Annual Meeting of the Institute of Food Technologists was held 16-20 May 1965 in Kansas City, Missouri. An abstract (10A) of this paper appears on p. 43 of the program. Address: James Ford Bell Research Center, General Mills, Minneapolis, Minnesota 55427.

254. **Product Name:** Supro 610 (Isolated Soy Protein). Renamed PP610 by Nov. 1987.
Manufacturer's Name: Ralston Purina Co. Special Soy Products Dept.
Manufacturer's Address: Plant: Louisville, Kentucky. Offices: Checkerboard Square, St. Louis, MO 63199.
Date of Introduction: 1967 May.
How Stored: Shelf stable.
New Product–Documentation: *Soybean Digest.* 1967. Aug. p. 30. "Purina's Supro 610 for protein enrichment." "Ralston Purina Co. has achieved a 'break-through' with the development of a new protein powder made from soybeans which will be used by food manufacturers for the protein enrichment of existing foods and as a main ingredient in new foods. Announcement of the product, called Supro 610, was made by D.B. Walker, Ralston Purina corporate vice president. The 'break-through' came in the elimination of the 'beany' flavor which has always characterized and limited soy protein powders in the past. 'Supro 610 has accomplished complete blandness of taste, which has long been the objective of soy protein researchers but has never before been achieved,' Mr. Walker said... 'Preliminary studies have shown that Supro 610, supplemented with methionine, is superior to the other standard protein food ingredient [sodium caseinate] against which high grade food proteins are measured." The product is made at the company's plant in Louisville, Kentucky. The first commercial quantity was shipped in May [1967].

Food Engineering. 1967. Aug. p. 154. "Soy protein without the soy taste." Supro 610, a spray-dried powder, is completely bland and contains more than 94% protein.

Soybean Digest Blue Book. 1969. p. 114. "Supro 610, bland isolated soy protein, spray dried powder, neutral for use as a protein food ingredient and protein fortification in food products. Specialty proteins for emulsification and high solubility."

Gentry & Connolly. 1969. Stanford Research Institute, Report No. 374. "Fabricated Foods." p. 10. "Ralston Purina manufactures Supro 610, a soybean protein powder, for use as a supplement and as a main ingredient in new foods such as instant breakfasts, dry soup mixes, dietetic foods, and instant high protein beverages. One of the largest producers of soy protein products." W.Z. Gottschall. 1969. "Ralston Purina Yesterday and Today." Nov. p. 13. "Supro 610 is NEW!"

Ralston Purina price schedule. 14 Sept. 1970. Supro 610.

"Quantity–Selling Price, Net

"Carload Lots (40,000 lbs. or minimum) $0.40 per pound

"Truckload (20,000 lbs. or minimum) $0.405 per pound "

"10,000 lbs.–19,950 lbs. $0.415 per pound

"500 lbs.–9,950 lbs. $0.415 per pound

"50 lbs.–450 lbs. $0.430 per pound

"The above prices are f.o.b. our plant at Louisville, Kentucky, and are subject to change without notice.

"Terms are net 15 days–freight is prepaid and added to invoice.

"Package: 50 lb. bags.

Ad (full-page) in *Soybean Digest.* 1972. Nov. p. 14. "You make the choice." Compares Ralston Purina's Supro 610 ("a spray-dried, isolated soybased protein") with sodium caseinate, which are shown on opposite sides of a balance scale. Supro 610 costs $0.40 a pound in carload quantities F.O.B. Louisville, Kentucky. Sodium caseinate can "cost you as much as 50% more than Supro 610."

Horan. 1974. Meat analogs. p. 380. This product is a powdered soy protein isolate.

Letter from Susan W. Vorih, Communications Manager, Protein Technologies International. 1993. June 17. Supro 610 was first produced and sold in October 1966.

255. Horton, Yvonne. 1967. Soybean products: Candid consumer. *Christian Science Monitor.* July 6. p. 10.
• ***Summary:*** Increasingly sophisticated edible plant proteins are now available to American consumers, after getting their start in institutions.

Synthetic bacon bits, named Bac-Os, made by General Mills, Inc. from isolated soy protein under the trade name Bontrae, resemble crisp fried pieces of lean bacon without fat. They are being test marketed in Buffalo and Syracuse, New York; in Sacramento and Stockton, California; and in Denver, Colorado.

Before being test marketed at retail outlets, Bac-Os were used for salads on Eastern Airlines flights and for bacon, lettuce and tomato sandwiches in restaurant chains, university dining halls, etc.

Another high-protein product made from Soybeans by General Mills is Modern Protein Food (MPF), also called Multi-Purpose Food; it is recommended by the maker for stocking fallout shelters, for stretching food budgets, and for vegetarian or other special (religious) diets.

Many other food manufacturers are doing research on "vegetable protein products." Archer Daniels Midland Co. of Minneapolis [Minnesota] makes TVP (Textured Vegetable Protein), which contains no waste, less than 1% fat, and can be cooked in many ways. Other companies involved in the field are Central Soya Co., Ralston Purina Co., Swift and Co., and Worthington Foods. Address: Home economics writer, Christian Science Monitor.

256. *Food Engineering.* 1967. Soy protein without the soy taste: Complete blandness of the 94%-protein isolate plus its high nutritive value promise wide application as protein supplement and major food ingredient. 39(8):154. Aug.
• ***Summary:*** Supro 610, a spray-dried powder, is completely bland and contains more than 94% protein. A table shows the nutritional composition, including the essential amino acids (in grams per 100 gm of pure protein).

257. *Soybean Digest.* 1967. Changes in soybean division at Purina. Aug. p. 50-51.
• ***Summary:*** "Ralston Purina Co.'s soybean division has been broadened in name and scope, and has been restructured to accommodate growth opportunities, it has been announced by W.L. Golden, divisional vice president in charge of the division. The soybean division will now be called the protein division. Activities will be directed toward the development of new protein sources and the marketing of many refined and isolated protein products."

"Work has started on a new Ralston Purina Co. office building and research complex at Checkerboard Square in St. Louis. Total cost of the project will be in excess of $10 million. The new office building, to be known as The Tower to Ralston Purina people, will rise 15 stories above the ground when completed, reaching an elevation of 192 feet." A photo shows W.L. Golden.

258. *Soybean Digest.* 1967. Ralston Purina closes Decatur [Illinois] processing plant. Nov. p. 32.
• ***Summary:*** "Ralston Purina Co. of St. Louis, Missouri, closed its soybean processing plant at Decatur, Illinois on Nov. 1 for an indefinite period... The company's other soybean processing plants are located at Bloomington, Illinois; Lafayette, Indiana; Raleigh, North Carolina; Louisville, Kentucky; Memphis, Tennessee; Kansas City [Missouri]; and Iowa Falls, Iowa."

259. *Food Product Development.* 1968. Concentrated, isolated soy protein is bland, light colored and water dispersible. 1(6):56. Dec/Jan.
• ***Summary:*** Supro 610 is made by Ralston Purina Co., Special Soy Products Dept. It contains 95% protein with none of the typical "beany" flavor. When supplemented with methionine, it has a PER of 2.72.

260. Sanford, David. 1968. Unfoods: Do you know what you're eating? *New Republic* 158(2):13-15. May 18.
• ***Summary:*** Discusses (critically) the meat-like products made by Thomas J. Lipton Co., Loma Linda Foods, Worthington Foods, and General Mills (Bac*Os). "Swift & Co. markets a soy larded chili, salisbury steaks, canned meat loaf and sloppy joes to restaurants, which call them pretty much what they like.

"The transforming of soy protein into edibles involves, in the case of Worthington Foods, General Mills and Ralston Purina a process licensed by Robert Boyer, an inventor and protégé of Henry Ford." Note: No mention is made of Loma Linda using spun soy protein fibers. Many legitimate issues regarding the labeling of modern soy protein products are raised.

"Bac*Os, the bacon-like bits test marketed over the past 18 months in Denver [Colorado], Buffalo [New York] and Sacramento [California], is about to be advertised nationally. Two years ago a token quantity of Bac*Os was seized by the Food and Drug Administration in Buffalo and a case was brought in the US Federal District Court (Western Region) in New York to force General Mills to identify their product as 'imitation bacon.'...

"Bac*Os bottles didn't say that Bac*Os were bacon, just that they were a lot *like* bacon... Its label now reads 'Crispy Bontrae bits with a flavor like bacon.' Bontrae, the label explains, is a registered trademark for a vegetable protein product. Arthur Odell, who manages General Mills' isolated protein program, thinks that that is sufficient."

261. Wilcke, H.L.; Martinez, W.; Calvert, F.E. 1968. Oilseed meals and flours for food use: Export issue. *Soybean Digest.* May. p. 18, 20.
• ***Summary:*** Contents: Introduction. Flour for humans. Categories of use: Functional characteristics (binder, emulsifier, etc.), texture, color, nutrition. We never buy protein ("In fact, if the average housewife were asked to define protein, she would probably respond in terms of meat, milk, or eggs").

Flour from oilseeds (at a 6% moisture level) typically contains about 50% protein, 1½% fat, and 3% fiber. Full-fat soy flour is available on the market, as well as the typical defatted flour.

Soy concentrate has been defined as, "The product prepared from high-quality, sound, clean dehulled soybeans by removing most of the oil- and water-soluble nonprotein constituents and shall contain not less than 70% protein (N x 6.25) on a moisture-free basis.

"The isolates, as the name implies, are protein fractions isolated from the defatted flakes or flour. The protein content of the isolate, when calculated on a nitrogen x 6.25 basis, varies from approximately 92% to 95%, or on a moisture-free basis from approximately 97% to 100% protein equivalent. The fiber is quite low and the ash is also low.

This the protein is provided in a much more concentrated form, and consequently less of these products are added than when the flour is used directly."

Note: Frank E. Calvert came to Ralston Purina from the Ford Motor Company, where he did research on soy proteins. Address: Ralston Purina.

262. *Soybean Digest.* 1968. Joins Ralston Purina Co. July. p. 22.
• ***Summary:*** "Dr. Charles W. Kolar has joined the protein division research organization of Ralston Purina Co., it has been announced at company headquarters in St. Louis by W.L. Golden, director, new venture management, and F.E. Calvert, director of protein division research. Dr. Kolar received his Ph.D. in food science in 1967 from Michigan State University at Lansing."

263. Calvert, F.E. 1968. Re: Your request for fresh sample of Textured EdiPro (spun protein fiber). Letter to W.J. Wolf, Acting Head, Meal Products Investigations, USDA ARS Northern Utilization Research and Development Div., 1815 N. University St., Peoria, Illinois 61604, Aug. 30. 1 p. Typed, with secretary's signature on letterhead. [1 ref]
• ***Summary:*** In response to Wolf's letter of Aug. 28, Calvert is sending a 1-quart sample of fresh Textured EdiPro.

Note 1. This is the earliest English-language document seen (Oct. 2015) that mentions Textured EdiPro (with "EdiPro") spelled as one word. Address: Director, Protein Research, Protein Div., Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63199. Phone: CHestnut 1-3600.

264. Wintgen, K.H. 1968. [Coating colors based on isolated soybean protein]. *Papier* (*Darmstadt*) 22(7):429-35. [Ger]* Address: International Div., Ind. Protein Ralston Purina Co., Brussels, Belgium.

265. Goldberg, Ray A. 1968. Agribusiness coordination: A systems approach to the wheat, soybean, and Florida orange economies. Boston, Massachusetts: Harvard University Graduate School of Business Administration. xix + 256 p. See p. 101-47. Index. 29 cm. [402 ref]
• ***Summary:*** Section III, titled "Soybeans," contains three chapters. 6. The Dynamics of the Soybean System. Changes in Domestic Consumption: The Utilization of Soybean Meal, The Utilization of Soybean Oil. Changes in Export Consumption: Soybeans, Soybean Meal, Soybean Oil, Changes in Production. Changes in Processing and Marketing. Summary.

7. The Structure of the Soybean System. Channels. Firms and Entities. Coordinating Patterns: Common Ownership in the Soybean Industry (farm cooperatives, export firm ownership patterns, soybean processing firm integration, edible oil product manufacturers' ownership patterns, nonintegrated firms in the soybean industry). Coordinating Institutions and Arrangements (the futures markets, trade associations, bargaining associations, pool arrangements). Vegetable Oil Export Company: governmental activities, contractual relationships. Summary.

8. Behavioral and Performance Patterns in the Soybean Economy. Behavioral Patterns: Storage, Consumption, Output. Performance Patterns: Profitability (Allied Mills, Inc., Archer-Daniels-Midland Co., Central Soya Co., Inc., General Mills, Hunt Foods and Industries, Inc., The Procter & Gamble Co., Ralston Purina Co., Swift & Co., Textron's Spencer Kellogg Div.), Price Stability, Competition (ease of entry and exit, concentration). Adaptability. Summary. Address: Assoc. Prof. of Business Administration, Harvard Univ., Boston, Massachusetts.

266. *Food Processing* (*Chicago*). 1969. Soy protein debuts as main course. Winter. p. F4-F7. Foods of Tomorrow section.
• ***Summary:*** About textured soy protein products that can take the place of meat, especially Bontrae (from General Mills, Inc., Minneapolis, Minnesota), TVP from ADM (Minneapolis, Minnesota), and Stripples from Worthington Foods (Worthington, Ohio). The costs vary widely. "Unflavored spun soy fibers in an acid-salt media [medium] cost about 50 cents a pound." Prices of the finished products to consumers are about 2/3 to 3/4 of that of the meat they can replace. "Expanded-soy textured protein [extruded textured soy flour] is less expensive. Cost in chunk or dry granular form ranges from 12 to 40 cents a pound. Since it rehydrates with 2 parts water, the cost on an as-served basis ranges from 4 to 13 cents a pound."

Bontrae comes in the form of frozen, free-flowing, pre-cooked crumbles or dice packed in 5-lb cartons. "General Mills is making a sizable increase in the capacity of its pilot plant for the production of Bontrae..." Bontrae is presently being marketed mainly to Minnesota State institutions, hotel, restaurant, and institutional accounts in Albany, New York, and college food service accounts in the Baltimore (Maryland), and Washington, DC, area.

ADM "calls its expanded-soy textured vegetable protein TVP" (registered trademark). The company "had the first production-size facility for textured soy protein and is now in the midst of a major expansion." In the U.S., TVP has been sold mainly to food processors for use in canned, dehydrated, and frozen foods. But in Europe it is sold mostly to consumers, in 200 gm (7 oz) retail packages.

Swift & Co. (Chicago) entered the market 2 years ago with Texgran, expanded soy protein. In less than a year, sales exceeded capacity. A new plant, being constructed in Champaign, Illinois, should be finished soon.

H.B. Taylor Co. (Chicago) sells Textrasoy, an expanded-soy textured protein, which is the lowest cost textured protein available. Until about a year ago it was sold to the pet food industry.

"Six years ago [1963], Worthington Foods introduced a line of simulated meats based on spun-soy textured protein supplied by Ralston Purina." In 1966, Worthington built its own plant for making the "spun-soy fibers." A new line has just been developed for the institutional market. Worthington's latest product is Stripples, which can replace bacon. It undergoes no shrinkage in preparation for serving, compared with a loss of about 25% of its weight when bacon is broiled or fried. Although it costs twice as much as bacon, "the as-served cost is only half that of bacon." Ralston Purina still makes spun-soy textured protein in the form of unflavored fibers in an acid-salt media, or in flavored dehydrated form.

Color photos show: (1) A table set with 4 ready-to-eat dishes, each containing "Bontrae spun-soy textured protein," which "is being successfully market tested in restaurants and institutions." On one side is a menu with the bold title "C'est Bontrae." (2) A smiling lady placing silver platters of food on a sideboard. The caption: "TVP expanded-soy textured protein is penetrating the home market in Europe." (3) Three traditional bacon dishes on a table, each containing Stripples. The "latest soy protein convenience food," its hickory-smoked strips can be used in place of bacon. Both the light and dark stripes are protein.

267. **Product Name:** Purina Assay Protein RP-100 (Standardized Assay Isolated Soy Protein for Nutritional Research on Laboratory Animals).
Manufacturer's Name: Ralston Purina Co. Special Soy Products Dept.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63199.
Date of Introduction: 1969 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1969. p. 114. W.Z. Gottschall. 1969. Nov. "Ralston Purina Yesterday and Today." Purina Assay Protein RP-100 is used for laboratory research on many experimental animals.

268. *Food Engineering.* 1969. Vegetable 'meats' look good for the '70s. 41(5):85-87. May.
• ***Summary:*** Pioneer producer Worthington Foods, Inc. of Worthington, Ohio, now makes more than 60 "meatless-meat products." Sales are growing 20% a year, quality is steadily improving, and consumer awareness is growing. A larger proportion of the simulated meats has been sold to people abstaining from meat for religious, health, or philosophical reasons, but purchases have also been made by the meat-consuming public.

Worthington is taking a sophisticated new marketing approach with its bacon-like slices named Stripples, which are made from randomly layered, spun soy protein fibers. The process of making Stripples is described. The company spins soy protein isolate purchased from Ralston Purina, Central Soya, and others. Address: Worthington Foods, Inc., Worthington, Ohio.

269. Gentry, Robert E.; Connolly, Eleanor M. 1969. Fabricated foods. *Stanford Research Institute, Report* No. 374. 16 p. May. (Menlo Park, California, and Zurich, Switzerland).
• ***Summary:*** This is subtitled "A research report by the Long Range Planning Service." Contents: Executive summary. Scope and definitions. Present status and outlook: Changes in product mix, changing technology. Impact on food processing industry: Markets, marketing strategies, processing, research and development. Impact on food service industry. Impact on food wholesalers and retailers. Impact on flavor technology. Impact on packaging materials. Impact on agriculture: Meat and poultry, dairy products, oilseeds, grains. Impact on petroleum, natural gas, and coal. Boxes: New protein sources. Approval by the Food and Drug Administration (FDA). Representative groups of companies developing new sources and forms of food. Examples of fabricated foods–1980.

This report predicts that sales of fabricated foods in the USA will increase from about $1,500 million in 1969 to approximately $7,000 in 1980, but will still account for only 5% of total sales of the food processing industry. The primary impact during the 1970s will be on convenience, snack, and other specialty foods.

"Sales of meat, seafood, and poultry analogs amounted to only about $2.5 million in 1966. Worthington Foods and Loma Linda Foods were the major suppliers to a primarily religious and vegetarian market. In the past few years, several major food companies have entered the market and sales have risen to an estimated level of $10 million. As flavor and texture improve, 1980 sales will soar to $1,500 million to $2,000 million." The foodservice industry will be a prime outlet for the new products.

The most important food analog in America today is margarine. Among dairy foods, margarine accounts of about 66% by volume of the butter market, nondairy whipped toppings have about 60% of the whipped cream market, and coffee whiteners have about 35% of the cream market. In terms of sales: In 1968 sales of margarine are $475 million out of $1,150 million (41%) for the total butter and margarine market. By 1980 this is predicted to increase to $750 million out of a total $1,250 million (analogs will have 60% of the total market). Sales of coffee whitener are $30-35 million out of $85-100 million (35%) for the total coffee cream and coffee whitener market. By 1980 this is predicted to increase to $100 million out of a total $130-150 million (71%). Sales of nondairy whipped topping are $25 million out of $40-50 million (55.5%) for the total whipped cream and nondairy whipped topping market. By 1980 this is predicted to increase to $50-60 million out of a total $80-100 million (61%). Sales of filled and imitation milks are $3-4 million out of $3100-3200 million (0.11%) for the total

milk and imitation milk market. By 1980 this is predicted to increase to $600 million out of a total $3800-4000 million (15%, the biggest percentage increase). Sales of mellorine and other "frozen desserts" are $45 million out of $1200-1300 million (3.6%) for the total frozen dessert market. By 1980 this is predicted to increase to $80-90 million out of a total $1500-1700 million (5.3%).

A table (p. 5) titled "Soy Protein Products" discusses soy flour and grits, soy protein concentrate, and soy protein isolate, describing briefly the protein content, processing, price per pound, 1967 U.S. consumption, and applications. In 1967 soy flour and grits sold for $0.075/pound and 105-110 million pounds were consumed. Soy protein concentrate sold for $0.18/pound and 17-30 million pounds were consumed. Soy protein isolate sold for $0.37/pound and 22-35 million pounds were consumed.

Page 10 lists representative companies developing new sources and forms of food. For each, the company name, city, state, and product name or names are given. Companies selling soy protein products include Archer-Daniels-Midland (Minneapolis, Minnesota), Bryan Bros. Packing Co. (Subsidiary of Consolidated Foods Corp, Chicago, Illinois), Central Soya Co., General Mills Inc. (Minneapolis), Griffith Laboratories, Inc. (Chicago), Loma Linda Foods (Riverside, California), Ralston Purina Co., Swift & Co. (Chicago), H.B. Taylor Co. (Chicago), USDA ("Developing edible forms of soybean protein"), and Worthington Foods, Inc. (Worthington, Ohio).

Note: This is the earliest document seen (Aug. 2002) containing statistics on the meat alternatives industry or market–by geographical region. Address: 1. Senior economist; 2. Industrial economist, Stanford Research Inst., Menlo Park, California 94025. Phone: 415-326-6200.

270. Odell, A.D. 1969. Marketing considerations for textured protein products. *USDA Agricultural Research Service* ARS 72-71. p. 131-32. May. Proceedings of Conference on Protein-Rich Food Products from Oilseeds. Held 15-16 May 1968 at New Orleans, Louisiana.

• ***Summary:*** "We have already heard much about the present and future ways and means by which soy flour, concentrates, and isolates are gaining, and should continue to gain, greater acceptance in the human dietary. To the extent that these advances in utilization can produce a profit at the far end, they are permanent advances and, as such, will have long term commercial viability. Where no such profit motivation is demonstrable, there can be no industrial incentive, no spurs to in-depth research by the technically competent and, in the foreign markets, no shoring-up of the economic infra-structure of those developing nations who can and should be involved with these commodities and their end-product extensions. Until it is eaten, any food is merely a collection of organized chemicals of greater or lesser complexity. Since foods are not eaten because they are liked, but are liked because of the learning process of eating them, marketing's job is to get the consumer to take the first swallow. With an unconventional food, this requires sophisticated and strenuous marketing effort, no matter how brilliant the background research to create the food, or how obvious the need may be for the product itself.

"Marketing, then, of a rather special type holds the key to the future of consumer products from these raw materials. Why marketing of a special type? Simply because, with the exception of certain parts of the Orient, and even there, in only a limited sense, the new and "never before" foods which can be created from these flours, concentrates, and isolates are totally strange to the consumer. Novelty in foods poses an acceptance problem even among the highly sophisticated in the affluent nations. Greater convenience, better packaging, freezing, freeze drying, and other technical advances applied to traditional foods create no insurmountable obstacles on the domestic scene. A totally new food, however, creates its own problems.

"General Mills, Inc., Ralston-Purina, Worthington Foods, Swift, Archer-Daniels-Midland, and others are, as all of you know, engaged in the creation and introduction of both processor- and consumer-oriented foods from various forms of soy protein. The structural integrity that is engineered into these foods by chewy gels, extrusion puffing, or spinning has, as its purpose, the creation of products that fit into a prized sector of the menu–texture, chewiness, proper mouth disappearance, and general gustatorial gratification. As such, all of the products on which all of us are working have nutritional excellence, can be shelf stable, can possess a considerable degree of mimicry of the familiar, can be used to extend traditional foods, and can certainly be designed to meet parochial preference patterns. Given all these attributes and economy along with them, one would be tempted to conclude that these products are a cinch to succeed in the market place. Such a conclusion would be absurd." Address: Central Research Laboratories, General Mills, Inc., Minneapolis, Minnesota.

271. Wilcke, H.L. 1969. Summation of conference. *USDA Agricultural Research Service* ARS 72-71. p. 140-41. May. Proceedings of Conference on Protein-Rich Food Products from Oilseeds. Held 15-16 May 1968 at New Orleans, Louisiana.

• ***Summary:*** "I am just going to give you a few of the thoughts that this Conference is leaving with me.

"Now, the world's production of the three major oilseeds, including USSR, according to the President's Science Advisory Committee Report on World Food Supply, in 1961 to 1962, was: soybeans–31 million metric tons; cottonseed–20.6 million metric tons; and peanuts in the shell–14.1 million metric tons–a total of 65.7 million metric tons.

"If we translate this into proteins, that means 18.1

million metric tons of protein, which is a lot of protein.

"Now, the work reported from Mexico emphasized the possibility of the adaptation of further crops–sesame and chick peas. These, of course, would add to this as well as many of the others such as sunflower. Certainly, we are not using the protein from these sources as well as we might, particularly when quantities of a product that could be high quality often are used as fertilizer or even dumped. So, it is very appropriate that we be considering at this Conference the protein-rich food products from oilseeds.

"Because of the fact that cotton is indigenous to many of the protein-deficit areas, it should certainly be used more extensively as a direct human food. The work reported from the Southern Utilization Research and Development Division points to the possibility of solving the problems of gossypol through two new methods of producing protein concentrates, providing a high-protein concentrate, and also providing a means of inactivating mycotoxins–even though additional work needs to be done to reduce these methods to the realm of practicality and economic feasibility.

"Further work has resulted in methods for the production of protein isolates with quite differing and very intriguing properties. These now await practical evaluation.

"Peanuts are providing very useful flours, concentrates, and isolates.

"Soybean flour and grits, concentrates and isolates are being produced and marketed in the United States, at least, and many new and exciting products are being produced from these soybean-protein sources.

"The versatility of all of these oilseed proteins has been emphasized in this Conference by the description of their possible and probable uses. At this Conference, it has been recognized that protein cannot be separated from the total food problem. It has also been recognized that all forces, including government, universities, private industry, must be involved in working out these problems.

"It has also been recognized that we cannot be interested in the protein for the sake of protein. It must be a form that will be consumed because it is desired–not because we want somebody to consume it. It is of no value until it has been eaten and utilized by the body–whether human or animal.

"Now, we have recognized too that there are many ways in which the protein supplies of the world can be increased. Some very significant progress has been made in some of the fields, such as the production of new IR8 rice; in the production of higher protein wheat in Mexico; and, in the potential of corn with a protein of higher biological value.

"In looking at these protein sources from the viewpoint of this country, I would like to ask the question: Why should oilseed protein products be labeled as substitutes? Has our consumption pattern been so perfect that it can't be improved? Can we expect the perfect product from any of these?

"I submit that the emphasis for economy, nutrition, palatability, and functionality should be upon the final product and not on the individual components.

"Why then ask a protein source to be odorless, tasteless, colorless, and then very frequently reject the product because it does not add to these characteristics? Isn't it time to classify oil-protein sources as products in their own right and to recognize them as something new and exciting? Just as much as it is time, or past time, for the dairy industry to take the halo off of their products and look at them for what they are.

"Now, when I eat peanuts, I am eating peanuts. I am not under any delusion that I am eating steak. So, I think there is no reason why these products should not be considered as new products, to be sure, but products which should be taking their place.

"Quite often we discard useful products–those which may have one or more useful and desirable characteristics–simply because they do not possess all of the things that we would want. This has been pointed out by our speaker this noon, that we do this particularly when we are judging by U.S. standards. We must recognize that preferences for taste, colors, textures, and other criteria vary drastically in different areas. There is nothing more dangerous than generalization. We must focus upon specific needs and specific characteristics.

"This Conference, certainly, has brought together an invaluable summary of the present status of protein from oilseeds by the many outstanding speakers. I think one of the major results of the concern for world food supplies, and more specifically for world protein supplies, is the attention focused upon all available sources of protein and the acquisition of a library of information which we can put to very good use domestically. This will serve the United States well when there is a need for protein sources of differing characteristics–functional, economic, palatability, or otherwise.

"Now, if we fulfill our promises and our moral obligations to those countries which face serious protein deficits, we will continue with a real sense of urgency to seek new technology and to apply existing technology to the development of protein sources–indigenous, if possible, but certainly products that are not only acceptable but desirable by each of the populations we are working with–that they be made available at minimum cost, and in so doing, we will acquire this information to which I referred before.

"We will supplement our research–basic, applied, developmental–toward the elucidation and identification of properties, both unique and conventional, of our protein resources-be they animal, plant, fish, single cell, or others. So that when the food fabricator desires certain properties, he may quickly identify possible sources that are practical and economical. There must be the goals, not for the simple purposes of utilizing oilseed, but to place these products in their proper perspective in helping to provide food for the

future.

"I think that is what this Conference was about." Address: Ralston Purina Co., St. Louis, Missouri.

272. Altschul, A.M. 1969. Combating malnutrition: New strategies through food science. *Plant Foods for Human Nutrition* 1(3):149-61. June. [7 ref]
• ***Summary:*** This article begins: "We might describe what has happened in the past 25 years as a derangement of our ecosystem caused by rapid increase in population density without concurrent increased in wealth and the capacity to produce food."

Note: In 1974 world hunger and malnutrition, along with human population growth worldwide, were considered the two great problems on the planet. Another major problem was the "protein gap."

Contents: Introduction. New protein foods. Vegetable protein mixtures (soy protein concentrate, CSM). Improved cereal products. Domestic food production (malnutrition among the poor in the USA).

Protein beverages: Vitasoy, successfully marketed in Hong Kong, is a soybean beverage that contains nearly 2.5% protein; it competes successfully with the most popular soft drinks on the market. Monsanto Co. has signed an agreement with K.S. Lo of Vitasoy, for marketing Puma, a soy beverage, in other parts of the world. Coca-Cola recently announced that Saci, which contains 3% soy protein, is now being test-marketed in Brazil. Textured foods (General Mills makes Bac*Os from spun soy fibers. Ralston Purina manufactures these soy fibers. Worthington Foods makes and sells a line of textured meatlike products based on spun soy protein fibers. Swift's Texgran and Archer Daniels Midland's TVP are made by extruding defatted soy flour. H.B. Taylor Co. makes Textrasoy by thermoplastic compacting of the defatted soy flour).

Soybeans (the five categories of processed products are: full-fat soy flour, defatted soy flour, a 60-70% protein concentrate, soy milk, isolated soy protein–the modern version of Oriental soy curd {*tofu*}). Cottonseed. Peanuts. Other sources (copra from coconuts, sesame, fish protein concentrate). Private sector's role (AID program, Quaker Oats, Hinds Co., Vitasoy, Coca-Cola Co.). Photo and brief biography of Dr. Aaron M. Altschul.

Page 76: Photos show bottles of Puma (Guyana), Saci (Brazil), and Vitasoy (Hong Kong). For each is given: The percentage and source of protein. The percentage of calories from protein. The cost per bottle in U.S. cents (range 3.5 to 5 cents).

Fig. 3 (p. 152) is a graph that shows, for various countries of the world, the percentage of total grain supplies fed to animals (Denmark and USA are highest at 72-78%) versus animal protein consumption (pounds per person per year) (Denmark and USA are highest at about 45 lb). Address: Special Asst. for Nutrition Improvement to the U.S. Secretary of Agriculture, USDA, Washington, DC.

273. McCammon, J.F. 1969. Ralston Purina's position in soy proteins. *Soybean Digest.* Sept. p. 34.
• ***Summary:*** Ralston Purina makes both edible isolates for human consumption (including spun soy protein fibers) and soy protein for many industrial uses, including coatings for fine papers. In the edible isolate field, Ralston Purina has no consumer food products for sale. A photo shows McCammon. Address: General Manager, Protein Dep., Ralston Purina Co., St Louis, Missouri.

274. Sair, Louis. 1969. Soy protein concentrates. Paper read in Sweden, September 5. 17 p.
• ***Summary:*** "It is a pleasure to come from the United States to present work we have been doing for years which involves soy proteins.

"Before getting into the topic of soy protein concentrates, I do think that I should give you a little background on the company which I represent.

"I have worked for the Griffith Laboratories for over 20 years and I am Vice President and Director of Research. The company is now 50 years old and the founder, E.L. Griffith, and his two sons, C.L. Griffith and F.W. Griffith, realized that there was a need in the United States for a company that would work with the Meat Industry and specifically with the Sausage Industry.

"Some 40 or 50 years ago, most of the processes were trade secrets and there was a great lack of technical knowledge on what was actually going on. The Griffiths felt that the use of chemistry and science in meat processing could do nothing but help the industry and in turn develop a good company for the Griffiths.

"The thinking and vision which they showed has resulted in a vibrant, strong company with six manufacturing plants in the United States, one in Mexico, two in Brazil, two in Canada, and a new plant in Holland. During these 50 years the Griffiths have pioneered many facets in the Meat Industry. These have included the development of a uniform foolproof meat cure called "Prague Powder" and the pioneering of gas sterilization with ethylene oxide and propylene oxide. The initial conception of arterial pumping of hams came from Australia but it was the Griffiths who largely introduced this process into the United States and in order to make the process successful, they developed stainless pumps and scales to insure uniformity of pumping. The Griffiths appreciated the variability in spices and seasonings and much work was done on the development of procedures and methodology which would bring a better chemical understanding to this difficult flavor problem."

"The movement into the soy protein business by Griffith came about through two particular situations. The first was prior to going with Griffith, I had been in charge of Protein Research for one of the largest soy companies in the United

States and the second was the fact that one of our salesmen brought back a sample of sodium caseinate with him from Europe. This sample of caseinate has virtually changed the whole movement of additives or extenders in meat products.

"On looking at sodium caseinate we found that the addition of 2 to 3 pounds of sodium caseinate to 100 pounds of meat in an emulsion definitely aids in emulsification. The sodium caseinate did a superior job as far as our experience is concerned to either milk or to the cereals which were normally sold for this field.

"This brought us to think of the soy proteins and to wonder why we could not apply soy proteins to the Meat Industry.

"The growth of the Soy Industry in the United States has been a very remarkable one. Within only a decade we now produce, in the United States, over a billion bushels of soy. Nature endowed this plant with remarkable properties with regard to a high content of an edible oil and a very high level of nutritious protein.

"In order to utilize the soy, normally the fat is first removed and in almost all cases this is brought about through solvent extraction with hexane. The oil is refined and sold for edible purposes.

"The defatted soy [meal] contains about 50% protein and after suitable heat treatment it has become the backbone of the Feed Industry in the United States. The soybean meal offers a highly nutritious low cost feed ingredient for commercial feeding. The success in using soy for feed has not paralleled a similar pathway in its use for humans.

"Nature endowed the soybean with excellent qualities but in addition gave the soy a flavor factor which most humans find unsuitable to their palate. The flavor is described as beany or bitter.

"An enormous amount of effort has gone into work attempting to remove this beany flavor and most of the processes involve some form of steam or heat treatment. Progress has been made but the soy flour or flakes for edible use still have, more or less, a beany flavor.

"Chemists, appreciating this problem, have taken different approaches. The first approach has involved a procedure to remove the soy protein from the flour or flakes and in so doing end up with a protein product from soy with little of the beany flavor. The product produced by this process is referred to as soy protein isolate and two major manufacturers in the United States are Central Soya and Ralston Purina.

"The process is a comparatively simple one and largely comes about from work that was developed in Japan in the very early 1900's.

Sair then describes how Griffith Labs. started developing an "isoelectric soy protein concentrate."

Page 5: "We suspended the soy flour or flakes in water, just as you do in making the isolate. Then, rather than add alkali to dissolve the protein, we did exactly the opposite. We immediately added acid to bring the soy protein glycinin to its isoelectric point; that is the point where it has the minimum of solubility in water which is in the pH range of 4.0. We now have the soy flour or flakes suspended in a dilute acid medium where the protein was insoluble but the sugars, color, and the flavor factors were soluble. We then exhaustively washed the suspended insoluble protein in water to remove the ingredients which we wished to remove and after completely washing the protein we suspend the insoluble protein in water, bring the pH up to 6.5, which solubilizes the protein, followed by spray drying.

"In the manufacture of the isoelectric wash soy we remove essentially all the extraneous factors in soy which are removed in the manufacture of the isolate except in our process we do not remove the fiber present in soy or the polysaccharides which are present in fat-free soy. As a result in the manufacture of isoelectric washed soy, you end up with a product which has 70% protein minimum on a dry basis rather than 90% protein when the isolate is made.

"In order to clearly define the distinction between the soy protein isolate and the soy protein concentrate, I would like to cover the individual manufacturing steps as shown in Table I."

This table compares the two processes, step by step. Address: Vice President and Director of Research, Griffith Laboratories, Chicago, Illinois.

275. Prestbo, John A. 1969. Meatless 'meats': Several firms develop soybean-based copies of beef, pork, chicken. Some now on market mixed with real thing; low cost, high-protein food is aim. Questions about taste, labels. food aim. *Wall Street Journal.* Oct. 2. p. 1, col. 1 and p. 21, col. 4.
• ***Summary:*** Discusses soy-based "pork, beef, and nuts" made by 6 U.S. companies including ADM, General Mills, Swift & Co., Worthington Foods, and Ralston Purina Co. Americans are eating more of these meat analogs than they may realize. "Soup mixes, canned stews and chili, frozen ravioli and prepared, frozen hamburger patties are among a growing number of grocery store staples that now contain relatively small amounts of flavored, textured soybean 'meats' along with real meat. In many instances, the only mention of the analogs on the labels of these convenience foods is in the fine-print list of ingredients. Analogs also are being tested in restaurants, factory cafeterias and institutions."

"Since last year, the New York State Department of Mental Hygiene has been adding General Mills Inc.'s meatless crumbled 'beef' and diced 'ham' and 'chicken' to meals for its 90,275 patients in 49 institutions."

Sales of soy-based analogs this year are estimated at $10 million and growing fast, up from about $3 million 5 years ago. "One study conducted by a West Coast research firm forecasts sales of $1.5-$2 thousand million for the products by 1980, which would equal 5-6% of the meat and poultry

market now projected for that year."

"One of the first products to use analogs, Skippy Peanut Butter with Smoky Crisps (simulated 'bacon' bits), was dropped last year after little more than a year in test markets."

"Last year a cattlemen's convention innocently devoured a banquet entree of 'meat loaf,' only to be jolted later by a speaker who told them they had eaten soybeans, not beef."

"Right now, most meat analogs retail for as much or more than the real meat they imitate. But eventually analogs' biggest attraction is expected to be low cost–roughly half that of trimmed, boned and cooked real meat."

Extruded soy "meats" wholesale for an average of $0.35/lb., while those made from spun soy protein fibers range from $0.45 to $0.80/lb. General Mills is building its first meat analog plant at Cedar Rapids, Iowa. Worthington Foods makes a bacon analog named Stripples, which sells for $0.79 per half pound package. "Worthington is also developing meatless breakfast sausages with similar characteristics which it plans to call Sizzles.

"Other food makers are trying different approaches to using analogs. Nalley's Fine Foods division of W.R. Grace & Co. is test-marketing Meat Mate, a package containing dehydrated, textured soy particles. When mixed with a pound or more of ground meat and some water, the particles expand, extending the meat weight by up to 50%. Different types of Meat Mate contain various spices." Other products include Wham, Bac-Os, and Bac'n.

276. Hartman, Jane. 1969. Versatile meat analogs will satisfy individual needs. *Modern Hospital.* Oct. p. 138.

• ***Summary:*** "If you think that meat analogs are nothing more than 'fake food,' you have a pleasant surprise in store."

"General Mills, the Ralston-Purina Company, Worthington Foods and other food processors are all actively researching and test marketing meat analogs." A diagram (courtesy of General Mills) shows how textured soy protein meat analogs, made from spun soy fibers, are manufactured.

A small portrait photo shows Miss Hartman. Address: Food Service Consultant, Baltimore, Maryland.

277. Altschul, A.M. 1969. Food: Proteins for humans. *Chemical and Engineering News* 47(49):68-81. Nov. 24. [11 ref]

• ***Summary:*** This article begins: "We might describe what has happened in the past 25 years as a derangement of our ecosystem caused by rapid increase in population density without concurrent increased in wealth and the capacity to produce food."

Note: In 1974 world hunger and malnutrition, along with human population growth worldwide, were considered the two great problems on the planet. Another major problem was the "protein gap."

Contents: Introduction. New protein foods. Vegetable protein mixtures (soy protein concentrate, CSM). Improved cereal products. Domestic food production (malnutrition among the poor in the USA).

Protein beverages: Vitasoy, successfully marketed in Hong Kong, is a soybean beverage that contains nearly 2.5% protein; it competes successfully with the most popular soft drinks on the market. Monsanto Co. has signed an agreement with K.S. Lo of Vitasoy, for marketing Puma, a soy beverage, in other parts of the world. Coca-Cola recently announced that Saci, which contains 3% soy protein, is now being test-marketed in Brazil. Textured foods (General Mills Makes Bac*Os from spun soy fibers. Ralston Purina manufactures these soy fibers. Worthington Foods makes and sells a line of textured meatlike products based on spun soy protein fibers. Swift's Texgran and Archer Daniels Midland's TVP are made by extruding defatted soy flour. H.B. Taylor Co. makes Textrasoy by thermoplastic compacting of the defatted soy flour).

Soybeans (the five categories of processed products are: full-fat soy flour, defatted soy flour, a 60-70% protein concentrate, soy milk, isolated soy protein–the modern version of Oriental soy curd {*tofu*}). Cottonseed. Peanuts. Other sources (copra from coconuts, sesame, fish protein concentrate). Private sector's role (AID program, Quaker Oats, Hinds Co., Vitasoy, Coca-Cola Co.). Photo and brief biography of Dr. Aaron M. Altschul.

Page 76: Photos show bottles of Puma (Guyana), Saci (Brazil), and Vitasoy (Hong Kong). For each is given: The percentage and source of protein. The percentage of calories from protein. The cost per bottle in U.S. cents (range 3.5 to 5 cents).

Discuses private companies making protein foods as part of a USAID 3-year grant program to encourage U.S. companies to develop commercially viable protein foods for production and marketing in developing countries. A total of 14 projects were funded. Address: Special Asst. for Nutrition Improvement to the U.S. Secretary of Agriculture.

278. Gottshall, W.Z. 1969. Ralston Purina yesterday and today. Paper presented at United Nations Industrial Development Organization Expert Group Meeting on Soya Bean Processing and Use. 17 p. Held 17-21 Nov. 1969 at Peoria, Illinois.

• ***Summary:*** Contents: Introduction. Agricultural products and services. Consumer products. Restaurants and food service. International operations. Protein production and marketing. New ventures. Corporate departments. Purina people and the future. Five protein products.

A good history of the company on the year of its 75th corporate birthday, or Diamond Jubilee [this would give its founding date as 1894]. It employs more than 23,000 people, has operations throughout the USA and in some 30 foreign countries, and transacts more than $1,000 million of business annually. The manufacture and sale of Purina Chows for

livestock and poultry still represents the largest source of business volume for the company.

"From a little scoop shovel, horse feed firm in St. Louis in 1894, Ralston Purina's Chow Division in the Agricultural Products Group has grown to the world's largest manufacturer of rations for animals. It is the only feed manufacturing business which markets its products in all 50 states of the United States."

Although Ralston Purina has sold human foods since 1898, the company's fastest growth in this area has come since the late 1950s. "The first food product was Ralston Whole Wheat Cereal, named after Dr. Ralston, the leader of a health club of the 1890s." Chex cereals are also well known. In 1926 the purchase of the Ry-Krisp Company of Minneapolis, Minnesota, added a Scandinavian-style rye cracker to the company's product line. In 1957 the company entered the pet food market with Purina Dog Chow, followed by Purina Cat Chow in 1962. In 1963 a major acquisition added the famous Chicken-of-the-Sea brand of tuna.

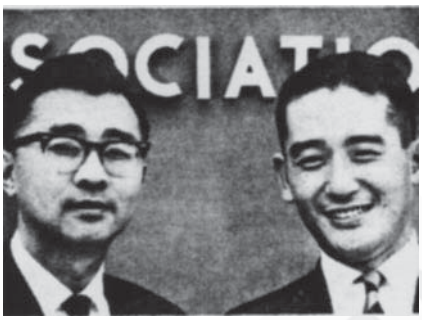
Protein isolated from soybeans was found to have many uses in food and industrial products. "Today these protein products are used in a wide variety of foods and products such as plastics, paints, paper coatings and adhesives."

Note: In early 1959 a special soy products was formed as part of the soybean division with Wayne E. Tjossem as manager. Donald B. Walker was director of the soybean division. In mid-1967 the soybean division was renamed the protein division. Activities were directed toward the development of new protein sources and the marketing of many refined and isolated protein products. In late 1971 the protein division assumed complete operating stature. P.H. Hatfield was been named division vice president.

The five protein products (each made from isolated soy protein) are: Supro 610, Edi-Pro A & N, Textured Edi-Pro (spun soy protein fibers), and Purina Assay Protein RP-100 (used for laboratory research on many experimental animals). Address: Ralston Purina.

279. *Soybean Digest.* 1969. Chen, Sera to posts in Far East for ASA [American Soybean Assoc.]. Nov. p. 58.
• ***Summary:*** "Dr. Steve Chen will be ASA country director for Taiwan in a new office to be opened soon in Taipei. Karl Sera will be feed and meal specialist in ASA's office in Tokyo, Japan, working with Scott Sawyers, Far East director. Dr. Chen has most recently been doing research on carbohydrate of soybeans and development of high-protein food items for Ralston Purina International at St. Louis. Previously, as director of marketing for Ralston Purina Eastern at Hong Kong, he was engaged in promotion of Purina mixed feeds, animal health products, and consumer products...

"Dr. Chen holds a B.S. degree at National Taiwan University and M.S. and Ph.D. degrees at West Virginia University... Mr. Sera attended St. Joseph's College at



Yokohama, Japan; and received his B.S. in dairy science at Iowa State University... Both Dr. Chen and Mr. Sera will be working with Scott Sawyers, ASA Far East director. Both men are married and have families." A photo shows Chen (left) and Sera.

280. *Soybean Digest.* 1969. The soy foods companies. Nov. p. 40, 42-44.
• ***Summary:*** A summary of the U.S. companies making soy protein foods and their products. Included are Central Soya, Archer Daniels Midland Co., Swift Chemical Co., General Mills, Ralston Purina, A.E. Staley, Loma Linda Foods, Worthington Foods, Fearn Soya Foods, and El Molino Mills.

281. *Soybean Digest.* 1969. The soy foods companies: Worthington Foods (Document part). Nov. p. 44.
• ***Summary:*** "Worthington Foods at Worthington, Ohio, is a foremost producer of some 55 vegetable protein foods, including vegetarian entrees, meatless meats, and milks. Many simulate meat, fish, fowl, or nuts. They have been on the scene only since 1962.

"Worthington's vegetable protein foods are marketed frozen, dehydrated, or canned, or as an ingredient in other foods. Since 1966, Worthington Foods has manufactured its own spun protein, which it formerly purchased from Ralston Purina Co., for its meatless meats."

282. Dean, R. Hal. 1969. Foods for babies, pregnant mothers, all ages: Ralston Purina's position in soy proteins. *Soybean Digest.* Dec. p. 17.
• ***Summary:*** "Ralston Purina was founded 75 years ago in St. Louis, Missouri, as an animal feed company. The company today is the world's largest producer of formulated livestock and poultry feeds with plants in over 40 states and 30 foreign countries."

Ralston has recently "developed an isolated edible soy protein product for human consumption with excellent nutritional and formulatory properties... Our company is in the process of submitting a proposal for a 1-year clinical observation test feeding program for the Phoenix [Arizona] area. The product to be used during the test period is a recently developed highly nutritious food beverage supplement." Address: Chairman of the Board, Ralston Purina Co.

283. National Soybean Processors Assoc. 1969. Year book & trading rules–1968-1969. Washington, DC: National Soybean Processors Association. 64 p. 23 cm. Spiral bound.
• ***Summary:*** Contents: Constitution and by-laws (As amended Aug. 6, 1968). Officers and directors. Names of members. List of standing committees. Trading rules on soybean meal. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}, sampling of soybean meal {automatic sampler, probe sampler}). Trading rules on soybean oil. Definitions of grade and quality of export oils. Tentative soybean lecithin specifications. Appendix to trading rules on soybean oil: Uniform sales contract, grading soybean oil for color (N.S.P.A. tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed). Foreign trade definitions (for information purposes only). Address: 1225 Connecticut Ave., N.W., Suite 314, Washington, DC 20036. Phone: 202/659-4610.

284. Atkinson, William T. Assignor to Archer Daniels Midland Company (Minneapolis, Minnesota; a corporation of Delaware). 1970. Meat-like protein food product. *U.S. Patent* 3,488,770. Jan. 6. 6 p. Application filed 7 March 1969. 1 drawing. [8 ref]
• ***Summary:*** This is ADM's basic U.S. TVP patent based on extrusion cooking of defatted soybean flakes. "Abstract of the disclosure: A hydratable food product is obtained by forming a protein mix of a proteinaceous material having protein content of at least 30 percent, and preferably a solvent-extracted oil seed protein material, with 20-60 percent of water based on the weight of the protein mix, masticating this mix at temperatures substantially above the boiling point of water, and thereafter extruding this mix at elevated pressures and temperatures through an orifice into a medium of lower pressure and temperature.

This application is a continuation-in-part of application Ser. No. 587,939, filed Aug. 17, 1966, which in turn is a continuation-in-part of application Ser. No. 369,189, filed May 21, 1964, now abandoned. The present invention relates to the production of meat-like food products from vegetable, fish, and similar protein sources. More particularly, the present invention relates to the production of protein structures having a texture and appearance very similar to muscle protein found in common meat products like steaks, fowl, chops, hams, and the like."

In Example 1 the following components, listed in the order that they are added, were mixed in a ribbon blender at 120ºF for about 20 minutes: 11,350 gm of extracted soybean flakes containing 50% soy protein and 6.5% moisture; 45 ml of 50% hydrogen peroxide for purposes of flavor and odor control dilutes in 380 ml water; 1,700 gm imitation beef seasoning; 3,785 ml of water, 90 gm of 97% pure sodium hydroxide; and 340 gm of calcium chloride dissolved in 500 ml of water. The resulting mixture was extruded.

In "Meat Analogs," Horan (1974, p. 375) notes that the product described in this patent has probably had "the greatest impact in bringing the low-cost, textured vegetable products into commercialization: defatted soy flake or flour (50% protein) is put through a continuous process in an extruder to give an expanded and molecularly oriented material having textural properties described as plexilamellar. The product contains an open cell structure in which the majority of the cells have dimensions of greater length than average width and are aligned in the direction of flow of the plastic mass through the extruder. These types are commonly referred to as thermoplastic-extruded products."

Brian (1976) reports that "Approximately 60% of the soy flour and grit texturizing capacity in the U.S. is licensed under this Atkinson patent." The process yields a plexilamellar fibril and is best know in ADM's product trademarked TVP. The product resulting from Atkinson's patent was given a large new market in 1971 when it was accepted into the school lunch program in the USA.

Note 1. The Atkinson patent dominated the industry from 1970 to 1976, and during that time ADM very effectively marketed and promoted TVP. However in Feb. 1976 a very similar U.S. patent (No. 3,940,495) was issued to Ronald J. Flier and assigned to Ralston Purina. A lawsuit and trial concluded that the Flier patent now dominated the Atkinson patent because it could be traced back to a July 1964 patent application. Thereafter most large manufacturers of textured soy flour took licenses on the Flier patent–even ADM!

Note 2. Interview with Don Aldon, former soy researcher at Swift & Co. 1985. Feb. 26. In about 1963-64 Dean Wilding of Swift invented a product named Texgran; it was a textured soy flour, somewhat like today's TVP. Wilding invented a texturization process while trying to find a way to extrusion cook soy flour. He visited Wenger and saw a variety of products they made. He recognized their value and bought a machine. Aldon worked for about 18 months developing the process, doing research, and generating information to be used in the patent. Swift started selling the product before they applied for the patent. "As soon as our competitors saw this product, they recognized its value because they had been extruding dog food. Ralston Purina slammed things together and got a patent application in first. Two weeks later ADM had one in. Then 3-4 weeks later Swift applied." Swift started selling Texgran in 1964-65. The patent was finally issued in about 1971-72. Litigation went on for years and years between the three companies. Finally Ralston got the basic patent since they had applied first. ADM and Swift got a royalty-free license. They did that just to settle the litigation. Address: Minneapolis, Minnesota.

285. *Soybean Digest.* 1970. Help for a hungry world: UN meeting at Peoria. Jan. p. 18-19.

• ***Summary:*** "Help for hungry people of the world-based on the profit motive–was asked by a man in a United Nations organization and promised by men in the U.S. soy food industry at a meeting in Peoria, Illinois, the week before Thanksgiving.

"Recommendations from the Expert Working-Group Meeting on Soy Protein Foods will go before the United Nations Industrial Development Organization, Vienna, Austria. If adopted, they will be incorporated into UNIDO's official report and proposed to U.S. companies. Action of some kind appears likely.

"Action against hunger was the tone established in the opening address Nov. 17 by Dr. M. Mautner, chief of UNIDO's light industries section, on behalf of Abdel-Rahman, UNIDO executive director, and maintained the rest of the week. With the knowledge and authority of a corporation chairman of the board and with the human concern of one of the family, Dr. Mautner held the meeting to a central theme:

"Industry in countries like the U.S. and Japan can make a profit and help hungry people feed themselves by setting up food processing companies in developing countries and hiring native labor.

"Action was in a statement, with working committees to implement it, proposed Nov. 21 for recommendation to UNIDO. Prepared by Wayne Gottshall of Ralston Purina International, St. Louis [Missouri]; Dr. Dale W. Johnson of Crest Products Inc., Park Ridge, Illinois; and Dr. Jaan I. Tear of Alfa-Laval AB, Tumba, Sweden, the statement read:

"'The food-processing and food-equipment-manufacturing industries present would like to express their willingness to cooperate with UNIDO and other UN agencies in seeking realistic ways of meeting the nutritional requirements in the developing countries.'

"Examples in India and Uganda of the kind of action asked and promised were described by Charles Purrett, vice president of international operations for Worthington Foods Inc., Worthington, Ohio. This company has a 30-year, profit-making history of manufacturing food from soy and wheat proteins.

"Companies in Uganda, India: It has an interest in Africa Basic Foods, which makes high protein food from soybeans near Kampala, Uganda. Mr. Purrett said it 'has contributed a substantial amount of money in addition to technical people, who are in Africa at the moment on Worthington's payroll.'

"Between 1965, when the Uganda plant was built, and 1968, soybean production increased 12 to 15 times, increasing income from farm and factory jobs. About 120 tons of soybeans went into human food in 1968. Worthington helped develop Vegetable Industries & Products in India. L. Nagaich, managing director, said, 'Worthington has a humanitarian interest with commercial success as a prime force.'

"'Action-oriented' UNIDO, according to Frank K. Lawler, editor of *Food Engineering*, wants industries 'to stand on their own merits in self-sustaining, profit-making enterprises while benefiting the developing countries nutritionally and economically.' He visited UNIDO in Vienna, traveled with Dr. Mautner in the U.S., then joined the working group in Peoria.

"More than 40 soy protein-food scientists, industrialists and equipment manufacturers from 15 countries met 4 days at the U.S. Department of Agriculture's Northern Utilization Research Laboratory of the Agricultural Research Service and a day at the University of Illinois, Urbana.

"Current efforts are not enough: Dr. Mautner said the most challenging problem of mankind today is to produce enough food at a cost the hungry can pay; but current efforts are not enough. Production is not keeping pace with demand. Protein has not received the expected interest in developing countries. Some foods are not satisfactory because they are incomplete nutritionally, cost too much or do not taste or look right.

"Dr. Mautner considers unsatisfactory any program that depends on subsidy by a donor country. He asked for transfer of know-how to developing countries and repeated the request in various ways throughout the meeting.

"Dr. Robert J. Dimler, director of the Northern Laboratory, reviewed history of U.S. soy development, especially the use of protein in food. G.C. Mustakas reviewed Northern Laboratory research on soy flours and their use in human nutrition.

"Dr. K.A. Harkness, Ohio State University agricultural engineer, sees soy products and other non-animal food as the only way man can cope with overpopulation and pollution in the future.

"Other scheduled speakers at the Northern Laboratory included: Mogens Jul, secretary of the United Nations Protein Advisory Group; Dr. Tokuji Watanabe, Japanese Ministry of Agriculture and Forestry; Dr. Edwin W. Meyer, Central Soya, Chicago; and L.C. Adolphson, Archer Daniels Midland, Decatur, Ill. Scheduled speakers at the University of Illinois included: Dr. G.K. Brinegar, Dr. D.E. Alexander, Dr. R.L. Cooper, Dr. E.R. Leng, and Dr. John Hetrick.

"Experiences in making acceptable, nutritious food with soy products were reported at Peoria by Dr. Shiro Miyasaka, Brazil; Dr. Isaac A. Akinrele, Nigeria; Amara Bhumiratana, Thailand; and Armando Civetta, Colombia. Dr. Mautner closed the meeting with a call for demonstration plants in Nigeria, Thailand and Latin America.

Photos show: (1) Dr. Robert J. Dimler, Director of the USDA Northern Utilization Research Laboratory, welcomes Dr. M. Mautner of the United Nations Industrial Development Organization and the Expert Working Group. (2) Dr. Dale W. Johnson of Crest Products answers a

question at meeting.

286. Jenkins, Sherman L. Assignor to Ralston Purina Company (St. Louis, Missouri). 1970. Method for preparing a protein product. *U.S. Patent* 3,496,858. Feb. 24. 7 p. Application filed 9 Dec. 1966. 4 drawings. [4 ref]
• ***Summary:*** This product is textured soy flour. "A method of preparing an expanded protein food product somewhat resembling meat directly from soybean meal itself, which utilizes soybean meal that has substantially all the fat or oil removed. A predetermined proportion of sulfur or sulfur compounds is added to the soybean meal and this mixture is then aqueously moistened. The moistened soybean meal mixture is agitated, heated and pressurized in an extruder chamber to cause conversion of the meal to a flowable substance which is forced through restricted orifice means into a zone of lower temperature and pressure, normally atmospheric to obtain an expanded food product stable in water.

"In recent years, Ronald J. Flier, a co-worker of the inventor herein, conceived and developed a unique method of producing a novel meat simulating food product from relatively inexpensive protein-containing vegetable materials. This concept is set forth in copending patent application Ser. No. 381,853, entitled Protein Product, filed July 10, 1964, now abandoned, and its continuation-in-part application entitled Protein Product and Method and Apparatus for Forming Same, filed Dec. 9, 1966, Ser. No. 600,471. this present invention is an improvement over the basic invention set forth therein." Address: Ava, Missouri.

287. *Soybean Digest.* 1970. The competing proteins: Soybeans can hold their own. March. p. 32-33.
• ***Summary:*** Discusses proteins that compete with soybean meal: urea, high-lysine corn, petroprotein, cottonseed protein, and fish protein concentrate.

The discussion is by Roy E. Martin, general manager, vegetable protein products, Swift Chemical Co. (Chicago, Illinois) and Edward J. Cordes, general manager, soybean division, Ralston Purina Co. (St. Louis, Missouri). A small portrait photo shows each of these two men.

288. *Ralston Purina Magazine* (*St. Louis, Missouri*). 1970. Thanks to Mr. Ford. May/June. p. 26-29.
• ***Summary:*** Henry Ford had an eye for promising young men. And two of Ralston Purina's key research men, Frank Calvert (R&D director for new venture management) and Bob Boyer (senior scientist, central research) received a truly unique education." In 1930 the new Chemical Laboratory opened in Greenfield Village; Calvert and Boyer were among the 15 boys from the Ford Trade School, Henry Ford's technical school in Massachusetts, who were chosen to work there. Boyer, age 21, who had attended the Ford Trade School [at the Rouge Plant in Dearborn, Michigan] from 1927 to 1930, was put in charge of the project. After deciding to focus on soybeans in 1931, they developed a process for extracting soybean oil. Every morning at 8:00 sharp, Henry Ford used to appear at Boyer's office to see how his pet project was going.

"In 1938 Frank Calvert joined The Drackett Company in Cincinnati [Ohio], and he was followed in a few years by Boyer. 'At Ford we were trying to make synthetic wool out of [soy] protein but the war cut these efforts short,' says Boyer.

The work on 'soybean fabric' continued at The Drackett Company during the early 1940s. 'We tested the wool fabric for salt content and other factors and one day–I'll never forget it–it occurred to me that if we could make something for the outside of man, why not for the inside.' That's how it came about that in 1949 Bob Boyer filed the patent for edible soy protein fiber.

"He obtained the use of a textile pilot plant and hand made samples of 'synthetic meats.' Later that year, armed with a soy protein 'ham loaf' he contacted Worthington Foods, a firm making meat substitutes for people who shun meat for religious, health or other reasons "If they hadn't shown interest I probably would have dropped it because I had no income at the time.'

"Swift was the first company to take out a license on the patent and Worthington followed not far behind. Soon several companies were licensed to use the patent and Boyer was kept busy with consulting work...

"In 1957 The Drackett soybean operation was sold to Archer Daniels Midland, and Calvert became technical of their protein operations. The paths of Boyer and Calvert crossed again in 1962 when they both joined soybean research activities at Ralston Purina. Boyer had worked as a consultant to Purina when the company began investigating industrial and edible uses of soybean. When he joined the company he assigned his patent ownership to Purina."

"'Back in the 1930s many people thought our work was crazy,' recalls Boyer. 'But Mr. Ford was shrewd enough to know' better. 'The best thing he did was to help popularize the soybean.'"

Photos show: Calvert and Boyer, together and separately. The automotive products made at Ford's lab being displayed in New York in 1931; Calvert and Boyer are present. Boyer and Ford conversing. Ford and Boyer standing behind the famous white "plastic" car.

289. Ashton, Maureen R.; Burke, Carole S.; Holmes, A.W. 1970. Textured vegetable proteins. *British Food Manufacturing Industries Research Association, Scientific and Technical Surveys* No. 62. 36 p. Aug. [92 ref]
• ***Summary:*** Contents: Introduction. Protein sources. Extraction. Spinning. Extrusion. Gelation. Other methods for generating texture. Commercial aspects. Nutritional aspects. Legal aspects. References. Appendix. The appendix

contains an extensive list of patents (mostly British and U.S.) on textured vegetable proteins grouped by the company assigned to or inventor. For each patent, the inventors, country, patent number and year are given, with a brief description of the subject. No patent titles are given in either the appendix or bibliography. The companies/inventors are Archer Daniels Midland Co. (2 patents), R.A. Boyer (3), F.P. Research Ltd (1), General Foods Corp. (7), General Mills Inc. (23), C. Giddey (1), J.H. Kellogg (2), Lever Bros. and/or Unilever (20), G.K. Okumura and J.E. Wilkinson (1), Ralston Purina (4), Swift & Co. (4, including 2 listed for R.A. Boyer), Dr. A. Wander A.-G. (2 Swiss), Worthington Foods Inc. (2), C.L. Wrenshall (1). Address: 1-2. BSc; 3. PhD, FRIC. All: British Food Manufacturing Industries Research Assoc., Randalls Road, Leatherhead, Surrey, England.

290. *Soybean Digest.* 1970. Henry Ford and his plastic car (Photo caption). Aug. p. 45.
• ***Summary:*** This photo (half-page, black-and-white) shows Henry Ford in about 1941 swinging an ax into a car trunk lid made of soybeans, to show the trunk's toughness.

A smaller photo shows Robert Boyer and Henry Ford in the soybean laboratory where Boyer developed spun soy protein fibers. Boyer is now with Ralston Purina Co. Photos courtesy of Ford Archives.

291. Bure, Jean. 1970. La production de viandes végétales [The manufacture of meat alternatives {vegetable meats}]. *Economie Rurale* (*L'*) No. 85. p. 177-81. July/Sept. [Fre]
• ***Summary:*** Some cereal and animal proteins share a common past (e.g., the experience of Beccari in 1728, Liebig's hydrolysates, etc.) However, most of the new synthetic meats appearing in the U.S. are derived, not from cereals, but from the soybean.

Huge milling groups have put on the market these new "vegetable meats." These products were presented in France at the *Salon des Industries de l'Alimentation* (*S.I.A.L.*) in 1966 and 1968.

The making of "vegetable meats" consists in the production of protein fibres from a concentrated extract to which a structure similar to that of meat is given. This is done by spinning out and by shredding.

The makers are well aware that they cannot compete with meat, but they want to create new money-making products completing their ever-expanding range of convenience foods.

Note: Within this article is another article (p. 176-81) titled *Le Fabrication de Viandes Vegetales*, by M. Munier (*Ingénieur ENSIA à l'ARIA*) which has these contents: Historical (Boyer, how to make spun protein fibers). Importance of research enterprises. Production of protein fibers: Extraction of pure proteins [soy protein isolates], formation of the fibers. Research on a structure analogous to that of meat. Other processes for the manufacture of vegetable meats: Shredding (U.S. Patent 3,047,395 of 1962), extrusion–expansion (British Patent 1,049,848), others (aside from Ford, the great captains of industry have likewise obtained patents: Swift, Unilever, General Foods, Nabisco, Worthington Foods, Ralston Purina, General Mills, Pillsbury Mills, etc.). Some new products: Bontrae, TVP, Textrasoy, Texgran, Edi Pro. Organoleptic and nutritional aspects: Organoleptic problems, nutritional problems. In conclusion, by J. Bure. FAO estimates the as follows the annual protein available to human beings: (1) Animal proteins, 30 million metric tons, of which about 10 million come from meat and poultry, about 4 million come from fish and other seafood, and about 2 million come from eggs. (2) Vegetable proteins, 150 million tons. of which about 110 million come from cereals, about 20 million come from oilseed cakes (including soya), and nearly 10 million come from legumes.

Therefore, there is 5 times as much vegetable protein available as animal protein. But animal protein is of higher quality. Address: Directeur du Département des industries céréales de l'Ecole nationale supérieure des industries agricoles et alimentaires.

292. Wilding, M.D. 1970. Oilseed proteins. Present utilization patterns. *J. of the American Oil Chemists' Society* 47(10):398-401. Oct. [10 ref]
• ***Summary:*** A review of the uses of soy protein. Soybean is the most economical source of protein in terms of yield/acre. Flavor problems have been solved. Textured soy protein is reported. Figure 1 shows the relative efficiencies of protein conversion from some major protein sources. "The time has now come as predicted by Harry W. Miller in 1943, that our chief interest in the soybean is in its value as a human food."

The first significant development in texturizing proteins was made by Robert Boyer in 1947; he developed an edible soy protein fiber using a process similar to that for making textile fibers. This process is described. Today such fibers are being produced commercially by General Mills, Worthington Foods, and Ralston Purina, and used in some very sophisticated "engineered meat-like items." General Mills recently announced its intention to construct a multimillion dollar plant to make these "fabricated engineered foods."

Figure 1 shows the number of days of protein requirement (by a moderately active man) produced by one acre, yielding selected food product. Legumes make very efficient use of the land, grains make fairly efficient use, and livestock make very inefficient use. Soybeans make the most efficient use of the land to produce protein; they will sustain a man for 2,224 days. Beef cattle make the least efficient use; they will sustain a man for only 77 days.

Tables show: (1) The estimated production and prices of soy proteins. Soy flour and grits (120-126 million lb, 7-8 cents/pound). Soy concentrates (19-33 million lb, 18-26 cents/pound). Soy isolates (24-38 million lb, 35-45 cents/

pound). (2) Amount of soy flour (million lb) used in various applications (both extrapolated from Eley 1968). (3) Physical properties and functional advantages of textured soy protein.

Large amounts of soy protein are also now being used to make fluid beverages. In Brazil, the Coca-Cola Co. has launched Saci, a chocolate flavored soy beverage. In British Guiana, Monsanto is making Puma. In Hong Kong Vitasoy is a commercial success. Address: Research & Development Center, Swift & Co., Oak Brook, Illinois.

293. *Food Processing* (*Chicago*). 1970. Protein adds nutritional 'punch' to snacks. Autumn. p. F6-F7. Foods of Tomorrow section.
• ***Summary:*** The section titled "Soy protein" notes: TVP Smoky Chiplet is a high-protein snack made by Archer Daniels Midland Co. (Decatur, Illinois). Soy specialties as ingredients for high protein snack foods are available from Cargill Inc. (Minneapolis, Minnesota). For soy protein isolate ingredients contact Ralston Purina Co. (St. Louis, Missouri). For soy flour information contact A.E. Staley Mfg. Co. (Decatur, Illinois). Three brochures about soy protein, soybean oil, and soybean processing are available from the National Soybean Processors Assoc. (1225 Connecticut Ave., N.W., Washington, DC). "Soy protein concentrate for snack formulation is available from Swift Chemical Co." (Oak Brook, Illinois).

294. Horan, F.E.; Odell, A.D.; Forman, M.J. 1971. Textured vegetable proteins. *PAG Bulletin* (*Protein Advisory Group, WHO / FAO / UNICEF*) 2(1):22-26. Winter. No. 13.
• ***Summary:*** This paper was compiled from background documents presented by the authors at the 18th PAG [Protein Advisory Group] meeting held on 9-12 Feb. 1971 at Rome, Italy. Contents: Introduction. Spun monofilament products. Extrusion-expansion products (currently marketed at about $0.45/lb). General considerations. Case studies: Thailand (ADM's TVP), Brazil (Swift & Co.'s textured meat analogs), India (Swift & Co., ditto). Textured vegetable protein products: Fibroprotein–Spun Protein Fibers (Worthington Foods Div., Ohio), Textured Edi-Pro (Ralston Purina Co., Missouri), Texgran (Swift & Co., Illinois), Bontrae (General Mills, Minnesota; spun vegetable protein products), Carne Vegetal (Industria e Comercio de Productos Alimenticios Vegetal Ltd., Brazil). LiveLong–VP (Nisshin Flour Milling Co. Ltd., Japan; a wheat gluten extract in the form of a dried or frozen mincemeat-like product. "It seems to be made by a filament extrusion process using isolated wheat gluten protein"). The Farmarco Co. (Far-Mar Co., Kansas), The Fuji Oil Co. (Japan; thermoplastic extrusion), and Shefa Protein Foods Ltd. (Israel) each manufactures texturized soy food products by thermoplastic extrusion.

Introduction: "The chief virtue of the individual members of this new class of foods rests in their ability to supply precisely reproducible balanced dietary inputs of essential amino acids with greatly enhanced agronomic efficiency and with high consumer acceptance... At the moment two broad classes of meat analogues are apparent. The extrusion–expansion products sell for US 10-15¢ per pound; the spun monofilament products sell at present in the USA for 20-25% less than meats, but are still too expensive to be of interest for developing countries."

"General considerations: Meat analogs do not appear to have a negative connotation to vegetarians; there are many examples of eager acceptance of meat analogs by such groups. The textured protein approach is also a stride forward in food efficiency, since conversion of soy to animal protein averages about 7% efficiency."

"Over the past few years US/AID has entered into contracts with twelve different U.S. commercial companies to investigate and evaluate low-cost proprietary protein products in some ten developing countries."

Note: This is the earliest English-language document seen (Dec. 2004) that uses the word "Fibroprotein" to refer to edible spun soy protein fiber. Address: 1. ADM, Decatur, Illinois; 2. General Mills, Minneapolis, Minnesota.

295. **Product Name:** Potato Crispers (Protein Supplemented Potato Chips).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1971 March.
Ingredients: Incl. dehydrated potatoes, hydrogenated vegetable oil, isolated soy protein, modified food starch, salt, glyceryl monostearate.
Wt/Vol., Packaging, Price: 4.5 oz box. Retails for $0.39 (1971).
How Stored: Shelf stable.
New Product–Documentation: Spot in Food Product Development. 1971. Feb/March. "Entering markets." Two photos show the front and back of the box.

296. Meyer, Gerald. 1971. The company at Checkerboard Square: Ralston reaches far from its St. Louis center. *New York Times.* Aug. 29. p. F3.
• ***Summary:*** A good overview of Ralston Purina today, and a look back at its wise and charismatic founder, William H. Danforth.

The company began in 1894 as the Robinson-Danforth Commission Company, a St. Louis partnership that produced mixed feed for horses and mules. In 1896, after a tornado wrecked the mill, Danforth was able to get a loan on the strength of his character. But this time he started alone. "Two years later he began producing a wheat breakfast food that won the endorsement of a health club president named Dr. Ralston.

"The cereal, and in 1902 the company, were given the willing doctors name."

Photos show: (1) R. Hal Dean. (2) The checkerboard

square logo. (3) William H. Danforth.

297. Laine, Iris Coyn. 1971. Soy goes to school. *School Lunch Journal* 35(7):41-43. July/Aug.
• ***Summary:*** "On February 22, 1971, USDA authorized the use of textured vegetable protein, fortified with vitamins and minerals, to meet part of the minimum requirement of two ounces of cooked meat for the Type A school lunch." Discusses: What this means: Main dishes, sandwiches. What are textured vegetable proteins? Look and taste. Nutritional content. What products are available? Want more information? Contact the Food Protein Council. The nine regular members of the Council are listed: ADM, Cargill, Central Soya Co, Far-Mar-Co, Griffith Laboratories, Miles Laboratories, Ralston Purina Co., A.E. Staley Manufacturing Co., and Swift Chemical Co.

"For schools that prepare their own foods, there are several recipes in USDA's 'Quantity Recipes for Type A School Lunches', that are ideal for including textured vegetable protein products." The names of ten main dishes (with the USDA Card No. for each) and 2 sandwiches are given. A photo shows three school lunch dishes which include textured vegetable proteins: Hamburger, sloppy joe, and spaghetti sauce. Address: Foodservice Relations Director, Food Protein Council.

298. Belshaw, Fran. 1971. Protein isolate is stable at pH 2.0. *Food Processing* (*Chicago*). Nov. p. 18-19.
• ***Summary:*** The title refers to Supro 350® soy protein isolate. "Foods containing fruit acids, lactic acid, and vinegar can now be fortified with an extremely stable, versatile protein that functions much like casein or egg solids-products that are extremely difficult to use in foods below pH 4.0. The powder, isolated from soy has been successfully formulated into fruit flavored puddings (lime, lemon, pineapple, raspberry, and strawberry) and other food products with suitable food acids." Address: Associate editor.

299. *Soybean Digest.* 1971. What's ahead for soy protein? Nov. p. 11-13.
• ***Summary:*** Discusses the work of the Food Protein Council, established this year as an autonomous organization within the National Soybean Processors Association. "The goal of the new FPC is to centralize promotion of edible vegetable protein for use in human food." The focus in 1972 will be on the school foodservice market, plus the institutional and commercial restaurant market. "The Food Protein Council, like its parent association, the National Soybean Processors Assn., is managed by Smith, Bucklin & Associates Inc... Member companies of the Council are: Archer Daniels Midland Co.; Cargill Inc.; Central Soya Co. Inc.; Far-Mar-Co, Inc.; Griffith Laboratories; Miles Laboratories Inc.; Ralston Purina Co.; A.E. Staley Manufacturing Co.; and Swift Chemical Co."

300. *Soybean Digest.* 1971. A protein division for Ralston Purina. Nov. p. 30.
• ***Summary:*** "A newly formed protein division of Ralston Purina Co. has assumed complete operating stature and will report to W.L. Golden, corporate vice present, the company reports. P.H. Hatfield has been named division vice president. Products currently available from the division include the Supro and Edi-Pro lines of refined and modified soy isolates for the food industry. Expansion of volume will focus on values of soy proteins to the development and fortification of food products."

301. *Wall Street Journal.* 1972. Archer-Daniels-Midland president Andreas reportedly will quit: Executive expected to retain big equity and remain a director; Donald Walker seen successor. Jan. 18. p. 26.
• ***Summary:*** Lowell W. Andreas, age 49, will step down as president of ADM within a few weeks; he was not available for comment.

Donald B. Walker, who presently heads the firm's soybean processing operations, was once an executive in the soybean operations of Ralston Purina Co.

In 1965 the Andreas brothers, Lowell and Dwayne, obtained a controlling interest in ADM at a time when profits were drooping. Since then profits have more than quadrupled. "In fiscal 1971 ended June 30, net income was $12.2 million, or $3.83 a share, and sales were $659.8 million.

"The Andreas brothers, after taking control, sold off some unprofitable divisions and trimmed overhead costs dramatically." They also moved the company headquarters to Decatur, Illinois, from Minneapolis, Minnesota.

302. Arndt, Robert H. Assignor to Ralston Purina Company (St. Louis, Missouri). 1972. Method of preparing a simulated skim milk. *U.S. Patent* 3,642,492. Feb. 15. 6 p. Application filed 1 June 1967. [5 ref]
• ***Summary:*** "A method of preparing a commercially acceptable, nutritious substitute for dry skim milk as a food additive, comprising the basic steps of pretreating sweet dairy whey, separately pretreating isolated vegetable protein, particularly soy protein, by a dynamic physico-thermo-vapor flash treatment to remove objectionable flavors and odors, blending these pretreated ingredients in a certain controlled ratio, and adjusting the hydrogen ion content to a specific controlled range. The product is preferably flash dried to a powder." Address: St. Louis, Missouri.

303. Arndt, Robert H. Assignor to Ralston Purina Company (St. Louis, Missouri). 1972. Method of preparing a simulated milk product. *U.S. Patent* 3,642,493. Feb. 15. 7 p. Application filed 1 June 1967. [5 ref]
• ***Summary:*** "A method of preparing a simulated whole

milk beverage product by physico-thermo-vapor flash pretreating isolated vegetable protein, preferably isolated soy protein, and combining it with sweet dairy whey and special vegetable oil or fat formed by hydrogenating oil in a special procedure, and in controlled proportions, involving mixing of the isolated protein and vegetable oil together while reliquifying or suspending them in water, reliquifying the whey separately, if in dry form, blending the materials, adjusting the pH to a certain range, and homogenizing the materials in a special multiple stage manner." Address: St. Louis, Missouri.

304. *Wall Street Journal.* 1972. Ralston, Archer, Swift accord. April 6.
• ***Summary:*** The three companies announced jointly settlement of litigation concerning a vegetable protein product, in federal district court at Peoria, Illinois. Ralston and Swift agreed to pay Archer a royalty for a nonexclusive license to make, use, and sell textured protein products made under a patent held by Archer.

Note: This short article (2 column inches) is in the lower right corner of an unknown page. It may appear only in the Midwest edition.

305. *Journal Star* (*Peoria, Illinois*). 1972. Agreement reached on soybean patent. April 9.
• ***Summary:*** Discusses the settlement of litigation entered into by ADM, Ralston Purina Co. and Swift & Co. involving a high-protein meat-like product made from soybeans. Swift claims that "Morris D. Wilding filed for the patent March 1, 1965. ADM says William T. Atkinson applied for the patent Aug. 7, 1966, and Ralston claims Ronald J. Flier filed for it Sept. 9, 1966.

"On Aug. 13, 1971, the U.S. Patent Office Board of Patent Interferences wrongly rule that Flier was the inventor, says ADM's suit. Ralston contests ADM's claim."

306. *Journal Star* (*Peoria, Illinois*). 1972. Soybean dispute settled. April 11.
• ***Summary:*** On 18 Aug. 1971 ADM filed against Ralston Purina Co. (St. Louis, Missouri) and Swift and Co. (Chicago, Illinois). They filed countersuits. Each of the companies claimed the patent for making simulated meat from vegetable sources (mainly soybeans; for human consumption and pet foods) had been assigned to them by inventors. ADM granted to Ralston and Swift a nonexclusive license to make and sell products under a process patented by William T. Atkinson. They will pay ADM a $30,000 royalty.

Ralston Purina granted to ADM a license to make and sell the product under a patent of Ronald J. Flier; ADM will pay a royalty of up to $30,000. Swift granted to ADM and Ralston a royalty-free license.

307. Hoer, Ralph A. Assignor to Ralston Purina Company (St. Louis, Missouri). 1972. Protein fiber forming. *U.S. Patent* 3,662,672. May 16. 5 p. Application filed 19 May 1969. [3 ref]
• ***Summary:*** "A process of continuously forming tender textured protein structures is disclosed. The structures are formed from an aqueous slurry of a proteinaceous material having a solids content of up to about 35% by weight. The proteinaceous solids should be of a fairly high purity. The proteinaceous slurry is formed into textured filaments or fibers by continuously heating the slurry under pressure and cooling the slurry. The texture of the protein structures can be readily controlled by the process conditions, starting material, or reagents used in the process." Address: Ballwin, MO.

308. *Food Product Development.* 1972. Meat pattie chosen first product to gain nutritional, textural advantages of new protein fiber. 6(3):18. May.
• ***Summary:*** Textured Edi-Pro 200, a soy protein fiber made by Ralston Purina Co., contains all the vitamins and minerals necessary to meet the requirements of the school lunch program as described in FNS Notice 219. (Note: FNS is USDA's Food & Nutrition Service). Larry's Food Products of Gardena, California, is the first processor to incorporate this fiber into a line of pre-cooked meat products. Larry's produces more than 250,000 hamburger patties daily.

309. *Food Technology.* 1972. Fibrous soy protein goes commercial June 1. 26(5):25, 28. May.
• ***Summary:*** "Ralston Purina Company's new fibrous form of textured soy protein (Textured Edi-Pro 200) will go into full commercial production on June 1, 1972."

310. McCormick, Richard D. 1972. Nutrition upgraded, final texture controlled using new structured protein fiber. *Food Product Development* 6(3):23, 26. May.
• ***Summary:*** Textured Edi-Pro 200 is a soy protein fiber made by Ralston Purina Co.

Note: This is the earliest English-language document seen (Oct. 2015) with the word "structured" in the title, referring to type of soy protein product, and particularly to soy protein fiber. Address: Editorial Director.

311. Mustakas, G.C. 1972. Re: Memorandum–Extrusion cooking research as related to textured protein patents. Visit of Mr. Endre Sipos of Central Soya Co. Letter/Memorandum to E.D. (Engineering & Development Lab.) files, June 27. 1 p. Typed, without signature (carbon copy).
• ***Summary:*** Endre Sipos is assistant director of research at Central Soya Co., 1825 North Laramie Ave., Chicago, Illinois. He visited and spent about 2 hours "seeking background information on the relevancy of our early extrusion-cooking studies with the textured soy protein patent applications. ADM has been issued a product patent,

and in the near future a Ralston-Purina employee will be issued a process patent; the latter will be assigned to ADM who will control the patent rights. In a recent court settlement, Ralston-Purina and Swift will get use of the patents on a royalty-free basis.

"Central Soya does not feel that the patent claims are justifiable based on prior art both at NMN [probably Northern Marketing and Nutrition Division, later called Northern Regional Research Center, Peoria, Illinois] and in their own research laboratories. Their patent attorneys are now studying the case and feel that their company could make a good case in any infringement suit.

"Mr. Sipos questioned me extensively about our early extruder work, our patent, and our affiliations with UNICEF, AID, and the Wenger Company.

"In discussing current research, Mr. Sipos emphasized their continuing interest in protein isolates and concentrates commenting that this market will continue to grow. A large obstacle involves the whey disposal problem and it must be solved. He thought this was an area in which the regional laboratories should be getting into. Central Soya currently has a government grant to work on the problem. He feels that ultrafiltration (UF) and reverse osmosis have promise but there are some engineering problems remaining to be solved. They are assigning 40 cents per pound to the value of the protein recovered by UF. I mentioned that we had a definite interest in soy whey disposal for future work pending availability of funds and personnel.

"When I asked about protein yields in the commercial isolate process, he said they are around 30 to 35 percent depending on how much washing they give the curd. This agrees somewhat with Dale Johnston's (Crest Products) published figures of 25 to 50 percent. Such low yields are a deterrent to the development of low-cost foods from isolates."

Note: This is the earliest document seen (March 2002) that uses the term "reverse osmosis" in connection with soy. Address: Principal Chemical Engineer, Engineering & Development Lab., Northern Regional Research Lab., Peoria, Illinois.

312. *Soybean Digest.* 1972. Ralston Purina expands. Oct. p. 28.
• ***Summary:*** "Ralston Purina Co., St. Louis, Missouri, has begun a major expansion of its industrial soy protein plant at Louisville, Kentucky, according to division vice president P.H. Hatfield. With this expansion, plus the completion of the company's protein plant under construction at Memphis, Tennessee, Purina will have doubled its total industrial protein output in slightly more than 1 year. The Louisville plant's protein is designed for use in paper, paperboard coatings, and other industrial applications."

313. *Food Processing* (*Chicago*). 1972. Plants, companies, personalities [Ralston Purina Co.]. 33(11):6. Nov.
• ***Summary:*** Ralston Purina Co. has started a major expansion of its industrial soy protein plant in Louisville, Kentucky. The company also has a new protein plant under construction in Memphis, Tennessee. When the two plants are completed, the company will have doubled its total output of industrial soy protein in slightly more than a year.

314. **Product Name:** Poly-Soy (Soy Fiber from Processing Isolated Soy Proteins) [Grits, or Flour].
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164.
Date of Introduction: 1972.
How Stored: Shelf stable.
New Product–Documentation: Leaflet from Protein Div. of Ralston Purina Co. 1972? Undated. "Need a reactive extender? Let Poly-Soy fill your needs." 8 p. The product is available as either grits or flour. The composition: Moisture 10%, protein 25%, fat 1%, fiber 11%, carbohydrate 48%, ash 5%, calcium 1.2%, phosphorus 0.7%.

Note 1. Poly-Soy is the residue fraction after extraction of protein in making soy protein isolates. The word "Poly" is an abbreviation of "polysaccharides."

Note 2. This is the earliest document or commercial soy product seen (June 2013) concerning soy cotyledon fiber / polysaccharides resulting from making soy protein isolates.

Brochure from Ralston Purina Co. 1972? Undated. "Industrial proteins: Poly-Soy–A reactive extender for polymers." Technical bulletin. It begins: "Poly-Soy is Ralston Purina's trade name for a related series of products derived from the soybean and manufactured to be used as a reactive extender in polymer systems."

315. Snider, Nancy. 1972. Soybean (protein) recipe ideas. New York, NY: Arco Publishing Co., Inc. 112 p. Illust. Food category / recipe index. 18 cm.
• ***Summary:*** Contents: Preface. About this book. Who makes what: Archer Daniels Midland Co. (TVP), Central Soya (Promosoy), Far-Mar-Co (Ultra-Soy), General Mills, Inc. (Bac*os, Bontrae), The Griffith Laboratories, Inc., Ralston Purina Co. (Edi-Pro), A.E. Staley Co. (Mira-Tex), Swift & Co. (Texgran), H.B. Taylor Co. (Textrasoy), Worthington Foods, Inc. (Fibrotein). The facts about soy protein. Soy what? Cooking with soy protein. Cover-ups. Things to do with bacon-flavor soy protein. Soy cooking tips. Breakfast ideas. Breakfast put-ons. Appetizers. Soups. Garnishes for soups. Entrees. Soy sandwiches. Breads. Desserts. Food category / recipe index (within each major food category {appetizers, bread, breakfast ideas, desserts, etc.}, recipes are listed alphabetically).

316. **Product Name:** C-Pro (Soy Fiber from Processing Isolated Soy Proteins).

Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164.
Date of Introduction: 1973 January.
How Stored: Shelf stable.
New Product–Documentation: Richard H. Lalumondier asked the NRRC at Peoria, Illinois, for information about the residue fraction from their isolate process which they call "C-Pro." It has the following composition. Protein 25%, water 10%, carbohydrate 50%, ash 5%, and fat 2%. The company is looking for industrial uses.

317. *SoyaScan Notes.* 1973. Ralston Purina has two isolate plants coming on stream in March (Overview). Jan. 18. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** The plant at Memphis, Tennessee, will make edible isolates and the plant at Louisville, Kentucky, will make industrial isolates. The output of whey from the Memphis plant is anticipated to be equivalent of the BOD for sewage from a city of 300,000. This calculates to an isolate output of about 20 million lb/year.

318. Lockmiller, N.R. 1973. Increased utilization of protein in foods. *Cereal Science Today* 18(3):77-81. March. [13 ref]
• ***Summary:*** Details are given on each type of soy protein product and the way each is used. Table 4 gives the price per pound for various soy protein foods, the estimated annual production in 1972, and the current uses. Soy flour and grits, $0.15-$0.17/lb, 352-500 million pounds produced in 1972. Used as ingredients for baked goods, dog foods, sausages.

Soy protein concentrates, $0.21-$0.25/lb, 40-50 million pounds produced. Used in manufacturing textured products. Ingredients in processed meats, baby foods, and health foods.

Soy protein isolates: Regular $0.41-$0.45/lb, modified isolates $0.92-$1.33/lb. Production of both types: 35-40 million pounds. Regular isolates are used in manufacturing analogs such as meatless ham, bacon, hot dogs, etc. Modified isolates are used in whipping agents.

Textured soy protein products: Extruded flours, $0.27/lb and up. Spun isolates $0.50/lb and up. Production of both combined: 35-40 million pounds in 1972. Textured soy protein products are use in bacon bits, bacon strips and similar foods.

Table 6 shows what companies supply which of the following types of edible soy-based ingredients: Soy flour and grits (defatted, low-fat, full-fat), concentrates, isolates, spun fibers, textured soy prod. The companies are ADM (soy flour and grits–defatted, low-fat, and full fat, textured soy prod.), Cargill, Central Soya, Far-Mar-Co, General Mills, Griffith Labs, Gurley, Inc., Lauhoff Grain Co., Miles (Worthington), National Protein, Ralston Purina, A.E. Staley, Swift & Company. Address: A.E. Staley Mfg. Co., Decatur, Illinois.

319. **Product Name:** Supro ™ 50 (Extruded Textured Soy Flour).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, MO 63188.
Date of Introduction: 1973 March.
New Product–Documentation: Soybean Digest Blue Book. 1973. p. 110. *Soybean Digest Bluebook.* 1979. p. 102. Now named simply "Supro 50."

320. Fischer, Norman H. 1973. Beanburgers–More Americans turn to soybean products as meat substitutes: Restaurants, stores find consumers like the taste and especially the price. The future gets a lot closer. *Wall Street Journal.* April 3. p. 1, col. 1.
• ***Summary:*** In the continuing struggle against high meat prices, King's Food Host, a restaurant chain based in Lincoln, Nebraska, has been adding TVP for several months now to its Big King burgers at about 20 of its 140 branches. It sells these "soyburgers" for $0.49, which is 10 cents less than usual. Sales have been very good, with no complaints.

In the past, soybean products have been slipped into a variety of consumer foods, but during the past few months, they have been increasingly advertised as extenders in hamburgers. Consumers seem to welcome the reduction in meat prices.

"The future is now: Over the past several years, such companies as General Mills Inc., Archer-Daniels-Midland Co., Ralston Purina Co., and the Worthington Foods subsidiary of Miles Laboratories Inc., have developed soybean products that have virtually the same appearance, texture and taste as beef, pork, poultry, seafood and even nuts. Some of these all-soy products already are on the market, and more are being added annually.

"U.S. Agriculture Department [USDA] researchers say that by 1980 soy protein could account for as much as 8% of the nation's 'meat' requirements."

This is good news for those who grow and process soybeans. The National Soybean Processors Association says that sales of soy protein products for use in human foods totaled about $75 million last year, a ten-fold jump from five years earlier. And buoyed by the growing use of soy as an extender for ground beef, sales this year are expected to reach $120 to $140 million.

"The biggest move was made in mid-March by Red Owl Stores Inc. in Minneapolis [Minnesota], when it introduced 'Juicy Burger II' in the fresh-meat counters of its 51 supermarkets in the Minneapolis-St. Paul area and its six Duluth stores. 'Juicy Burger II' is 75% ground beef and 25% soy protein, plus a few flavorings. It is selling for about 75 cents a pound, 20 to 25 cents less than all-beef hamburger sells for." Address: Staff reporter.

321. *Business Week.* 1973. Making it cheaper to eat protein. May 12. p. 184, 186.

• ***Summary:*** Skyrocketing food prices are forcing the food industry to develop new textured soy protein products to extend or substitute for meat, suing either of three general methods: Spinning (Miles Laboratories/Worthington Foods), concentrating (Central Soya Co. concentrates), or extruding (ADM, this is now the leading method for making textured vegetable protein).

"Archer Daniels Midland vigilantly protects both its broad product patent and its copyright on the initials TVP (for textured vegetable protein). The company cemented its patent position with a court suit in 1971. Today, five of its eight competitors–Cargill, Miles Laboratories, A.E. Staley, Swift, and Ralston Purina–sell vegetable protein lines under license from ADM.

"Burger mixes: TVP got its first big boost when the Agriculture Dept. [USDA] in 1971 approved its use in the national school lunch program. By the end of 1972, total demand had grown to about 55-million lb. a year, with ground beef as the largest single market.

"Red Owl Stores, Inc., sells such burger mixes across its butcher counters, usually in a mix of 75% meat to 25% vegetable protein. Called Juicy Burger II, or Juicy Blend II, the product sells for $0.75 a lb., compared with $0.99 a lb. for ground beef. Red Owl says that the mixture outsells whole meat by 3 to 1. Kroger Co., the nation's third-largest food chain, last month came out with its own mix of ground beef and textured vegetable protein, called Burger Pro.

"Dr. Virgil O. Wodicka, director of FDA's Bureau of Foods, says: 'Don't tell consumers what it isn't–tell them what it is.'"

322. Cranebrock, Al Van. 1973. Archer-Daniels-Midland getting fat on soybean hamburger diet. *Los Angeles Times.* June 3. p. 3, 6.

• ***Summary:*** Supermarket chains in growing numbers are buying TVP to mix into their meat. "Just in the last week or so, Jewel Cos. Inc., whose food stores dominate the grocery business in the Chicago area, has begun selling TVP by itself in a private-label package and displayed next to beef in the meat departments. The idea is that the TVP can be mixed with the beef in the home to suit a family's taste."

ADM is currently sold out of TVP, is producing around the clock seven days a week, and will have expanded its capacity by 50% next month and an additional 50% by December. ADM has licensed Ralston Purina, Swift, and A.E. Staley Mfg. Co., among others, to produce TVP. It is estimated that TVP now accounts for 25% of ADM's earnings but only a small fraction of that in sales. Address: Exclusive to The Times from Reuters.

323. *Food Processing* (*Chicago*). 1973. 21 outstanding new food plants: For making new and better products, increasing production, lowering costs [Ralston Purina's plant for soy protein isolates]. June. p. 14.

• ***Summary:*** Ralston Purina Co. has built a 50,000 square foot plant to make soy protein isolates in Memphis, Tennessee. Innovations include spray drying in a 92-foot tall tower. It was completed in May.

Ralston has also built a 275,000 square foot pet foods plant in Atlanta, Georgia. Completed in 1972.

324. *St. Louis Post-Dispatch* (*St. Louis, Missouri*). 1973. Donald Danforth Sr. dies; headed Ralston Purina. July 15. p. 3A.

• ***Summary:*** "Donald Danforth Sr., retired chairman of the board of Ralston Purina Co., died Saturday in Barnes Hospital in St. Louis after a short illness. He was 74 years sold.

Mr. Danforth, son of the late William H. Danforth who founded Ralston Purina in 1894, retired from active management of the company in 1963 but remained a member of the board of directors. He was a widely known business and civic leader.

"In addition to his business interests, he was deeply involved in youth development and philanthropic work.

"His association with Ralston Purina spanned more than 50 years, as he directed the growth of a small family-owned feed business into one of the largest corporations of America.

"Born in St. Louis on Nov. 12, 1898, Mr. Danforth was a lifelong resident of the city.

"He attended Clark School on Union Avenue and went to high school at the old Smith Academy, entering Princeton University after his graduation from Smith. His college days were interrupted by World War I when he entered the Army and became a second lieutenant in the infantry.

"After the war ended he returned to Princeton and was graduated in 1920 with a bachelor of arts degree.

"In the fall of 1920 he joined Ralston Purina, then a relatively small company pioneering a new field, the animal feed industry. The firm had been founded 26 years earlier by his father.

"At that time the company had five mills in St. Louis, East St. Louis, Nashville, Tennessee, Buffalo, New York, and Fort Worth, Texas.

"For the first five years, Mr. Danforth held jobs in the company's advertising, buying and sales department.

"In 1925, he became secretary-treasurer of the company, spending most of his time reorganizing the company's cereal department.

"In 1925 he married to Miss Dorothy Claggett, and in succeeding years they had four children: Dr. William H. Danforth II, who was a physician and the chancellor of Washington University, St. Louis; Dorothy, now Mr. Jefferson Lewis Miller of St. Louis; Donald Jr., who is president of Danforth Agri-Resources Inc. of St. Louis, and John Clagett Danforth, attorney general of Missouri.

"In 1929 Danforth became vice president and treasurer of Ralston Purina and three years later, in 1932, he assumed

full and active direction of the company's operations as president.

"During Danforth's presidency and chairmanship from 1932 until 1953, the company's sales rose to about $850,000,000 from $19,000,000 annually.

"The company's total assets grew from $17,000,000 to almost $350,000,000.

"Today, Ralston Purina ranks among the 75 largest companies in the country. Its sales are almost 2 billion dollars annually.

"In 1956 Mr. Danforth became chairman of the board of Ralston Purina and in the fall of 1963 he relinquished his active role in management.

"He continued as a member of the board of directors and a member of the company's executive and finance committees.

"Throughout his career, Danforth was active in community and educational affairs. In addition to serving as first president of the United Fund of St. Louis, he was chairman of the Community Chest in 1951.

"He was an emeritus member of Civic Progress, Inc., a past member of the board of directors of the Chamber of Commerce and a former president of the boards of trustees of Country Day School and Mary Institute.

"After serving as president of the Danforth Foundation for 10 years, he was vice president of the board and secretary at the time of his death.

"Danforth was past director of the First National Bank of St. Louis, St. Louis Union Trust Co., General American Life Insurance Co. and St. Luke's Hospital.

"Surviving, in addition to his wife, sons and daughter and grandchildren, are a sister, Mrs. Randolph P. Compton of Scarsdale, New York.

"Visitation will be at the Lupton Funeral Home at 7233 Delmar Blvd. on Monday from 5 to 9 p.m. Funeral will be Tuesday at the Church of St. Michael and St. George."

325. *Food Product Development.* 1973. Entering markets: Ralston Natural Health™ Protein Snack Chips... 7(6):36, 38. July/Aug.
• ***Summary:*** "... introduced by Ralston Purina Co., St. Louis, contain 25% protein and lists as ingredients brown rice, yellow pea powder, and wheat starch fortified with isolated soy protein. No preservatives are added to the snack product. The package design, produced by Container Corp. of America, won a merit award in the 30th National Paperboard Packaging Competition." Two photos shows the package front.

326. *Food Technology.* 1973. Food industry news: Ralston Purina has new protein plant. 27(8):56. Aug.
• ***Summary:*** The new 50,000 square feet soy protein processing facility has opened on a 40-acre site in Memphis, Tennessee. It is producing the following soy protein isolate products for food use: Edi-Pro A and N, and Supro 610, 620, 630, 350, and 7.

327. Humphries, Bill. 1973. N.C. first to plant it in U.S. [the soybean in North Carolina]. *News and Observer* (*Raleigh, North Carolina*). Sept. 16.
• ***Summary:*** During the late 1870s, "a North Carolinian named Christopher Wilson Hollowell, owner of Bayside Plantation near Elizabeth City, was growing soybeans as a farm crop.

"The first commercial processing of soybeans in America took place at Elizabeth City 61 years ago, in 1912" [sic, 1915]. By 1924 Illinois had edged out North Carolina as America's No. 1 soybean producing state; each grew about 1 million bushels.

Six soybean crushing plants in the Tar Heel state [North Carolina]–including Cargill's at Fayetteville and Ralston Purina's at Raleigh–could handle all the soybeans grown in the state. But about 35% move out of the state for processing and for export overseas.

"One of the few plants in the United States devoted exclusively to processing soybeans for human consumption is the United Roasters Inc. facility at Clayton. This firm, with offices in Raleigh, markets roasted soybeans under the name "Golden Soya." A major U.S. concern currently is negotiating for acquisition of United Roasters and plans to make roasted soybeans a major snack food from coast to coast, utilizing up to 15 million pounds of beans annually."

Note: Soybeans were first grown in North America in 1765 by Samuel Bowen (Hymowitz & Harlan. 1983). Address: Farm editor.

328. Lehman Brothers. 1973. Ralston Purina Company: Company & industry study. New York. 112 p. Nov. 27. [5 ref]
• ***Summary:*** This company study includes a study of the U.S. soybean crushing industry. Leading processors of soybeans 1972-73 (p. 71). Company (estimated million bushels crushed/percentage of total): Cargill (130 million /18.0 percent), Archer-Daniels-Midland (120/16.6), Central Soya (90/12.5), Ralston-Purina (70/9.7), Esmark (55/7.6), A.E. Staley (55/7.6), Anderson Clayton (40/5.5), Allied Mills (35/4.8), Others (127/17.6). Total bushels crushed is 722 million.

Year Total Crush Percentage crushed by 4 largest companies
1954-55 241.4 million bu 41%
1963-64 436.8 million bu 50%
1972-73 721.9 million bu 56%.

329. **Product Name:** Dari-Pro line (Soy Flour Mixes for Baking).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, MO 63188.

Date of Introduction: 1973.
New Product–Documentation: *Soybean Digest Blue Book.* 1973. p. 109.

330. **Product Name:** Dari-Pro 36A, 36S, 33A (Dairy Analogs Made from Soy Protein Isolates plus Whey or Caseinates).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, MO 63188.
Date of Introduction: 1973.
New Product–Documentation: *Soybean Digest Blue Book.* 1973. p. 109. *Food Product Development.* 1974. Oct. p. 73 "Functional milk proteins, blends designed to match product requirements."

331. Ralston Purina Co. 1973. Food proteins–Summary: Products, specifications and applications (Leaflet). St. Louis, Missouri. *
Address: St. Louis, Missouri.

332. American Soybean Assoc. ed. 1974. Proceedings: World Soy Protein Conference. *J. of the American Oil Chemists' Society* 51(1):47A-216A. Jan. Held 11-14 Nov. 1973 in Munich, Germany. 28 cm. [566 ref]
• ***Summary:*** See next page. Contents: Session I: World protein markets. Session II: Soy protein products, their production, and properties. Session III: Legal and regulatory aspects of soy utilization in foods. Session IV: Utilization of soy proteins in foods. Session V: Utilization of soy protein in foods. Session VI: Nutritional aspects of soy protein foods. Session VII: Future developments and prospects. Round-tables papers. Registration list (directory of participants). Directory of exhibitors and press.

Berwin Tilson, president of the American Soybean Assoc., notes in the introduction (inside front cover): In Oct. 1972 "It was felt that the time was right to gather together top representatives from all areas affecting the soy foods industry... 1,100 representatives from 47 countries actually attended." This was a pioneering and very important conference. It was opened by the U.S. Secretary of Agriculture Earl L. Butz, and senator Hubert Humphrey delivered a memorable, inspirational address. Many distinguished scientists and politicians also presented papers.

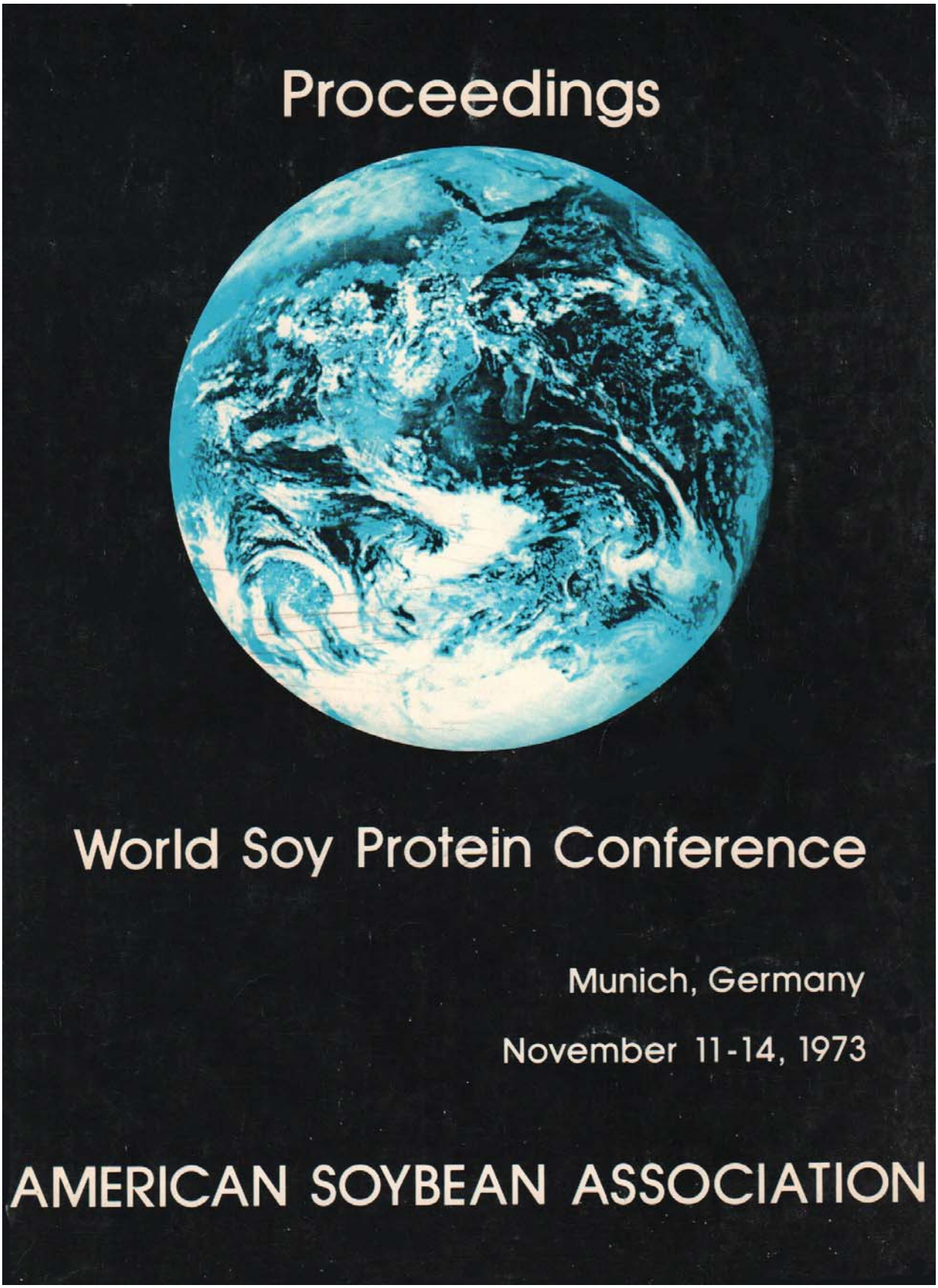
Exhibitors (inside back cover): Purina Protein Europe (Brussels, Belgium). Archer Daniels Brussels S.A. (Belgium). Cargill Inc. (Minneapolis, Minnesota). McKee CTIP (Rome, Italy). Central Soya International Inc.–Chemurgy Division (Brussels, Belgium), Alfa Laval AB (Tumba, Sweden; soymilk equipment). Staley Europe (Amsterdam, Holland). A/S N. Foss Electric (Hilleroed, Denmark). Westfalia Separator AG (Oelde, West Germany). A/S Nirg Atomizer (Soeborg/Copenhagen, Denmark). Nabisco Inc.–Protein Foods Div. (Fairlawn, New Jersey). Miles GmbH (Frankfurt am Main, Germany). Lucas Meyer und Edelsoja GmbH (Hamburg, Germany). General Mills Inc. (Minneapolis, Minnesota). Address: Hudson, Iowa.

333. Decock, Alain. 1974. Soy protein isolates in hypoallergenic infant formulations and humanized milks. *J. of the American Oil Chemists' Society* 51(1):199A-200A. Jan. Proceedings, World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973.
• ***Summary:*** Contents: Introduction. Soy protein isolates. Humanized milks. Address: Purina Protein Europe, Brussels, Belgium.

334. Horan, Frank E. 1974. Soy protein products and their production. *J. of the American Oil Chemists' Society* 51(1):67A-73A. Jan. Proceedings, World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973. [12 ref]
• ***Summary:*** Contents: Abstract. Introduction. History of the soybean in the U.S. Economic impact. Soybean protein. Textured soy protein. References.

Table XII states that U.S. producers of edible soy protein products are: ADM, Cargill, Central Soya, Far-Mar-Co, General Mills, Griffith Labs, Lauhoff Grain Co., Miles Labs (Worthington), National Protein, A.E. Staley, Swift & Co. All make textured soy protein products except National Protein (which makes only grits and flours). Central Soya, Ralston Purina, and Staley make soy protein isolates. Central Soya, Far-Mar-Co, Griffith Labs, and Swift & Co. make soy protein concentrates. Address: Archer Daniels Midland Co., Decatur, Illinois.

335. Wilcke, Harold L. 1974. Future developments in soy protein research and technology. *J. of the American Oil Chemists' Society* 51(1):175A-77A. Jan. Proceedings, World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973. [3 ref]
• ***Summary:*** Contents: Abstract. Introduction. Acceptability of soy products through flavor and color. Functional characteristics of soy protein. Technology and the soybean. References. Address: Ralston Purina Co., St. Louis,



Missouri.

336. *Food Product Development.* 1974. Entering markets: Crispits™, the protein-fortified snack entry from Ralston Purina Co.,... Feb.
• ***Summary:*** "... St. Louis, comes in three flavors–potato, sour cream, and corn. In test market, the snack is expected to be in national distribution by mid-year. Soy raises protein content to 20 per cent. Dehydrated potatoes or corn flour, vegetable oil, isolated soy protein, and rice flour are major ingredients. Packages have a foil/film pouch within the paperboard carton."

337. Spata, James A.; Nelson, A.I.; Singh, S. 1974. Developing a soybean dal for India and other countries. *World Crops* (*London*) 26(2):82-84. March/April. [7 ref]
• ***Summary:*** Uses the sodium bicarbonate blanch technique. Photos show Spata and Nelson. Dr. Spata is a project leader with the Ralston Purina Co. In 1965 he joined the U.S. Peace Corps and spent two years as an agricultural rural adviser in Nigeria. His entire year of 1972 was spent at G.B. Pant University at Pantnagar, India, where he worked on soybean dal. Prof. Nelson has been at the University of Illinois since 1949. In 1971 he accepted a two-year assignment with the U.S. Agency for International Development (USAID) at G.B. Pant University. His official capacity was Adviser in Soybean Processing Technology. From 1961 to 1964 Dr. Surjan Singh was an Assistant Professor of Dairy Science at G.B. Pant University. He was then awarded a grant from USAID to study at the University of Illinois. In 1971, after his return, he was made Acting Department Head of Food Science; he worked with Prof. Nelson. Address: 1. Ralston Purina Co.; 2. Univ. of Illinois; 3. G.B. Pant Univ.

338. *Detroit Free Press* (*Michigan*). 1974. Ralston plans Japan joint venture. July 30. p. 13, cols. 1-2.
• ***Summary:*** "Fuji Oil Co. and Ralston Purina Co. said they will form a joint venture to manufacture soybean protein in Japan. The new firm, called Fuji Purina Protein Co., will be based in Tokyo."

Note: This is the earliest document seen (Sept. 2020) that mentions "Fuji Purina" or "Fuji Purina Protein Co."

339. Associated Press. 1974. Ralston Purina Japanese plant. *Lincoln Journal Star* (*Lincoln, Nebraska*). July 31. p. 28, col. 2.
• ***Summary:*** Tokyo–Fuji Oil Co. of Japan said on July 30 that it has established a joint venture in Japan with Ralston Purina Co. of the USA to manufacture soy protein.

Fuji officials said the new firm, Fuji Purina Protein, is equally owned by the two companies.

Plans call for the new firm "to build a 200 metric-ton-per month capacity plant at Fuji's Hannan plant in Izumisano, Osaka, where operation start-up is scheduled for September, they said."

Note: Hannan is a city located in Osaka Prefecture, Japan.

340. United Press International (UPI). 1974. Ralston in Japan venture. *New York Times.* July 31. p. 51.
• ***Summary:*** "St. Louis, July 30 (UPI)–The Ralston Purina Company announced today it was joining the Fuji Oil Company of Osaka, Japan, in a venture to manufacture in Japan structured soya protein food products developed by Ralston Purina."

These will be used as extenders for fish, poultry and meat products.

Note: This is the earliest document seen (Sept. 2020) concerning the joint venture that would soon become known as Fuji-Purina.

341. *Food Processing* (*Chicago*). 1974. Soy combinations: Specific protein functions of isolate and textured pieces are combined to improve meat characteristics. 35(7):34. July. Foods of Tomorrow section.
• ***Summary:*** Researchers at Ralston Purina Co. have found that formulating meat patties with two forms of vegetable protein–a special improved soy isolate (Supro 620T for meat products) plus minced textured vegetable protein (Supro 50A [textured soy flour])–produces juicy patties without mushiness. The combination gives extra yield plus firm, meaty texture, and good flavor and appearance.

342. **Product Name:** Supro 50A (Textured Soy Flour).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1974 July.
Wt/Vol., Packaging, Price: 50 lb multiwalled bags.
How Stored: Shelf stable.
New Product–Documentation: Article in *Food Processing* (Chicago). 1978. July (Foods of Tomorrow section). p. 34. "Soy combinations: Specific protein functions of isolate and textured pieces are combined to improve meat characteristics." Researchers at Ralston Purina Co. have found that formulating meat patties with two forms of vegetable protein–a special improved soy isolate (Supro 620T for meat products) plus minced textured vegetable protein (Supro 50A [textured soy flour])–produces juicy patties without mushiness. The combination gives extra yield plus firm, meaty texture, and good flavor and appearance.

Supro 50A general product description. 1980. Jan. 1. "Supro A is a high quality textured soy flour produced from selected soybeans. It is supplied in various particle sizes and colors." It has a PER of 2.2 and contains 55.0% protein on a moisture free basis.

343. **Product Name:** SPF-200 (Structured Protein Fiber).
Manufacturer's Name: Ralston Purina Co.

Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1974 September.
New Product–Documentation: *USDA Farmer Cooperative Service. FCS Research Report.* 1976. "Appendix–Companies producing and distributing soy products." No. 33. p. 53-82. Jan. See p. 63. Ralcon Foods (2 North Riverside Plaza, Chicago, Illinois 60606) makes SPF-200-Fortified (hydrated product). Color: natural. Flavor: unflavored. Note: Although published in a report dated Jan. 1976, this appendix is actually dated Sept. 1974.

Ralston Purina Co. 1976 July 1. "SPF 200 Structured Protein Fiber: General Product Description. This one-sided leaflet gives physical properties, microbiological data, packaging, manufacturing ("by Ralcon Foods, a licensee of Ralston Purina Company"). Amino acid composition. Typical [nutritional] analysis.

Ralston Purina Co. 1980. "Purina proteins–Product summary and information." This 8-panel booklet contains a brief description of various products including structured isolated soy proteins: SPF 200 (a structured isolated soy protein fiber available in the frozen, hydrated form. It is retort stable with no degradation of fiber. Its texture is similar to that of meat muscle fiber), and Purina Protein 220 (an isolated soy protein granule).

SPF 200 general product description. 1980. Jan. 1. "SPF 200 is a filament-like fiber that is a processed isolated soy protein. SPF 200 is used to lend structure and texture to food systems." It contains 93% protein on a moisture free basis.

Kevin J. Hannigan. 1980. Food Engineering. May. p. 11. "Crab salad with soy." Ralston Purina's spun soy protein fiber (SPF-200), backed up by Haarmann & Reimer Corporation's Natural "Taste of Crab" is used to extend crabmeat in an excellent crab salad.

Talk by Dr. Kolar of Ralston Purina at INTSOY Short Course. 1980. June. SPF-200 is a structured protein fiber that is not spun or extruded. It is made using heat exchangers.

344. Adolphson, L.C.; Horan, F.E. 1974. Textured vegetable protein products as meat extenders. *Cereal Science Today* 19(10):441-44, 446. Oct.
• ***Summary:*** "During the 1971-72 school year, about 23 million pounds of textured soy protein (hydrated) were used; in 1972-73 the amount was doubled; and during the past school year an estimate is that at least 50 million pounds (hydrated) were employed...

"In order for the commercial manufacturers to have a common goal in the development of novel protein systems, such as textured vegetable protein products, a number of industrial companies have banded together to form the Food Protein Council (Food Protein Council, Suite 1150, 1730 Pennsylvania Ave., N.W., Washington, D.C. 20006. George M. Perrin, Executive Secretary).

"The council consists of the following regular members: Archer Daniels Midland Co.; Cargill, Inc.; Central Soya Co., Inc.; Far-Mar-Co, Inc.; General Mills, Inc.; Grain Processing Corp.; Griffith Laboratories; Lauhoff Grain Co.; Miles Laboratories, Inc.; National Protein Corp.; Procter & Gamble Co.; Ralston Purina Co.; A.E. Staley Manufacturing Co.; and Swift Edible Oil Co."

A photo shows the two authors, with a brief biography of each. Address: Archer Daniels Midland Co., Decatur, Illinois.

345. *Food Product Development.* 1974. Functional milk proteins, blends designed to match product requirements. 8(8):73. Oct.
• ***Summary:*** Discusses various blends made by the Dairy Food Systems Div., Ralston Purina Co., St. Louis, Missouri. Dari-Pro 36A, 36S, and 33A contain soy protein isolates.

346. Stone, David E. 1974. Profile: Francis E. Calvert pioneer of soybean protein. *Food Engineering* 46(10):40, 42. Oct.
• ***Summary:*** Francis Earle Calvert was born in 1912 in Cambridge, Massachusetts. He was selected by Henry Ford to be part of a special group attending Ford's Wayside Technical School in Sudburry, Massachusetts. There was no tuition–a Godsend during the Great Depression. Then he attended Ford's Edison Institute at Dearborn, Michigan. Calvert's introduction to the soybean came directly from Ford himself–in the early 1930s. One day the great entrepreneur dropped in lugging a 100-pound sack of soybeans, saying that there must be something valuable in them since Orientals had been using them for 4,000 years. He challenged the young students to find out how to use them.

He and his young co-workers at the Greenfield Village laboratory had developed a destructive distillation process. It decomposed the soybeans using heat in a closed container. Later Calvert helped to design a new solvent extractor for soybean built like an Archimedes screw; it removed soybean oil using a counter-current solvent. Soon Calvert, and colleague Robert Boyer, were making spun protein fibers for upholstery in Ford cars, as well as plastic car parts.

Because soybeans were hard to get, the young men had to grow their own. They planted several thousand acres of soybeans, then had to develop mechanical equipment to harvest them. Now they set out to adapt them to human consumption. In 1936 the lab delivered fortified soymilk to Dearborn families, made a soy sherbet that was sold in the Ford employee cafeteria, and canned green soybeans for use as a vegetable.

Why do soybeans have a bitter taste? Its a survival mechanism.

The Drackett Corporation hired Calvert, and shortly thereafter they purchased the Ford Textile Fiber Division. They put Calvert in charge of basic protein research. In 1949 he was appointed research director at Drackett. In 1962

Calvert joined Ralston Purina Co. in special soy products research. He retired in Aug. 1973. Address: Product Mgr., Food Protein Div., Ralston Purina Co.

347. Predicasts, Inc. 1974. World manufactured soybean foods. Special Study No. 108. Predicasts, Inc., 200 University Circle Research Center, 11001 Cedar Ave., Cleveland, OH 44106. vi + 93 p. Dec. 24. No index. 28 cm. Research Analyst: Frederick M. Ross.

• ***Summary:*** Contents: 1. Introduction. 2. Summary. 3. Economics of Soybean Foods: Soybeans, soy flour, meat extenders (based on extruded textured soy flour), synthetic meat (based on spun isolates). 4. Industry structure: General, $1,000 million food and feed giants (ADM, Cargill, Central Soya, General Mills/Takeda Chemical, Nabisco, Ralston Purina/Fuji Oil, and Esmark [Swift]), other major manufactured soy food companies (Unilever, General Host [New York], Miles Laboratories/Worthington & Kyowa Hakko Kogyo, A.E. Staley Mfg. Co., Stange [Chicago, Illinois], Chambers & Fargus [Humberside, England]), food industry structure. 5. Demand for manufactured soybean products: Demand for meat & substitutes, supply of natural meat, demand for meat substitutes, demand for soy flour. 6. North America: United States, Canada. 7. Latin America: General, Argentina, Brazil, Mexico, Other Latin America (Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay). 8. West Europe: General, France, West Germany, Italy, Spain, United Kingdom, Other West Europe. 9. East Europe: General, Hungary, Poland, USSR, Other East Europe. 10. Africa: General, Egypt, Nigeria, South Africa, Other Africa & Mideast. 11. Asia: General, China, India, Indonesia, Japan, Pakistan, Other Asia. 12. Oceania: Australia, New Zealand, Other Oceania.

Most sections contain numerous tables, mostly on meat and meat substitute consumption, and raw protein consumption, by country. Address: 200 University Circle Research Center, 11001 Cedar Ave., Cleveland, Ohio 44106. Phone: 216-795-3000.

348. Ralston Purina Co. 1974. Ralston Purina vignettes (News release). Checkerboard Square, St. Louis, MO 63188. 9 p. Dec.

• ***Summary:*** Highlights from the history of Ralston Purina Co. In 1893 a financial panic gripped America. Having just graduated from Washington University in St. Louis, William H. Danforth was seeking to launch his career in some St. Louis business. Two church associates, George Robinson and William Andrews, suggested a business making horse and mule feed. In those days horses and mules ate only hay, corn, and oats. The two men convinced young Danforth to join them in the new feed manufacturing business. Thus in 1894 the Robinson-Danforth Company was formed with a capital of $12,000. “Cheaper than oats and safer than corn” was the slogan of their new product, which they mixed with shovels on the floor of a back room.

After 2 years the little feed business was thriving. They moved to new headquarters to Eighth and Gratiot in St. Louis, the present site of company headquarters. There milling machinery was installed. By March 1896 Will Danforth had become president of the company. On May 26 of that year, Andrews sold his share in the company to Will, making Will the majority stockholder. The next day, the mill was completely destroyed by the worst tornado in St. Louis history. Though Danforth had no collateral, Mr. Walker Will, president of a local bank, loaned him $25,000 to rebuild the mill at its former location.

In 1898, on a buying trip to Kansas, Danforth met a miller who had discovered a way to prevent cracked wheat from becoming rancid without removing the germ. Danforth, who was convinced that food had a big effect on health, packaged the miller’s cracked wheat and sold it to St. Louis grocers under the name Purina Whole Wheat Cereal. The word Purina had been coined from the company slogan–”where purity is paramount.” After only 4 years, the company had diversified into the food business.

“At the same time the fame of Dr. Everett Ralston’s health ideas was spreading. Clubs of his followers boasted 800,000 members. In his book, “Life Building,” he recommended a whole wheat cereal similar to Purina’s product. Danforth approached Dr. Ralston, who agreed to endorse the Purina cereal provided it was renamed Ralston Wheat Cereal. The arrangement benefited both, and the name stuck. By 1902, the names Ralston and Purina had become so widely known that the name of the firm was changed to Ralston Purina Company.” Also in 1902 the red and white checkerboard, once worn by every person in the Brown family that Will had known as a kid, became the company’s trademark and logo. Since that time the Checkerboard trademark has been used with a consistency unique in American business. Even the company’s headquarters in St. Louis is named Checkerboard Square.

By 1904, in time for the Louisiana Purchase Exposition in St. Louis, the company had added two new food products packaged in checkerboard bags: Purina Whole Wheat Flour and Purina Pancake Flour. Distributed to fair visitors, each of these products won first prize in its category–helping the young company to share the spotlight at the Exposition.

Wanting to do his part in World War I, Danforth left his burgeoning business in 1914 and went to France as YMCA secretary for the troops of the Third Army Division. “After noting the enthusiastic way soldiers responded to the word ‘chow,’ he replaced the word feed with ‘Chow’ on all Purina animal rations.”

“While visiting England after the war, Danforth was introduced to a form of feed which contained several ingredients pressed into small cubes. In 1921, he tried the cube form in Purina Chows and the innovation caught on. Soon the entire American feed industry was manufacturing

pellet-form feed. Danforth insisted on a distinctive name for his and 'Checkers' entered the Purina vocabulary."

In 1920 Will's son, Donald, joined the company. In 1926 he convinced his father to start an experimental farm for testing products. The company bought 300 acres of land at Gray Summit, Missouri, and research began. Not only feed, but management and sanitation experiments were conducted. Today the farm uses 820 acres and approximately 50,000 people tour it each year.

In 1950 set out to develop a dog food to be sold through grocery outlets. After successful test marketing, Purina Dog Chow entered national distribution in April 1957. "Advertising stressed the food's palatability with an Eager Eater theme. Gaines was then the total sales leader in dry dog foods. By December of that year, Purina had captured 14.8 per cent of the market. August, 1958, saw Dog Chow pass Gaines and become the nation's leading dry dog food, a position it has held ever since."

On 10 January 1962 company officials in New York were celebrating the listing of Ralston Purina stock on the New York Stock Exchange. But that afternoon "the worst disaster in Purina's history took place" when a "violent dust explosion followed by a fire demolished the St. Louis Chow manufacturing elevator. Two workers were killed and 25 were hospitalized with severe injuries. One fireman suffered a heart attack while battling the flames." It took 3 days to put out the fire. Fortunately the company's main office building nearby, which housed 1,000 employees, was not seriously damaged. Address: St. Louis, Missouri.

349. Duda, Zbigniew. 1974. Vegetable protein meat extenders and analogs; with special emphasis on proteins of soybean origin. Rome, Italy: Food and Agriculture Div. of the United Nations. Animal Production and Health Div. vii + 89 p. No index. 27 cm. [214 ref]
• ***Summary:*** Contents: Author's preface. Acknowledgements. Foreword. Introduction. Raw materials: Soybeans, other raw materials. Definitions: Meat extenders, meat analogues. Protein rich products originating from soybeans: Soy flour and grits, food utilization of soybean flours and grits, soy protein concentrates, soy protein isolates, texturized soy protein. Technological and functional properties of vegetable protein. Market considerations. A random selection of T.V.P. extenders and analogues with their characteristics and uses: Miles Laboratories, Inc., Marschall Division, Elkhart, Indiana, USA, Vegetable protein food products (Temptein TM spun textured vegetable protein, vegetable protein meat analogues, bacon-like flavoured chips, dehydrated ham-like flavoured cubes, R pepperoni-like flavoured links, Pro-lean 45 TM, Maxten textured vegetable protein, Morningstar Farms–breakfast links, patties, slices), Swift food protein, General Mills, Inc.–textured vegetable protein foods, Worthington Foods, Inc.–textured vegetable protein foods, Archer Daniels Midland Co.–textured vegetable protein products, Purdy Steak Corp.–textured vegetable protein products, A.E. Staley Manufacturing Co.–textured and untextured vegetable protein products (200 series textured vegetable protein products, 400 series), Ralston Purina Company–textured soy protein products, Central Soya International Inc.–soy protein products, Nabisco, Inc. Protein Food Division–textured vegetable protein products, Lucas Meyer–soy protein products. Possible sources of meat substitutes other than soybeans: Protein from beans, from rapeseed, from sunflower seed, from cottonseed, from peanuts, other sources of proteins. General technological considerations. Projected consumption and market penetration. Cost considerations: The scale of production, the degree of processing, the price of raw materials. Conclusions. Selected Bibliography. Appendix I: USA soybean processors and products manufactured. Appendix II: Selected recipes using TVP for type A school lunches. Appendix III: Addresses of some companies making soy protein products. Appendix IV: Soybean utilization chart.

This book is compiled from a British viewpoint and cites many British journal articles, thus making it a nice complement to the American articles and bibliographies on this subject. Its bibliography is excellent. Address: Meat and Milk Service, Animal Production andf Health Div., FAO, Rome, Italy.

350. **Product Name:** [Fuji Pure (spun soy protein fiber)].
Foreign Name: FujiPua.
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Toyama Building 121, 2-chome Azuchi-cho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1974.
Ingredients: Defatted soybean meal.
How Stored: Shelf stable.
New Product–Documentation: Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 443. This was the first spun soy protein fiber made in Japan.

351. **Product Name:** Chuck Wagon.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, MO 63188.
Date of Introduction: 1974.
New Product–Documentation: Horan. 1974. Meat analogs. p. 380. This product is made of textured soy flour (50% protein).

352. **Product Name:** Supro 620.
Manufacturer's Name: Stange Canada.
Manufacturer's Address: Mississauga, ONT, Canada.
Date of Introduction: 1974.
New Product–Documentation: Predicasts. 1974. World

Manufactured Soybean Foods. p. 13. "Stange (Chicago, Illinois) is one of the world's largest spice and food manufacturers with 1973 sales of $36 million. The firm, through Stange Canada, operates a plant in Mississauga, Ontario, that makes 'Supro 620' soy protein isolate, a very high grade protein ingredient for health foods, instant breakfasts, puddings and other specialty foods. The soy isolate is sold to large food manufacturers throughout North America for inclusion in their retail food products." Note: This product was apparently later purchased by Ralston Purina.

353. Leading processors of soybeans, 1972-73. 1974. See p. 71

• ***Summary:*** This two-part table is Exhibit 39 of an unknown document. The two sources of the information are Lehman Brothers Estimates, and USDA. In 1972-72 (the crop year begins in September) an estimated 722 million bushels of soybeans were crushed in the United States. Estimates of the number of bushels crushed by major U.S. soybean crushers is as follows:

Cargill 130 million bushels. 18.0% of industry total.

Archer-Daniels- Midland 120 million bushels. 16.6% of industry total.

Central Soya 90 million bushels. 12.5% of industry total.

Ralston-Purina 70 million bushels. 9.7% of industry total.

Esmark [Swift] 55 million bushels. 7.6% of industry total.

Staley, A.E. 55 million bushels. 7.6% of industry total.

Anderson Clayton 40 million bushels. 5.5% of industry total.

Allied Mills 35 million bushels. 4.8% of industry total.

Others 127 million bushels. 17.6% of industry total.

Part II of the table shows the growing consolidation in the soybean crushing industry:

Year: 1954-55. Crushings (million bu.): 241.4. Four largest companies: 41% of total. Eight largest companies: 64%. Twenty largest companies: 89%.

Year: 1958-59. Crushings (million bu.): 398.8. Four largest companies: 40% of total. Eight largest companies: 63%. Twenty largest companies: 86%.

Year: 1963-64. Crushings (million bu.): 436.8. Four largest companies: 50% of total. Eight largest companies: 70%. Twenty largest companies: 88%.

Year: 1967-68. Crushings (million bu.): 576.4. Four largest companies: 55% of total. Eight largest companies: 76%. Twenty largest companies: 94%.

Year: 1972-73. Crushings (million bu.): 721.9. Four largest companies: 56%* of total. Eight largest companies: 82%*. Twenty largest companies: 97%*. * = Estimates.

354. Andreas, Dwayne O. 1975. Presentation on ADM. Paper presented to the New York Society of Security Analysts. 11 p. Jan. 21. Unpublished manuscript.

• ***Summary:*** Mr. Andreas has been processing soybeans and other agricultural commodities constantly since 1938. Four of ADM's top executives come from competing companies: Mr. Walker from Ralston [Purina], Mr. Burket from Central Soya, Mr. Randall from Cargill, and Mr. Bean from Anderson-Clayton. In 1965, thanks to an entirely new technology that was developing for soybean processing, ADM was transformed from a conglomerate into a non-conglomerate focusing on food technology. "Thanks to a great job that had been done in research, ADM received basic patents on TVP (Textured Vegetable Protein; TVP is a registered trademark). This knowledge was immediately commercialized and TVP has been very successful... it is now produced by some 12-13 different companies."

"The Marshall Plan developed Western Europe and Japan into the greatest cash customers that the United States ever had... This global internationalizing of food distribution had the effect of disorienting much of the entire food processing industry. That is, a plant that was not located so that it had access to the world markets might have become worthless or obsolete overnight. And dozens did."

Currently ADM has about 17% of the soybean processing business in the U.S., 17% of the wheat milling, 25% of the barley malting, 25% of the margarine oil business, 30% of the linseed oil, and 27% of the durum flour business (the basic flour for making pasta products).

A four-horse team is pulling ADM in a certain direction for the future. "One is the edible soy business which includes our TVP and soy flours, in which we are the leaders, and will soon include our soy protein concentrates. It is inevitable that edible soy proteins will increase in use over the next 20 years by leaps and bounds on a worldwide basis. And it is for no other reason than economic compulsion. The cost of making good quality high protein edible products out of soy is so low compared to other protein sources that it is just a matter of how long it will take the food companies to learn how to use it in more ways. In the soy flour business many soy flours are now being used to replace dried milk products just as margarine once replaced butter and this use is due to grow substantially in the next few years. The soy fortified bread and roll products you saw today are examples of how protein levels can be boosted by 50% with little or no increase in cost. ADM is the largest producer in the world of soy flour.

"TVP business has an enormous potential, maybe largely outside of the United States. In every country where there is a balance of payments problem, and where they are importing meat, we get a terrific tail wind from the government in selling TVP...

"The second thing going in our favor is the continuing worldwide expansion of the margarine business. Margarine is replacing butter, and that's a trend that is unstoppable. This trend is fundamental to our business, since about eighty percent of all of our fats and oils, corn oil, soybean oil, go in

margarine.

"A third part of our business which has almost unlimited future growth is the soybean meal portion, where we make a refined [dehulled] grade of soybean meal that's used by the poultry industry all over the world. Under today's technology, poultry is by far the cheapest form of meat that's commercially produced. It will expand very much faster than either pork or beef, because it's so much cheaper and so easy to produce, and that business will continue to grow enormously, worldwide.

"The fourth horse of our four-horse team is the corn refining business." We produce corn syrup and fructose [two different products], which are experiencing very rapid growth in demand. Two other very good firms, Standard Brands and the A.E. Staley Co. are now producing fructose, but suddenly most of the soft drink people have decided to use fructose, creating an enormous demand. So "we changed our plans and now plan to produce about 480 million pounds of fructose by next winter and to double that by sometime in 1976."

So the four-horse team pulling ADM into the future is edible soy products, margarine, soybean meal, and refined corn sweeteners (corn syrup and fructose). Address: Chairman and CEO of ADM.

355. *Food Technology.* 1975. Ralston Purina to build new plant. 29(3):89. March.
• ***Summary:*** "Ralston Purina Co. has announced plans to build a food protein plant in Pryor, Oklahoma, on a 35-acre tract of land 35 miles east of Tulsa. The plant will produce a line of isolated soy proteins and among the applications for the company's tailored protein ingredients are hypo-allergenic baby foods, coffee whiteners, whipped toppings, desserts, snacks, breakfast foods, and processed meats.

"The one-story, highly automated plant is expected to be on stream by spring 1976."

356. Dahle, L.K.; Montgomery, E.P.; Brusco, V.W. 1975. Wheat protein-starch interaction. II. Comparative abilities of wheat and soy proteins to bind starch. *Cereal Chemistry* 52(2):212-25. March/April. [14 ref]
• ***Summary:*** Wheat proteins and soy protein isolates have different abilities to bind starch, and to bind dextrins. The ability of wheat protein to bind starch is greatly diminished by the action of a disulfide-splitting agent but not by a sulfhydryl blocking agent.

The soy isolates used in this study were commercial products obtained from Ralston Purina and containing 95% protein. They are Edi-Pro (isoelectric), Edi-Pro N (neutral), Supro 610 (modified), and Supro 7 (modified, soluble). Address: Basic Research Dep., Campbell Inst. for Food Research, Camden, New Jersey 08101.

357. *Food Processing* (*Chicago*). 1975. Soy protein isolate for emulsified meat systems: Specifically designed to replace costly salt soluble meat protein. April. p. 92.
• ***Summary:*** Supro 620, a soy protein isolate, is made by Ralston Purina Co., St. Louis, Missouri. It can be used to replace 30-60% of meat protein in meat systems.

358. *Cereal Foods World.* 1975. Products: Dari-Pro 35. 20(7):338. July.
• ***Summary:*** "The Protein Division of Ralston Purina Company recently developed 'DARI-PRO 35 for Cakes and Donuts,' a unique spray-dried blend of milk proteins and soy protein isolate that simulates the function of non-fat dry milk in cake and cake donut systems. This bakery ingredient is a carefully controlled blend of sweet dairy whey, soy protein isolate and calcium and sodium caseinates. Bakers can use the product without adjusting the levels of the other ingredients, thereby cutting costs. Quality control measures during manufacture of 'DARI-PRO 35 for Cakes and Donuts' are designed to insure consistency in the product, minimizing the problems created by the seasonal and supplier variation of non-fat dry milk. Contact: Ray Dankenbring, Dept. CFW, Ralston Purina Company, 900 Checkerboard Square, St. Louis, Missouri 63188."

359. *Food Processing* (*Chicago*). 1975. Protein update: Guides to protein products and companies. Aug. p. 28, 33-34, 36, 38, 40-41, 44, 48, 50.
• ***Summary:*** Discusses soy protein products made by: ADM, Baltimore Spice, Cargill, Carnation Co., Central Soya Co., Custom Food Products Inc., DMI Inc., Far-Mar-Co., General Mills, Grain Processing Corp., Griffith Laboratories, Industrial Grain Products Ltd., Lauhoff Grain Co., Miles Laboratories, Nabisco, National Protein Corp., Paniplus Co., Ralcon Foods, Ralston Purina, Staley (A.E.) Co. (Protein Div.), Swift & Co. Details on how each product can be used and a complete address for each company are given.

Note: A table (p. 25) shows what soy proteins are available from what companies. For example: General Mills, Inc. (Minneapolis, Minnesota): Makes spun and textured vegetable protein products. "Spun protein is produced from soy isolate base and is used in products such as frozen ham dices and frozen chicken dices and chunks." Recently the company has developed a patented process for Steam Texturization of protein. The product has a clean taste and comes in a range of particle sizes. Its texture is very similar to that of pork, beef, poultry and seafood. "Products are available to meet specific application needs with regard to texture, flavor, color, size, and nutrition. Products can also be produced to retain many times their weight of moisture."

Grain Processing Corp. (Muscatine, Iowa): A line of soy protein concentrates with 70% protein. Two new soy protein isolates, including high and low solubility products, with 90% protein, are spray dried, free flowing powders.

Griffith Laboratories (Chicago, Illinois): Soy protein

concentrate, powdered and granular structured. The latter is recommended as a meat extender in meat patties since it imparts texture, binding characteristics, moisture retention and extra nutrition. This textured soy concentrate is also "available in any number of seasoning blends." Address: Assoc. Editor.

360. Food Systems Branch and Research Branch, Agriculture Canada; Grain Marketing Office. Industry, Trade and Commerce. 1975. U.S. Food Protein Council (Document part). In: Plant Proteins in Canada: Utilization for Human Food. 1975. Canada. iii+ 163 p. See p. 50. Sept. 28 cm. [1 ref]

• ***Summary:*** The three objectives of the Council are listed. "Members of the Council include: Archer Daniels Midland, Cargill, Central Soya, Far-Mar-Co., General Mills, Griffith Laboratories, Lauhoff Grain, Miles Laboratories, National Protein, Ralston Purina, A.E. Staley, Swift, Honeymead Products, Riceland Foods, Pfizer, and Nestlé."

Source: Grain Marketing Office, Trade Commissioner Service of I.T. & C. [Department of Industry, Trade and Commerce]. Address: Canada.

361. Anton, J.J. 1975. Good market climate nurtures soy industry growth. *Food Product Development* 9(8):96-99. Oct.

• ***Summary:*** For ten years, the number of dairy cows in America has been decreasing. Few young men aspire to be dairy farmers. The result is rising milk prices. The U.S. government support price is now $0.606 per pounds, versus approximately $0.40 just two years ago–a 50% increase.

Table I shows that soybeans can produce more protein per acre of crop land than any other farm crop (508 lb), versus only 97 lb for milk, and 58 lb for beef (the least efficient converter). Note: The source of the statistics in table I is not given. However the source appears to be Roy E. Martin 1970, p. 27.

The main products consumed by Americans are steak, potatoes, hamburgers, hot dogs, doughnuts, cake, pie, and soft drinks.

"Today there are 17 companies involved in one phase or another of soy protein manufacture... Government projections say that by 1980 soy products will penetrate the meat market to an equivalent of four million head of cattle and six million hogs" (Table III. Source: Feedlot Management).

In 1975 the total soy ingredients marketed to the food industry should be approximately 700 million pounds, representing $170 million of business. This is projected to grow to 2,430 million lb in 1980, worth $816 million. Table IV gives amount used, price per pound, and total value, for 1974 and a projection for 1980, for the following soy products: Soy flour, textured vegetable protein, soy protein concentrate, soy protein isolate, structured protein fiber, and total. For 1974/1980: Soy flour 300/600 million lb at 12/15 cents/lb. Textured vegetable protein 140/1000 million lb at 20/26 cents/lb. Soy protein concentrate 175/350 million lb at 30/36 cents/lb. Soy protein isolate 75/400 million lb at 60/75 cents/lb. Structured protein fiber 20/80 million lb at 40/505 cents/lb. Total: 300/2,430 million lb worth $170/$816 million.

On a percentage basis, the fastest growing products are textured soy protein products (19.7% of the total in 1976 increasing to 41.2% of the total in 1980) and soy protein isolates (10.6% of the total in 1976 increasing to 16.5% of the total in 1980).

There are some exciting new applications for soy products. Decker Treats, marketed by Armour & Co., resembles a hot dog but approximately half of the meat protein is replaced with soy protein isolate. The replacement provides cost savings while not affecting finished product quality or consumer acceptance. Another product, Proclaim bread, made by ITT Continental Baking Co., contains 50% more protein than competing breads. Address: Director of Marketing, Protein Div., Ralston Purina Co., St. Louis, Missouri.

362. National Soybean Processors Association. 1975. Year book and trading rules 1975-1976. Washington, DC. ii + 103 p.

• ***Summary:*** On the cover (but not the title page) is written: Effective October 1, 1975. Contents: The National Soybean Processors Association [Introduction and overview]. Constitution and by-laws. Officers and directors. Executive staff. Members. Standing committees. Food Protein Council. Trading rules on soybean meal. Sales contract. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}, sampling of soybean meal {automatic sampler, probe sampler}), official weighmaster application, semi-annual scale report, official referee chemists (meal). Trading rules on soybean oil. Sales contract. Definitions of grade and quality of export oils. Soybean lecithin specifications. Appendix to trading rules on soybean oil: Inspection, grading soybean oil for color (N.S.P.A. tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed), official weighmaster application, semi-annual scale report, official referee chemists (oil). Soybean oil export trading rules. Foreign trade definitions (for information purposes only).

The page titled National Soybean Processors Association (p. ii) states: "The NSPA is the professional association of America's soybean processors. Its members process and market more than 95 percent of all soybean crushed within the continental U.S. From nearly 85 processing centers, in every major soybean producing region of the nation, NSPA

members service America's agricultural community.

"During the past crop year about 700,000,000 bushels of soybeans moved through processing plants of NSPA's 33 member firms. Approximately 60 percent of America's 1.2 billion-bushel soybean crop is bought and processed by NSPA members. Exporters account for another 32 percent of the crop, and the remainder [8%] is returned to farms for seed, feed, and residuals." Also discusses industry programs, soybean research, and international market development.

The section on officers, executive committee, and board of directors (p. 7-8) gives the name, company affiliation, and phone number of each person. Officers–President: Lowell K. Rasmussen, Honeymead Products Co. Vice President: John G. Reed, Jr., Continental Grain Co. Secretary: Stiles M. Harper, Southern Soya Corporation. Treasurer: T.J. Suelzer, Central Soya Co. Immediate past president: James R. Spicola, Cargill, Inc. Executive Committee: Donald B. Walker ('77), ADM. James R. Spicola, Cargill. Thomas J. Suelzer, Central Soya. John G. Reed, Jr., Continental. Martin Hinby ('76), Cook Industries.

Board of Directors (alphabetically by company; each member company has one representative on the board): Thomas H. Wolfe, Anderson, Clayton & Co. Donald B. Walker, Archer Daniels Midland Co. George H. Heinz, Buckeye Cellulose Corp. John Fallon, Bunge Corporation. James R. Spicola, Cargill, Inc. Thomas J. Suelzer, Central Soya Co., Inc. John G. Reed, Jr., Continental Grain Co., Martin Hilby, Cook Industries. Joe C. Givens, Dawson Mills. Alfred Jenkins, Delta Cotton Oil & Fertilizer Co. John A. Dotson, Far-Mar-Co., Inc. Kenneth E. Sullivan, Farmers Grain Dealers Assn. of Iowa. Donald M. Chartier, Farmland Industries, Inc. Gaylord O. Coan, Gold Kist Inc. Lowell K. Rasmussen, Honeymead Products Co. David C. Thompson, Krause Milling Co. Kenneth J. McQueen, Land O'Lakes, Inc. Floyd W. Brown, Lauhoff Grain Co. Kermit F. Head, Missouri Farmers Assn.–Grain Div. James A. Smith, National Protein Corp. Robert E. Hicks, Owensboro Grain Co., Inc. Frank P. Perdue, Perdue Incorporated. John H. Payne, Planters Manufacturing Co. William T. Melvin, Planters Oil Mill, Inc. Theodore W. Bean, Quincy Soybean Co. E.J. Cordes, Ralston Purina Co., W.L. Knoll, Riceland Foods, Inc. J.D. Morton, Sherman Oil Mill. Stiles M. Harper, Southern Soya Corp. James W. Moore, A.E. Staley Mfg. Co. W.W. Moore, Swift Edible Oil Co. Preston C. Townsend, Townsend's Inc. Tyler Terrett, West Tennessee Soya Mill, Inc.

Executive office, Washington, DC: Executive Director, Sheldon J. Hauck. Director, Public Affairs: Jack DuVall. Administrative Asst.: Jean N. Sullivan. National Soybean Crop Improvement Council: Robert W. Judd, Managing Director. General counsel: Edward H. Hatton, Esq., Jenner & Block, Chicago, Illinois.

Members (listed alphabetically by company; within each company, first the name of the official Association representative {who is on the Board}, followed by the other personal members listed alphabetically by surname. For example, Archer Daniels Midland Co., the company with the most personal members, has 24. After the name of each personal member is given his address and phone number. In the listing below, the number of personal members is shown in parentheses after the name of each company, followed by city and state of the various locations): Anderson, Clayton & Co. (6); Phoenix, Arizona; Osceola, Arkansas; Jackson, Mississippi; Vicksburg, Mississippi; Houston, Texas. Archer Daniels Midland Co. (24); Decatur, Illinois; Galesburg, Illinois; Granite City, Illinois; Fredonia, Kansas; Mankato, Minnesota; Red Wing, Minnesota; St. Louis, Missouri; Fremont, Nebraska; Lincoln, Nebraska; Kershaw, South Carolina. Buckeye Cellulose Corp. (8); North Little Rock, Arkansas; Augusta, Georgia; Cincinnati, Ohio; Memphis, Tennessee. Bunge Corporation (5); St. Louis, Missouri; New York City, New York; Cargill, Inc. (15); Gainesville, Georgia; Cedar Rapids, Iowa; Des Moines, Iowa; Sioux City, Iowa; Washington, Iowa; Chicago, Illinois; Wichita, Kansas; Minneapolis, Minnesota; Fayetteville, North Carolina; Memphis, Tennessee; Chesapeake, Virginia. Central Soya Co., Inc. (11); Chicago, Illinois; Gibson City, Illinois; Decatur, Indiana; Fort Wayne, Indiana; Indianapolis, Indiana; Belmond, Iowa; Marion, Ohio; Bellevue, Ohio; Delphos, Ohio; Chattanooga, Tennessee. Continental Grain Co. (8); Guntersville, Alabama; Chicago, Illinois; Taylorville, Illinois; New York City, New York; Cameron, South Carolina. Cook Industries (12); Pine Bluff, Arkansas; Emporia, Kansas; Marks, Mississippi; Memphis, Tennessee. Dawson Mills (3); Dawson, Minnesota. Delta Cotton Oil & Fertilizer Co. (1); Jackson, Mississippi. Far-Mar-Co., Inc. (1); St. Joseph, Missouri. Farmers Grain Dealers Assn. of Iowa (Cooperative), Soybean Processing Div. (1); Mason City, Iowa. Farmland Industries, Inc. (3); Van Buren, Arkansas; Sergeant Bluff, Iowa; Kansas City, Missouri. Gold Kist Inc. (3); Atlanta, Georgia. Honeymead Products Co. (3); Mankato, Minnesota. Krause Milling Co. (2); Milwaukee, Wisconsin. Land O'Lakes, Inc. (3); Fort Dodge, Iowa; Sheldon, Iowa. Lauhoff Grain Co. (1); Danville, Illinois. Missouri Farmers Assn.–Grain Div. (4); Mexico, Missouri. National Protein Corp. (2); Champaign, Illinois; Chicago, Illinois. Owensboro Grain Co., Inc. (1); Owensboro, Kentucky. Perdue Incorporated (2); Salisbury, Maryland. Planters Manufacturing Co. (2); Clarksdale, Mississippi. Planters Oil Mill, Inc. (1); Rocky Mount, North Carolina. Quincy Soybean Co. (4); Quincy, Illinois. Ralston Purina Co. (8); Bloomington, Illinois; Lafayette, Indiana; Iowa Falls, Iowa; Louisville, Kentucky; St. Louis, Missouri; Raleigh, North Carolina; Memphis, Tennessee. Riceland Foods, Inc. (8); Helena, Arkansas; Stuttgart, Arkansas. Sherman Oil Mill (1); Fort Worth, Texas. Southern Soya Corp. (1); Estill, South Carolina. A.E. Staley Manufacturing Co. (8); Decatur, Illinois. Swift Edible Oil Co., Div. of Swift & Co. (1);

Chicago, Illinois; Townsend's Inc. (2); Millsboro, Delaware. West Tennessee Soya Mill, Inc. (1); Tiptonville, Tennessee.

Associate Members: Anderson Clayton Foods, Dallas, Texas. Best Foods Div. of CPC International Inc., Englewood Cliffs, New Jersey. Canadian Vegetable Oil Processing Co., Hamilton, Ontario, Canada. Capital City Products Co., Div. of Stokely-Van Camp, Inc., Columbus, Ohio. I.H. French & Co., Champaign, Illinois. General Mills, Inc., Minneapolis, Minnesota. Glidden-Durkee, Div. of SCM Corporation, Chicago, Illinois (Gerald J. Daleiden). Grain Processing Corp., Muscatine, Iowa (H.P. Woodstra). Hartsville Oil Mill, Hartsville, South Carolina (Richard A. Koppein). Humko Products, Memphis, Tennessee. Hunt-Wesson Foods, Inc., Fullerton, California. Kraft Foods Div. of Kraftco Corp., Chicago, Illinois. Lever Brothers Co., New York City, New York. Maple Leaf Mills Ltd., Toronto, Ontario, Canada (W.G. Milliken). Procter & Gamble Co., Cincinnati, Ohio. Quaker Oats Co. (The), Chicago, Illinois. Schouten International, Inc., Minneapolis, Minnesota. Southern Cotton Oil Co., New Orleans, Louisiana. Southern Feed Ingredients Co., Memphis, Tennessee. Wilsey Foods, Los Angeles, California.

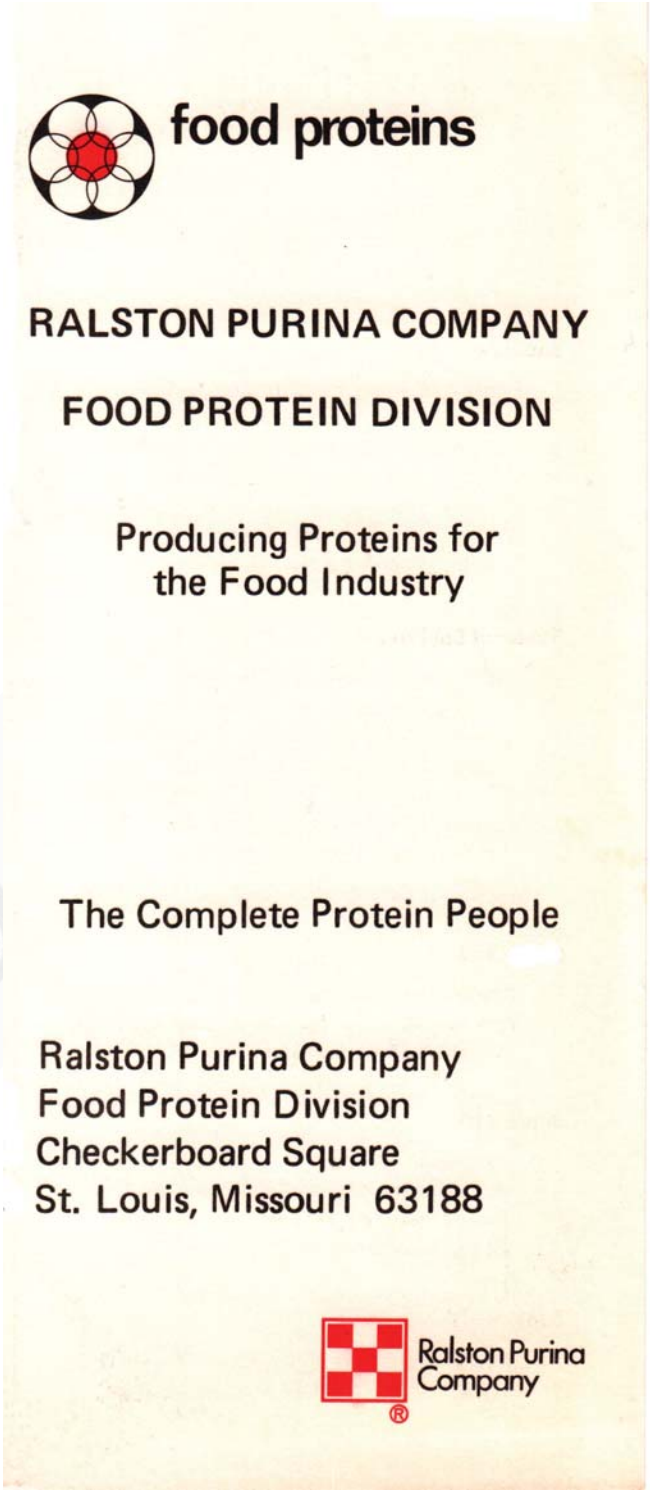
Standing committees: For each committee, the function of the committee, the names of all members (with the chairman designated), with the company and company address of each are given–Crop Improvement Council. Meal trading rules. Oil trading rules. Safety and insurance. Soybean Research Council. Technical. Traffic and transportation. Food Protein Council (Objective and rules adopted 3 March 1971, amended 5 Nov. 1971). Address: 1800 M St., N.W., Washington, DC 20036. Phone: (202) 452-8040.

363. Ralston Purina Co. 1975. Food proteins: Producing proteins for the food industry. The complete protein people (Leaflet). St. Louis, Missouri. 1 p. front and back. 2 panels on each side. Each panel 22 x 9.5 cm. Red, black and white,
• ***Summary:*** "Supro 50: 50% protein-high quality textured vegetable protein to be used as a texturizer, shrink controller, cost controller, extender and improver in many meat applications. Available in various particle sizes and colors. Meets FNS 219 standards. Retort stable product available also.

"Textured Edi-Pro 200: Structured, high quality protein isolate fibers (90% protein), available in frozen hydrated form (35% solids). Protein is retort stable without degradation of fiber. Texture and mouth feel similar to that of replaced protein source. Functions as a protein fortifier, texturizer, shrink controller, cost controller.

"Supro 350: Isolated soy protein, stable at acid pH's below 4.0. Ideal for use in acid puddings, imitation sour cream systems.

"Supro 610: Extremely bland soy protein isolate for use in instant breakfasts, health foods, puddings, frozen desserts.



Product acts as an emulsifier, thickener, water binder.

"Supro 610T: Supro 610 traced with TiO2 [titanium dioxide] for frankfurter, sausage, and emulsified meat applications.

"Supro 620: New soy protein isolate with increased gel strength, lower viscosity, higher dispersion.

"Supro 620T: New soy protein isolate with increased gel

RALSTON PURINA COMPANY FOOD PROTEIN DIVISION

Manufacturer of Ingredients for the Food Industry Specializing in Soy Proteins

Supro 50

50% protein-high quality textured vegetable protein to be used as a texturizer, shrink controller, cost controller, extender and improver in many meat applications. Available in various particle sizes and colors. Meets FNS 219 standards. Retort stable product available also.

Textured Edi-Pro 200

Structured, high quality protein isolate fibers (90% protein), available in frozen hydrated form (35% solids). Protein is retort stable without degradation of fiber. Texture and mouth feel similar to that of replaced protein source. Functions as a protein fortifier, texturizer, shrink controller, cost controller.

Supro 350

Isolated soy protein, stable at acid pH's below 4.0. Ideal for use in acid puddings, imitation sour cream systems.

Supro 610

Extremely bland soy protein isolate for use in instant breakfasts, health foods, puddings, frozen desserts. Product acts as an emulsifier, thickener, water binder.

Supro 610T

Supro 610 traced with TiO_2 for frankfurter, sausage, and emulsified meat applications.

Supro 620

New soy protein isolate with increased gel strength, lower viscosity, higher dispersion.

Supro 620T

New soy protein isolate with increased gel strength, lower viscosity, higher dispersion, and TiO_2 traced. Designed especially for emulsified meat applications.

Supro 700

Highly modified soy protein isolate specially processed to produce a high degree of solubility. Film forming and emulsifying properties - used in non-dairy coffee whiteners.

Supro 900

New experimental acid soluble soy protein isolate in a pH range from 2 to 7. Ideal for carbonated beverages, gelatin desserts, still beverages, dry beverage mixes and hard candies. Commercially available in late 1973.

Edi-Pro A

Isolated soy protein, pH 4.5 for protein enrichment of baby foods/geriatric foods and other retortable products. Must be enzyme inactivated.

Edi-Pro N

Isolated soy protein, pH 6.5 for protein enrichment of baby foods/geriatric foods and retortable products. Must be enzyme inactivated.

strength, lower viscosity, higher dispersion, and TiO2 traced. Designed especially for emulsified meat applications.

"Supro 700: Highly modified soy protein isolate specially processed to produce a high degree of solubility. Film forming and emulsifying properties–used in non-dairy coffee whiteners.

"Supro 900: New experimental acid soluble soy protein isolate in a pH range from 2 to 7. Ideal for carbonated beverages, gelatin desserts, still beverages, dry beverage mixes and hard candies. Commercially available in late 1973.

"Edi-Pro A: Isolated soy protein, pH 4.5 for protein enrichment of baby foods/geriatric foods and other retortable products. Must be enzyme inactivated.

"Edi-Pro N: Isolated soy protein, pH 6.5 for protein enrichment of baby foods/geriatric foods and retortable products. Must be enzyme inactivated." Address: St. Louis, Missouri.

364. Ralston Purina. 1975. Meatball (Ad). *Soybean Digest.* Nov. p. 3.

• ***Summary:*** This full-page color ad shows Ralston Purina's new flower-shaped logo for "Proteinability." Supro 620 soy isolate is a modified soy isolate "developed for use in meat products where water and fat binding properties are desired. 620 forms a firm resilient gel when thermally processed, imparting a meat like bite to emulsified meat products. It is high in nutrition and molecular weight. Supro 620 is bland which in most applications allows the meat flavor to dominate.

Supro 50 is textured vegetable protein [extruded textured soy flour]. "Supro 620 in combination with Supro 50 produces juicy patties that have a firm, meaty texture, and an excellent flavor and appearance."

This ad also appeared in *Food Product Development* (Feb. 1976, p. 33).

Note: This is the earliest document seen (Sept. 2020) that contains the word "proteinability." Address: Checkerboard Square, St. Louis, Missouri 63188. Phone: (314) 982-2393.

365. Schwartz, F.H. 1975. Valor nutritivo y usos de las proteínas aisladas de soya [Nutritive value and uses of isolated soy proteins]. In: American Soybean Assoc., ed. 1975. Memorias: Primera Conferencia Latinoamericana Sobre la Proteina de Soya. Mexico City. 232 p. See p. 63-69. [11 ref. Spa]
• ***Summary:*** Note: This is the earliest Spanish-language document seen (Dec. 2015) that uses the term *proteínas aisladas de soya* or *proteínas de soya aisladas* to refer to isolated soy protein. Address: Ralston Purina Co., St. Louis, Missouri.

366. *Soybean Digest.* 1975. Korean / German teams study soy protein [on U.S. tour]. Nov. p. 29.
• ***Summary:*** "A Korean Soy Protein Team recently visited the U.S. on a 16-day study tour to help acquaint them with the latest developments in using soy protein and oil in foods. The group studied the uses of soy protein products–textured soy protein, soy flour, meat analogues and dairy analogues–as a means of improving human diets. "'For centuries soybeans have been a major source of protein in the Korean diet,' said ASA Market Analyst Kyung Lee who accompanied the team. 'However, this consumption of soybeans has been through the traditional Oriental foods, which account for 70% of the total Korean soybean consumption.'

"Team members, Mrs. Jun Ryun Wang of the Korean Food Development Institute; Mr. Churl Woo Park, a government food policy official; and Mrs. Kyung Hwa Chun, a member of the Korean press, will relay information on new soy protein developments to the government, food industry and public.

"Their visit, which included stops in Minnesota, Illinois, New York, Missouri and California, was arranged by ASA in cooperation with the Foreign Agriculture Service. Places visited during the trip included: the department of food science at the Univ. of Minnesota; General Mills in Minneapolis, Minnesota; Central Soya, Chicago, Illinois; the Univ. of Illinois, Champaign; Nabisco International Co., New York; and Ralston Purina, St. Louis, Missouri.

"According to Dr. Lee, the demand for better diets including more protein can be met partially by the soy protein foods which have been developed in recent years.

"A team of country feed dealers from West Germany also visited Iowa and Nebraska during the month of September to update their knowledge of mixed feed production, grain elevator operation, livestock production and animal science research. The group of 23 spent time at the Story Cooperative at Story City, Iowa; the Don Newby hog operations in Bondurant, Iowa; the Livestock Exchange in Omaha, Nebraska; and at the Univ. of Nebraska in Lincoln.

"'In 1973, U.S. agricultural exports to West Germany amounted to $1.5 billion of which $570 million was for soybeans,' said Dr. Lee, who helped arrange the trip. 'These soybeans imported are consumed for livestock feed and in this respect, the role of country feed dealers in the soybean industry in Germany is very important,' he said."

367. Ralston Purina Co. 1975. Ralston Purina Company (News release). Checkerboard Square, St. Louis, MO 63188. 11 p. Dec.
• ***Summary:*** Contents: Introduction. Agricultural products and service. Research. Protein production and marketing. Consumer products. Food service and restaurants. International and Canadian operations. Ralston Purina and the future. New ventures. Corporate organization.

"Ralston Purina Company was founded in 1894 as the Robinson-Danforth Commission Company, St. Louis, Missouri." A broadly-based, protein-oriented food and feed company, it employs more than 50,000 people throughout the USA, Canada, and overseas. "The Company transacts more than $3,000 million of business annually and is known domestically and worldwide for its Checkerboard trademark products." Address: St. Louis, Missouri.

368. Giovanna, Jasper Di. 1975? My recollections of I.D. ["Ike"] Sinaiko and early history of Illinois Soy Products Co. Illinois? 22 p. Undated. Unpublished typescript.
• ***Summary:*** In early 1935 Jasper saw a news story in the newspaper in Springfield, Illinois, stating that a man from Madison, Wisconsin, named Isaac Sinaiko had purchased an old flour mill and warehouse located near The Springfield Stock Yards. It said that Mr. Sinaiko, together with certain associates, intended to install machinery and equipment and remodel the building to accommodate a soybean processing business.

The U.S. was still in the throes of the terrible 1929 to 1937 Depression. Jasper, who had only part-time work, was looking for a better job. At the time he was doing stenographic work, light bookkeeping, and other secretarial work. Through Mr. Rankin, superintendent of the Springfield Stock Yards, he got in touch with Ike Sinaiko–who called him to say that he would soon need a stenographer-clerk-bookkeeper. They met at Jasper's office in Springfield and Jasper began to send out letters to potential customers advising them of the new business; each contained samples of soybean meal and soybean cake.

The new company, named Illinois Soy Products Co., was incorporated under the laws of Delaware. Associated with Ike in the company were his father, Alex, and his brother, Joe. A little later an attorney, Carl Sorling, an attorney in Springfield, also joined. Carl had a very successful law firm,

apparently specializing in corporate law.

The president and managing of the company was I.D. Sinaiko. His father, Alex, still lived in Madison, Wisconsin, but come to Springfield often and spent time at the plant during construction and installation. Joe Sinaiko was Ike's elder brother. He also had a younger brother, Arlie, who was an eye, ear, nose, and throat doctor. Joe Sinaiko lived in Cedar Rapids, Iowa, where he ran the Iowa Milling Co., a soybean processing plant which he owned. "Joe Sinaiko was one of the first soybean processors in the State of Iowa and one of the earliest in the United States." In Madison, Wisconsin, the home of the Sinaiko family, the Sinaikos had operated a feed store and feed jobbing business. But, in the early days, Joe Sinaiko was the only family member who had experience with soybeans and soybean processing. In the early days Joe had also manufactured feeds, and at times soap. "In Iowa Joe had a large recognition and enjoyed a big following. He was lovingly referred to in certain circles as 'Iowa Joe.'"

While the plant was being remodeled and the machinery installed, Alex and Joe Sinaiko spent a great deal of time in Springfield. They guided the activity and worked closely with Ike. Since Ike had little real experience with soya processing, and Jasper had absolutely none, Joe spent much time patiently teaching them. They began to order booklets, circulars, and other information on soybeans from the University of Illinois Agricultural Experiment Station, the U.S. Department of Agriculture in Washington, DC, the National Soybean Processors Association, etc.

As the plant opening approached, Ike hired a traveling salesman, Matt Carrigan, to call on the trade and also to solicit soybean meal and cake business. The machinery being installed for soybean processing was made largely by the V.D. Anderson Co. of Cleveland, Ohio. Anderson's representative in the Illinois area, John Lundberg, contributed his experience and knowledge. The original machinery included three "Duo Expellers," which each crushed or pressed 350 bushels of soybeans per day, for a total of 1,050 bushels/day.

In 1935 the soybean industry in the USA was in its infancy. Most of the soybeans were yellow, but some black or brown soybeans were grown for hay. The latter were considered inferior for processing since they contained 1-2% less oil and because the dark skins discolored the yellowish soybean meal. "Some buyers seeing the dark specks got the idea that the meal had been adulterated."

The Sinaiko's hired James Schlesinger to be plant superintendent. His son-in-law, Gordon Cruikshank, who worked for the C&IM Railway Co., gave Ike and Jasper much valuable help concerning rates and the use of "Milling in Transit" billing of soybean meal. Much money was involved in proper application of "transit billing" and rates.

"In the fall of 1935 processing started at the Illinois Soy Products Company. Prices for soybeans were between 50¢ and 60¢ per bushel. I believe our starting base wage rate for laborers was 25¢ per hour and for skilled men up to 45¢ per hour. 'Skilled' men would be maintenance men, millwright, and expeller operators.

"I soon learned that Ike Sinaiko was a man of high character, soft-spoken, keen of mind and with a friendly disposition. He was a charitable and also religious man. He quickly made friends in business circles and also in personal activities. He became active in his church. Also, Ike's wife Ruth was very well liked and made friends readily... He was well liked by his 'peers' in the Soybean Industry.

"Inasmuch as the soybean industry was very young at the time, a good deal of effort was needed to induce farmers to plant more soybeans. We had also to disseminate information to buyers of Soybean Meal as to how to feed successfully the soybean meal to cattle, hogs, chickens, turkeys etc." (p. 5)

Ike started a plan of trading soybean meal for soybeans on a pound for pound basis. This appealed to soybean growers and helped the company, which was profitable for two or three years. However when oil prices began to increase relative to meal prices the practice was discontinued.

"I learned a lot from Ike because of the gentle way he responded to angry shippers who were disturbed by grade discounts. Ike had a pleasing manner with customers and potential customers. He was always generous, but not overly so."

"Ike had a wonderful way with children. He was very democratic with employees and soon earned their friendship and respect." A long story follows of how he helped Albert Cresswell and his family (p. 6).

Both Ike and Joe were very wise and skillful in capitalizing on the movement of markets. They had a knack of buying and selling at the right time. Ike illustrated this many times to the profit of Illinois Soy Products Co.–which was a success right from the first year. Another factor was the expanding livestock and poultry industries; demand for soybean meal in feeds was greater than the supply.

The soybean meal made by the company was sold under the brand name of "Illini," a good choice for a processor located in Illinois. "Although the Illinois Soy Products Company was the only soya processing plant in Springfield there were 3 large competitors in Decatur, Illinois: A.E. Staley Mfg. Company, Archer Daniels Midland Company, and the Shellabarger Soybean Processing Company. Allied Mills was located at Taylorville, Illinois just 26 miles away. Funk Brothers Seed Company had a soybean plant at Bloomington, Illinois. Ralston Purina Company operated at St. Louis, Missouri; Glidden in Chicago. There was also a plant in Quincy, Illinois, but I have forgotten the owners of that plant. Ike soon became on good terms with the operators of those plants and they sometimes loaned us machinery parts and gave us information regarding what to do about

problems. Of course, Joe Sinaiko was daily in touch with Ike and was extremely helpful with machinery, loan of personnel, and when needed loans of money. Ike had great respect for Joe and also Love."

The company soon began to expand, adding several larger Anderson expellers. Ike and Ruth built a new, beautiful and spacious house in southwest Springfield, adjacent to Washington Park. Ike began to travel more, both on business and for pleasure. He took his family to Israel, Europe, and Havana, Cuba–leaving Jasper in charge. Ike suffered from asthma, and all the dust around the soybean plant made it difficult for him to breathe properly. He cleared his throat frequently, and occasionally hinted that he would like to get away from the Illinois humidity. Continued.

369. Giovanna, Jasper Di. 1975? My recollections of I.D. ["Ike"] and early history of Illinois Soy Products Co. (Continued). Illinois? 22 p. Undated. Unpublished typescript. • ***Summary:*** Continued: At Joe's suggestion, Ike entered the Illinois Soy Products Co. into membership with the National Soybean Processors Association. He even served on some Association committees. The secretary or president of NSPA at the time was Edward J. Dies, an author of agricultural or Wall Street subjects. He wrote several books about soybeans.

In about 1937 Ike had some meetings with a representative of a German company that designed and built solvent extraction plants for soybeans. At that time most of the industry capacity was of the expeller type (or hydraulic in the southern U.S.). A number of larger companies, including ADM in Decatur, were looking at solvent extraction plants. Eventually, after serious consideration, Ike decided against such a plant, apparently for three reasons: (1) He wanted to move to a better climate; (2) Extraction plants required considerable water and sewage usage, neither of which were easily obtainable at the plant site; (3) These plants were very expensive.

Ruth Sinaiko's maiden name was Grebler. Her parents moved from Wisconsin to Springfield to be near Ruth and Ike and for new business opportunities. This made everyone happy. Ike and Ruth adopted a baby girl. "They named her Jean and gave her all their love."

As time passed, the acreage planted to soybeans in the U.S., including Illinois, increased. The country began to come out of the Depression. Irving Rosen, a brother-in-law of Ike's, together with Joe and Alex Sinaiko, bought the soybean plant at Quincy. Max Albert, another brother-in-law, also with Joe Sinaiko's help, bought property at Galesburg, Illinois and made plans for a soybean processing plant.

These plants became successful and this made Ike happy. There were good relations between the various families and many get-togethers. Frequently Ike would take Jasper to these get-togethers. "They all treated me very affectionately. Joe and Ike would advise me of the virtues of working hard and of being honest and of keeping good morals and character. This impressed me very much and had much to do with how I handled myself."

"During this time, along with the rapid expansion of the livestock and poultry feeding there was a big jump in volume of pet food business, especially the dog food business. There was a growing acceptance of dry dog food which was relatively new in pet feeding. Soybean products were widely used in the manufacture or formulation of 'dry' dog food. Ike got the idea to make a Soya Pea-Sized Cake for use in Dog Food. This product was obtained by a screening process of the Soybean Cake after it left the Cake Crusher in our process. The Pea-Sized Cake was accepted and became a permanent part of the business of the Illinois Soy Products Company."

Ike also made a mixture of molasses with soybean cake for feeding cattle. Then he ordered and installed a "pellet machine" and made "Soybean Meal Pellets" for about a year. But neither of the two products was successful. Note: This is the earliest English-language document seen (June 2018) that contains the term "Soybean Meal Pellets" (regardless of capitalization).

Discusses Hitler's 1938 rise to power in Germany, his oppression of Jews, and the family of Eric Nadel of Hamburg. Eric and his wife came to Springfield and Ike hired him to work in the office. He also later helped Otto Langfelder.

Joe and Ike decided to start a soybean plant in Decatur, Illinois, because of the favorable freight rates and "milling in transit" privileges. Also large amounts of soybeans were grown in the surrounding area. They purchased the vacant Hight Elevator, an old concrete elevator situated on the I.C. railroad in an industrial area, and started Decatur Soy Products Co. It began production at harvest time in 1939. ADM's new solvent extraction plant was not ready until shortly afterwards.

When Germany invaded Poland and Britain [sic], and World War II began, the commodity markets exploded. The war helped the soybean industry to grow, and most processors thrived. Decatur Soy Products was a financial success its first year.

During the 1930s, the U.S. was a net importer of fats and oils. Most of the imports came from Southeast Asia. After the Japanese bombed Pearl Harbor, these imports stopped. The U.S. government took emergency action to increase our supply of oils and fats by a big increase in the planting of soybeans and other oilseeds. Their program included control of the soybean processing industry by the U.S. Commodity Credit Corporation (CCC). After many meetings, a plan was developed which put all soybean processors under contract with CCC. This contract fixed the profit margins of the processors, and controlled the prices processors could pay for soybeans or charge for products. Ike played a role in these negotiations and his views were respected. The profit margin was good and processors, with

few exceptions, prospered. Through these meetings and related NSPA meetings Ike became well acquainted with the leaders of the Industry as well as the CCC and he attended many of the meetings where decisions were made. A few of these people were Soybean Johnson of Purina, Gene Funk of Funk Brothers Seed Company, Ed. Sheiter of A.E. Staley Mfg. Company, Dwayne Andreas of Honeymead Products, Ralph Goldseth of the Glidden Company, Clive Marshall of Allied Mills, Hank Lloyd of U.S. CCC, Ed Dies of the N.S.P.A. Mr. Shellabarger of The Shellabarger Soybean Processing Company."

The War created a major expansion in the livestock and poultry industries, and also in the usage of fats and oils, not only in the U.S. but in countries allied with us. Therefore soybean acreage grew rapidly and processing capacity grew with it. Yes despite this expanded capacity, demand for products was greater than supply. Because of the mushrooming demand for feeds, the availability of formula feeds was limited by the feed company's ability to buy proteins. Soybeans had become the single largest U.S. source of protein for the feed makers. Some processing firms began to hold back on selling proteins to the trade so they could increase their production of feeds, and some even used this advantage to enter the formula feed business. The feed firms that found their protein supplies completely or partially cut off were desperate to obtain supplies. Most of the processors, including Illinois Soy Products Co. and Decatur Soy Products Co. started allocation systems based on the previous year's usage. New customers could only be given an allocation as the processor's production expanded.

The leading U.S. grain company and exporter of grains, the Cargill Co., had recently entered the formula feed business. Since Cargill was not a soybean processor and found it difficult to buy enough soybean meal, Cargill decided to buy a going soybean processing business. Joe and Ike often visited and spoke with Julius Hendel of Cargill as well as some others prominent in Cargill's managing team, and Cargill's desire for a soybean plant was conveyed to Ike or Joe. After some preliminary talks, a deal was made for Cargill's purchase of the Illinois Soy Products Company. [in early 1944] The price paid was generous and afforded Ike and the other stockholders a very good capital gain. Cargill agreed to keep Eric Nadel and the other personnel on to help run their new acquisition.

"Following the sale of Illinois Soy Products Company, Ike made plans for moving his family and home to Los Angeles, California.

"Ike did not intend to retire. He scouted around in California for a business to buy or get into. There was an expeller-type soybean plant in Norwalk, California that was owned by The Glidden Company and which was closed-down. It had not operated for a while. Ike and Joe decided they could make a go of this business and they formed The Liberty Vegetable Oil Company, following purchase of the closed plant

"In the beginning Ike processed mostly soybeans and flax at The Liberty Vegetable Oil Company, but as time when along he learned to crush profitably such oil bearing seeds as safflower, copra, and off-grade walnuts ant other nuts which were in good supply in Southern California. Later, he put in a small scale refinery and produced refined oils for the cosmetic trade... This business was a success for Ike from the first year, though it took a good deal of doing on Ike's part."

370. *USDA Farmer Cooperative Service. FCS Research Report.* 1976. Appendix–Companies producing and distributing soy products. No. 33. p. 53-82. Jan. Edible Soy Protein: Operational Aspects of Producing and Marketing. [60 ref]

• ***Summary:*** Part I. "Companies producing and/or distributing under private label brands of textured vegetable protein products that meet the requirements of FNS Notice 219." (Note: FNS is USDA's Food & Nutrition Service). Lists every known company making such products (as of Sept. 1974), with the company address and the full name of each product. The following companies and brands are listed; (D) = Distributors: Allen Foods (D) Lasco; Archer Daniels Midland Co. TVP; Biggers Bros. (D) Farmbest Promate; Cargill Inc. Textratein; Central Soya Co. Inc. Promosoy, Centex; Continental Coffee Co. (D) Continental; Continental Organization of Distributor Enterprises, Inc. (D) Code Fortified; Embassy Grocery Corp. (D) Lucky Boy Pro-Tenda; Far-Mar-Co, Inc. Ultra-Soy; Federated Foods, Inc. (D) Parade Promate; First Spice Mixing Co., Inc. (D) Texite; Frozen Food Forum, Inc. (D) Frosty Acres; Galanides, Inc. (D) Galanides; General Mills, Inc. Bontrae (Frozen Hydrated or Dehydrated); Griffith Laboratories Griffith's GL-219, Promate, GSVP, GSPC; B. Heller & Co. (D) Heller's; Hollymatic Corp. (D) Hollymatic; Institutional Wholesalers, Inc. (D) Saxony; Lauhoff Grain Co., Inc. Vita-Pro; Marshall Produce Co. (D) Marshall; Miles Laboratories Maxten, Temptein; Nabisco, Inc. VMR I or II; National Institutional Food Distributor Associates, Inc. (D) NIFDA Promate; National Protein Corp. Textrasoy; National School-Pak (D) Promate; Nugget Distributors, Inc. (D) Nugget Promate, Nugget Magi-Pro; Oppenheimer Casing Co. (D) Textured Oppenheimer Pro; Portland Wholesale Grocery Co. (D) Preferred Stock; Ralcon Foods SPF-200; Ralston Purina Co. SUPRO; S.E. Rykoff & Co. (D) S.E.R.; John Sexton & Co. (D) Sexton Protein Plus; A.E. Staley Mfg. Co. Food Service Div. Nutra-Mate; A.E. Staley Mfg. Co. Mira-Tex; Swift Edible Oil Co. Swift's Texgran, SFP-TA, Burger-Aide I; Sysco Corp. (D) Sysco and Sysco Promate.

New additions to the list: Custom Food Products, Inc. (D) CFP; Miles Labs. Pro-Lean; Industrial Grain Products Ltd. Perplus; General Spice, Inc. Sotex.

Part II (p. 70-81). "Companies producing and/or distributing under private label acceptable textured vegetable

protein product mixes." Alberto-Culver Co. Milani; Bernard Food Industries, Inc. Tex-Pro; Biggers Brothers Inc. Farmbest; Continental Organization of Distributor Enterprises CODE; Federated Foods, Inc. Red & White or Parade; Kraft Foods. Kraft School Lunch Chili Mix & Textured Vegetable Protein. Kraft School Lunch Sloppy Joe Mix & Textured Vegetable Protein. Footnote: The textured vegetable protein component of the Kraft mixes is Promate #500-SL or Promate #100-SL manufactured by Griffith Labs. Lawry's Foods, Inc. Stretch; Milwaukee Seasoning Laboratories, Inc. MSL TVP, Flavormate; National Institutional Food Distributor Associates, Inc. NIFDA; National School Pak; North American Laboratory Co., Inc. Magic Menu; Nugget Distributors, Inc. Nugget; Sysco; Williams Foods, Inc. Williams Expand; The Golden Dipt Co. Golden Dipt/DCA.

Note: The above product mixes are used in the Type A school lunch. Typical mixes are for chili mix, meat loaf or meatballs, patty mix, pizza sauce, sloppy joe, spaghetti sauce, or taco filling. The name of the manufacturer of the textured soy protein ingredient is given for each. Address: Farmer Cooperative Service.

371. Flier, Ronald J. Assignor to Ralston Purina Company, Inc. (St. Louis, Missouri). 1976. Protein product and method for forming same. *U.S. Patent* 3,940,495. Feb. 24. 10 p. Application filed 17 Jan. 1973. [5 ref]
• ***Summary:*** "Related U.S. Application Data: Continuation of Serial Number 600,471, Dec. 9, 1966, abandoned, which is a continuation-in-part of Serial Number 381,853, July 10, 1964, abandoned."

"Abstract: A method of producing an expanded product which resembles meat, directly from soybean meal itself, including the steps of utilizing soybean meal that has substantially all the fat removed to an amount of about 5% or less, and preferably 2% or less, moistening the soybean meal such as mixing the soybean meal with water to obtain a moisture content of about 20%-40% by weight, controlling the pH within the range of 5 to 12, preferably 6 to 9, preferably adding an edible pH altering electrolyte while maintaining the controlled pH, and then simultaneously, mechanically working, heating above 212ºF, and pressurizing the moistened soybean meal in an extruder chamber sufficiently to cause continuous conversion of the meal to a flowable substance, and forcing the substance through and out of restricted orifice means to expand it into a lattice network structure having resilience, body strength, and appearance approaching that of meat. 52 claims, 1 drawing figure."

Note 1. "Abandoned" means that the patent examiner probably gave the inventor a hard time on the patent application so that the inventor abandoned all or part of it.

Note 2. At the time this patent was issued, there was another rather similar U.S. patent (No. 3,488,770) that had been issued to William Atkinson of ADM on 6 Jan. 1970. The Atkinson patent, between 1970 and 1976, and played a major role in making TVP a very widely used product in the USA. However after the Flier patent was issued, a lawsuit and trial determined that the Flier patent dominated the Atkinson patent largely because it could be traced back to 1964. For more details, see the interview with Ed Meyer on 10 May 1993.

Note 3. On 6 Sept. 1989 the United States District Court–Central District of Illinois ruled in a case of Ralston Purina vs. A.E. Staley that patent No. 3,940,495 (the Flier patent) "is held to be unenforceable by virtue of inequitable conduct." Address: Ladue, Missouri.

372. *Food Engineering.* 1976. Soy isolate replaces casein: First use is in coffee whitener. 48(4):41. April.
• ***Summary:*** Supro 710, is a new soy protein isolate, made by Ralston Purina Co., St. Louis, Missouri. It can be used to replace casein or caseinate, especially in coffee whiteners.

373. Garino, David P. 1976. Foreign demand for soy protein is seen tied more to economics than nutrition. *Wall Street Journal.* May 17. p. 28 (East). Or West Coast ed. p. 22.
• ***Summary:*** "Foreign countries are developing quite an appetite for soy protein."

A shortage of meat in Poland has led the government to decree that Polish sausage and other meats contain soy protein.

International demand for soy protein is growing faster than U.S. demand say experts in the field.

Although soy protein is being used in an ever increasing number of foods, its main use continues to be as a meat extender and substitute, largely for economic rather than nutritional reasons. It generally takes 2-2½ lb of feed to produce one lb of chicken (live weight), 3½-4 lb of feed for one lb of pork, and 4-5 pounds of feed for one pound of beef–all live weight. So when feed prices rise, as they have in recent years, meat production becomes more costly and soy protein extenders look more attractive. Sales of soy protein isolates climbed 60% last year, following a gain of about 40% in 1974 according to Ralston Purina. In 1976 sales of textured soy flour in Europe are growing at 15-20% a year. West Germany doesn't permit use of soy protein in meat.

The percentage of disposable income spent on food is 18% in the USA, 25% in Western Europe, more than 25% in Eastern Europe, and about 40% in developing countries. Address: Staff Reporter.

374. Ralston Purina Co. 1976. Proteinability–we worked a long, long time before we gained it (Ad). *Soybean Digest.* May. p. 2.
• ***Summary:*** In this full-page color ad, the "Proteinability" logo is like a sunflower with 6 round petals. "Protein

knowledge doesn't come easy. It takes years of search and study. And its takes commitment. We committed ourselves. Then we chased every protein rainbow on nature's horizon. After we learned from nature we developed our own technology. Our purpose–to supply the world's food industry with the highest quality, most economical protein products possible." Contact Ralston Purina Co. in St. Louis, Missouri, or Purina Protein Europe in Brussels, Belgium. "Proteinability–we're the first source."

375. *Food Processing* (*Chicago*). 1976. New food plants: Construction engineering trends [Isolated soy proteins; Ralston Purina Co.]. June. p. 28.
• ***Summary:*** On a 100-acre site in Pryor, Oklahoma, Ralston Purina Co., is building a plant to make isolated soy proteins. An illustration shows the plant, which is designed using a phase concept to allow future expansion. Using slipform concrete construction, the first phase of the highly automated is expected to be finished this fall.

376. **Product Name:** [Fujipur SP-90 (Spun Soy Protein Fibers)].
Foreign Name: Fujipur SP-90.
Manufacturer's Name: Fuji Purina Protein Ltd. Subsidiary of Fuji Oil Co. and Ralston Purina.
Manufacturer's Address: Sumiyoshi-cho 1, Izumisano, Osaka, Japan. Offices: Time Building, 9th floor, Kanda Suda-cho 1-28-2, Chiyoda-ku, Tokyo.
Date of Introduction: 1976 June.
New Product–Documentation: *Soybean Digest Blue Book.* 1976. p. 48.

377. **Product Name:** Supro 350, Supro 610T, Supro 620, Supro 620T, Supro 710, Edi-Pro A, Edi-Pro N (Isolated Soy Protein). Renamed PP620 and PP710 by Nov. 1987.
Manufacturer's Name: Ralston Purina Co. Protein Div.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1976 June.
New Product–Documentation: *Soybean Digest Blue Book.* 1976. p. 48.

378. Boyer, Robert A. 1976. Early history of the plant protein industry. *Cereal Foods World* 21(7):297-98. July.
• ***Summary:*** "Shortly after the turn of this century, there appeared on the American scene one of the first examples of a food product based on a processed plant protein. Dr. John Harvey Kellogg, in an effort to add more vegetable protein foods to the menu of his famed Battle Creek Sanitarium [in Michigan], developed a method for producing wheat gluten from ground wheat and converting it into an attractive entree resembling a cut of meat."

Yet long before, people of the Orient have obtained a major portion of their protein from bean curd or tofu. There follows a good history of modern soy protein development from 1930 to the present. In the "late 1950s, the first edible soy protein plant went on stream in Chicago [Illinois, where Central Soya made Promine]. This was followed a few years later at another edible plant in Louisville, Kentucky [owned by Ralston Purina Co.]. Soon products began appearing on the marketplace listing 'soy protein' or 'vegetable protein' in their ingredient lists... This triggered a rapid growth in the plant protein industry starting in the mid-1960s... To summarize, it can be said that the first 65 years were the hardest for this new industry, but after that the progress was irresistible. Nothing is as powerful as an idea whose time has come."

A portrait photo shows Boyer, who "attended the Edison Institute of Technology before serving as Manager of the Soybean and Chemurgic Laboratory, Ford Motor Co. from 1931 to 1943. He spent the next six years as Director of Research for Drackett Co. Boyer worked as a Protein Consultant for the next 13 years with such companies as Swift and Co., Unilever Ltd., Worthington Foods Inc., Nabisco, General Mills and Ralston Purina. In 1962 he joined Ralston Purina as Protein Scientist. He served in this capacity until his retirement in 1971, at which time he assumed his present position." Address: Protein Consultant, Miles Laboratories, Inc., Elkhart, Indiana, 46514.

379. **Product Name:** Supro HD-90 (Isolated Soy Protein).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1976 July.
New Product–Documentation: General Product Description. 1976. July 1. "Supro HD-90 Soy Protein Isolate: General Product Description. This one-sided leaflet gives physical properties, microbiological data, packaging, amino acid composition. Typical [nutritional] analysis.

"SUPRO HD-90 is a specially processed soy protein isolate that has a high molecular weight and excellent nutritional properties. It is processed to provide a high density, powdered soy isolate. Bland in flavor, SUPRO HD-90 is designed for use as a nutritional enhancer of foods, particularly dietary and health foods."

380. Shen, Jerome L. 1976. Solubility profile, intrinsic viscosity, and optical rotation studies of acid precipitated soy protein and of commercial soy isolate. *J. of Agricultural and Food Chemistry* 24(4):784-88. July/Aug. [21 ref]
• ***Summary:*** The data of this experiment support three conclusions: "(1) A single solubility measurement at a given pH and ionic strength, such as the nitrogen solubility index, is insufficient to characterize the solubility of an isolate. (2) Some soy proteins are insolubilized by acid precipitation. Additional proteins are insolubilized by commercial processing. Dialysis prior to acid precipitation,

however, prevents these insolubilization reactions. (3) Loss of solubility cannot be used as the sole criterion of soy protein denaturation, since some reactions at pH 12 treatment that denature the proteins actually increase the solubility." Address: Ralston Purina Co., St. Louis, Missouri 63188.

381. Smith, Bill. 1976. Ralston Purina's farm business mushrooming: especially near Princeton. *Journal Star* (*Peoria, Illinois*). Sept. 8. p. A-10.
• ***Summary:*** Ralston is building a huge mushroom farm inside an above-ground building. This is the fourth such operation built or purchased by the company in the last five years. It will make Ralston Purina the biggest producer of mushrooms in the United States. The first mushrooms are expected to be on area dinner tables by late November. The farm is expected to employ about 300 people when things are in full swing and production is expected to reach 225,000 pounds a week.

Until recent years, most mushrooms in the USA were grown in old limestone caves, largely in Pennsylvania.

Photos show: (1) The steel skeleton of the building as it rises. (2) George Tykol, plant manager. (3) James Elliott, general manager.

Northern Regional Research Center: Notes from the director: 1978. April 7. Three staff members "visited Ralston-Purina's above-ground mushroom farm near Princeton, Illinois. This facility was opened November 1976 and produced 12 million pounds of mushrooms in 1977. Their process consists of composting horse bedding straw (obtained from Chicago racetracks) plus various protein amendments. Following the composting phase, the material is pasteurized with steam and inoculated with *Agaricus bisporus* spawn. After a short period of vegetative growth, a peat moss-lime 'casing' layer is placed on top of the compost trays to promote formation of the familiar edible mushroom."

382. Schapiro, Abraham. 1976. Preparation of water dispersible protein products. *U.S. Patent* 3,988,511. Oct. 26. 10 p. Application filed 2 Jan. 1974. [7 ref]
• ***Summary:*** Lecithin makes various protein products, such as soy proteins, dispersible. Mentions applications involving Central Soya's Promine D and Promine F, and Ralston Purina's Isolate No. 610 and 620. Address: P.O. Box 548, Kentfield, California 94904.

383. Edwards, A. Christopher. 1976. Isolated soy proteins–Functions and applications. In: Archer Daniels Midland Co., comp. 1976. Edible Soy Protein Seminar. Decatur, Illinois. 220 p. See p. 201-07. Held at Moscow, USSR and Warsaw, Poland.
• ***Summary:*** This paper begins (p. 204): "It has been established that pH, structure, solubility, ionic strength and temperature have an effect on the functional properties of the protein. Since food systems can vary in pH, are submitted to heat treatment, salt is added and various other processes are carried out, it is necessary to know how these conditions will affect the functionality of isolated soy proteins.

"I will elaborate on these principles by choosing an application from the meat industry. The incorporation of soy isolates in comminuted meat products compliments the meat binding proteins in their function as water and fat stabilizers, emulsifiers and heat coagulants.

"In processed meats, it is general practice to use low quality meats, having low levels of 'binding proteins.' The water binding and fat emulsification capacity is consequently limited. Furthermore, these remain degenerate on heat processing, whereby the binding properties are further diminished.

"Certain specific soy isolates are known to be able to emulsify and stabilize larger quantities of fat and water than meat proteins, and to form a rigid gel at concentrations above 10%, without loss of any of their binding characteristics. Furthermore, these remain stable through the heat processing steps.

"A practical illustration is the incorporation of soy protein:water:fat emulsion, having a 1:5:5 ratio. This emulsion is stable at room temperature, after retorting and cooking or frying..." Address: Managing Director, Purina Protein Europe S.A., Brussels, Belgium.

384. Koch, Carol. 1976. USSR, Polish seminars foundation for future contracts. *Soybean Digest.* Nov. p. 19.
• ***Summary:*** "'Edible soy protein seminars being conducted in Poland and the USSR are just the foundation on which we hope to build a future for soybean market development in these countries,' according to Dennis Blankenship, ASA director of market development.

"Conducted in late October, Blankenship remarked that these seminars marked the first time American industry could deal directly with prospective Soviet and East European customers on the topic of soy protein foods as a means of meeting world food needs. The seminars were jointly sponsored by ASA, the Food Protein Council and the Foreign Agricultural Service.

"Drawing together expert technicians in the production and application of various soy protein products, the seminars briefed government and institutional feeding officials on the uses soy could have in their nutritional programs. Delegates came from the USSR, Hungary, Poland, Romania, Yugoslavia, East Germany, Czechoslovakia and Bulgaria.

"Among, the speakers at the seminars was Richard Burket, Archer Daniels Midland. According to Burket, 'As an industry, the edible soy protein industry is rather young.' But as a food product, it finds uses ranging 'from basic [soy] flour to the textured products and are used in everything from bakery products to meat and dairy products.' It looks to be a growing market on an international basis, he contends, because soy protein provides an economic protein source

that is versatile. It's biggest boost came from the U.S. Government when it's use was approved in school lunch programs thus opening the door to the growing institutional feeding market.

"One portion of the seminar discussed the nutritional aspects of soy protein products; the general manufacturing process plus composition, function and nutritional properties of soy flour and grits; textured soy protein products, and soy concentrates and isolates. Speaking to these topics, respectively, were Dr. Irvin E. Liener, Univ. of Minnesota; Dr. Donald Quass, Dawson Mills, Minnesota; Dr. Bernard Link, Cargill Inc., Minnesota; Dr. L.D. Williams, Central Soya Co., Illinois.

"The second part of each seminar covered the various applications of soy ranging from consumer applications to bakery, meat and whipping applications plus a look at developments that may take place in the future. Chris Edwards, Ralston Purina S.A., Belgium, opened the discussion of soy applications and was followed by Robert Bartz, Nabisco Protein Foods, New Jersey; Dr. Morton S. Cole, Archer Daniels Midland, Illinois; William Readdy, Griffith Laboratories, Illinois; Jaap Van Son, A.E. Staley, The Netherlands; and Sheldon J. Hauck, Food Protein Council, Washington, D.C.

"Addressing both seminars on the future soybean supply prospects and technology available to U.S. soybean farmers were Dick Falb, ASA, and Gerald Michaelson, ASA president from Dawson, Minnesota.

Keynoting the Moscow meeting was U.S. Assistant Secretary of Agriculture Richard Bell, and U.S. Ambassador Richard T. Davies opened the Warsaw conference.

"A special 1-day seminar on soybean meal utilization followed the USSR meeting.

"Following an introduction to participants by Alan Trick, ag attache, Dick Falb, ASA, provided an overview of U.S. soybean production. Then the conferees were given the technical information for application of soybean meal in their livestock and poultry rations.

"Dr. Keith Smith, ASA animal nutritionist, discussed the production, composition and utilization of soybean meal; and Dr. Park Waldroup, Univ. of Arkansas, delineated current trends in amino acid nutrition.

"Dr. Vaughn Speer, Iowa State Univ., addressed the use of soybean meal and amino acid requirements for pregnancy and lactation in swine. Closing out this special conference was W.W. Cravens, Central Soya, discussing soybean meal usage in U.S. feed.

"With favorable reception of these seminars, both from the soy for human nutrition standpoint and for livestock rations, Blankenship says ASA hopes to be able to expand communication channels between the U.S. and these countries."

385. Ralston Purina. 1976. We were on nature's trail for a long, long time before we branched out on our own (Ad). *Soybean Digest.* Nov. p. 39.
• ***Summary:*** "Long before protein became the "magic food supplement" we were studying everything about protein nature would release. After we learned from nature, we branched out on our own. Our purpose–to develop protein systems that would be functional, nutritional, and economical.

"Result... Ralston Purina has become the number one source of *Proteinability* in the world, more totally engaged in the development of food protein ingredients–soy isolates, textured vegetable proteins and dairy blends–than any other company."

Purina Protein Europe is located at 391 Avenue Louise, 1050 Brussels, Belgium.

386. *Dun's Review.* 1976. The five best-managed companies: Ralston Purina's protean growth. 108(6):39, 48-50. Dec.
• ***Summary:*** "Besides being the world's largest producer of animal feed and pet food, Ralston Purina is also a leader in protein production and nutrition research, which have vast implications for the company's future." Chairman Hal Dean (for Robert Halladay Dean) notes: "'We are still a broadly based agricultural company. Our basics haven't changed. But the growth we see is in other areas... Call us a nutrition company..." Over the past 5 years the company's earnings have more than doubled. It was the increases in such high-margin consumer operations as cereals, tuna, pet foods, and restaurants (Jack-in-the-Box) that contributed most to the profits. The 900-unit Jack-in-the Box chain, which serves burgers and tacos, is America's third largest fast-food operation–after McDonald's and Burger King. Since Ralston acquired the chain in 1968, sales have nearly tripled to $350 million. The company "today gets about half its operating profits from consumer products. It markets such familiar foods as Chex, Ralston and Freakies cereals as well as Ry-Krisp, and it holds the top position in pet foods (Purina dog and cat chows, Chuck Wagon, Tender Vittles, Lovin' Spoonfuls) with an estimated 35% of the market. It also processes Chicken of the Sea and Van Camp tuna, which serves as a hedge against the decline in demand for meat protein and animal feed."

The company crushes more than 50 million bushels of soybeans a year. "In protein technology, Ralston Purina is a leader in soy isolates, which are used as food additives. The company has already developed nine soy protein isolates containing a minimum of 90% protein, which are marketed to food manufacturers as binders, emulsifiers and enhancers of color and texture in a wide variety of foods. It is the only company to develop successfully a soy isolate for nondairy creamers."

Ralston Purina dominates the soy isolate business, which seems to gave a very bright future. The company "currently produces about 75 million pounds of soy isolates from three

plants (a fourth is being built). The venture represents less than 1% of sales and has only just begun to turn a profit. But Dean is convinced that as more food processors recognize the 'functionality' of soy isolates as food enhancers, the business will become a key element in Ralston Purina's future growth. Analysts estimate that by 1980 the company's soy-protein sales could reach $200 million and contribute 10% of company profits."

387. Banton, O.T. ed. 1976. History of Macon County [Illinois], 1976. Decatur, Illinois: Macon County Historical Society. iv + 555 p. See p. 135-36, 223-25. Illust. Index. 23 cm.

• ***Summary:*** Pages 135-36: "One of the biggest shifts in farming operations in Macon and other central Illinois counties came with the start-up, on Sept. 30, 1922 by the A.E. Staley Mfg. Co., of one of the first commercial soybean processing facilities in America. Augustus E. Staley. Sr., who for more than 10 years had been convinced that soybean production and processing could become a profitable operation, took a gamble on the venture with his bean plant and started urging farmers of the region to increase their soybean acreage. More than 32,000 acres of beans were raised in Central Illinois in 1922, but prior to that their uses had been limited. The Staley plant produced soybean oil, for which there was a market, and soybean meal, which was far better livestock feed than the whole beans had been. For the first few years the Staley bean plant failed to make a profit, but that soon changed and the plant has been enlarged several times. Bean acreage likewise has expanded almost explosively, until beans have joined corn as a leading farm crop.

"In 1925 Macon County farmers harvested 2,300 acres of beans. By 1935 this had increased to 83,000 acres, yielding 21 bushels per acre, with the crop valued at $1,185,000. By 1965, some 108,600 acres were harvested, with a yield of 32 bushels per acre. Value of the crop was $8,814,000. Acreage has continued to increase, and the 1975 record crop was valued at $25,093,000; the average yield was 39 bushels per acre. Yields of both beans and corn have been materially increased in recent years by farmers cutting down the space between rows–from 40 to 30 inches, which made possible the growing of many more plants per acre. The reason for the earlier 40-inch rows was that 40 inches was needed for a horse to walk between the rows at cultivating time.

"Government support programs, introduced in 1933 to protect farmers against ruinous prices in years of heavy crop yields and make farm income less susceptible to whims of the weather, have been up and down in the last 10 years. During the time of grain surpluses, acreage controls were on wheat and corn. These controls were removed in 1974, and holding acreage out of production has gone by the wayside. Today few control programs remain."

Pages 223-25: Central Mills at Main St. and Broadway was established in 1855 and produced flour under various trade names. It was known as Hinkle & Condell when David S. Shellabarger bought into it in 1858.

"Shellabarger had come to Decatur two years earlier from Carlyle, Pennsylvania, where his family had been millers since 1776. Selling his Hinkle firm interest in 1872, Shellabarger with three partners, Isaac Shellabarger, Benjamin Dillehunt and William Bowers, took over a larger mill, the Great Western, at Cerro Gordo and Water Streets. New machinery was installed and larger buildings added. In 1888 David Shellabarger became sole owner and was joined in the business by his three sons. As the wheat belt moved westward the Shellabargers opened flour mills in Kansas, and the Decatur mill centered on corn products. The Shellabarger family continued to be identified with the grain industry in Decatur for nearly a century after David's arrival in 1856.

"W.H. Suffern moved his elevator to Decatur from Pierson in 1891 and in partnership with Robert I. Hunt formed Suffern, Hunt & Co. A cereal mill built in 1907 produced the first breakfast food corn flakes, which were shipped to Indianapolis and Battle Creek, Michigan, for packaging. The mill, located on the site of the Polar Ice Co., burned in 1909. Pratt Cereal Mill was the first cereal oil mill in the United States. Organized in 1895 by F.M. and R.E. Pratt, who had arrived in 1880, it was the forerunner of the A.E. Staley Mfg. Co. The plant occupied some two blocks along the Wabash tracks on the east side of Decatur. The firm brought in 100 carloads of machinery and erected large storage tanks. Ten carloads of corn were ground daily for an output of 25,000 gallons of oil which was used in soaps, paints and salad oil. Corn starch and animal feed were by-products. In 1902 the Pratt and Shellabarger mills, along with several others in the Midwest, were purchased by American Hominy Co., a trust business centered in Indianapolis [Indiana]. The Decatur units, known as the Wellington Starch Co., were bought by A. E. Staley in 1909 from American Hominy, enabling him to start his starch firm here in 1912.

"Augustus Eugene Staley, Sr., founder and chief executive of the giant soybean and corn processing firm which bears his name, was born on a farm near Julian, North Carolina in 1867. As a farm boy he grew up amid post Civil War privations of a Southern state. He had little schooling and his time was spent in farm chores. Deciding on a job as a traveling salesman at the age of 17 he peddled tobacco to country stores in the Carolinas, Virginia and Tennessee. Later he traveled for an extract firm and for Royal Baking Powder, possibly visiting Decatur.

"After 15 years of selling on the road, Staley settled in Baltimore and entered the starch business in a small way with $1,500 in capital. He had fancy boxes imprinted 'Cream Corn Starch,' and filled them from bulk starch purchased in barrels. He did the packaging at night and the selling by day. The 'Cream' designation is still used by the company.

"Though the first years were difficult, Staley's business began to expand so rapidly that Eastern competitors shut off his starch supply. He turned to the Corn Belt, looking for factory space to make his own starch. He raised $600,000 in capital by incorporating and selling stock to his many grocery store friends. A half dozen not too new buildings on 21 acres in Decatur launched the venture in a defunct corn processing plant.

"With World War I halting export business, the Staley plant had to close for 15 months. Staley mortgaged his home, borrowed on his life insurance and went back to his earlier investors who backed him with more dollars. The plant reopened and as business picked up vast expansions were undertaken. A corn syrup refinery began operating in 1920. Seeing great possibilities in the little known soybean brought from Manchuria by missionaries, Staley encouraged Midwestern farmers to grow this grain and in 1922 the company opened the nation's first [sic] soybean processing plant, pioneering this important 'money crop' industry. Prices of soybean oil today are quoted FOB [f.o.b. = free on board] Decatur. One of the most recent additions to the Staley line of corn sweeteners is high fructose syrup used as a sugar substitute in food and soft drink processing.

"The A.E. Staley Mfg. Co. with its international headquarters, research center and principal grain refining facilities located in 137 buildings on a 400-acre site in Decatur has a daily processing capacity of more than 200,000 bushels of corn and soybeans. Employment averages about 3,800 in 15 U.S. plants and 12 sales offices. International activities span the globe and the company has a policy of acquiring at least one small related firm annually. A.E. Staley was frequently described as a man of confidence and vision, and the success of his Decatur venture bears out that description. He was a personal benefactor to numerous local institutions. A monument to Staley, who died in 1940 and was as succeeded as company president by A.E. Staley Jr., is a 14-story company office building erected in 1929, a graceful edifice of stone and marble. As an old man looking back on his career, Staley, during an interview at the time he was given an honorary degree by Millikin University, made this comment: 'My salesmanship built this business.'

"The Staley family has been a benefactor to local institutions. Two of the larger gifts are the Staley Pavilion, a large section of Decatur Memorial Hospital, and the Staley Library at Millikin University, the latter built in 1976. Success of the Staley company in corn and soybean processing brought other companies in the industry to Decatur, and the city earned the title 'Soybean Capital of the World.'

"Archer-Daniels-Midland Co. which was based in Minneapolis, erected a Decatur plant in 1939 and later acquired soybean plants that had been operated by Spencer-Kellogg, Shellabarger and Ralston Purina. Other divisions moved from Minneapolis to Decatur and in time the entire international office with some 400 employees followed. A textured vegetable protein (TVP) plant and new office building were constructed. A new $30 million corn refinery added 300 jobs. Recently acquired by ADM was the Tabor & Co. elevator firm."

Photos show: (1) Soybean test plot, Dane Brett Farm 1960. Signs show Clark, Shelby, Harosoy and Lindarin soybean varieties, (2) A biplane dusting a field. "Controlling the corn borer was a problem in 1951. This was the beginning of chemical pesticide use on the farm." (3) "Augustus Eugene Staley from a portrait in the Masonic Temple. Mr. Staley contributed a large sum to the building of the temple." (4) Staley Co. office building. (5) Aerial view of ADM Decatur East soybean processing plant.

Note: The editor, O.T. Banton, was also editor of the *Herald and Review* (Decatur, Illinois).

388. Schultz, John M.; Mason, William P. 1976. Soybeans: Brazil as a competitive force. MBA thesis, Harvard Business School. vii+ 151 leaves. 28 cm. [49 ref]

• ***Summary:*** This is the best report seen to date on the soybean industry in Brazil. Contents: Preface. Indexes of tables and figures. Introduction. 1. World food demand. 2. Fats, oil & meals. 3. Brazilian production. 4. Comparative cost of production. 5. Development of agricultural inputs and infrastructure. 6. Brazilian commercialization of soybeans and its products. 7. Government's role in the Brazilian soybean system. 8. Brazilian soybean supply-demand model. Summary & Conclusions. Appendices: Conversion rates, Glossary of Brazilian organizations. Bibliography.

Tables: (1) Change in world population growth. (2) World population, 2000: Less developed regions, developed regions, total–for high, medium, and low projections. (3) Where population is growing fastest (percentage growth from 1950 to 1970): Latin America 75% (doubling time 22 years), Africa 59%, Asia 52% (DT 24 years), Oceania 46%, North America 37%, Russia 35%, Europe 18%. (4) Percent of world population by regions: In 1973 developing world has 75% of total, developed world has 25%. In 2000 those figures are expected to change to 80% and 20%. (5) Per capita demand for related commodity groups by areas worldwide (kg per year): (6) Net demand for fats and oils by region: 1970, 1985, 2000. (7) Index of world net food demand by commodity: 1970, 1985, and 2000. (8) Index numbers of total and per caput food production. (9) Joint product derivation for 8 oilseeds (average percentage weight of oil and meal; soybean is 80 to 18). (10) World production of fats & oils, market shares for edible vegetable oil, palm oils, industrial oils, animal fats, marine oils (1965, 1970, 1975). (11) Gross fats & oil exports, for 13 oils and fats, annually from 1971/72 to 1974/75, with projections to 1980/81 at which time–#1 Palm oil 3.1 million metric tons (mmt). #2. Soybean oil 1.02 mmt. Sunflower oil 1.00 mmt. Butter 0.75 mmt. (12) World production of fats & oils, for

14 oils and fats. (13) Exports of fats & oils (vegetable & animal), Malaysia and Brazil. (14) U.S.A. food oils and fats domestic use, 1960, 1974, & 1985 projections. In 1960 the diet was 58% vegetable fats and 42% animal fats. In 1985 the projected diet was 90% vegetable fats and 10% animal fats. (15) Soybean yields for selected regions (1971-75): World average, USA, Brazil, China. (16) World cropland area by commodity, 1970. All cereals have 73.5% of the total, vs. 10.8% for oilseeds and 6.3% for pulses and nuts. (17) World soybean production (1970/71 to 1975/76): USA, Brazil, China, Others. "The U.S. embargo in 1973 gave Brazilian exports a boost as importing countries placed greater emphasis on double sourcing." (18) Cottonseed oil production and export for U.S. and world, 1970-1975. (19) Sunflower seed oil production, 1970-1975. (20) Palm oil: Production and exports in major producer-exporter countries and the world annual 1965-75 with projections for 1976, 1980 and 1985. Countries are West Malaysia, Sabah (a Malaysian state located on the northeast tip of the island of Borneo), Indonesia, Ivory Coast, Zaire. (21) Value of four oil crops per hectare for selected countries. Crops: Oil palms, soybeans, sunflower, peanuts. Countries: West Malaysia, USA, USSR, Nigeria. Oil palms have by far the greatest oil yield and value per hectare. (22) Palm oil: Production in specified countries (Western hemisphere 3.5%, Africa 39.1%, Asia 57.4%): Forecast for 1975 and percentages. (23) Palm oil–local consumption vs. exports (1974): For West Malaysia (exports 96% of production), East Malaysia (92%), Indonesia (92%), Ivory Coast (60%), Zaire, Western Hemisphere. (24) Palm kernel oil–production and exports 1971-75. (25) Coconut oil: Production & export. (26) Lard production & export: Selected years. (27) Lard rendered per hog: USA. Yield of lard per hog in USA decreased from 13 kg in 1963 to 6.7 kg in 1974–as demand for lard decreased. (28) World meal production and gross exports by commodity: Selected years 1955, 1967, 1974. Soybean meal is always the leader by far, with cottonseed meal 2nd. (29) Present and projected world consumption of animal products: Poultry, pork, and beef. Poultry and hogs are the main consumers of soybean meal. Cattle consume mostly pasture and grass–as nature designed. (30) Protein meal: World production exports, share of market by commodity, 1955, 1970/71, 1974/75. Soybean meal is by far the leader, followed by cottonseed meal. A U.S. moratorium on soybean exports in 1973 and 1975 enabled Brazil to enter major markets as a source of dependable supply. (31) Soybean meal and seed, production and exports (U.S., Brazil, and world) (meal equivalents). (32) Peruvian fishmeal, production and exports. (33) Peruvian fishmeal exports, soybean equivalents. (34) Brazilian production by states. (35) Changes in acreage planted. (36) Land area of Rio Grande do Sul. (37) Parana production by regions. (38) Cultivated land in Sao Paulo. (39) Land area of central-west states. (40) Weighted average comparison of costs of production. (41) Comparison of fertilizer and lime costs (Brazil and the U.S.). (42) Comparison of machinery cost. (43) Brazilian labor rates. (44) Comparison of regional costs of production. (45) Seed soybean variety usage by state. (46) Fertilizer demand. (47) National fertilizer program. (48) Chemical demand. (49) Land costs by state. (50) 1974 storage capacity by states. (51) Comparison of transportation systems. (52) Capacities at main ports. (53) Comparison of average export profits. (54) 1975 crushing capacity by state. (55) Major crushing firms. (56) Exports. (57) Major importers of Brazilian soybeans and soybean products. (58) Exporter percentages of soybeans. (59) Brazilian ICM tax rates, Jan. 1, 1976. (60) Historical supply-demand relationships. (61) Projection of supply-demand relationships.

Figures: (1) World population growth (in millions) 1900-2000. (2) Soybeans and their products. (3) Relationship between beans and end products. (4) European Community: Apparent consumption of fats and oils, 1965-1975. (5) Oilseeds. (6) Price comparison, coconut, palm, and soybean oil, average monthly cash prices. (7) Per capita consumption of poultry meat. (8) Peruvian anchovy catch, 1960-1975. (9) Map of Brazil. (10) Comparison of average prices for wheat and soybeans at the farm level. (11) Comparison of wheat-soybean acreage. (12) Index changes of soybean production, acreage, and yields. (13) Map of Rio Grande do Sul. (14) Map of Parana. (15) Map of Sao Paulo. (16) Map of Santa Catarina. (17) Map of Central-west states. (18) Comparison of rainfall during growing season. (19) Industry structure. (20) Map of climatic conditions. (21) Map of soil conditions. (22) Brazilian railroad systems. (23) Export corridors program. (24) Comparison of Brazilians–U.S. prices at he farm. (25) Map of crushing facilities. (26) Per capita Brazilian vegetable oil demand. (27) Per capita Brazilian meat consumption. (28) Brazil's major agricultural exports. (29) Comparison of market share in exports of soybeans. (30) Schematic supply-demand relationships. (31) 1976 planting estimates (Based on wheat & soybean prices). Address: Harvard Business School, Cambridge, Massachusetts.

389. *Food Engineering.* 1977. World's largest soy isolate plant: Ralston Purina opens new 100,000 square foot facility. 49(1):68-69. Jan.

• ***Summary:*** The $15 million facility was officially opened last month in Pryor, Oklahoma, by Ralston Purina's Protein Division. The production capacity is highly confidential, however it can be said that the new plant doubles the combined capacity of Ralston's two existing isolate plants in Memphis, Tennessee (opened in June 1973), and Louisville, Kentucky.

During the past 3½ years Ralston has worked with Fuji Oil Co. of Osaka, Japan, to form and operate a joint venture named Fuji Purina Co. Ltd. in Japan.

Nine different soy protein isolates, each with different

functional properties, will be produced in the new plant: Edi-Pro A, Edi-Pro N, Supro HD-90, Supro 350, Supro 610, Supro 620, Supro 630, Supro 640, and Supro 710. A description of the properties of each is given.

390. *Food Processing* (*Chicago*). 1977. Plants, Companies Personalities. Feb. p. 12.
• ***Summary:*** "Ralston Purina, St. Louis, recently opened their third plant for the production of soy protein isolates at Pryor, Oklahoma. The $15 million, 100,000 sq ft plant will produce a line of nine different soy protein ingredients for sale in the U.S. and 24 foreign countries. Plant employs the latest in processing technology–with process efficiency reported to be 300% over previous industry standards. Energy requirements/supply were prime consideration in the location of the plant. The company reached an agreement on a long-term firm supply contract for natural gas. In addition, plant is connected to an 8-inch high pressure steam line that supplies steam from the GRDA steam generating plant, eliminating the need for boiler installations."

A small photo shows an aerial view of the plant.

391. *Food Technology.* 1977. Ralston Purina dedicates new protein plant. 31(2):94. Feb.
• ***Summary:*** The plant which will produce nine different soy protein isolates in Pryor, Oklahoma was dedicated Dec. 1.

392. *Wall Street Journal.* 1977. Ralston Purina Co. expects record profit and sales in fiscal 1977. April 7.
• ***Summary:*** According to R. Hal Dean, chairman and chief executive officer. "In fiscal 1976 the diversified food and aninal-feed concern earned a record $125.9 million, of $1.18 per share."

393. *Cereal Foods World.* 1977. Soy protein plant. 22(4):184. April.
• ***Summary:*** "Ralston Purina Co.'s Protein Division has announced plans to construct a new soy protein manufacturing plant in Ieper, Belgium. Construction of the plant, subject to final approval by the Belgian government, will begin shortly and is expected to be completed by fall 1978. The plant will produce the company's line of soy protein isolates. It is Ralston Purina's first protein processing plant in Europe, and the only commercial soy isolate processing facility in Europe."

An artists rendering shows an aerial view of the plant.

394. Crocco, Stephanie C. 1977. Coming up: New regulations for cured meats with soy isolate. *Food Engineering* 49(4):64-66. April.
• ***Summary:*** Ralston Purina Co., Central Soya, and Grain Processing Corp have announced techniques that enable isolated soy proteins to be added to curing systems used in making ham, corned beef, and similar foods. The main advantage of adding soy isolate is that shrinkage is greatly reduced during processing. When the product is pumped with soy isolate, the final weight after cooking may be 130% more than when no isolated is added. Address: PhD, Midwest Editor.

395. *Food Engineering.* 1977. Tuna salad analog based on soy protein. 49(6):ef-14, 15. June. In special section on Engineered Foods.
• ***Summary:*** New U.S. regulations to protect porpoises almost guarantee a severe reduction in the tuna catch. To help alleviate such consequences, the PFW/Hercules Food Technology Center in Middletown, New York, has developed this prototype tuna salad analog which contains no tuna meat. The recipe includes Edipro 200 soy protein, MSG, and artificial and natural tuna flavors.

396. **Product Name:** [Fuji Pur {Spun Soy Protein Fibers} (SP-90, 100, MM, FF)].
Manufacturer's Name: Fuji Purina Protein Ltd. Subsidiary of Fuji Oil Co. and Ralston Purina.
Manufacturer's Address: Sumiyoshi-cho 1, Izumisano-shi, Osaka-fu, Japan. Offices: Kanda Suda-cho 1-28-2, Chiyoda-ku, Tokyo.
Date of Introduction: 1977 June.
New Product–Documentation: *Soybean Digest Blue Book.* 1977. p. 36.

397. Ralston Purina Co. 1977. The versatile isolate–for the world who burns the candle at both ends (Ad). *Food Engineering* 49(6):ef-4, 5. June. In special section on Engineered Foods.
• ***Summary:*** This striking two-page color ad shows 4 candles burning in the sand. A moon is reflected in candle. The ad also demonstrates Ralston Purina's increasing commitment to becoming the world leader in isolated soy proteins.

"Proteinability–we're the first source." "Today's demand for protein based foods, along with our rapid depletion of traditional protein sources, has caused food scientists to look at the new source of protein–the soybean.

"Nearly 20 years ago, Ralston Purina saw this need for a new protein resource and responded with the development of soy protein isolates... isolates with a 90% protein minimum designed with a wide range of functional characteristics that would give the food industry the versatility it required." Address: Checkerboard Square, St. Louis, Missouri. And, Protein Purina Europe SA, 391 Avenue Louise–Box 6, B-1050 Brussels, Belgium.

398. *Food Processing* (*Chicago*). 1977. Fortified soy isolate improves quality, yield, and economics of cured meats. 38(7):84. July.
• ***Summary:*** Supro 640T Fortiblend, a fortified soy protein isolate made by Ralston Purina Co. of St. Louis, Missouri,

was awarded Honors in the Food Processing Awards contest because "it will help to dampen the increasing price for ham... It is also a rather ingenious way to utilize the technology of protein isolates."

"The fortified isolate can be used to produce cured hams pumped to 150% of initial weight–laboratory cook yields of 135% have been produced consistently without problems. Hams have been extended up to 50% without the soy isolate being noticeably evident in the cured product... When compared to 'water added' hams, the finished products exhibit more firmness and improved slicing characteristics." A photo shows large slices of ham.

399. **Product Name:** Supro 640T Fortiblend (Fortified Soy Protein Isolate).
Manufacturer's Name: Ralston Purina Co., Protein Div.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188. Phone: 800-325-7136.
Date of Introduction: 1977 July.
How Stored: Shelf stable.
New Product–Documentation: Food Processing (Chicago). 1977. July. p. 84. "Fortified soy isolate improves quality, yield, and economics of cured meats." Supro 640T Fortiblend, a fortified soy protein isolate made by Ralston Purina Co. of St. Louis, Missouri, was awarded Honors in the Food Processing Awards contest because "it will help to dampen the increasing price for ham... It is also a rather ingenious way to utilize the technology of protein isolates."

Soya Bluebook. 1981. p. 62. Supro... 640T Fortiblend.

400. Struthers, Barbara J.; Dahlgren, R.R.; Hopkins, D.T. 1977. Biological effects of feeding graded levels of alkali treated soybean protein containing lysinoalanine (N-2-[carboxyethyl]-L-lysine) in Sprague-Dawley and Wistar rats. *J. of Nutrition* 107(7):1190-99. July. [14 ref]
• ***Summary:*** Lysinoalanine (LAL), an unusual amino acid, is one of the products resulting either from severe alkaline treatment or heat processing of proteins. It has been shown to cause a unique renal lesion in rats (i.e. it harms their kidneys). Address: Ralston Purina Co., 900 Checkerboard Square, St. Louis, Missouri 63188.

401. Ralston Purina Co. 1977. Food Proteins: Demonstration meat patty (Leaflet). St Louis, Missouri. 1 page. Single sided. 28 cm.
• ***Summary:*** See next page. "The concept of combining the unique properties of SUPRO 620T, Ralston Purina's soy protein isolate, with SUPRO 50-3, textured soy protein, in a meat patty system, results in a cohesive patty that also maintains a flavor and texture characteristic of all-meat patties. In actual in-plant production applications and under laboratory test conditions, this unique blend of soy protein properties has demonstrated increased yields, thereby providing the processor with lower total unit cost.

"The typical bland flavor characteristics of SUPRO 620T allows processors to fully utilize the isolate's binding capabilities while producing a flavorful meat patty. The formulation shown below typifies the ingredient ratio in a meat patty system."

402. Steinke, F.H. 1977. Protein efficiency ratio. Pitfalls and causes of variability: A review. *Cereal Chemistry* 54(4):949-57. July/Aug. [13 ref]
• ***Summary:*** PER is grams of weight gained divided by grams of protein consumed. In all tests a casein control group is included and the value of the test protein is reported relative to the casein group. By long history, the PER value of the test protein may be reported relative to casein corrected to 2.5 PER. Address: Ralston Purina Co., St. Louis, Missouri 63188.

403. *National Provisioner.* 1977. Flashes on suppliers: Ralston Purina Co. Oct. 8. p. 18.
• ***Summary:*** Ralston Purina Co. announced plans to expand by more than 50% the capacity of its isolated soy protein facility at Pryor, Oklahoma. Scheduled completion date is mid-1978.

404. *Wall Street Journal.* 1977. Ralston Purina venture in Japan. Oct. 13. p. 18.
• ***Summary:*** St. Louis–The Ralston Purina Company announced that it has formed a joint venture with Fuji Oil Co., Osaka, to market soy proteins in Japan.

"The joint venture, Fuji Purina Protein Ltd., will market soy protein products manufactured by both Ralston and Fuji Oil."

405. *Food Processing* (*Chicago*). 1977. Isolated soy protein facility expansion. Nov. p. 8.
• ***Summary:*** Ralston Purina plans to expand by 50% its isolated soy protein manufacturing plant at Pryor, Oklahoma. It is expected to be in production by mid-1978.

406. Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Daizu tanpaku kogyo-ka e no michi [Road to industrialization of soy protein. Part I (Document part)]. In: Fuji Seiyu K.K. 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 417-30. [Jap]
• ***Summary:*** Outline: As a major Japanese soybean crusher, processing whole soybeans into soybean oil and defatted soybean meal, Fuji Seiyu produced large amounts defatted soybean meal. In 1962-62 Fuji Seiyu began to make *Fuji Takaramame* (a by-product of tofu powder) and *Proplus* using soy protein from defatted soybean meal, even though these were not considered to be good soy protein products.

In 1967 Fuji developed isolated soy protein (containing

Food Proteins

DEMONSTRATION MEAT PATTY

The concept of combining the unique properties of SUPRO 620T, Ralston Purina's soy protein isolate, with SUPRO 50-3, textured soy protein, in a meat patty system, results in a cohesive patty that also maintains a flavor and texture characteristic of all-meat patties. In actual in-plant production applications and under laboratory test conditions, this unique blend of soy protein properties has demonstrated increased yields, thereby providing the processor with lower total unit cost.

The typical bland flavor characteristics of SUPRO 620T allows processors to fully utilize the isolate's binding capabilities while producing a flavorful meat patty. The formulation shown below typifies the ingredient ratio in a meat patty system.

FORMULA

Ingredient	%	Weight (Lb.)
Beef Trimmings (50/50)	47.00	96.00
Boneless Beef	17.15	34.30
Water	24.00	46.00
SUPRO 620T	2.00	4.00
SUPRO 50-3	8.00	16.00
Salt	0.60	1.20
Corn Syrup Solids	0.50	1.00
Dehydrated Onion	0.40	0.80
Monosodium Glutamate	0.25	0.50
Ground White Pepper	0.10	0.20
	100.00	200.00

Product is prepared in 200 lb. blocks to a final fat percentage of 28 ± 1%.

MANUFACTURING PROCEDURE:

1. Pregrind or hydroflake meat portion.
2. Place meat and water in mixer and begin mix.
3. Add SUPRO 620T , SUPRO 50-3, and flavorings, and mix 3½ minutes.
4. Regrind, using a 1/8 or 3/16 inch plate.
5. Form patties to desired thickness.
6. Sear patties under a broiler.
7. Freeze and package in desired quantities.

1 AUG. 1977

* Ralston Purina Company
Checkerboard Square, St. Louis MO 63188 • 800/325-7136

Avenue Louise 391, B-1050 Brussels, Belgium. (02) 647 98 90

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more than 92% protein) from defatted soybean meal, and started to sell this FujiPro isolated soy protein. Since it was a completely new product and little was known about it, sales were slow in the beginning. But later it started to be sold to makers of second generation meat products (such as sausages or ham).

In 1969 Fuji started to sell Fuji Nikku ("Fuji Meat"), which is a textured protein product (*soshiki tanpaku seihin*) and this expanded their market among hamburger and hamburger ball (meatball) makers. Based on the above experience, Ralston Purina (America's leading soy protein manufacturer) got to know Fuji and invited the company to do a joint venture. Three years later, in Dec. 1973, the two companies contributed 200 million yen and founded a joint company named Fuji Purina Protein K.K. In 1974 they started to make and sell *FujiPur / FujiPua* (for "Fuji Purina"), a spun soy protein fiber. Presently, Fuji Seiyu is trying to expand into new, undeveloped markets for soy protein foods (p. 418).

For 1964 the Food Bureau (*Shokuryo-chô*) of Japan's Ministry of Agriculture, planned the following usage of soybean meal: Food 347,000 metric tons (tonnes). Feed 691,000 tonnes. All but 69,000 tonnes of the food use went for miso, shoyu, and tofu. Of this 69,000 tonnes, 40,000 tonnes went for soy protein foods (such as breads, biscuits, doughnuts, shortcake, ice cream, fish paste products, cheese, soup, etc.) and 30,000 tonnes for glutamic acid / MSG (p. 419).

Fuji decided to industrialize soy protein very early and also to make isolated soy protein their main soy protein product. Other Japanese companies that tried to enter the soy protein market failed because they produced only soy protein concentrate (p. 420).

Fuji Seiyu finished their research on isolated soy protein at the end of 1966, then started test production in their 1-tonne pilot plant. In June 1967, they started to build their full-scale plant, and finished by the end of the year; it had a capacity of 100 tonnes/month. The company named its first product Fuji Pro; this isolated soy protein contained more than 90% protein and about 6% moisture (p. 421).

Then the company found that they could use Fuji Pro in fish paste products, so they tried to sell it to companies making such products. But these manufacturers were very conservative, so after 6 months Fuji gave up and began selling it to secondary meat producers (p. 423).

The meat industry was also very conservative, but after many visits to these companies, Fuji got to understand them better. Some of these companies were already importing soy protein from the USA and using it in their meat products. Fuji's research & development department developed a sausage containing Fuji Pro and presented samples to the meat processors; they made many repeat visits. In 1968 Fuji received an order from a large meat processor; after that they received orders from medium and small processors one after another. In Nov. 1968 Fuji's sales finally reached 100 tonnes/month. Later, after many careful investigations, the Japan Agricultural Standards (JAS) decided to make isolated soy protein a JAS product with a standard of identity for use in ham, sausages, etc. In this way, sales of Fuji Pro expanded. But there was also another reason for expansion: Exports! Actually exports started earlier and were easier than sales to the domestic Japanese market. And it was because of the demand from abroad that Fuji decided to build their first full-scale plant in 1967, even though they didn't have any clear idea about their domestic sales. Fuji's exports went Shoemaker, a Dutch food company; this relationship started in about 1964 (p. 424).

At that time the Dutch company was selling soy protein made by Central Soya in the USA. Being dissatisfied with the product's quality and prices, they looked to Japanese oil makers to produce these products. They contacted several companies, including Fuji Seiyu, which answered their inquiry and told them: "We are still study isolates, but we have a product that contains 50% protein." They sent Shoemaker a sample of Fuji Takaramame. However Shoemaker wanted a soy protein isolate, so no business was transacted. But from that time on, the two companies stayed in close communication and began to exchange information. Shoemaker asked Fuji to develop a soy protein isolate, provided important suggestions concerning the research, and sent Fuji a report of the European market for such a product. Shoemaker's cooperation played an important role in the development of Fuji's isolated soy protein.

Initially, Fuji had placed heavy emphasis on developing soy protein products for second generation fish paste products, but after considering the potential demand in Europe, Fuji started to research soy proteins for meat products such as ham and sausage. Fuji Pro was developed to be highly elastic, emulsifiable, and water soluble–characteristics desired by the European market. Fuji sent some samples. Before they started commercial production, they signed a contract with Shoemaker as a sales agent; it named Fuji as a IPSO (International Protein Sales Organization) and exporter. Thus, it was because of the European market that Fuji could start commercial production without a domestic market, and it was this European market that enabled Fuji to sell isolates in Japan. Everything seemed backwards. For example, some Japanese from the meat industry went to Europe to study that industry. There they learned that soy protein (named IPSO) was being used in ham and sausages. Returning to Japan, they discovered to their surprise that the soy protein was made in Japan by Fuji. In 1969 Fuji's contribution to Japanese exports (oil and protein) was honored with an award (p. 425-26).

A knowledge of the overseas market for soy protein was a great help to Fuji as its soy protein products began to serve an international market. This also gave ideas for development of new products–starting with meatlike

soy protein products. They received news from Bernard Hawley in England that textured soy protein products had been developed in the USA. Hawley was a nutritionist and a consultant (Hawley & Associates) and Fuji began to use his consulting services in April 1966 (p. 428). Hawley made many trips to Japan and he and Mr. Nishimura (the president of Fuji Seiyu) became great friends. In 1967 Fuji sent Hawley to the USA and asked him to study the market for textured soy proteins and the send Fuji a market report (p. 429). Meanwhile, the company president and a man from the planning department also went to the USA to study the market; they soon decided to start making textured soy protein immediately. They visited Wenger Manufacturing Co. in the USA, signed a contract in April 1968, and received a machine [extrusion cooker] that year. Actually they bought only the main body of the machine from Wenger; the other parts (including the power mill) were invented and designed by Fuji technicians (p. 430). (Continued). Address: Tokyo, Japan.

407. Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Daizu tanpaku kogyo-ka e no michi [Road to industrialization of soy protein. Part II (Document part)]. In: Fuji Seiyu K.K. 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 431-48. [Jap]

• ***Summary:*** Continued (p. 431): In 1969 Fuji Nikku ("Fuji Meat"), a textured soy protein product, was introduced and production started. At that time Texgran, a similar product made by Swift & Co. (USA) was being sold in Japan, but Fuji Nikku was the first such product to be made in Japan (70% protein, wet type). Many tests were made to determine the size and shape (p. 430-31). Finally Fuji decided to produce both large and small piece, in both wet and dry form.

The next problem was to find a market for the product in Japan. In 1969 they tried demonstrations at department stores in Tokyo, but sales were very slow. Fuji concluded that it was too early to sell the product to retail customers. Then they developed flavored and seasoned varieties of Fuji Nikku in tomato sauce, sold canned. Next they fried it for sale to portable food vendors, but that failed too. They produced only three lots before stopping. In 1969 Mr. Hariaki (presently director of the protein department) succeeded in selling 100 tonnes/month to a large company that made hamburgers and meatballs–the first sales of Fuji Nikku, caused largely by high meat prices. But when meat consumption fell, so did sales of Fuji Nikku (p. 433).

In 1970 the Osaka branch of Fuji Seiyu sold 5 million yen of soy protein products; the Tokyo branch sold 10 million yen. Production grew and these two became independent as the Protein Division.

In about 1971 many new soy protein products were introduced in Japan (see large table, p. 435); major manufacturers included Nihon Tanpaku and Nihon Koyo. Now competition started. In 1971 a total of 15,000 metric tons of soy protein was made in Japan; Fuji accounted for about 50% of this. In 1972 Fuji bought a company which was producing protein under Nikka Oil. Fuji also did some joint ventures with Hohnen Oil Co. on their oil and protein project. In 1969 Ralston Purina had established its own research organization, Nihon Purina Corp. Their first joint venture was with Taiyô Gyogyo for pet foods. In Dec. 1973, after various trials and decisions, Ralston Purina invited Fuji to do a joint venture. Fuji Oil Co. and Ralston Purina decided to start their joint venture with one of Ralston Purina's products, Edipro-200, a spun soy protein fiber. They wanted to make it in Japan (p. 440-41). In July 1974 Fuji Purina Protein K.K. was founded capitalization of 200 million yen, contributed equally by both companies. The first product they made was named FujiPur (for "Fuji Purina"), the spun soy protein fiber. It sold quite well to companies making products from beef. One day they appeared on a popular Japanese TV program and Fuji's artificial meat was fed to a baby tiger; the animal wouldn't eat it. That was embarrassing! (p. 445).

Fuji Pro (soy protein isolate) was first sold to hamburger makers and then to makers of fish paste products. Around 1971 it was sold to makers of ready to eat frozen food (*osôzai*). For the future, the company is aiming at health foods and drinks, dairy products, confectionery, hospitals, schools, factory cafeterias, retort packages, etc. (p. 446).

In about Dec. 1974 Fuji started to sell soy protein food at retail for home use–rather than as an ingredient or raw material. Thus it took FujiPro 10 years and it took Fuji Takaramae 15 years to establish soy protein in Japanese society. Address: Tokyo, Japan.

408. George, Susan. 1977. How the other half dies: The real reasons for world hunger. Montclair, New Jersey: Allanheld, Osmun & Co. xxix + 308 p. Index. 21 cm. [500+* ref]

• ***Summary:*** Soybeans are discussed in several places: Between 1972 and 1973 U.S. soybean production increased by 25% (p. 9).

Chapter 4, titled "Technology: Now who pays to do what to whom?" shows that no new technology, not even a new crop is neutral in the effects it has on different classes of people. A report on soybeans in Brazil commissioned by the French Government Center for External Trade showed that they are becoming an increasingly important crop there. Since Brazil can produce and sell its crop between the two U.S. soybean harvests, the government's official agricultural policy encourages Brazilian farmers to grow more soybeans since they are a profitable export crop. The price of soybeans is attractive, so farmers have abandoned corn, a traditional crop, as well as wheat (to a lesser extent) because soybeans demand less fertilizer. Since soybean production is easily

mechanized, fewer Brazilians need be employed. Soybeans are usually crushed to make oil and meal. This complex processing technology is being taken over by the world's most competent processors–large multinational agribusiness firms, such as Cargill and Bunge. Small Brazilian processors are going bankrupt. Since Brazil's infrastructure for transporting and loading the soybeans is substandard, the World Bank has been kind enough to contribute half the price of new private export corridors to the seaports, which the Brazilian government has kindly declared necessary for the multinationals. No doubt the Brazilian soybean industry will be profitable for multinational agribusiness, but what will be the consequences for ordinary Brazilians. From 1970 to 1972, the price of corn, a traditional staple food and feed, has risen 60%, while the price of chicken has gone up 33%. Soybeans have drastically decreased the amount of land previously used for growing the *feijao* or black bean–another staple crop and key human protein source; during this period its price jumped by 275%. Rice production also suffered from the soybean competition. All of these developments hurt average Brazilians, and especially the poor.

In addition, real estate prices in areas best suited to soybean production have risen dramatically; one hectare in Rio Grande do Sul, which sold for 1,500 cruzeiros in 1972, sold for less than 10,000 cruzeiros less than a year later. Thus, smaller farmers with less mechanization are losing out to those who can afford to buy more than and agricultural equipment. Soybean production in Brazil directly counteracts the efforts of the Brazilian government to limit inflation (p. 67-69).

Chapter 6, titled "Planned scarcity," notes that in the USA, one acre in 6.5 is now planted to soybeans. Europe is only 2% self-sufficient in plant protein production. After World War II, Europe introduced American hybrid corn to replace local varieties; though the yield was higher, the protein content was lower. Thus a new protein source had to be found for feeding livestock, and U.S. soybean meal seemed to be the most rational and inexpensive solution. Export of soybean meal from the U.S. to Europe jumped from only 47,000 tons in 1949 to nearly 5 million tons in 1972-73. Major U.S. processors set up crushing mills in Europe. In short, the entire post-war European livestock industry has been developed on the basis of extensive use of low-price soybean meal. The U.S. established a "near-monopoly position for supply not only of Europe but of Japan and other nations."

Discusses the 1973 U.S. soybean export embargo, which began in June and sent prices soaring to $12 a bushel, from $2. The embargo was removed 3 months later and at year's end it became clear that the scare over shortages was unwarranted. The Food for Peace program introduced soya oil into countries like Spain and Tunisia that had never before tasted anything but their own olive oil. Even the butter-rich Netherlands now consumes more imported soy margarine than butter. "Far be it from me to suggest collusion I can't prove, but it is at least evident who profits from higher prices and who suffers. A futures market in soya meal was opened in London in April 1975 as a measure that might check price fluctuations." Yet the key fact is that European countries do not produce soybeans, nor any alternative protein crop.

Discusses the new effort to extend the use of soya beyond feeding animals by promoting TVP, and the international conference held at Munich, Germany, in Nov. 1973. Earl Butz (U.S. Secretary of Agriculture) led the American delegation; Hubert Humphrey stated: "Food is a new form of power. Food is wealth. Food is an extra dimension in our [U.S.] diplomacy." "Americans presented 24 out of the 38 papers (including 13 by agribusiness representatives and 10 by USDA people). Only one was by a nutritionist. "One sees absolutely no alternative to continued US MNC (multinational corporation) control of the world plant-protein production and prices." "The only rational way to offset price and foodstock manipulation by the giant traders would be to have grain stocks held in government hands, to be released or held back as the market situation demanded." The grain traders are "frantically opposed to any reserve system..." (p. 122-25).

Chapter 8, titled "Food aid?... Or weapon," discusses: Importance of feedgrains exports, Soybean Council of America, American Soybean Association, PL 480, promotion of soybean exports to Spain, Iran, and Korea, Ralston Purina and Cargill, Food for Peace counterpart funds used to finance research in recipient countries, "common defense" military expenditures (p. 172, 176).

Chapter 11, titled "What can 'they' do?" discusses alternative food sources, single-cell protein (SCP), America's energy-devouring food-production system which could exhaust U.S. fossil fuel reserves within 25 years, research by DuPont showing that when soybeans are experimentally flooded by carbon dioxide, they quadruple yields and fix more nitrogen (p. 239-40). Address: A Smith College graduate now studying at the Sorbonne. Fellow of the Transnational Inst.

409. Ralston Purina Co. 1977? Supro 620: Isolated soy protein and its use in emulsified meat systems. St. Louis, Missouri. 8 p. Undated. 28 cm.

• ***Summary:*** Describes the use of Supro 620 in the manufacture of frankfurters, mortadela, meat loaves, lunch meats, and other emulsified-type meat products.

Note: *Webster's Dictionary* defines mortadela (a term first used in 1613, derived from the Latin word for a sausage seasoned with myrtle berries) as "a large smoked sausage made of beef, pork, and pork fat and seasoned with pepper and garlic." Address: Checkerboard Square, St. Louis, Missouri 63188. Phone: 1-800-325-7108.

410. American Soybean Assoc. ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. Held 25-27 Jan. 1978, Republic of Singapore. No index. 29 cm. [328 ref]
• ***Summary:*** See next page. Contains 34 papers, largely about the use of modern soy protein products. Individual papers are cited separately. The "registration list" (p. 127-35) is a detailed directory of participants and the press, sorted by country or continent.

The eight "Exhibitors" (p. 136) were American Soybean Association (Hudson, Iowa), DeKalb County Exports Inc. (Ottawa, Illinois), Intercom News (Kansas), Japan Vegetable Protein Food Association (Tokyo), Kikkoman Shoyu Co. Ltd. (Tokyo), Ralston-Purina (St. Louis, Missouri), United Vegetable Oil Co. (Pte) Ltd. (Singapore), and Wenger International Inc. (Kansas City, Missouri). Address: Hudson, Iowa.

411. Schwarz, F.H. 1978. Developments of soy protein technology. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 74-76.
• ***Summary:*** Focuses on soy protein isolates, including Ralston Purina's Supro 620. Discusses "pumping," a process by which an aqueous protein solution is injected via hollow needles into meats (especially hams) to reduce cooking losses. "One of the key points that I would like to make today is that the place where soy proteins have been and are commercially the most successful is when they are used in combination with animal proteins such as meat, fish, milk and eggs to lower the unit cost of the traditional product." Address: Ralston Purina Co., St. Louis, Missouri.

412. Villa-Abrille, Carlos. 1978. Marketing of extended meat products in Third World countries. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 110-15. [1 ref]
• ***Summary:*** Contents: Statement of the problem. Applications. Case studies: Ralston Purina (reasons for developing the product, quantification and qualification of demand, determination of product type and form, communicating the value, conclusion), Pure Foods Corporation (reasons for developing the product, quantification and qualification of demand, conclusion). Summary.

Per capita consumption (kg/person) of total red meat in specified countries in 1975, in descending order of amount is: Uruguay 104, Australia 101, Argentina 98, New Zealand 95, United States 83, Canada 73, Belgium-Luxembourg 73, West Germany 68, France 67, United Kingdom 57, USSR 45, Taiwan 20, Japan 16. Address: Pure Foods Corp., Manila, Philippines.

413. *Food Product Development.* 1978. Meat engineered with whey-soy blends, soy protein isolates: Development aids. 12(1):52. Feb.
• ***Summary:*** A color photo shows various sausages and sliced deli meats. By mixing or injecting meats with combinations such as whey-soy, whey-soy-caseinate, or soy isolates alone, a processor can increase product yield, flavor, uniformity, lean, and protein content, while decreasing cooking shrinkage and cost. Various products are listed. Those containing soy are: (1) Procon Plus, combines sweet dairy whey with the binding properties and low flavor profile of Procon 2000 soy protein concentrate. From A.E. Staley, Decatur, Illinois, or Circle 911. (2) Pro-Blend combines sweet dairy whey, sodium caseinate, and soy protein concentrate to replace nfdm. From Griffith Laboratories, Alsip, Illinois. They used this to develop Skillet Strips, a "bacon alternative containing bacon ends and pork trimmings." (3) Pro-Fam soy protein isolates. From Grain Processing Corp., Muscatine, Iowa. (4) By using sausage technology, Ralston Purina (St. Louis, Missouri) has developed fabricated pastrami containing their Supro 620T soy protein isolate. The other ingredients and process are described.

414. Steinke, Fred H.; Hopkins, Daniel T. 1978. Biological availability to the rat of intrinsic and extrinsic iron with soybean protein isolates. *J. of Nutrition* 108(3):481-89. March. [27 ref]
• ***Summary:*** A rat feeding study employing the hemoglobin repletion methodology showed the relative iron availability for 3 isolated soy proteins to be 59-64% (mean = 61%) that of ferrous sulfate. Iron added to the diets containing isolated soybean protein had bioavailabilities similar to that of iron present in the soybean which supports the common dietary iron pool hypothesis. The high iron content (0.18 mg/gm protein) coupled with the bioavailability data make the isolated soybean proteins a good dietary iron source. Address: Central Research, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

415. Ward, A.G. 1978. Commercial development of soya bean protein products in the EEC. In: Commission of the European Communities. Agriculture. 1978. Report of the Study Group on Vegetable Proteins in Foodstuffs for Human Consumption, in Particular in Meat Products. See p. 83-85. Appendix IV. April.
• ***Summary:*** "The soya bean is the main source of specialized vegetable protein products for human consumption within the EEC. Wheat gluten is also used but only to a very limited extent." It is difficult to estimate the current scale of usage for human consumption.

"Belgium: N.V. Vamo Mills produces toasted defatted flour and grits. No extruders known to occur in Belgium. Production of isolates being undertaken by Purina Protein

INTERNATIONAL SOYA PROTEIN FOOD CONFERENCE

Proceedings

Republic of Singapore
January 25~26~27, 1978

Europe (associate of Ralston Purina Company USA).

"Denmark: Aarhus Oliefabrik A/S produces defatted flour, soya concentrate (Danpro) and textured soya concentrate. The company operates the only extruder in Denmark. Dansk Sojakagefabrik A/S produces defatted soya flour and grits as well as full fat soya flour.

"France: Société Industrielle des Oléagineux produces defatted soya flour and grits as well as full fat soya flour. Rhône Poulenc is reported to be working with an experimental soya protein spinning plant (not yet commercial). No information has been received about extruders functioning in France.

"Germany: Ölwerke Noury and Van Der Lande, Ölmühle Hamburg A.G. and Holtz and Willemsen all produce defatted soya flour and grits and the first two also produce full fat soya flour and grits. No information has been received about extruders functioning in Germany.

"Netherlands: Cargill Soja Industrie B.V. (associated with Cargill Inc., USA) produces defatted flour and grits. The company has three extruders for textured soya products, each with a capacity of about 7,000 to 10,000 tons per annum. These are not thought yet to be working to capacity. Unimills B.V. produces defatted soya flour, soya concentrate and products textured by extrusion with a single extruder. ADM–De Ploeg B.V. produces defatted soya flour and grits and also textured soya flour. The company has a single extruder of capacity 7,000 to 10,000 tons per annum, and is an associate of Archer Daniels Midland Co., USA.

"United Kingdom: British Soya Products produces defatted soya flour and grits as well as full fat flour. The company also produces by its own techniques (not conventional extrusion) the "Bespro" range of textured products. These may include gluten with the soya material. Spillers Ltd (Soya Food Ltd and Lucas Ltd) produces defatted flour and grits as well as full fat flour. Soya concentrate (Newpro) and textured soya flour are also produced. It is believed that the company now has the production capacity of two extruders (14,000 to 20,000 tons per annum). GMB (Proteins) Limited (jointly owned by General Mills Inc., USA and Bush, Boake Allen Ltd) produces a textured soya product ("Bontrae"), not by conventional extrusion. It is thought the current production capacity is a few thousand tons per annum. Miles Laboratories (U.K.) is linked to Miles Laboratories Inc., USA. Information is lacking as to whether the company has production capacity in the U.K. for textured products, as well as importing U.S. products. Courtaulds Limited produces a range of spun soya protein products (Kesp), some of which may incorporate gluten. Annual production is not known. The British Arkady Co. Ltd is associated with Archer Daniels Midland Co., USA. Defatted soya flour and grits, full fat soya flour and textured soya products (by extrusion) are produced. The single extruder has a capacity of 7,000 to 10,000 tons per annum. Extensive research and development has been carried out by Unilever Ltd. (in close association with Unilever in the Netherlands) to develop the "mesophase" process for the preparation of soya protein products and to utilize them in foods. The processes have not yet been commercially exploited.

"No information has been received concerning the production of soya protein products for human consumption and in particular textured products from Ireland, Italy and Luxembourg but Italy has very substantial capacity for the production of oil and meal from soya beans." Address: Procter Dep. of Food and Leather Science, Univ. of Leeds, Leeds.

416. Moore, Karen. 1978. Fabricated bacon parrots breakfast favorite. *Food Product Development* 12(4):98, 101. May.
• ***Summary:*** Bacon presently sells for about $1.69/lb. Ralston Purina has developed and tested a highly acceptable fabricated bacon containing lean meat trimmings (fresh ham shanks, 35%), fresh ham fat 35%, moisture 23.75%, Supro 620T soy protein isolate 3%, and salt 2% as part of a curing solution. The product has several advantages over its all-meat counterpart. Protein content is higher (12.6% vs. 8.4%), fat content is reduced (30% vs. 69.3%), cooked yield is higher (45.6% vs. 28.3-30%), and price is lower ($0.35-40 vs. $1.69).

417. *Wall Street Journal.* 1978. Ralston Purina plans to spur pet food sales with new products. Oct. 23. p. 22.
• ***Summary:*** Ralston Purina, facing intense competition in the pet-food field, plans to introduce about 6 new products, including Moist & Chunky (a soft-dry dog food) and Country Blend (a dry cat food). Soy is not mentioned.

418. Hahn, David T. 1978. Soy chips add nutritious dimension to snack food market. *Food Product Development* 12(9):72. Oct.
• ***Summary:*** Ralston Purina Co. has developed a high-protein "snack chip made entirely from *Supro 620*, soy protein isolate." The process is described. Two color photos show the chips. Address: Ralston Purina Co., St. Louis, Missouri.

419. National Soybean Processors Association. 1978. Year book and trading rules 1978-1979. Washington, DC. ii + 106 p.
• ***Summary:*** On the cover (but not the title page) is written: Effective October 1, 1978. This is the 50th anniversary issue. Contents: The National Soybean Processors Association [Introduction and overview]. Constitution and by-laws. Officers and directors. Executive office. Members. Standing committees. Food Protein Council. Trading rules on soybean meal. Sales contract. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}), sampling of soybean meal (automatic sampler, probe sampler), official

weighmaster application, semi-annual scale report, official referee chemists (meal). Trading rules on soybean oil. Sales contract. Definitions of grade and quality of export oils. Soybean lecithin specifications. Appendix to trading rules on soybean oil: Inspection, grading soybean oil for color (N.S.P.A. tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed), official weighmaster application, semi-annual scale report, official referee chemists (oil). Soybean oil export trading rules. Foreign trade definitions (for information purposes only).

The page titled National Soybean Processors Association (p. ii) states: "During the past crop year about 900,000,000 bushels of soybeans moved through processing plants of NSPA's 29 member firms. Approximately 55 percent of America's 1.7 billion-bushel soybean crop is bought and processed by NSPA members. Exporters account for another 41 percent of the crop, and the remainder [4%] is returned to farms for seed, feed, and residuals." Also discusses industry programs, soybean research, and international market development."

The section on officers, executive committee, and board of directors (p. 7-8) gives the name, company affiliation, and phone number of each person. Officers–Chairman: John G. Reed, Jr., Continental Grain Co. Vice Chairman: C. Lockwood Marine, Central Soya Co., Inc. President: Sheldon J. Hauck. Secretary: A.E. Idleman, A.E. Staley Manufacturing Co., Inc. Treasurer: Edward J. Cordes, Ralston Purina Co. Immediate past chairman: Lowell K. Rasmussen, Honeymead Products Co.

Executive Committee: Gorge A. Heinz ('79), Buckeye Cellulose Corp. Donald H. Leavenworth ('79), Spicola, Cargill, Inc. C. Lockwood Marine, Central Soya Co. Inc. John G. Reed, Jr., Continental Grain Co. Gaylord O. Coan ('80), Gold Kist, Inc. Lowell K. Rasmussen, Honeymead Products Co. William T. Melvin ('80). Planters Oil Mill, Inc. Theodore W. Bean ('79), Quincy Soybean Co. Edward J. Cordes, Ralston Purina Co. Richard E. Bell ('80), Riceland Foods, Inc. Austin E. Idleman, A.E. Staley Mfg. Co.

Board of Directors (alphabetically by company; each member company has one representative on the board): Thomas H. Wolfe, Anderson, Clayton & Co. Charles Bayless, Archer Daniels Midland Co. Keith Voight, Boone Valley Coop. Processing Assn. George H. Heinz, Buckeye Cellulose Corp. David C. Thompson, Bunge Corporation. Donald H. Leavenworth, Cargill, Inc. C. Lockwood Marine, Central Soya Co., Inc. John G. Reed, Jr., Continental Grain Co. Joe C. Givens, Dawson Mills. Alfred Jenkins, Delta Cotton Oil & Fertilizer Co. Kenneth E. Sullivan, Farmers Grain Dealers Assn. of Iowa. Donald M. Chartier, Farmland Industries, Inc. Gaylord O. Coan, Gold Kist Inc. Lowell K. Rasmussen, Honeymead Products Co. Kenneth J. McQueen, Land O'Lakes, Inc. Floyd W. Brown, Lauhoff Grain Co. Kermit F. Head, Missouri Farmers Assn.–Grain Div. Robert E. Hicks, Owensboro Grain Co., Inc. Sewell L. Spedden, Perdue Incorporated. John H. Payne, Planters Manufacturing Co. William T. Melvin, Planters Oil Mill, Inc. Theodore W. Bean, Quincy Soybean Co. Edward J. Cordes, Ralston Purina Co. Richard E. Bell, Riceland Foods, Inc. J.D. Morton, Sherman Oil Mill. Stiles M. Harper, Southern Soya Corp. Austin E. Idleman, A.E. Staley Mfg. Co. Preston C. Townsend, Townsend's Inc. Tyler Terrett, West Tennessee Soya Mill, Inc.

Executive office, Washington, DC: Executive Director, Sheldon J. Hauck. Director, Public Affairs: Jack DuVall. Director, Regulatory Affairs: William F. Sullivan. Administrative Asst.: Helen Miller. National Soybean Crop Improvement Council: Robert W. Judd, Managing Director.

Members (listed alphabetically by company; within each company, first the name of the official Association representative {who is on the Board}, followed by the other personal members listed alphabetically by surname. For example, Archer Daniels Midland Co., the company with the most personal members, has 26. After the name of each personal member is given with his address and phone number. In the listing below, the number of personal members is shown in parentheses after the name of each company, followed by city and state of the various locations): Anderson, Clayton & Co. (6); Phoenix, Arizona; Jackson, Mississippi; Houston, Texas. Archer Daniels Midland Co. (26); Decatur, Illinois; Galesburg, Illinois; Granite City, Illinois; Fredonia, Kansas; Mankato, Minnesota; Red Wing, Minnesota; Fremont, Nebraska; Lincoln, Nebraska; Kershaw, South Carolina. Boone Valley Coop. Processing Assn., Eagle Grove, Iowa. Buckeye Cellulose Corp. (8); North Little Rock, Arkansas; Augusta, Georgia; Cincinnati, Ohio; Memphis, Tennessee. Bunge Corporation (6); Cairo, Illinois; Logansport, Indiana; Emporia, Kansas; New York City, New York; Cargill, Inc. (18); Osceola, Arkansas; Gainesville, Georgia; Cedar Rapids, Iowa; Des Moines, Iowa; Sioux City, Iowa; Washington, Iowa; Chicago, Illinois; Wichita, Kansas; Minneapolis, Minnesota; Fayetteville, North Carolina; Sidney, Ohio; Memphis, Tennessee; Chesapeake, Virginia. Central Soya Co., Inc. (11); Gibson City, Illinois; Decatur, Indiana; Fort Wayne, Indiana; Indianapolis, Indiana; Belmond, Iowa; Marion, Ohio; Bellevue, Ohio; Delphos, Ohio; Chattanooga, Tennessee. Continental Grain Co. (6); Guntersville, Alabama; Chicago, Illinois; Taylorville, Illinois; New York City, New York; Cameron, South Carolina. Dawson Mills (3); Dawson, Minnesota. Delta Cotton Oil & Fertilizer Co. (1); Jackson, Mississippi. Farmers Grain Dealers Assn. of Iowa (Cooperative), Soybean Processing Div. (1); Mason City, Iowa. Farmland Industries, Inc. (5); Van Buren, Arkansas; Sergeant Bluff, Iowa; Hutchinson, Kansas; St. Joseph, Missouri. Gold Kist Inc. (3); Atlanta, Georgia. Honeymead Products Co. (3);

Mankato, Minnesota. Land O'Lakes, Inc. (2); Fort Dodge, Iowa; Sheldon, Iowa. Lauhoff Grain Co. (1); Danville, Illinois. Missouri Farmers Assn.–Grain Div. (5); Mexico, Missouri. Owensboro Grain Co., Inc. (2); Owensboro, Kentucky. Perdue Incorporated (2); Salisbury, Maryland. Planters Manufacturing Co. (2); Clarksdale, Mississippi. Planters Oil Mill, Inc. (2); Rocky Mount, North Carolina. Quincy Soybean Co. (4); Quincy, Illinois. Ralston Purina Co. (8); Bloomington, Illinois; Lafayette, Indiana; Iowa Falls, Iowa; Louisville, Kentucky; Kansas City, Missouri; St. Louis, Missouri; Raleigh, North Carolina; Memphis, Tennessee. Riceland Foods, Inc. (8); Helena, Arkansas; Stuttgart, Arkansas. Sherman Oil Mill (1); Fort Worth, Texas. Southern Soya Corp. (1); Estill, South Carolina. A.E. Staley Manufacturing Co. (7); Decatur, Illinois. Townsend's Inc. (2); Millsboro, Delaware. West Tennessee Soya Mill, Inc. (1); Tiptonville, Tennessee.

Associate Members: ACLI Soya Co, White Plains, New York. Anderson Clayton Foods, Dallas, Texas. Balfour MacClaine International, Ltd., New York City, New York. Best Foods, a Unit of CPC International Inc., Englewood Cliffs, New Jersey. California Vegetable Oils, Inc., San Francisco. Canadian Vegetable Oil Processing Co., Hamilton, Ontario, Canada. Cobec Brazilian Trading and Warehousing Corp. of the U.S., New York City. Louis Dreyfus, Stamford, Connecticut. Durkee Foods, Div. of SCM Corporation, Chicago, Illinois (Gerald J. Daleiden). Gordon-Kutner Co., Dallas, Texas. Grain Processing Corp., Muscatine, Iowa (H.P. Woodstra). Hartsville Oil Mill, Hartsville, South Carolina (Richard A. Koppein). Humko Products, Memphis, Tennessee. Hunt-Wesson Foods, Inc., Fullerton, California. Lever Bros Co., New York City, New York. Maple Leaf Mills Ltd., Toronto, Ontario, Canada (W.G. Milliken). Marwood Company, San Francisco, California. Overseas Commodities Corp., Minneapolis, Minnesota. Pillsbury Co., Bloomington, Minnesota. Procter & Gamble Co., Cincinnati, Ohio. PVO International Inc., San Francisco, California. Quaker Oats Co. (The), Chicago, Illinois. Schouten International, Inc., Minneapolis, Minnesota. Sofico, Memphis, Tennessee. Spencer Kellogg, Div. of Textron, Inc., Buffalo, New York. Alfred C. Toepfer, Inc., New York City, New York (Dieter Rahlmann).

Standing committees: For each committee, the function of the committee, the names of all members (with the chairman designated), with the company and company address of each are given–Crop Improvement Council. Meal trading rules. Oil trading rules. Safety and insurance. Soybean Research Council. Technical. Address: 1800 M St., N.W., Washington, DC 20036. Phone: (202) 452-8040. Telex 89-7452.

420. Ralston Purina Co. 1978. William H. Danforth (News release). Checkerboard Square, St. Louis, MO 63188. 6 p. Oct.

• ***Summary:*** "William H. Danforth was known to the American business world as a rugged pioneer of a new industry and the founder of the far-flung Ralston Purina Company, but the youth of America will long remember him as a special friend and counselor, a benefactor, and a magnificent example of the philosophy of life he sponsored.

"From the time Mr. Danforth was a sickly farm boy in the Southeast Missouri swamp country and was 'dared' by his school teacher to become 'the healthiest boy in the class,' he built his life on the proposition that to live is to dare. How well the dare idea served him was witnessed by his success in pioneering the commercial feed industry, and in being his company's active Board Chairman and a tireless traveler and leader of youth until his death on Christmas Eve, 1955, at the age of 85.

"The Ralston Purina Company, which Mr. Danforth founded, has over 60 manufacturing plants in the United States, Canada, Central and South America and Europe. The company is the world's largest manufacturer of balanced rations for livestock and poultry. It is a major manufacturer of breakfast cereals, and one of the hundred largest corporations of America. Mr. Danforth was also a director of several large corporations. But his work with and for American youth was the source of his greatest satisfaction.

"Upon graduating from Washington University in St. Louis in 1892, young Will Danforth found a job in the brick business. Since building material sales were seasonal, he was not satisfied. With characteristic directness he observed that 'animals must eat the year round,' so in 1894 he and a partner went into the business of mixing formula feeds for farm animals.

"Two years later a tornado wiped out their mill. Will Danforth went to the bank and negotiated a loan solely on the strength of his determination to make good. From these beginnings grew the Ralston Purina Company, and the man, William H. Danforth.

"The year 1894 was doubly important to Mr. Danforth, for it was in that year the he was married to Miss Adda Bush. In the succeeding years two children were born, Dorothy, the late Mrs. Randolph P., Compton, and Donald, now deceased, former President and Chairman of the Board of the Ralston Purina Company.

"Always interested in Christian leadership principles, Mr. Danforth and a group of friends organized the American Youth Foundation in 1924. It has as its purpose the training of young men and women in Christian ideals and helping them prepare for a life of responsibility and leadership. A 300-acre camp site near Shelby, Michigan, was acquired. As president of the American Youth Foundation, Mr. Danforth helped establish Camp Miniwanca there. For more than 30 years, up to the time of his death, he spent his summers at Camp Miniwanca where he met, counselled and inspired thousands and thousands of young men and women.

"During the First World War, Mr. Danforth served with

the Third Division, American Expeditionary Forces. His keen sense of sales promotion, which characterized his entire business life, followed him to the battlefields of France as he observed the enthusiastic connotation that the word 'chow' brought to soldiers in the field. Rations labeled 'chows' seemed to out-taste and out-satisfy just plain food, so when he returned to his business after the war, he applied the name 'Chow' to all livestock and poultry feeds which his company manufactured. Thus came into being the famous 'Purina Chows,' known to farmers throughout the United States and in Canada and other foreign lands.

"Another manifestation of Mr. Danforth's sales promotion genius was his early realization of the value of a distinctive trademark. In a time when standard packaging was practically nonexistent he bagged his Chows in sacks marked vividly with a uniform red and white checkerboard pattern. He remembered the children of a family in his boyhood who were always clothed from the same bolt of checkered gingham. The checkerboard shirt or dress quickly identified each member of the family, and Mr. Danforth thought it would work with the products he manufactured. The Purina Checkerboard has become one of the most famous and effective trademarks in American business.

"For all of Mr. Danforth's heavy executive schedule over the years and his 'daring' for high stakes in the business world, he avoided letting business crowd out a happy balance of living. This represented the essence of his personal philosophy, the 'Four Square' life.

"Mr. Danforth outlined his philosophy in a number of books, the best known of which is entitled 'I Dare You,' now in its sixteenth edition. He believed that a person has not one, but four lives to live, and to illustrate he would draw a familiar 'checkerboard' on a piece of paper. On the left side of the checker he would write 'Physical'; at the top he would write 'Mental'; on the right-hand side he would write 'Social'; and at the base of the checker he would write 'Religious.'

"A man's ingredients for life are a body, a mind, personality and character, Mr. Danforth would say, and all four must grow in balance with each other. The mind should not be developed at the expense of the personality, nor the body at the expense of character.

"Mr. Danforth made no secret that he took his health seriously. He would proudly relate that he had never lost a day at the office on account of illness. He walked his mile a day because it made him feel better, and his rule was to get eight hours of sleep a night with the windows open. He ate moderately and kept his weight down.

"In 1927, Mr. and Mrs. Danforth set up the Danforth Foundation as a personal family trust fund for the purpose of working through schools and colleges to aid young people in their development toward becoming wholesome and useful citizens. The Danforth Foundation has extended help in the form of fellowships or scholarships to many college students and teachers. In addition, the Foundation has helped to build 24 meditation chapels on college campuses and in hospitals.

"Through the activities of the Danforth Foundation and the American Youth Foundation, great groups of young men and women came to know his buoyant personality. A new acquaintance was always an adventure to him, and he never overlooked an opportunity to meet a stranger. A familiar scene in St. Louis often occurred at noon when Mr. Danforth took his walk. If he had been stopped for a few seconds by a red light at a street intersection, he would look around to see who else might be waiting. He would often walk up to a stranger, introduce himself and start a friendly conversation. By the time the two of them started across the street together they had found an area of mutual interest and were carrying on an animated conversation.

"Typical of Mr. Danforth's interests was his work with the Christmas Carols Association in St. Louis. About 1909, he and a group of friends revived the old custom of meeting to sing Christmas carols. They did this for the sheer pleasure of singing and of bringing Christmas songs to others. There was no particular plan or organization. The group of carolers grew each year, and they found themselves the recipients of many gifts, wholly unsolicited. Such gifts were turned over to the Children's Aid Society. Then in 1924, the Christmas Carols Association was formed and the Danforth genius for organizing was applied. Up to the time of his death he had been the Association's only president. Strangely yet appropriately, death came to him suddenly as he waited at home for the arrival of a group of Christmas Carolers on Christmas Eve.

"Today, the Christmas Carols Association in St. Louis embraces some 2000 singing groups each Christmas season with about 40,000 singers. They try to cover the entire city, block by block, to bring Christmas songs to stores, public places and homes. The thousands of gifts are divided among 56 children's agencies.

"Mr. Danforth's life-long adventure to 'dare' for new and bigger stakes was anchored in–and stabilized by–a few unchanging fundamentals he considered basic. For nearly 40 years, he wrote an inspirational 'Monday Morning Message' each week for his associates and employees. In one of these in 1955, while he was in his 84th year, he pointed out the significance to him of some of these unchanging fundamentals.

"'Some folks are continually making changes,' he said. 'I flatter myself that I like new ventures and new experiences. But when it comes to fundamentals I believe in finding the right foundations and building on them. I'm a poor changer. For instance, here are some of the fundamentals I have never changed: I have been a church member for over 60 years, married to one wife for over 60 years, a lodge member for over 60 years, a Purina man for over 60 years.

"'Four-Square principles have been pillars of strength in

my life. I have never had cause to change. The longer I live with such fundamentals, the more valuable they become.'

"From a solid base of unchanging fundamentals, Mr. Danforth flung his 'dare' in many directions. His living monument stands in the hearts of American Youth who remember his magnificent challenge to them–'Aspire nobly, adventure daringly, serve humbly.'" Address: St. Louis, Missouri.

421. *Foreign Agriculture* (*USDA Foreign Agricultural Service*). 1978. Soy protein plant opens in Belgium. Dec. 11. p. 15.

• ***Summary:*** The first manufacturing plant in Western Europe for the production of isolated soy protein has been opened by Ralston Purina at Ieper [Ypres], Belgium, according to the U.S. Agricultural Attaché in Brussels. The plant, which will supply isolated soy protein for European food processors, cost about $16.6 million and will employ about 100 workers.

422. *SoyaScan Notes.* 1978. Chronology of soybeans, soyfoods and natural foods in the United States 1978 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. 25-27. International Soya Protein Food Conference held in Singapore, sponsored by the American Soybean Association. 400 people from 24 countries participated.

Jan. *Whole Foods* magazine starts publication in Berkeley, California, founded by Steven & Henrietta Haines, and Jim Schreiber. The first issue features an article titled "Making Money Making Tofu," about five tofu companies. Westbrae has a full-page color ad titled "Someday all of this will be as familiar as apple pie," showing five types of miso plus sea vegetables.

Feb. 17. Laughing Grasshopper tofu shop changes its name to New England Soy Dairy, Inc., the first company to use the term "soy dairy" in its name. Also in 1978 White Wave in Boulder, Colorado, publishes a charming poster announcing, "We've got an alternative. White Wave Soy Dairy." An illustration shows a man leading his cow, standing under a beanstalk, looking in wonder at the seeds, soybeans.

March. The Cow of China, America's third soy deli, run by White Wave, opens in Boulder, Colorado. It is later renamed Good Belly Deli.

April. Nasoya Foods Inc. starts making tofu and soymilk in Leominster, Massachusetts, inside a former dairy. Founded by John Paino and Robert Bergwall. May. 3. "What is this Thing Called Tofu" by Patricia Wells published in *The New York Times.*

May 22-25. Keystone Conference on Soy Protein and Human Nutrition held in Keystone, Colorado, organized by Ralston Purina. 105 registrants. The world's top researchers on the subject present 34 papers demonstrating a new scientific understanding of the quality of soy proteins for human nutrition. The influential 406-page proceedings, titled *Soy Protein & Human Nutrition,* are published in 1979, edited by Wilcke, Hopkins, and Waggle.

May. The Soy Deli opens at The Soy Plant in Ann Arbor, Michigan. America's fourth soy deli.

June. Brightsong Tofu, founded by Joel Brightbill and Bob Heartsong, starts making tofu in Redwood Valley, California. Sharon and Richard Rose bought the company in June, 1980 and in Nov. 1980 started The Real Food Tofu Cafe, a soy deli, adjacent to it.

June 26. First Takai catalog of tofu and soymilk equipment published, written by William Shurtleff. The first publication of its type in English, it helps start many new soyfoods companies.

July 28-31. First Soycrafters Conference held at The Soy Plant in Ann Arbor, Michigan. Conceived and organized by Steve Fiering. 75 people attend. The Soycrafters Association of North America (SANA) is founded, with Larry Needleman as the first president and a board of directors.

Sept. First issue of *Soyanews* published in Sri Lanka.

Oct. *The Farm Vegetarian Cookbook* (revised ed.) by Louise Hagler published by The Farm's Book Publishing Co. in Tennessee.

Oct. Morinaga Milk Co. in Japan starts to export their tofu in aseptic Tetra Brik cartons worldwide. They issue a color recipe booklet to accompany each carton.

Oct. Kendall Food Co. starts to make America's earliest known commercial amazake in Brookline Village, Massachusetts. Amazake is made from koji, as are miso and shoyu. Not even in Hawaii was commercial amazake made before this–so far as we know.

Oct. 29-Nov. 3. World Conference on Vegetable Food Proteins held in Amsterdam, The Netherlands. More than 1,000 participants. Sponsored by the American Soybean Assoc. and others.

Nov. The Tofu Shop, America's fifth soy deli-restaurant, opened in Rochester, New York, by Greg Weaver. Large and very creative menu. Later called The Tofu Gardens, and The Lotus Cafe.

Dec. American Soybean Association moves its headquarters from rural Hudson, Iowa, to St. Louis, Missouri, into greatly enlarged, modern offices.

Dec. *The Book of Tofu* (extensively revised, Americanized edition), by Shurtleff and Aoyagi published by Ballantine Books in a mass-market paperback edition. By 1987 the two editions have sold over 450,000 copies.

Dec. *Tofu Goes West,* by Gary Landgrebe published by Fresh Press.

Dec. *How to Cook with Miso,* by Aveline Kushi published by Japan Publications.

Dec. *Tofu Madness,* by Olszewski published by Island Spring tofu company in Washington [state].

Dec. Growing use of the term "shoyu" and less misuse

of the term "tamari" in publications, indicating awareness of the difference between these two types of soy sauce.

* *Peaking Out on Tofu*, by Matthew Schmit self-published in Colorado.

* Soymilk Piima, resembling the traditional Finnish cultured dairy product, is first made (on a home scale) by Pat Connolly in southern California.

* Soy oil: The King with no crown. A series of studies initiated by the American Soybean Assoc. in 1978 showed, surprisingly, that although soy oil is by far America's widely used oil (accounting for 84% of all vegetable oils and 58.3% of all edible oils and fats), most consumers are simply not aware that they are using soy oil. When 1,200 female heads of households were asked "What oils can you think of?" only 17% mentioned soy oil (52% mentioned corn oil, 36% peanut oil, and 23% safflower oil), and only 7% reported having purchased soy oil in the past 6 months. The ASA Market Development Foundation promptly began a campaign to increase product recognition and loyalty, improve product image, and to encourage manufacturers worldwide to identify soy oil on product labels. The slogan used is shown at the start of this paragraph.

423. Shearson Hayden Stone Inc. 1978. Special survey: U.S. and Canadian soybean processing facilities. New York, NY. 8 p. Nov.

• ***Summary:*** The USA has a total soybean crushing capacity of 1,226 million bushels/year based on 330 available days. A ranking of the capacity of major U.S. soybean crushers is as follows (as of 1 Nov. 1977):

Cargill 224 million bushels/year. 18.3% of industry total.

Archer Daniels Midland 178 million bushels/year. 14.5% of industry total.

Central Soya 94 million bushels/year. 7.7% of industry total.

A.E. Staley 93 million bushels/year. 7.6% of industry total.

Ralston Purina 92 million bushels/year. 7.5% of industry total.

All Co-ops 232 million bushels/year. 19.0% of industry total.

Other 312 million bushels/year. 25.4% of industry total.

The leading soybean crushing states (in million bushels per year capacity) are: Illinois 258, Iowa 176, Minnesota 83, Tennessee 73, Indiana 70, Arkansas 69, Missouri 68, Mississippi 59, Ohio 50.

The individual soybean crushing plants with the largest capacity are (* = food grade plant): ADM* (Decatur, Illinois) 150,000 bushels/day. Quincy Soya (Quincy, Illinois) 120,000 bushels/day. Cargill, Inc. (Memphis, Tennessee) 100,000 bushels/day. A.E. Staley (Des Moines, Iowa) 100,000 bushels/day.

Canadian soybean crushers capacity (total 148,000 bushels/day) are: Maple Leaf Mills (Windsor, Ontario) 60,000 bushels/day. Victory Mills (Toronto, Ontario) 42,000 bushels/day. Canadian Vegetable Oil Processing (CVOP, Hamilton, Ontario) 33,000 bushels/day. Maple Leaf Mills (Toronto, Ontario) 13,000 bushels/day. Total: 148,000 bushels/day. Note: Maple Leaf Mills is the largest Canadian soybean crusher, with a total capacity of 73,000 bu/day.

424. Darrington, Hugh. 1979. Soy protein comes to Ypres [Ralston Purina's new isolated soy protein plant opens in Belgium]. *Food Manufacture* (*London*) 54(1):61-62. Jan.

• ***Summary:*** A large photo shows the new Belgian plant, which is said to be the first of its kind in Europe. It was built at a cost of 19 million British pounds by Ralston Purina Europe, a company started by Ralston Purina in 1972 to help them enter the European market. Ralston Purina's vegetable protein story really began 20 years ago, when they began researching alternative methods of supplementing meat, milk and egg proteins with proteins from oil seeds. The new Belgium plant at a cost of £10M was built by Purina Protein Europe, a company started by Ralston Purina in 1972 to help them enter the European market. The isolate is available in 9 different forms, depending upon application, ranging from Purina Protein A, a simple acidified protein and Purina Protein 500E (general purpose) to Purina Protein 200–a fibre version. It is being used now in French pate, ham products, poultry roll, Scandinavian fish balls, and protein enriched pasta.

The new plant was officially opened by Belgian Prime Minister Leo Tindemans and will employ around 100 people. Products from Ypres will be distributed in the UK and Ireland by McAuley Edwards Ltd, 9 High Street, Baldock, Herts, which is a joint venture company with Ralston Purina. They also operate a Protein Application Laboratory now being expanded and relocated at St. Albans, which developed the application of Purina's products for the entire European market.

425. *Food Engineering.* 1979. Dairy products with soy protein. 51(1):ef-10, 11. Jan. [1 ref]

• ***Summary:*** Contents: Introduction: Coffee creamers and whip toppings. Soy isolate in yogurt. Soy-based infant formulas. Soy-whey drink mix. Soy in ice cream. Room for new technologies.

A table lists 15 soy-based infant formulas, showing the product name, form (powdered, ready to feed, or concentrated liquid), and manufacturer. The product names are Bon Lact, Espelin, Isomil, Lactopriv, Mull-Soy, Multilac, Neo-Mull-Soy, Nursoy, Nutri-Soja, Prosobee, Sobee, Soja Semp, Soyalac, i-Soyalac, Vegebaby.

426. **Product Name:** Purina Protein 220 (Isolated Soy Protein).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis,

MO 63164.
Date of Introduction: 1979 January.
Wt/Vol., Packaging, Price: 50 lb (22.7 kg) multiwall sleeve-pak bags.
How Stored: Shelf stable.
New Product–Documentation: See next page, Ralston Purina Co., Protein Division. 1979. Aug. 1. General product description.

427. Davis, Melissa. 1979. The soy of cooking: Out of the field, into the kitchen. *Washington Post.* March 15. p. E1, E14, E20.
• ***Summary:*** Starts by discussing Henry Ford's interest in and work with soybeans. He wanted to find a way to "grow automobiles out of the soil. In 1940 he discovered that soybeans were his bumper crop."

Last week a milestone in soybean history was made on Capitol Hill [Washington, DC]. "About 500 people including senators, representatives, ambassadors, diplomats and freeloaders turned up at the International Soybean Fair.

While Chai Zemin (of the People's Republic of China) and Bob Bergland (U.S. Secretary of Agriculture) stood shaking hands, people pushed and shoved to get to the bar and to hors d'oeuvres made from every soybean product imaginable–soy flour, tofu or bean curd, textured vegetable protein (TVP), soy milk, soy sauce, etc. Also mentions tempeh and miso.

Although most Americans think of soybeans as something fed to chickens and cows, companies like Miles Laboratories, Procter & Gamble, Ralston Purina, Nabisco and Kraft are "hoping we will take soybeans into our kitchens."

The hors d'oeuvres at the Soybean Fair (10 dishes prepared by chefs from the Chinese Embassy and 13 presented by the Food Protein Council) attempted to prove that soy protein foods can be tasty and attractive. Although one critic said, they 'taste like vacuum cleaner dust,' some of them came close (the Morning Star Farms bacon analog had a dusty nutty taste very unlike bacon). There were a few interesting hors d'oeuvres including soy nuts and garlic smothered bean curd."

Then comes a description of how to cook soybeans using 3 different methods: (1) Pressure cooker method–45 minutes at 10-15 pounds pressure. (2) Regular method–soak, then cover and simmer for 4½ to 5 hours, or until tender. Add water as needed. (3) Freezer method: Pour the soaked beans with water into ice trays or freezing containers. The beans should be just covered with water. Freeze overnight, or as long as you like. Remove from freezer, place in a pot with sufficient water to cover. Cover and simmer (do not boil) for 2½ to 3 hours, or until tender. Add more water if needed.

Then come four recipes: (1) Soy nuts. (2) Peanut Butter Cookies (with 3 cups soy flour; makes 60 cookies). (3) Fried bean curd with garlic and scallions (6 servings). (4) Soyburgers (with 7 cups cooked soybeans; makes 16. From *The Farm Vegetarian Cookbook*).

The event was largely sponsored by the Food Protein Council and its member companies. "There were a few interesting hors d'oeuvres including soy nuts and garlic smothered bean curd."

428. Anton, J.J. 1979. The marketing of isolated soy proteins. *J. of the American Oil Chemists' Society* 56(3):409-11. March.
• ***Summary:*** In 1976 the Gallup organization conducted a survey showing that "soy protein is most often named by consumers as the protein source of the future."

"Today the growth rate of isolated soy protein is several times greater than that of other classes of soy proteins. Today its worldwide expansion rate is estimated to be more than 25% per year."

"With the recognition of isolated soy proteins as comparable nutritionally to meat, milk and eggs, the opportunity to position soy as a major nutrition source surely will be a future direction for marketing." This recognition came about in May 1978 as a result of the Keystone Conference on Soy Protein and Human Nutrition, held in Colorado.

Soy protein is probably the most widely researched food in human history.

A portrait photo shows J.J. Anton. Address: Protein and Dairy Food Systems Div., Ralston Purina Co., Checkerboard Square, St. Louis, Missouri.

429. Desmyter, E.A.; Wagner, T.J. 1979. Utilization of vegetable proteins in meats of large cross sectional area. *J. of the American Oil Chemists' Society* 56(3):334-36. March.
• ***Summary:*** Contents: Abstract. Introduction. Current technologies related to whole cuts of meat. Incorporation of isolated soy protein in whole cuts of meat. Typical applications. A shows one of the authors. Address: 1. Purina Protein Europe, Brussels, Belgium; 2. Ralston Purina Co., St. Louis, Missouri.

430. Hardin, Clifford M. 1979. Conditions and trends in the world protein economy. *J. of the American Oil Chemists' Society* 56(3):173-77. March. [5 ref]
• ***Summary:*** This brilliant article unfortunately contains no subdivisions (A-level heads), making it difficult to summarize.

A graph shows U.S. exports of feed grains and wheat from marketing year 1970-71 to 1976-77 (million tons). Tables show: (1) Grain and livestock–production and exports 1974-75 as percent change from year earlier. (2) Feed uses of grain in Developed countries (with USA broken out), centrally planned countries, and developing countries, in 3 years–1960, 1970, 1976.

(3) Estimates of sources of world protein production.

Purina® Protein

BRAND

220

Isolated Soy Protein

General Product Description

Purina Protein 220 is a specially processed isolated soy protein that is highly digestible, and has excellent nutritional properties. It is processed to provide a granular product that is essentially bland in flavor.

Purina Protein 220 has excellent water absorption properties and provides chewy structure when used in course ground meat systems.

Purina Protein 220 is available with titanium dioxide as a tracer for use in USDA inspected meat establishments.

TYPICAL ANALYSIS

Protein (N x 6.25 Moisture Free Basis)	91.5%
Moisture	6.0%
Fat (PE extract)	0.2%
Fiber (crude)	0.1%
Ash	3.8%
Calcium	0.20%
Phosphorus	0.8%
Potassium	0.08%
Sodium	1.1%
pH	7.1

MICROBIOLOGICAL DATA

Standard Plate Count	< 10,000/gm
Salmonella (by test)	Negative
Yeast-Mold	< 100/gm

PACKAGING

Purina Protein 220 is available in 50 lb. (22.7 Kg) multiwall sleeve-pak bags.

AMINO ACID COMPOSITION

Amino Acid	gm AA/ 100 gm Product	gm AA/ 100 gm Protein (100%)
Alanine	3.6	4.1
Arginine	6.6	7.5
Aspartic Acid	10.5	11.9
Cysteine	1.2	1.3
Glutamic Acid	19.0	21.5
Glycine	3.7	4.2
Histidine	2.3	2.6
•Isoleucine	4.3	4.9
•Leucine	7.2	8.1
•Lysine	5.6	6.3
•Methionine	1.2	1.3
•Phenylalanine	4.8	5.4
Proline	4.9	5.5
Serine	4.6	5.2
•Threonine	3.3	3.7
•Tryptophan	1.3	1.5
Tyrosine	3.5	4.0
•Valine	4.0	4.5
Total Sulphur A.A.	2.4	2.6
Total Aromatic A.A.	8.3	9.4

•Essential Amino Acids

NUTRITION

Purina Protein 220 is a source of vegetable protein. The protein in the product is highly digestible and is an excellent source of protein for food products.

PHYSICAL PROPERTIES

Color	Cream to light buff
Flavor	Bland
Particle Size	10-40 mesh
Bulk Density	Standardized

LABELING

Isolated Soy Protein

Ralston Purina Company
Protein Division
Checkerboard Square, St. Louis MO 63188 • 800/325/7108
Avenue Louise 391, B-1050 Brussels, Belgium. (02) 647 98 90

1 AUG 1979
PT 6678B-80A6

D.220.050

Plants produce 79% of the world's protein vs. 21% from animals. Among the plants, cereals, roots and tubers produce 52% of the total vs. 12% from oilseeds. (4) FAO estimates of world average per capita protein supply, 1961-65 and 1974, in booth grams per day and percentage of total.

A photo shows Clifford M. Hardin. Address: Vice Chairman of the Board, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri.

431. Kolar, C.W.; Cho, I.C.; Waltrous, W.L. 1979. Vegetable protein application in yogurt, coffee creamers and whip toppings. *J. of the American Oil Chemists' Society* 56(3):389-91. March.

• ***Summary:*** Contents: Abstract. Coffee creamers. Whip toppings. Yogurt.

"Soy proteins and, in particular, isolated soy proteins are being used in coffee creamers and whip toppings. With the increasing cost of traditional protein sources, more food manufacturers are investigating and utilizing soy proteins in other dairy type products. Isolated soy protein added as a replacement for the nonfat dry milk in the production of yogurt increased the viscosity and gel strength to a greater amount than nonfat dry milk and sodium caseinate added on an equivalent protein basis.

"Coffee creamers are generally grouped into 3 categories: liquid, frozen and dry.

"Whip toppings: Isolated soy proteins are being used in the manufacture of 4 types of whip toppings: (1) aerosol, (2) liquid, (3) frozen, and (4) frozen, prewhipped toppings.

"Yogurt: Two styles of yogurt are popular in the U.S. These are Swiss and sundae styles. The Swiss style is a stirred yogurt incubated in bulk. Fruit and flavorings are commonly combined with the yogurt before packaging. The sundae style is produced by the addition of fruit and flavoring to the retail cup followed by the addition of an inoculated milk to the container."

"Research has been conducted to investigate the potential use of isolated soy proteins as replacement of some of the stabilizer products such as plant hydrocolloids and sodium caseinate. The addition of isolated soy protein contributes to increased viscosity and gel strength and will contribute to the protein content while many of the stabilizer products do not... Isolated soy protein may be used to replace the nonfat dry milk or sodium caseinate that is added to milk to improve viscosity and texture of yogurt. In addition, the isolate is effective in reducing syneresis or whey separation from the gel structure of the yogurt." A photo shows Kolar.

Note: This is the earliest published document seen with the term "coffee creamers" (or "coffee creamer") in the title. Address: Ralston Purina Co., St. Louis, Missouri.

432. Lo, G.S.; Settle, S.L.; Steinke, F.H.; Hopkins, D.T. 1979. Effect on transit time and fecal output of soy polysaccharides in pigs. *Federation Proceedings* (*FASEB*) 38(3):548 (Abst. #1644). March.

• ***Summary:*** Soy polysaccharides (SP) are primarily the cell wall components of soybean cotyledons, which are derived from processing defatted soybean flakes. Tests were conducted on pigs to investigate the physiological functions of SP. Calcium, phosphorus, zinc, and copper retention were not affected in the pigs fed diets containing SP and cellulose. Magnesium retention was reduced significantly in the pigs fed SP and wheat bran. Results from this study indicated that SP is able to decrease transit time, increase fecal volume and fecal moisture with minimal effects on mineral and nitrogen utilization. Address: 1-3. Ralston Purina Company, St. Louis, Missouri 63188.

433. Nichols, J.H. 1979. How the consumers perceive proteins. *J. of the American Oil Chemists' Society* 56(3):415-16. March.

• ***Summary:*** The writer and his company are in the soy protein industry. In 1976 in the United States, the Gallup Organization conducted a national sample attitude survey sponsored by the Food Council of Washington, DC. the "Gallup study has two findings that are relevant. The first is that 33% of the consumers stated that the soybean would be the most important source of the protein in the future. This is the largest number of people to make this conclusion for any of the foods mentioned. The rest of the foods receiving less frequent mentions included beef, fish, powdered milk, cheese, peanuts and pork."

The study also found that "54% of the consumers stated that they has eaten foods containing soy proteins during the year."

Moreover 39% of those polled said that soy protein improves the quality of the finished food.

And 26% said that soy protein will have no effect on the quality of the finished food.

Gallup also found that the more affluent and educated a person was, the more likely he or she would have positive perceptions of soy proteins. The food industry must work hard to repeatedly provide foods containing soy proteins that meet or exceed consumer expectations. Address: Ralston Purina Co., Belgium.

434. Ralston Purina Co. 1979. The versatile isolate–for the world who burns the candle at both ends (Ad). *J. of the American Oil Chemists' Society* 56(3):216A-217A. March.

• ***Summary:*** "Proteinability–we're the first source." This striking two-page color ad, which shows 4 candles burning in the sand, appeared as early as June 1977 (which see). It demonstrates Ralston Purina's continuing commitment to becoming the world leader in isolated soy proteins. Address: Checkerboard Square, St. Louis, Missouri. And, Protein Purina Europe SA, 391 Avenue Louise–Box 6, B-1050 Brussels, Belgium. Phone: 1-800-325-7136.

435. Roberts, L.H. 1979. Vegetable protein legislation: An industry perspective. *J. of the American Oil Chemists' Society* 56(3):201-05. March. [11 ref]
• ***Summary:*** Contents: Abstract. Introduction. Food standards. Labeling of foods containing vegetable proteins. Types of vegetable protein uses. Nutrient fortification. A photo shows Roberts. Address: Food Protein Div., Ralston Purina Co., St. Louis, Missouri.

436. Wilcke, H.L.; Waggle, D.H.; Kolar, C.K. 1979. Textural contribution of vegetable protein products. *J. of the American Oil Chemists' Society* 56(3):259-61. March. [14 ref]
• ***Summary:*** An early process for the texturization of protein fibers was that described by Boyer in a 1954 patent in which "protein fibers were spun into a fibrous texture." The process is described briefly. Contains numerous photos and the following figures: (1) Steam texturization process (schematic diagram). (2) Process for manufacturing structured isolated soy protein (schematic diagram).

A portrait photo shows H.L. Wilcke. Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri.

437. Decker, C.D.; Kolar, C.W. 1979. Utilization of soy protein isolates in meat and fish applications. In: Hideo Chiba, et al., eds. 1979. Proceedings of the Fifth International Congress of Food Science and Technology (1978-Kyoto). Tokyo: Kodansha Ltd.; Amsterdam and New York: Elsevier Scientific Publishing Co. xi + 436 p. See Chapter 2.3, p. 79-82. Illust. Author index. Subject index. 26 cm. Series: Developments in Food Science, Vol. 2.
• ***Summary:*** Contents: Introduction. Economics and basic philosophy of using isolated soy proteins. Importation hydration principles. Comminuted applications (bologna and kamaboko). Muscle augmentation (pumping or injecting a slurry of soy protein isolates into whole cuts of meat, such as ham, or fish).

It is essential to use vegetable proteins to extend and replace more expensive animal proteins if future protein demands are to be met. "The soybean is one of the most successful sources of vegetable protein." "Processed soybean protein products, which as food ingredients can replace and extend meat and fish proteins, have only gained prominence within the last 10 years. Flours, concentrates, and isolates are the major forms of processed soy protein, and all forms are important to the world's food supply." Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

438. Ralston Purina Co. 1979. Proteinability (Portfolio). St. Louis, Missouri.
• ***Summary:*** This portfolio was handed out at the IFT (Inst. of Food Technologists) show in June 1979. On the red cover, in the upper left corner, the "Proteinability" logo is like a sunflower with 6 round petals. The word "Proteinability" is also written in black on a tab.

When opened, the portfolio folds out into three large panels. On the two left panels is a striking two-page color photo that shows 4 candles burning in the sand. A moon is reflected in candle. Below the two candles on the left is written, "Call toll free: 800/325-7136." Below the two candles on the right is written, "For the world who burns the candle at both ends." The far right panel is designed to hold inserts, but unfortunately none are there. At the bottom is written: "Proteinability–we're the first source." Address: Checkerboard Square, St. Louis, Missouri 63188. Phone: 1-800-325-7136.

439. Morgan, Dan. 1979. Cotton, wheat and corn bowing to the reign of king soybean. *Washington Post.* July 24. Section A. p. 1, col. 1.
• ***Summary:*** According to unofficial private estimates, America's largest soybean crushers (with their estimated capacity in millions of bushels) are: Cargill 224, ADM 178, Central Soya 94, A.E. Staley 93, and Ralston Purina 92.

"In West Germany soybean oil has gained wide acceptance and is produced by such major companies as Unilever. But the oil has encountered strong resistance in France as a cooking oil because 'the French prefer a richer, peanut smell and like butter,' says the American Soybean Association's Michael A. Phillips. Efforts to promote soybean oil in France also have encountered strong resistance from French agricultural interests.

"Earlier predictions that Brazilian soybean products would supplant those of the United States in markets abroad have proved to be exaggerated. Since the early part of the decade, foreign and local interests have invested massively in processing plants in Brazil. The Brazilian government backed this development with generous concessions to foreign investors and with enormous subsidies to exporters of meal. These subsidies have amounted to as much as $1 a bushel and have enabled exporters in Brazil to offer European and Japanese feed buyers discounts of $20 to $30 a ton below the U.S. price. But this year U.S. trade negotiators–spurred by the powerful Midwest farm bloc–obtained a promise from Brazil to phase out the subsidies."

440. Leviton, Richard. 1979. The beanfield. "Let the Earth say beans"–Henry David Thoreau. *Soycraft* (*Greenfield, Massachusetts*) 1(1):2. Summer.
• ***Summary:*** This is the first article (actually, more like an editorial) in this new magazine.

"Making and marketing soyfoods is becoming an increasingly widespread and satisfying practice. What attracts many people to soycrafting, I think, is that it serves as a focal point for many vital life-ambitions currently circulating in our generation.

"Desire for social service, anguish over world hunger, meaningful political action, skilled traditional foodcrafts, employing appropriate technology, self-employment, health-

consciousness, food-awareness and vegetarian lifestyles, ecological concern, local economies and community food self-reliance, an integrated, non-alienated workplace, and right livelihood–these are some of the core motivations that are the inspiration for many of the newly-formed tofu shops and soy dairies in the United States.

"While for Oriental shops, tofu-making is a respected cultural foodcraft, for the newer Occidental companies, it is, rather, a way to plug into the social system in a personally meaningful and socially beneficial manner. Tofu-making is a way of transforming late sixties' revolutionary anti-capitalist zeal into late seventies' benign capitalism and soyfoods evangelicism. It is, primarily, a visionary movement, initiated and managed by exceptionally talented and committed amateurs, who place a belief in high-quality products above mere monetary gains.

"While this visionary enthusiasm is contagious and certainly worthy of encouragement, it is now bringing tofu-makers face-to-face with an at least initially distressing reality of business-competition. Competition among Oriental tofu companies, especially in California, is nothing new, but for fledgling Occidental shops, who have up to now enjoyed prima donna status in a state or entire region, competition and the concomitant demands for efficiency and operational streamlining, has entered the soyfoods arena. How can soy-crafters maintain their high spirits and desire for unilateral cooperation and sharing when other similarly inspired companies are selling tofu in their own hometown market? Proprietary and Profit are two words from conventional business discourse that are now knocking at our doors. Harold Wilcke, speaking at an industry-wide conference on soy protein, sponsored last year by his company, Ralston Purina, posed the question: 'How do we justify the expenditures of shareholder's money organizing a public scientific conference that will provide a comprehensive summary of the information, when the usual policy is not to share such information, at least not with competitors?' The Food Protein Council (a trade association in Washington, D.C.), which represents fifteen of the major soy protein companies, who are all in mutual competition, has managed a modus operandi, a kind of middle ground, of providing marketing liaison between the soy companies and the consumer and government sectors–a formula from which SANA could benefit greatly. Mr. Wilcke answers his question with 'In the final analysis, the ultimate goal of everyone working with the soybean as a food is to provide the information that is necessary for the full recognition of the commodity as an important food source.' Let us abstain from fixing a price tag on our magnanimity and let's marshal our collective strength into popularizing soyfoods around the world.

"Growth–its extent and limits–is another current problem. Most shops, it seems, made their initial facility too small with inefficient equipment, and now, with sales booming, they are expanding and re-locating. More recent shops, however, seem to be expending considerably more time in planning and research, hoping to avoid the nuisance and expense of expansion within the first year of business, and some have a more concentrated vision of making money. Many shops, now entering their second and third years of business, are experiencing growing pains as cherished goals come into conflict: an ecological sensitivity conflicts with the need for packaging which democratizes tofu by putting it into the mainstream, the supermarkets: expanding sales requires more money, workers, and management which can invite alienation and bureaucracy. The rigorous demands of business survival are confronting the ideals of soycrafting in a dialectical joust: let's hope that some kind of positive synthesis emerges.

"Each company will need to chart its own boundaries for growth and adjust them to market conditions; each company will need to assess constantly its current prevailing attitude and practices against its original philosophy; and each company will have to blend inspired foodcrafting and estimable quality standards with astute business sense and a keenly managed operation. The perplexing demands of growth and survival in the marketplace which many are now experiencing, are, simply, a watershed in a company's maturation as euphoria transmutes into pragmatism.

"We have conceived *Soycraft* to provide a panoramic view of the dimensions and activities of the newly-emerged worldwide soyfoods industry and as an operational guide for soyfoods entrepreneurs. Most of us, who began as inspired amateurs with little previous business or manufacturing training, are now perceiving that this is the core of our present difficulties today in the American marketplace. Soycraft will, we hope, fill these gaps with information on manufacturing (machinery, techniques, capacities), marketing (promotions, channels, merchandising, advertising), finance (business tactics, risk and return concepts, people as resources), philosophical problems (local control, organic ingredients, dairy-like products), and long-range goals (growth, direction, diversity, franchises). We trust that, by addressing these topics and by pointing people in the directions to find their specific solutions, *Soycraft* will provide a worthwhile service to the industry.

"Soycrafters Association (SANA) is steadily growing with sixty new members since January, many international, many from large food corporations. SANA is gathering steam to tackle some important projects this year, such as developing a domestic source for nigari, developing promotional materials and generic radio and television advertising packages for member companies, and petitioning the USDA/FDA complex to approve tofu for school lunch programs. We are gradually building a strong network of food craftsmen, scientists, and soybean producers around the world.

"For their commendable assistance in the preparation of

this pioneer issue of *Soycraft*, I express gratitude to my wife, Kathy Leviton, for providing me with invaluable financial support over the last six months: to Bill Shurtleff, for his never-flagging encouragement, support, and advice; and to The New England Soy Dairy, my alma mater, for material support and office space. Gratitude is expressed also to Dr. Walter Wolf, of Northern Regional Research Center, for his editorial suggestions on soy protein chemistry; and to Dr. Kenneth Samonds, of the University of Massachusetts, for his comments on soy nutrition; and to the many companies and individuals that have put their trust and membership fees behind our efforts.

Note: For these reasons, some people have referred to the "soyfoods movement" in North America and soyfoods as a "way of life."

441. Morgan, Dan. 1979. Once-lowly soybean is nation's top cash crop, beating corn and wheat. *Los Angeles Times.* Aug. 13. p. D14, D16.
• ***Summary:*** Across the American South, large areas that had once been planted to cotton are now planted to soybeans. In 1979 American farmers will harvest more acres of soybeans than of either corn or wheat. Soybeans (all 21.3 billion bushels in 1979) are now also the leading U.S. cash crop, producing more income for farmers than corn, wheat, or cotton. In addition, soybean exports now "bring in more revenue than any other U.S. crop–$6.9 billion in 1978 compared with $5.9 billion for feed grains and $4.6 billion for wheat."

"The rise of soybeans to the status of a glamour crop came about through" the increased consumption of animal products (especially poultry and hogs) at home and abroad since World War II. Soybean meal became the main source of protein in feeds for these animals.

Pfizer and several other pharmaceutical firms have entered the soybean seed business.

A bar chart shows the largest U.S. soybean processors, based on the estimates of private security analysts. Figures are for capacity in millions of bushels per year: Cargill 224. ADM 178. Central Soya 94. A.E. Staley 93. Ralston Purina 92.

Soybeans grown near the Mississippi River–"the 'Main Street' of the world grain trade"–are like to be exported. The soybean trade up and down this river is largely dominated by multinational grain companies such as Cargill, Continental, and Bunge. In a 180-mile stretch of river from Osceola, Arkansas, up to Silkeston, Missouri, are 10 grain terminals belonging to those 3 multinationals. Address: The Washington Post.

442. Kadane, Victor V.; Meyer, E.W.; Whitney, R.W. Assignors to Central Soya Company, Inc. (Fort Wayne, Indiana). 1979. Meat pumping process. *U.S. Patent* 4,164,589. Aug. 14. 5 p. Application filed 5 Sept. 1978. [6 ref]
• ***Summary:*** "This application is a continuation-in-part of our co-pending application Ser. No. 761,424 filed Jan. 21, 1977, now abandoned.

"Background and Summary of Invention: This invention relates to a meat pumping process employing soy protein isolate and, more particularly, a non-gelable, soy protein isolate which is rapidly dispersible in water to provide a portion of the pumping medium, i.e., 'brine.'

"The pumping of hams with brine, sometimes referred as 'pickle', probably antedates recorded history. The most common salt employed is sodium chloride which provides curing (color), preservative (shelf life) and organoleptic (taste) functions."

Among the soy protein isolates used is Promine, Promine-D, and Supro640T. A table gives two brine formulations.

Soy is mentioned 37 times in this patent in the forms "Central Soya Company," "soy protein isolate (sometimes referred to as 'isolated soy protein')," "soybeans," "soy protein," "soybean flakes," "dehulled soybeans," "soy isolate" and "edible isolated soy protein." Address: 1. Langen, Fed. Rep. of Germany; 2. Chicago, Illinois; 3. Mundelein, Illinois.

443. Eldridge, Arthur C.; Black, L.T.; Wolf, W.J. 1979. Carbohydrate composition of soybean flours, protein concentrates, and isolates. *J. of Agricultural and Food Chemistry* 27(4):799-802. July/Aug. [22 ref]
• ***Summary:*** Products tested include: Nutrisoy 7B, toasted Nutrisoy, and unflavored minced TVP (from ADM), Baker's Concentrate, Promosoy 100 [soy protein concentrate made by aqueous alcohol leach process], and Promine D [isolate] (from Central Soya), uncooked flavored Crumbles [textured soy flour] (General Mills, Inc.), undenatured GL-301 [soy protein concentrate made by dilute acid leach process], and denatured Patti-Pro [soy protein concentrate made by dilute acid leach process] (Griffith Laboratories, Inc.), FPC [food protein concentrate, made by steaming & water leach process] (Swift and Co.), Edi-Pro N, Edi-Pro A, Supro 700, Supro 610 (isolates from Ralston Purina Co.).

Dehulled, defatted soybean flours contained the following mean sugar content: rhamnose 0.6%, fucose 0.1%, ribose 0.1%, arabinose 2.4%, xylose 1.0%, pinitol 0.9%, mannose 0.9%, galactose 7.6%, and glucose 8.1%. The same sugars were found in soybean protein concentrates; however, the amount of each was less. Soybean protein isolates contained mannose 0.8%, galactose 0.5%, and glucose 0.5%, with traces of the other five sugars. Address: Northern Regional Research Center, Peoria, Illinois.

444. *Wall Street Journal.* 1979. Ralston Purina sees fiscal 1980 as the start of new growth trend. Oct. 24.
• ***Summary:*** While conceding that soy protein sales haven't

increased as rapidly as expected, R. Hal Dean (chairman and CEO) predicted that they "will make a meaningful contribution to earnings, from 5% to 10% of total corporate profit, within three to five years."

445. *Feedstuffs.* 1979. Top 30 commercial feed manufacturers [in the USA] (based on capacity). 51(44):9. Oct. 29.
• ***Summary:*** 1. Ralston Purina Co. (7,000,000+ tons annual capacity; 61 mills in USA).
2. Allied Mills, Inc. (3,000,000+ tons; 23 mills).
3. Central Soya Co. (2,500,000 tons; 32 mills).
4. Agway, Inc. (2,000,000 tons; 22 mills).
5. Gold Kist, Inc. (2,000,000; 14 mills).
6. Farmland Industries, Inc. (1,550,000 tons; 20 mills).
7. Cargill, Inc. (1,000,000 tons; 33 mills).
8. Carnation Co. (1,000,000 tons; 14 mills).
9. Moorman Mfg Co. (1,000,000 tons; 7 mills).
16. ConAgra, Inc. (600,000 tons; 8 mills).
17. Land O'Lakes, Inc. (500,000 tons; 10 mills).
18. MFC, Inc. (500,000 tons; 7 mills).
Capacity in most cases is based on 2 shifts, 5 days a week.

446. *Feedstuffs.* 1979. The integrators: The 'in-house' feed manufacturers. 51(44):44. Oct. 29.
• ***Summary:*** The integrators–virtually 100% of the broiler industry and about 80% of the turkey and egg industries–are defined by control of the production, processing, and marketing functions. In each table, estimated feed usage is also given. One table shows America's top 20 broiler producers: The first number gives the company's rank and the second (in parentheses) the number of birds processed in millions in 1978: 1. Holly Farms (Federal Co. 260). 2. Gold Kist, Inc. (240). 8. Central Soya Co. (130). 9. ConAgra (129). 10. Wayne Poultry (Allied Mills. 114). 19 Cargill, Inc. (57).

Another table shows America's top 15 turkey operations. The second figure shows millions of pounds live weight processed: 1. Swift Dairy & Poultry Co. (325). 2. Armour & Co. (175-200). 3. Cargill, Inc. (150-175). 6. Land O'Lakes (100-110). 14. Central Soya (20-25).

A third table shows America's top 20 commercial cattle feeding companies. The second figure represents the total capacity in number of cattle: 1. Cargill, Inc. (Caprock Industries, 5 lots; 216,000 head; 982,800 tons of feed). 9. Continental Grain Co. (Allied Mills, 3 lots; 105,000 head). Cattle have an average 140-day finishing period in the feedlot, and consume 25 lb. of feed per head per day. in the

A fourth table shows America's top 20 table egg layer operations. The second figure is number of layers in millions: 1. Cal-Maine Foods, Inc. (11.0). 4. Cargill, Inc. (3.5). 13. ConAgra, Inc. (1.6). 15. Central Soya (1.5). 16. Gold Kist Eggs (1.33). 17. MFC Services (1.33).

447. *Food Trade Review.* 1979. Soya isolates in Europe. 49(11):644-46.
• ***Summary:*** In 1972 Ralston Purina "formed Purina Protein Europe and began organizing a marketing function. This was followed by a technical service organization which operated from a laboratory at West Haddon in the UK. This laboratory was known as the Purina Protein Application Laboratory, but it quite rapidly outgrew these premises and a new larger laboratory has been opened at St. Albans, Herts, about 40 minutes by road from London's Heathrow airport, to service the requirements of Europe."

In late September 1978 Ralston Purina opened Europe's first plant manufacturing isolated soy proteins at Ieper (Ypres), Belgium. Total budgeted cost of the new plant is approximately £10 million. An aerial photo shows the nearly completed factory.

448. Smouse, Thomas H. 1979. A review of soybean oil reversion flavor. *J. of the American Oil Chemists' Society* 56(11):747A-51A. Nov. [52 ref]
• ***Summary:*** Contents: Abstract. Introduction. Theories [of the cause of flavor reversion]: linolenic acid theory, isolinoleic acid, phosphatide theory, unsaponifiable matter theory, oxidative polymer theory. Flavor characterization.

Recent publications indicate that slight oxidation of the soybean fatty acids is the major cause of flavor reversion.

"Techniques that are effective in increasing the flavor stability of soybean oil are presented." Address: Manager, Lipid Sciences, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

449. Dussaigne, A.; Dronne, Yves. 1979. Les protéines nouvelles en alimentation humaine [The new proteins in human nutrition]. Rungis, France: Laboratoire de recherches et d'etudes sur l'economie des I.A.A. 111 p. Dec. [97 ref. Fre]
• ***Summary:*** Contents: Introduction. List of 30 tables. Part I: The protein industry. Definition and characteristics of proteins. The quantitative structure of the protein industry (the world protein industry, the French protein industry). Qualitative aspects of the protein industry. Energy problems in the protein industry.

Part II: New proteins in human nutrition. Supply and demand. Products derived from soya: Powdered products, textured products. The domains of utilization: Restaurants, the food industry. Regulations that are in force: In the USA, in Europe (France, Britain, European Union). The structure of the supply: Overview, manufacturers (American, European, Japanese, those in other countries). Development of consumption in the principal markets: The American market, European, Japanese.

Part III (p. 77+): Perspectives on development of new proteins. The nature and present utilization of new

proteins: Importance of terminology, characteristics of the potential markets (Third World countries, developed countries). Consumption of new proteins and the economic environment. Bibliography (in chronological order).

Note 1. This is the earliest document seen (Aug. 2015) that contains the term "European Union" in connection with soy.

Note 2. This is the earliest French-language document seen (Nov. 2015) that uses the terms *concentrat* or *concentrats* to refer to a soy protein concentrate. Address: France.

450. Hardin, Clifford M. 1979. Impact of plant proteins in worldwide food systems. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 5-17. [2 ref]
• ***Summary:*** "As income levels increase, people start climbing what has been termed the 'food ladder.' People with the lowest incomes live typically on diets that are high in starch–rice, corn, root crops. Such people crave fat in their diets, and they buy it when they can afford it. Next they want protein, including meats.

"And finally, they want some of the more luxury-type of items–fruits and vegetables out of season, and many of the refined types of foods that are sold in the modern supermarkets in the Western world." Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

451. Roberts, Leonard H. 1979. Worldwide regulatory perspective of plant proteins in foods. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 359-68. [8 ref]
• ***Summary:*** Contents: Introduction. Food class orientation. Regulatory approach (vertical vs. horizontal). Diversification of legislation. Conclusion.

Regulations concerning the use of vegetable proteins has been under continuous review by the U.S. Food and Drug Association (FDA) and by the USDA, "On June 14, 1974, FDA issued its proposed Common or Usual Name for Plant Protein regulation" (*Federal Register,* 1974). Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

452. Scrimshaw, Nevin S.; Young, Vernon R. 1979. Soy protein in adult human nutrition: A review with new data. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 121-48. [33 ref]
• ***Summary:*** Contents: Introduction. Available data on soy protein quality for adult humans. MIT studies of soy protein (using Supro 620 and 710, made by Ralston Purina). Evaluation of soy protein quality. Comparison of the protein quality of soy products and beef. Long-term tolerance and acceptability of soy protein products. Summary. Discussion.

"At total protein intakes that approximate current dietary allowances for good-quality protein in adults, well processed soy protein isolate products fully replace beef without reducing the utilization of dietary nitrogen...

"Under conditions of normal usage in adults, methionine supplementation of good-quality soy protein products is unnecessary and probably undesirable...

"Properly processed soy protein foods are well tolerated and of good protein value for human nutrition."

The discussion session contains the following exchange: "Scrimshaw: I suggest that PER [Protein Efficiency Ratio] should be discarded entirely as soon as possible. The AOAC (Association of Analytical Chemists) should adopt a standardized slope ratio assay instead... PER is not a suitable measure of protein quality for humans, and neither is NPU [Net Protein Utilization] determined at a single deficient level of intake.

"Hackler: I disagree; the slope is more expensive (it requires more labor, more animals and more dietary ingredients), and I would question that it is better for nutritional labeling purposes." Address: Massachusetts Inst. of Technology, 77 Massachusetts Ave., Cambridge, MA 02139.

453. Struthers, Barbara J.; Dahlgren, R.R.; Hopkins, D.T.; Raymond, M.L. 1979. Lysinoalanine: Biological effects and significance. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 235-60. [34 ref]
• ***Summary:*** "Lysinoalanine (LAL), an unusual amino acid formed as a result of alkali treatment of protein, was first reported in alkali-treated ribonuclease (Patchornik and Sokolovsky, 1964)... LAL has received the most attention because of its ability to induce a unique renal lesion in rats. The renal lesion was initially observed by Newberne and Young (1966). Woodard (Woodard and Alvarez, 1967; Woodard, 1969) was the first investigator to fully describe the lesion, which he termed cytomegalia." Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

454. Torun, Benjamin. 1979. Nutritional quality of soybean protein isolates: Studies in children of preschool age. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 101-19. [23 ref]
• ***Summary:*** Tests using two isolated soy protein products (Supro 620 and 710, made by Ralston Purina) on school-aged children showed them to be as digestible as cow's milk. Their nitrogen balance index was 96% and 86% of that for cow's milk, using nitrogen balance techniques for measurement. The PER of soy protein isolate was 2.10. Address: INCAP, Apartado Postal 1188, Guatemala City, Guatemala.

455. Waggle, D.H.; Kolar, C.W. 1979. Types of soy protein products. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 19-51. [42 ref]
• ***Summary:*** Contents: Introduction. Soybean supply: Seed structure and composition, composition of source material, storage and handling, soybean oil, food products from defatted soybeans, soy flours and grits, soy protein concentrates, isolated soy protein, amino acid and mineral composition. Food uses of soy proteins: Meat products, baked products, infant formulas and food, food analogs, dairy type foods (yogurt, sour cream, frozen desserts, cheese, and dip-type products), protein supplements, other uses. Address: Ralston Purina, Checkerboard Square, St. Louis, Missouri 63188.

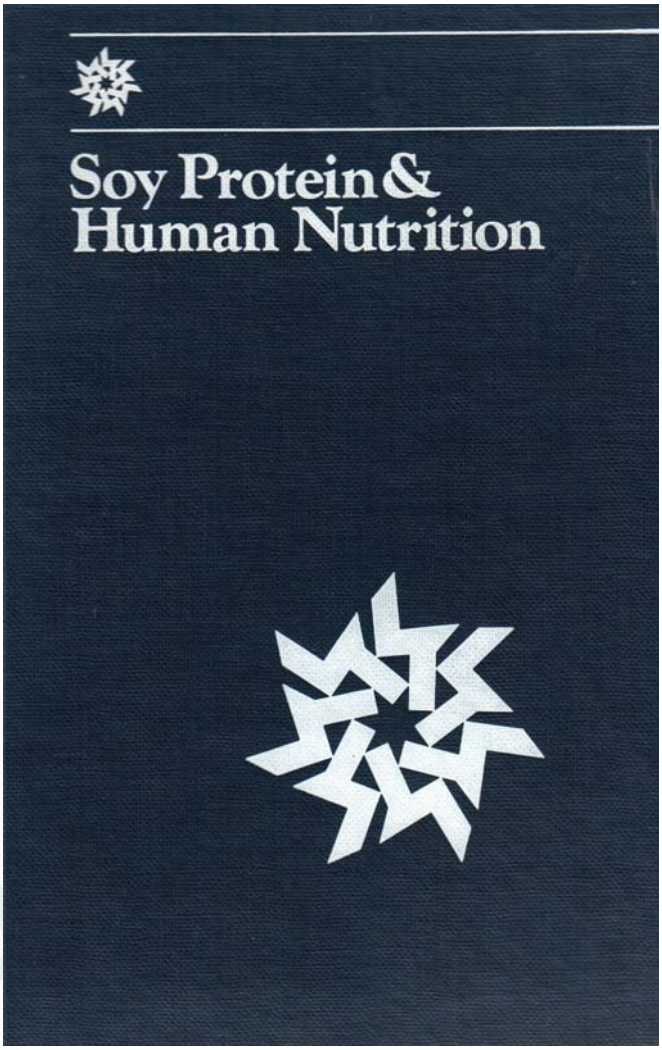
456. Wilcke, H.L. 1979. Keystone Conference: Objectives, and summary. In: H.L. Wilcke, D.T. Hopkins, and D.H. Waggle, eds. 1979. Soy Protein and Human Nutrition. New York: Academic Press. xiv + 406 p. See p. 1-3, 377-81.
• ***Summary:*** "This is the first Keystone Conference on soy protein and human nutrition." The Conference has three objectives: (1) "To present the most up-to-date information on the role that soy protein and plant proteins, in general, should fulfill in the human diet. The literature has become increasingly voluminous..." (2) To "stimulate interest among both the public and private sectors in pursuing research programs directed toward the determination of the proper place of plant proteins in the human diet..." (3) To "stimulate interest in better methods of evaluating the quality of plant proteins for human nutrition. Present methods of evaluation, largely based on animals as they are, do not supply a wealth of good information on both the nutritional value and the safety of food products... There is always a question when we must extrapolate information from one species to another." Address: Ralston Purina Co., St. Louis, Missouri.

457. Wilcke, Harold L.; Hopkins, Daniel T.; Waggle, Doyle H. eds. 1979. Soy protein and human nutrition. New York, NY: Academic Press. xiv + 406 p. Illust. Index. 23 cm. Proceedings of the Keystone Conference held in Keystone, Colorado, May 22-25, 1978. [500+ ref]
• ***Summary:*** 25 papers by various authors were presented at this important conference; many are cited separately. A conference summary and list of registrants are included.

The conclusions presented in this book are:

"(1) isolated soy protein, when measured by human nutritional studies, is comparable in protein quality to other high-quality protein sources such as meat, milk and eggs;

"(2) due to its quality, latest information shows that properly processed isolated soy protein is a protein source that can be used in a wide variety of food applications such as infant foods, processed foods, and other modern food



products; and

"(3) conventional methods of measuring protein quality for human nutrition are not adequate, and the protein quality of isolated soy protein is underestimated by the conventional and official methods for measuring protein quality." Address: Ralston Purina Co., St. Louis, Missouri.

458. Wilcke, Harold L.; Hopkins, Daniel T.; Waggle, Doyle H. 1979. Preface. New York, NY: Academic Press. xiv + 406 p. Illust. Index. 23 cm. Proceedings of the Keystone Conference held in Keystone, Colorado, May 22-25, 1978. [500+ ref]
• ***Summary:*** "Results reported here from actual nutritional experiments, where soy proteins, particularly the isolates, were fed to infants, growing children, and young adults, have clearly demonstrated that the soybean is a much more nutritionally adequate protein than had been expected on the basis of research done with animals. This has demonstrated a need for more adequate methods of evaluating proteins for the human. A panel of eminently qualified scientists has addressed this question and has made some positive

suggestions on better approaches to the evaluation of proteins for humans. Their discussions are presented as a part of this volume. Further, the work reported on the possible effects of the plant proteins on the plasma cholesterol levels of humans opens up an entirely new dimension for the evaluation of proteins. Therefore, this volume will be of particular interest not only to those who are seeking information on the characteristics of the soybean as a food and its potential in the food system but also for those who have the broader interest in how to evaluate proteins for humans.

"This volume has been organized to present the present state of knowledge regarding the nutritional values of the soybean as a potential in our food supply..." Address: Ralston Purina Co., St. Louis, Missouri.

459. *Food Processing* (*Chicago*). 1980. Plants and laboratories. Feb. p. 24.
• ***Summary:*** "Ralston Purina, St. Louis, Missouri, has decided to dispose of 232 Jack-in-the-Box fast-food restaurants and related facilities in the Central and Eastern parts of the country. To be divested are outlets in Chicago, Detroit, Kansas City, Eastern U.S. markets, including Florida."

460. *Food Technology.* 1980. People [Ralston Purina]. Feb. p. 110.
• ***Summary:*** "At the Protein Division of Ralston Purina Company, St. Louis, Missouri, John N. Nichols advanced to manager, market planning; David E. Stone named to newly created position of manager, market communications; Thomas D. Aiken appointed assistant manager, marketing services; and Julie L. Holekamp promoted to assistant manager, marketing services, to take charge of managing communications and promotion projects."

A small portrait photo shows each of the four people mentioned.

461. Lo, G.S.; Settle, S.L.; Steinke, F.H.; Hopkins, D.T. 1980. Effect of soy polysaccharides fiber (SPF) on lipid metabolism in rats. *Federation Proceedings* (*FASEB*) 39(3):784 (Abst. #2735). March.
• ***Summary:*** These studies show that SPF lowers serum cholesterol and triglycerides of rats fed hypercholesterolemic diets but has only minimal effects on rats fed diets without added cholesterol. Address: 1-2. Ralston Purina Company, St. Louis, Missouri 63188.

462. Tsai, Alan C.; Mott, E.; Owen, G.M.; Lo, G.S.; Steinke, F.H. 1980. Effect of a fiber-rich soybean product on fecal moisture, mineral excretion, glucose tolerance and serum parameters in humans (Abstract). *Federation Proceedings* (*FASEB*) 39(3):659 (Abst. #2083). April 13-18.
• ***Summary:*** In a diet-controlled study, 14 male college students were randomly assigned to two groups for 17 days. One group was fed a fiber-rich soy product containing 73.5% fiber. The fiber-rich product significantly increased fecal water content and did not change fecal excretion of nitrogen, calcium, phosphorus, magnesium, iron, zinc, and copper, total serum cholesterol (Ch), triacylglycerol (TG), levels of Ch and TG in chylomicron, VLDL, LDL and HDL, fasting serum glucose, and 20 other commonly tested serum parameters. In an oral glucose tolerance test, addition of 15 gm of the fiber source to the glucose solution significantly prevented the downward rebound of serum glucose at 120 and 180 minutes after dosing. Consumption of the fiber also appeared to lower serum insulin levels at 30, 60, and 120 minutes during the same test. No undesirable effects (physiological or clinical) were observed.

This study suggests that this fiber-rich soy product may have beneficial effects on sugar metabolism and bowel habit in humans. Address: Univ. of Michigan, Ann Arbor, MI 48109; and Ralston Purina Co., St. Louis, Missouri 63188.

463. Cooper, Russell. 1980. Rationale of soy protein products. In: Food Protein Council, ed. 1980. Government Seminar. May 21, 1980. Abstracts and Remarks. Washington, DC: FPC. See p. 5-10.
• ***Summary:*** This presentation is divided into an Abstract (p. 5-6) and Remarks (p. 7-10). Here is the Abstract:

"Interest in nutrition on the part of the consumer is growing by leaps and bounds. Seventy-seven percent of consumers interviewed in a recent U.S. survey conducted by Yankelovich, Skelly, and White, indicated they were more interested in nutrition now than they were only a few years ago. Consumers are requesting more information on how to eat well on less money; how to plan balanced meals; ideas for helpful snacks; diet and weight control and a host of other subjects.

"Research indicates that most people base their dietary habits not on what is good for them but on social and cultural factors like familiarity, availability, tradition, cost and personal matters like taste and pleasure.

"Recognizing the need for an overhaul in eating habits, agencies of the U.S. government are demonstrating new and acute concerns for the health quality of the American food supply. In 1977 the Senate select committee on nutrition and human health directed by George McGovern, issued a groundbreaking report entitled 'Dietary Goals,' advising Americans to specifically 'reduce cholesterol consumption from about 600 to 300 milligrams a day' and to 'reduce saturated fat consumption from 16 percent to about 10 percent of total energy intake and balance that with polyunsaturated and unsaturated fat...' In February 1980, the Department of Agriculture and the Department of Health, Education, and Welfare issued a report 'Dietary Guidelines for Americans,' which in principle adopts a McGovern plan to avoid too much fat, saturated fat and cholesterol.

"The use of vegetable protein, particularly highly functional, economical, and nutritious proteins, relates directly to these factors. Soy proteins, when combined with traditional foods, or used in new foods, allow consumers to choose traditional food products that are equivalent in protein and lower in fat, calories, and cholesterol. Whether the food is one in which a cost conscious consumer is looking for value, or one which is expected to provide nutrition in a prepared convenient manner, food products made with soy protein deliver the functional, economic, and nutritional alternatives consistent with today's food buying habits.

"A recently conducted Gallup organization poll determined that Americans view soy protein as a good nutritional value. Seventy-one percent regarded it favorably and seventy-nine percent of all Americans believe soy protein is a good or fair economic value. The gallop poll concluded that 'the most prevalent opinion among the public is that soybeans will be the most important source of protein for human consumption in the future.'

"The crux of the economics of protein production is the cost of conversion of the raw materials into edible proteins, regardless of the protein source. Essentially, the comparison is one of vegetable-sourced protein versus animal-sourced protein. Both have their origins in agricultural products, specifically grains. Beyond this base, however, the conversion of grains to protein from meat, milk, fish and eggs is a biological conversion whereas the conversion to vegetable protein is a technological conversion.

"Vegetable proteins offer the opportunity to directly utilize in the food systems one of the most efficient protein sources known–the soybean. Direct utilization of the soy protein offers the opportunity to alleviate the economic pressure on protein demanded by a complex, multi-step food system.

"The consumer is not alone in the economic pressures on their food budget. Food processors are facing new and more difficult demands as they work to supply quality products for a cost-conscious market. Although there is no one cure for these pressures, there are alternatives available to food processors today that are products of advancing food technology. Soy protein is one of these products. It comes from a raw material–soybean–that is abundant in supply, and is less costly to produce than traditional, animal-based protein products. Properly used, soy protein can be employed to produce finished food products that maintain traditional eating qualities, reduce cost and provide a good source of protein nutrition. It is not a panacea for economic woes; but it is a product that is commercially available today that can help food processors and consumers alike relieve some of these pressures bearing upon them.

"Our present technology and continuing developments will result in products that will enable food processors to offer effective responses to consumer demands for high quality economical nutritional food products. Not only are consumers accepting soy protein containing foods in growing numbers, they are also beginning to understand the importance of the renewable, efficient source of protein that offers quality and value to their traditional foods. The challenge of the '80's will be to maximize resource effectiveness in satisfying these consumer demands.

"It is up to government officials to make policy and program decisions that can encourage the development of soy protein products for their economical savings and the increased nutritional benefits that will accrue in our food system." Address: Manager, Marketing Regulatory Services, Ralston Purina Co., St. Louis, Missouri.

464. Hannigan, Kevin J. 1980. Crab salad with soy: Every particle looks and tastes like real crabmeat. *Food Engineering* 52(5):11. May.

• ***Summary:*** "If crabmeat is $12.50/lb, can soy extenders be far behind? As a matter of fact, one soy extender is way out in front. Ralston Purina's soy protein fiber (SPF-200), backed up by Haarmann & Reimer Corporation's 'Taste of Crab' Flavor Compound (R-6388), is used regularly to extend the crabmeat in an excellent crab salad. There's a hitch, though. Mostly, this tasty crab salad is prepared to feed a few hundred food scientists at IFT Shows."

A photo shows a "crab" salad which contains as much spun soy protein fiber as it does crabmeat (23% each by weight). To prepare the salad, just adjust soy protein fiber to pH 6.4 using sodium carbonate, then add the other ingredients (mayonnaise, chopped celery, onions, and sweet pickles, salt, pepper, etc.) and mix well.

465. Shurtleff, William. 1980. Notes from INTSOY Short Course in soybean processing, SANA Conference (Urbana, Illinois), and subsequent research trip (May 5 to Aug. 3). Lafayette, California: New-Age Foods Study Center. 143 p. Unpublished manuscript. 28 cm. Spiral bound.

• ***Summary:*** This five-week INTSOY short course at the University of Illinois at Urbana began on 16 June 1980. Contents: Introduction (John Santas, Tom McGowen, Dr. Siedler, D. L.S. Wei). Tour of Food Science Lab. History of INTSOY, by Dr. Thompson. Soybean nutrition, by John Erdman. Soybean grading methods, by D. Wei. A.E. Staley Mfg. Co., by Hank Parker. Soybean oil and margarine, by E.G. Perkins. Soybean crushing, by Ross Brian. Soybean agronomy, by Bill Judy. Antinutritional factors in soybeans, by Dr. Wei. Harvesting, drying, and handling raw soybeans, by Gene Shove. Field trip to University of Illinois agricultural machinery dept. Soybean nutrition, by Barbara Klein. Livestock feeding, by Don Bray. Processing whole soybeans for food, by Dr. A.I. Nelson. Ralston Purina Co. and soy protein isolates, by Dr. Kolar. Film titled "Protein for People" from Ralston Purina.

Third week: Margarine, by Dr. Wei. Quality control of

soy protein products, by Dr. Wei. Field trip to Kraft Foods Humco plant in Champaign, Illinois (Margarine, Vegemite). Wenger, extrusion cooking, and textured protein foods, by Randy McDonald. Low-cost extrusion cookers and cooking, by A.I. Nelson. Field trip to Lauhoff Grain Co. (good manufacturing practices). Drying foods, by Dr. Wei. Soya in Third World countries, by Dr. Thompson.

Fourth week: Soybean dal, by Dr. Nelson. Visit to Ted Hymowitz who is writing a book on the history of soybeans (p. 56). Sensory evaluation, by Dr. Tobias. Oriental soyfoods, by Dr. Wei.

Fifth week. Soymilk, soy yogurt, and soynuts, by Dr. Nelson (Kibun). Griffith Laboratories, by Ann Daniels (incl. history, HVP, soy protein concentrate, TVP). Home and village level production of soybean foods, by Dr. Nelson. Soy flour and soy fortified baked goods, by Dr. Cho-Chen Tsen of Kansas State Univ. Soybean crushing, soy flour, and plant sizes, by Sheldon Williams.

Shurtleff research trip. Visits to ADM and A.E. Staley Mfg. Co. in Decatur, Illinois, American Soybean Assoc. in St. Louis, Missouri (Read William Morse's 1929-31 journal of trip to East Asia). Talks with David Hildebrand, Mike Tarano. Address: P.O. Box 234, Lafayette, California 94549.

466. Ralston Purina Co., Protein Div. 1980. Purina proteins–Product information (Portfolio). St. Louis, Missouri. 18 inserts.

• ***Summary:*** Inserts include one glossy red brochure (titled "Purina Proteins: Product Summary") and 17 product specification sheets (each 8½ by 11 inches and single sided; most are dated). (1) Product summary brochure: Contains a brief description of each of the following products: Isolated soy proteins: Edi-Pro-A, Supro HD-90, Supro 350, Supro 610, Supro 620, Supro 630, Supro 640T Fortiblend, Supro 660, Supro 710, Supro 710K, Purina Protein 860.

Structured isolated soy proteins: SPF 200 (a structured isolated soy protein fiber available in the frozen, hydrated form. It is retort stable with no degradation of fiber. Its texture is similar to that of meat muscle fiber), Purina Protein 220 (an isolated soy protein granule).

Note: This is the earliest English-language document seen (Oct. 2015) that uses the term "isolated soy protein fiber" to refer to such an edible soy protein fiber.

Dari-Pro products: Dari-Pro 35 (a blend of milk proteins and isolated soy protein), Dari-Pro 300 (a blend of whey and isolated soy protein), and Specialized Dari-Pro (spray-dried blends of whey and isolated soy protein for special applications).

The specification sheets are dated as follows: Edi-Pro-A (1981), Supro HD-90 (1 Jan. 1980), Supro 350 (1 Jan. 1980), Supro 610 (1 Jan. 1980), Supro 610K (1 Aug. 1978), Supro 620 (1 Jan. 1980), Supro 630 (1 Jan. 1980), Supro 640T Fortiblend, Supro 660 (1981), Supro 710 (1 Jan. 1980), Supro 710K (1980), Purina Protein 810 (1 Oct. 1979). Supro 50A (textured soy flour; 1 Jan. 1980), SPF 200 (structured protein fiber made from spun isolated soy protein; 1 Aug. 1978), SPF 200F (fortified spun fiber; 1980), Purina Protein 220 (isolated soy protein; 1 Aug. 1979). Dari-pro 35 (1 Aug. 1978), Dari-pro 300 (1 Feb. 1980). Address: Checkerboard Square, St. Louis, Missouri. Phone: 1-800-325-7108.

467. Andres, Cal. 1980. Soy isolates offer wide range of functionalities: Fourteen-item line furnishes desirable properties for foods. Ingredients. *Food Processing* (*Chicago*). Sept. p. 40-41.

• ***Summary:*** "Many proteins are used by food processors for functional attributes rather than for nutritional fortification. The extremely wide range of functional properties that can be developed in foods by understanding the role of proteins was demonstrated at the IFT Expo in New Orleans."

Five color photos show different applications.

For more information contact Ralston Purina Co., Protein Div., Checkerboard Square, St. Louis, Missouri 63188. Address: Senior Associate Editor.

468. Dubois, Donald K. 1980. Soy products in bakery foods. *AIB Research Department, Technical Bulletin* 2(9):1-10. Sept. [12 ref]

• ***Summary:*** Contents: Introduction. Processing of soy products. Quality factors. Defatted soy flour. Enzyme active soy flour. Full fat, high fat and lecithinated soy flours. Soy grits. Soy protein concentrates. Soy protein isolates. Milk replacer blends. Soy bran. Nutrition. Products. Summary.

AIB stands for the American Institute of Baking. "Soy products, because of their unique functional and nutritional properties, have become major ingredients in many food systems. The use of soy protein as an ingredient, extender, or analog has spread to every category of food, and consumption of edible soy protein in the United States has grown from less than one hundred million pounds per year in the early 1960's to over one billion pounds per year in 1978."

Ten tables give the nutritional composition plus NSI (Nitrogen Solubility Index) and PDI (Protein Dispersibility Index) of different soy products, and the manufacturer of each, as follows: Table IV–15 defatted soy flours: A.E. Staley: Bland 50, I-200, and F-200. ADM Company: Baker's Nutrisoy, Nutrisoy, and Toasted Nutrisoy. Central Soya Co.: Soyafluff 200W. Cargill, Inc.: 70 PDI Soy Flour and 20 PDI Soy Flour. Dawson Food Ingredients: Dawsoy Flour 100/70, Dawsoy Flour 200/20, Dawsoy Flour 200/70, and Dawsoy Flour 200/88. Farmland Industries: 200L and 200E.

Table V–2 enzyme active soy flours: ADM Company: Nutrisoy 7-B. Cargill, Inc.: 90 PDI Soy Flour.

Table VI–1 full fat soy flour made by Ingredients Systems, Inc.

Table VII–1 low fat soy flour made by Food Ingredients.

Table VIII–4 refatted soy flours made by ADM: 15% High Fat, Bakers Nutrisoy, Toasted Nutrisoy T-6, and

Nutrisoy 220T.

Table IX–8 lecithinated soy flours: ADM Company: Soylec C6, Soylec C15, and Soylec T15. Central Soya: Soyalose 105W and Soyarich 115W. Cargill, Inc.: 3% Relecithinated soy flour, 6% Relicithinated soy flour, and 15% Relecithinated soy flour.

Table X–13 brands of soy grits: ADM Company: Defatted Soy Grits 8-20, Defatted Soy Grits 20-40, Defatted Soy Grits 40-80, and Defatted Soy Grits 80-0. A.E. Staley: Bland 50-Medium Grits and Bland 50-Coarse Grits. Lauhoff: Soy Grits 5/16, Soy Grits 8/30, and Soy Grits 20/0. Dawson Food Ind. [sic, Ingredients]: Dawson Grits 10, Dawson Grits 20, Dawson Grits 40, and Dawson Grits 60.

Table XI–3 "soy protein concentrates": Griffith Labs: Promax 70. ADM Company: Ardex 700F and Ardex 700G. A.R. Staley: Sta-Pro.

Table XII–16 "soy isolates" (incl. pH, particle size, and special properties of each): Ralston Purina: Edipro A, Supro HD 90, Protein 220, Supro 350, Supro 610, Supro 620, Supro 630, Supro 660, and Supro 710. Dawson Food Ind.: Isoprime 900, Isoprime 900GL, Isoprime 900G, and Isoprime 900L. Grain Processing Corp.: Pro-Fam S-955 and Pro-Fam S-970.

Table XIII–1 type of soy bran: Nutrisoy Fiber, made by ADM. Address: American Inst. of Baking, Manhattan, Kansas.

469. Boyer, Robert A. 1980. Work with Henry Ford and soybeans. I (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 18. 2 p. transcript.

• ***Summary:*** The Henry Ford Trade School was not the same as the Edison Institute of Technology. Boyer attended the Trade School.

In the mid- to late-1930s Henry Ford held several luncheons where the press and other famous or influential people were invited. He served a complete meal from soup to nuts. Out of these events came a 19-page booklet published in about 1936 by the Edison Institute and titled "Recipes for Soy Bean Foods." The purpose of these meals was to popularize soybeans and thereby to help farmers. But Ford was most interested in finding industrial uses for farm crops. He was deeply interested in the fact that soy had been used in the Orient for so long by millions of people as a key source of protein in the diet. But he had been interested in health before he got interested in soybeans. Still, he was very involved personally with soybeans as foods; he used them a lot in his own diet.

Ford grew his own soybeans on over 10,000 acres he bought in southern Michigan. The idea was not to help farmers by buying their beans but to encourage farmers to grow soybeans then process them in small-scale solvent extractors on their own farms. Eventually this village industry concept proved to be uneconomical so it was abandoned.

In about 1932 Ford set up his first solvent extractor near the River Rouge plant. About a year later he set up a plant to make soy protein isolates from the meal produced by the solvent extractor. In about the mid-1930s Ford built a soymilk plant in Greenfield Village. It was just a demonstration plant that made several hundred gallons of soymilk a day. The plant was part of the larger research effort; none of the milk was sold commercially. With the arrival of World War II, the process was taken by Bob Smith, one of the fellows who developed it, and used as the basis for a private plant [Delsoy Products] in Dearborn where he sold a lot of soymilk for use in whipped toppings, baked goods and frostings. It was quite successful. A big bakery in Detroit used a lot of the topping. As a result of that, the Rich Products Co. in Buffalo, New York, started making the same type of product and became very big. One of Bob Smith's workers [Holton "Rex" Diamond] went to Rich Products and made a big success of it. Rich is very well known; they also make coffee creamers.

Henry Ford was not a vegetarian. He ate like most Americans at the time, and he ate many steaks–even though he knew meat was not the best thing for you. Mrs. Ford suffered from arthritis and he sought diets to help her.

World War II killed the idea of the plastic car. The company would have needed to spend lots on dies to make it commercial. Also each plastic body took too long to produce; it had to cure for 3 minutes in the die. Young Henry Ford II threw out everything [not directly related to automobiles] that his grandfather was interested in. General Motors was actually the first company to make a commercial car with a plastic body–the Corvette, whose body was made of fiberglass.

Edsel Ruddiman was the man who got Ford interested in the food side of soybeans. Ruddiman was quite old. He had his own lab (which he got in about 1930-31) and was a very good scientist. He and Boyer worked closely together since their labs were nearby.

Ford grew 10,000 acres of soybeans in southern Michigan. Ford set up his first solvent extraction plant in about 1932 and his soy protein isolate plant a year later. Ford was personally very involved with soyfoods. He used them a lot in his own diet. He built a soymilk plant in Greenfield Village in the mid-1930s as part of his research efforts. He made several hundred gallons a day. The milk was not sold commercially. After the start of World War II the process was taken over by Bob Smith, one of the fellows working on it. Smith built a private plant in Dearborn where he made the milk into frostings for use in baked goods. It was quite successful. A big bakery in Detroit used a lot of it. As a result of that, Rich Product Corp. in Buffalo, New York, got interested and eventually became very successful. One of Bob Smith's workers, Rex Diamond, went to work for Rich. They also made non-dairy coffee creamers and milk.

Boyer was director of research for The Drackett Co.

from 1943-1949.

Ralston Purina's edible soy isolate plant was in Louisville, Kentucky. It was hard at the beginning to get people to use isolates. Mead Johnson started using an isolate in their infant formula. Address: 632 Edgewater Dr., Apt. 731, Dunedin, Florida 33528. Phone: 813-734-2415.

470. Boyer, Robert A. 1980. Work with Henry Ford and soybeans. III (Interview). Conducted by William Shurtleff of Soyfoods Center, Nov. 3. 3 p. transcript.

• ***Summary:*** Floyd Radford was head of Ford's soy farms. At the Chicago World's Fair the Ford exposition was producing soybean oil by solvent extraction of soybeans. The soybean oil was the sole fuel used to power a diesel engine, which ran an electric generator, which produced all of the electricity for the exhibit. It was very neat.

Boyer developed the first plant protein fiber in about 1938. That year the Ford Motor Co. had a machine to spin soy protein fibers at the World's Fair in New York. He was aware of work in Italy spinning casein into fibers from reading technical journals prior to 1936. He used the term "spinning" because the textile industry uses that term to describe how rayon is produced. In both cases, a more correct term would be "extruding," since the dope is extruded through spinnerettes.

Ford's soybean fiber spinning pilot plant had a capacity of 1,000 pounds of fiber a day, but they probably produced less than that. They would send the fiber to the mill, where 1 part of soy fiber would be blended with 3 parts wool to make sidewall (not seat) upholstery, which got less wear and wouldn't mark like cotton.

When making soy protein isolates, the fiber (insoluble cellulose) is removed during clarification by centrifugation; no one had ever been successful in removing it by filtration, which would be better. After dissolving the soybean meal in alkali, it is clarified by centrifugation, then precipitated. Practically the same process is still used to make soy protein isolates.

Just a few plastic trunk lids were ever made, and they were used only on demonstration or experimental cars; they were never part of commercial Ford vehicles.

When Boyer left Ford Motor Co. he went to work for The Drackett Co., which bought Ford's soy protein operations. Mr. Drackett sold [actually shut down] his soy fiber spinning operation in 1949. Drackett later sold all its soybean operations to ADM. After Boyer left Drackett in 1949 he filed for his first edible soy fiber spinning patent the same year; it may have been granted in 1951. He applied for a new, expanded patent, with much broader claims to a food product manufactured form man-made protein fibers, in 1951; it was granted in 1954.

In Aug. or Sept. 1949 Boyer paid his first visit to Worthington Foods. Worthington was the first company to whom he disclosed what he was doing, and showed a sample of a prototype product (pork chops) made from spun soy protein fiber. He did not go to Swift initially because he had been advised to keep away from meat companies, which might buy then bury his patents. If Worthington hadn't been interested in his spinning process when he first visited them, he might have just given up then. He wasn't sure if it was a screwball idea or not. Moreover, he had been out on his own for almost a year and was running out of money. Worthington was excited with Boyer's idea but they needed a source of fiber.

So Boyer went to the Virginia Carolina Chemical Co. (VCCC) in Taftville, Connecticut. They were spinning fibers for cloth and they allowed him to use their spinning pilot plant in 1949 to produce the first edible spun soy protein fibers for research purposes and prototypes; he was not employed by them. VCCC was interested enough to call in Corn Products Corp. (CPC), which was interested–but they said they wanted to use corn gluten instead of soy protein. Boyer said "Fine." After the first successful run, using the VCCC pilot plant, CPC got very interested. Fibers were spun from casein, corn gluten, and soy. CPC bought the first license to his soy fiber spinning process for food use in 1949. They took an exclusive option on the license for 9 months. The first sale of edible protein fiber was made by CPC to Worthington Foods; the fiber was made of corn gluten. After working for a year with CPC, everyone in the project realized that the flavor of corn gluten was so horrible that it would never work in foods. So CPC converted to a non-exclusive license. Boyer, now a bit desperate and against the advice he had been given, decided to approached a meat company. He chose Swift & Co., which took an option immediately; they were the second company to license his patent and from 1950 to 1954 they retained exclusive rights to his patent. In about 1955 Swift converted to a non-exclusive, and Boyer immediately went back to Worthington to see if they were interested in a license yet. They were.

So after having waited 7 years, Worthington finally purchased a spinning license in 1956. At that time, Boyer began to spend 50% of his time at Worthington for a year after they took the license. Initially Worthington did not spin their own soy fibers since it was too expensive for them and they did not have much money at the time. Ralston Purina was well equipped to make these fibers for them. It was not until the mid-1960s that Worthington started to spin their own fibers.

By 1977 seven large food companies had licenses on the patent: Swift & Co., Unilever/Lever Brothers in England, General Foods, Nabisco, General Mills, Ralston Purina, and Worthington.

The original Bac*O's were made from spun soy protein fibers. Today he thinks they are made from textured extruded soy flour. General Mills took a license from Boyer. They got 25% of his consulting time, Ralston Purina got 25% and Worthington got 50%. Bac*O's came on the market in about

1965 and were a real sensation. It was the biggest thing that had happened with Boyer's idea to date.

Loma Linda is now spinning soy protein fibers, as is some company in Japan–or at least they used to be.

How big is the market for foods made from spun soy protein fibers? Boyer would guess at least $30 million a year. Worthington's total sales was $20 million including gluten. Miles got Worthington a new plant shortly after they bought Worthington. Now Bayer owns Miles and Worthington. The Morningstar Farms line is not making the profits they would like it to make.

Note: This is the earliest English-language document seen (Oct. 2015) that uses the term "spin soy protein fibers." Address: 632 Edgewater Dr., Apt. 731, Dunedin, Florida 33528. Phone: 813-734-2415.

471. Shurtleff, William; Aoyagi, Akiko. 1980. Henry Ford and Robert Boyer: History of work with soya. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 25 p. Nov. 3. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** www.soyinfocenter.com/HSS/henry_ford_and_employees.php

A comprehensive history of the subject. Contents: Introduction: Ford. Early research with soybean oil and meal: 1928 chemurgic movement (joining of farm and industry), setting up Edison Lab, Dec. 1931 soybean chosen as most promising crop for use in industry and as a food, 1931 encouragement of farmers to grow soy, biographical sketches of Boyer and Ruddiman, soy oil (used in car paints and pioneer work in solvent extraction), meal, isolates, molded parts, plastic pilot plant, cottage industries, barn solvent mills, 1934 World's Fair. Ford, Ruddiman, and soyfoods: Soyfoods press luncheons (not all were impressed), 50 recipe cookbook, soymilk (commercial and personal), personal interest in soyfoods, Greenfield Village (soy flour and green vegetable soybeans), Ford's views on health. Development of the plastic car: Glidden first commercial plant for industrial soy protein isolates (1935), Ralston's food use plant in 1960, Ford built 3 small oil plants 1937-39, grew own soybeans, connection with American Soybean Association, soybean plastic car (trunk lid unharmed when hit by ax), jokes, soy a minor element in later structural plastics, idea lost in files, General Motors' plastic Corvette introduced 1953, lots of plastic by 1980 (but not from renewable resources like soy). Boyer's soybean wool and edible protein fibers: Soybean wool and history of fibers, wool pilot plant, how to make edible soy fibers, discovery of food protein idea. Henry Ford's passing: Death in 1947, his contribution (quotes), actually not much soy used in Ford's auto and tractor factories. Boyer's development of meat analogs: Drackett purchase of Ford protein spinning operation, first visit to Worthington (Sept. 1949), Corn Products Company purchase of first license on edible protein fiber patent, Swift purchase of exclusive rights from 1950-54, 1951-52 Unilever license for production outside U.S., Worthington purchase of license 1956, advantages and limitations, licenses after Worthington, royalties and consulting, Boyer's quality evaluation, the future. Address: Lafayette, California. Phone: 415-283-2991.

472. Ralston Purina Company. 1980. Annual report 1980. Checkerboard Square, St. Louis, MO 63188. 53 p.

• ***Summary:*** For the fiscal year ended 30 Sept. 1980, net sales were $4,886.0 million, net earnings were $163.0 million, and net earnings per common share (fully diluted) were $1.45.

Ralston Purina Co. has four business segments: (1) Grocery products (pet food and human food). (2) Agricultural products (includes formula feed products under the Checkerboard trademark, Purina Chow feeds for livestock and poultry, and soybean crushing plants). (3) Restaurants (Jack in the Box, Boar's Head, Hungry Hunter, etc.). (4) Diversified businesses (Keystone resort, protein production). For each of the four groups is given, from 1976 to 1980, sales, operating profit, and assets. Grocery products has the highest profits and assets, filed by agricultural products, restaurants, and diversified businesses.

Soybean crushing (which made oil and meal) has sales of 333.3 million in 1980 and contributed 6.8% of the company's sales; both figures were down from 1979. Address: St. Louis, Missouri. Phone: 314-982-1000.

473. **Product Name:** Dari-Pro Products (Isolated Soy Proteins Blended with Carbohydrates).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164.
Date of Introduction: 1980.
New Product–Documentation: Designed as a functional replacement for nonfat dry milk in specialized applications.

474. Burbach, Roger; Flynn, Patricia. 1980. Agribusiness in the Americas. New York, NY: Monthly Review Press. 314 p. Index. 21 cm. [62 ref]

• ***Summary:*** "In southern Brazil, more than a dozen multimillion-dollar soybean processing plants owned by U.S. multinationals are scattered throughout the region., surrounded by large-scale mechanized soybean farms, none of which existed two decades ago." In Brazil, soybean production has been growing at the rate of 8-12% a year over the past decade (p. 84-85).

The chapter titled "The U.S. Grain Arsenal" gives a history and assessment of PL 480, the U.S. Food for Peace Program (established in 1954), as "an institutionalized arm of U.S. imperialism... In the past 25 years, close to $30,000 million worth of agricultural commodities have been shipped overseas under the PL 480 program. It is not surprising that little of this food has reached the hungry in recipient

countries, since the original legislation did not even pretend to have a humanitarian purpose (The humanitarian intent clause was added to the law much later.) As suggested by its name–Agricultural Trade and Development Act–PL 480 was intended primarily to develop future commercial markets for U.S. grain exports and to solve the problem of mounting U.S. farm surpluses by dumping them overseas.

"In line with this purpose, over three-quarters of PL 480 commodities have been shipped abroad under long-term, low-interest credits provided by Title I of the law. These credits allow foreign governments to import U.S. agricultural products for resale in their own countries..."

The sale of Title I commodities generates funds for the recipient governments (known as "counterpart funds"); these funds as a form of U.S. economic assistance, which have often been used to finance military expenditures. The repayment of PL 480 loans in local currencies was allowed until 1981.

Title II of the program, under which the U.S. finances food donations to "friendly countries" through private international relief agencies is of less direct political use.

During the first 12 years of the PL 480 program, "one-quarter of all U.S. agricultural exports were financed by PL 480's easy credit terms... In 1969 PL 480 accounted for only 15% of U.S. agricultural exports, and by 1977 this figure had dropped to 4%.

"Under the guise of the food aid program, the U.S. Department of Agriculture has worked hand in glove with grain multinationals to develop these commercial markets. One of their goals has been to generate demand for U.S. agricultural products by encouraging people abroad to adopt American-style eating habits. Trade associations representing the U.S. food industry have received millions of dollars worth of PL 480 local currencies toward this end. The U.S. Feed Grains Council, for example, has used these monies to promote the development of local livestock and poultry industries which rely on imported feed grains. Another example is the Western Wheat Growers Association, which has encouraged people throughout Asia to eat wheat-based products like bread instead of locally grown rice."

Page 255: Archer-Daniels-Midland Co.

Brazil: 1974 acquired; soybean processing, edible oil refinery; Technologia Tecnologia em Vegetais e Proteinas SA / 50

1974 acquired / soybean processing, edible oil; ADM do Brasil Productos Agricolas

Cayman: 1974; soybean meal [built]; Agriproduct; 100

1975; offshore insurance; Agrinational / 100

Mexico: 1956 acquired; 1966: sold; grain mill products; Productos Api Aba SA / 50

1964 acquired; 1967: sold; plastics, synthetic resins; Admex SA / 40

1966; plastic resins; Quimica Organica SA

Peru: 1956 whaling station [built]; Balanerna del Norte SA / 50 Address: Members of NACLA.

475. Cox, Michael; Crockett, Desda. 1980. The subversive vegetarian: Tactics, information, and recipes for the conversion of meat-eaters. With recipes by Desda Crockett. Santa Barbara, California: Woodbridge Press Publishing Co. 128 p. Illust. by Clive Birch. Index of recipes. 22 cm. [15 ref]

• ***Summary:*** This witty and amusing book explains how to nicely convert meat-eaters to vegetarianism. It contains recipes and much nutritional information. This book was first published in the United Kingdom in 1979 by Thorsons Publishers Ltd.

A section titled "Soya Protein (p. 18-19) notes that "the great soya revolution has not materialized, even though Ralston Purina and other giant food producers have put money as well as faith soya products." The reason: Most Britons still believe in "the regenerative power of blood," and this believe that they need to consume meat. "More textured soya protein is sold in pet foods in Britain than in food for human consumption."

An interesting table on p. 31 outlines the main physiological differences between carnivorous and vegetarian animals in Nature. The author attempts to refute what he calls the "three vulgar errors" about vegetarianism" 1. That meat is essential to a proper diet. 2. That vegetarianism is an expensive alternative to eating meat. 3. That vegetarian cooking is boring and uninteresting. Address: United Kingdom.

476. Food Protein Council. ed. 1980. Government seminar. May 21, 1980: Abstracts and remarks. Washington, DC. 43 p. 28 cm. [65 ref]

• ***Summary:*** See next page. Contents: Introductory remarks, by B. Marlo Dirks (Procter & Gamble Co.). Rationale of soy products, by Russell Cooper (Ralston Purina Co.). Technical and nutritional aspects of soy protein, by Endre Sipos (Central Soya Co.). Current regulatory issues involving vegetable protein products, by Eugene I. Lambert (Covington and Burling, FPC Counsel). Educational effort by FPC, by Helen Horton (Miles Laboratories, Inc.).

Food Protein Council member firms: ADM, Cargill, Central Soya, Dawson Food Ingredients, General Foods Corp., General Mills, Inc., Grain Processing Corp., Honeymead Products, Kraft, Inc., Miles Laboratories, Inc., Nabisco, Inc., Procter & Gamble Co., Ralston Purina Co., A.E. Staley Mfg. Co. Address: 1800 M St., Northwest, Washington, DC 20036.

477. Schwarz, F.H.; Allwood, J.K. 1980. Role of soy protein products in national development. In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Proceedings. Boulder, Colorado: Westview Press. xv + 897 p. See p. 831-38. [7 ref]

FOOD PROTEIN COUNCIL

Government Seminar

MAY 21, 1980

Abstracts and Remarks

food protein council
1800 M STREET, N.W.
WASHINGTON, D.C. 20036
(202) 467-6610

• ***Summary:*** Contents: An overview of soy protein products. Relevant aspects of national development. Soy protein policy recommendations. References. The author advocates the increased use of soy proteins in combination with animal proteins. Address: 1. International Business Development, Protein Div.; 2. Economic Research Dep. Both: Ralston Purina Co., St. Louis, Missouri 63188.

478. Warf Institute, Inc. 1980? Warf Institute, Inc. (Brochure). Madison, Wisconsin. 21 p. Undated. 28 cm.
• ***Summary:*** WARF, which stands for "Wisconsin Alumni Research Foundation," is an analytical laboratory. This colorful brochure describes its services. This company was apparently purchased by Raltech Scientific Services, Inc., P.O. Box 7545, Madison, Wisconsin 53707–A subsidiary of the Ralston Purina Company; Raltech's business card (with logo) has been glued on the front and rear covers. Address: 3301 Kinsman Blvd., Madison, Wisconsin 53707. Phone: (608) 241-4471.

479. Ralston Purina Company. 1981. First quarter report to shareholders. Three months ended Dec. 31, 1980 and annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 12 p. 22 cm.
• ***Summary:*** "To Our Shareholders: Before discussing our excellent first quarter results, I would like to review an important development with respect to your Company.

"I am pleased to report that on January 29, 1981, at a special meeting of your Board of Directors, we chose William P. Stiritz, Group Vice President, to be my successor as Chairman of the Board and Chief Executive Officer upon my retirement. At that meeting, Bill was elected President and a Director, filling a vacancy on the Board that expires in January 1982. He was also appointed a member of the Executive and Finance Committees of the Board.

"Under our transition plan, Bill will succeed me as Chief Executive Officer on July 1, 1981, and will continue as President. I will continue as Chairman of the Board until the stockholders meeting on January 21, 1982, when the plan calls for Bill to become Chairman of the Board, President and Chief Executive Officer.

"Bill Stiritz is an experienced and capable executive with an outstanding record of achievement at Ralston Purina. He has made many significant contributions to our overall success. I have a very high regard for Bill, and I am confident that he will lead your Company into a new and exciting period of growth and opportunity.

"I am also pleased to report that the highest quarterly sales and earnings for any quarter in the Company's 87-year history were recorded for the first quarter ended December 31, 1980. The previous record earnings quarter was last year's first quarter and the previous quarterly sales record was set in the fourth quarter of last year.

"Earnings for the first three months of this fiscal year were $54,600,000 compared to $49,800,000 last year. Sales for the period were $1,401,100,000 compared to $1,218,500,000 for the same period last year. Primary earnings per share of Common Stock for the first quarter this year were 51¢ compared to 46¢ for the same period last year.

"Our first quarter results were better than anticipated and support our previous projection that fiscal 1981 will be another record year in earnings. We look to the remainder of the year with confidence. For a more detailed analysis of our first three months results, see the 'Review of Financial Information' elsewhere in this report.

"At their regular January meeting, your Board of Directors voted to increase the regular quarterly dividend rate on your Common Stock by 12½ percent, from 16¢ per share to 18¢ per share. This is the ninth increase in your dividend rate in the last nine years. We feel this reflects the continuing confidence your Board has in the future earnings capability of your Company.

"R. Hal Dean, Chairman of the Board and Chief Executive Officer February 16, 1981."

Page 10: "Very strong performance of our U.S. Soybean Processing Operations. and our U.S. Chow Division..."

Portrait photos show R. Hal Dean and William P. Stiritz.

Note: In Aug. 2014 www.valuewalk.com wrote: "In 1981, it would have been impossible to predict the transformation Bill Stiritz would achieve at Ralston or the remarkable impact he would have on the company's shares. Pretax margins grew from 9% to 15% and ROE [return on investment] more than doubled under his stewardship. When combined with a shrinking share base, this produced exceptional growth in earnings per share. A dollar invested with Stiritz when he stepped into the driver's seat at Ralston was worth $57 nineteen years later." Address: St. Louis, Missouri.

480. Ralston Purina Co. 1981. Fire or explosion in solvent extraction plant. Louisville, Kentucky. Feb. 13.
• ***Summary:*** Kingsbaker, C. Louis. 2005. "List of fires and explosions in extraction plants." Atlanta, Georgia. 3 p. Aug. 4. Unpublished manuscript. Address: Louisville, Kentucky.

481. Detjen, Jim. 1981. Officials suspect 200 gallons of chemical hexane in blasts. *Courier-Journal* (*The*) (*Louisville, Kentucky*). Feb. 14. p. 2.
• ***Summary:*** "Information for this story was also gathered by Carolyn Colwell, Leslie Scanton and Kay Stewart."

"What caused yesterday's explosions that ripped through old Louisville, injuring four people and causing millions of dollars of damage?

"The answer to that question is likely to be disputed for years to come.

"Lawyers for the Metropolitan Sewer District clearly believe that the Ralston Purina Co.'s Soybean Division at 2441 S. Floyd St. is responsible."

"But officials with Ralston Purina deny they were responsible for the explosions."

George Kyd, Ralston Purina's vice president at the company's headquarters in St. Louis, Missouri, "said it hasn't been determined if the explosions were related to any operations at its soybean processing plant."

Kyd acknowledged that cold temperatures may have caused some of the plant's operating equipment to malfunction. "But he said company officials promptly notified MSD officials and requested that an inspection be made."

"He said a team of 8 or 9 experts from Ralston Purina, St. Louis would conduct a full investigation of the situation and that the company would work closely with MSD, the state fire marshall's office and other authorities." Address: Courier-Journal Staff writers.

482. Edwards, Virginia B. 1981. 'I saw a flash and the house shook like paper.' *Courier-Journal* (*The*) (*Louisville, Kentucky*). Feb. 14. p. 1-2.
• ***Summary:*** "Information for this story was also gathered by Stan MacDonald, Elinor J. Brecher, Jim Detjen, Bob Johnson.

A manhole cover, blown high into the sky by the explosion, came down through the roof of a home, and then crashed through the floor–about a yard from where 10-year-old Bobby Lee was sleeping.

The rest of this long story describes what happened to various people as a result of the pre-dawn explosion. Address: Courier-Journal Staff writers.

483. Lawrence, Jay. 1981. Blasts leave Louisville to pick up the pieces: officials fear health hazards, huge repair bill. *Courier-Journal* (*The*) (*Louisville, Kentucky*). Feb. 14. p. 1-2.
• ***Summary:*** "Information for this story was also gathered by Sheldon Shafer, Bob Johnson, Stan McDonald, and Virginia B. Edwards."

The chain of massive sewer explosions began at 5:16, when it was still dark outside, and collapsed almost two full blocks of Hill Street, a city thoroughfare. Manhole covers were blown into the air. Only four people were reported injured, none seriously. City officials estimated damages at over $10 million.

A County Patrolman flying a police helicopter said he saw a line of "shiny brilliant green" blasts across South-Central Louisville. "Each was 'shooting straight up and then rounding out like a big ball.'" Address: Courier-Journal Staff writers.

484. MacDonald, Stan; Adams, Jim. 1981. Cut-off valve, piping might have averted spill at Ralston plant. *Courier-Journal* (*The*) (*Louisville, Kentucky*). Feb. 19. p. A1, A12.
• ***Summary:*** The spill of the flammable and explosive chemical hexane, used at the Ralston-Purina plant to extract oil from soybeans, might never have happened if a containment basin, a shut-off valve, and a piping system to siphon off excess hexane were in place. The explosion caused at least $42 million in damage to public property and utilities alone. Address: Courier-Journal Staff writers.

485. *Wall Street Journal.* 1981. Ralston Purina is sued for damages resulting from Louisville blast. Feb. 19. p. 20.
• ***Summary:*** "Louisville–Residents and business owners affected by an explosion earlier this week filed class action suits in federal court seeking more than $150 million in damages from Ralston Purina Co.

"The suits claim hexane, a flammable solvent used in soybean processing, leaked from a Ralston Purina plant into the city sewers and caused the blast. The explosion did about $42 million in damages to streets, sidewalks, and sewers, and injured four people. Nearly 2,000 people were evacuated after the explosion."

A spokesman for Ralston Purina said that the company was conducting its own investigation of the explosion and "still hasn't determined that hexane caused the explosion or leaked from its plant."

One suit, seeking at least $50 million, was from the Metropolitan Sewer District of Jefferson County and Louisville.

"Gov. John Y. Brown of Kentucky has asked President Reagan to declare the part of the city destroyed by the explosion a federal disaster area."

486. *Wall Street Journal.* 1981. Ralston Purina is sued for damages resulting from Louisville blast. Feb. 20.
• ***Summary:*** "Louisville–Residents and business owners affected by an explosion earlier this week filed class action suits in federal court seeking more than $150 million in damages from Ralston Purina Co."

Four people were injured. Nearly 2,000 people were evacuated after the blast.

487. *Chemical and Engineering News.* 1981. Ralston Purina suspect in Louisville blast. Feb. 23. p. 11.
• ***Summary:*** "A series of early morning explosions in the city's sewers sent manhole covers flying and left huge craters in streets."

488. Cooper, R.L. 1981. Regulatory approach of industrialized countries to accommodate use of soy protein. *J. of the American Oil Chemists' Society* 58(3):431-33. March.
• ***Summary:*** Contents: Abstract, Regulation of soy protein in foods. Accommodating soy protein in the food supply. Food standards. Labeling of food containing soy proteins. Nutritional guidelines for foods containing soy proteins. Enforcement.

"A reasonable approach to food legislation attempts: (a) to allow the production of properly labeled, safe, wholesome foods, recognizing new developments in modern food technology; (b) to ensure the nutritional value of foods; (c) to provide sufficient information and understanding to help the consumer make a wise purchase decision; and (d) to adopt controls as required to promote honesty and fair dealing in the marketplace." Address: Ralston Purina Co., St. Louis, Missouri.

489. Hopkins, D.T.; Steinke, F.H. 1981. Uses of soy protein in mixed protein systems to meet nutritional needs. *J. of the American Oil Chemists' Society* 58(3):452-55. March. [28 ref]
• ***Summary:*** "Soya products can be introduced into animal protein food systems to supplement animal protein. This can serve to increase the total protein available to target populations." Address: Ralston Purina Co., St. Louis, Missouri.

490. Struthers, B.J. 1981. Lysinoalanine: Production, significance and control in preparation and use of soya and other food proteins. *J. of the American Oil Chemists' Society* 58(3):501-03. March. [21 ref]
• ***Summary:*** "Formation of lysinoalanine (LAL) in proteins in response to alkali treatment is a well-known phenomenon... Higher temperatures, longer exposure times, and higher pH's generally result in more LAL formation. The addition of mercaptoethanol or cysteine to an alkaline protein solution decreases LAL formation markedly... LAL has not been shown to present a toxicological hazard to any species other than the rat. Its presence in large quantities in any protein indicates destruction of cysteine and lysine..." Address: Ralston Purina Co., St. Louis, Missouri 63188.

491. Waggle, D.H.; Decker, C.D.; Kolar, C.W. 1981. Soya products in meat, poultry and seafood. *J. of the American Oil Chemists' Society* 58(3):341-43. March. [24 ref]
• ***Summary:*** Contents: Abstract. Introduction: Basic principles of utilization, meat, poultry, seafood, maintenance of traditional quality.

"About 16% of the meat could be replaced with soya protein product A before the extended product became significantly different from the hidden all-meat control, whereas only 9% meat could be replaced by soya protein product B before the differences became significant." A trained 16-member taste panel was used.

A portrait photo shows C.W. Kolar. Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

492. *Des Moines Register* (*Iowa*). 1981. Ralston Purina sued over Louisville blast. April 18. p. 7.
• ***Summary:*** "Louisville, Kentucky (AP)–The city has filed a $50 million lawsuit against Ralston Purina Co., claiming damages from a series of explosions that rocked the city's sewer system Feb. 13. The suit charges that Ralston employees spilled a 'large volume' of hexane gas into the sewer system prior to the explosions and failed to notify the fire department about the spill."

493. *Feedstuffs.* 1981. Ralston Purina sued for damages in sewer blast. 53(8):8.
• ***Summary:*** "Louisville, Kentucky–Class action suits seeking more than $150 million in damages from Ralston Purina Co. were filed in federal court last week by residents and businesses affected by the explosion here earlier in the week.

"The suits claim hexane from a Ralston Purina plant leaked into city sewers and caused the blast."

494. Worthy, Ford S. 1981. The 500: The *Fortune* directory of the largest industrial corporations. *Fortune* 103(9):322-47. May 4.
• ***Summary:*** Companies are ranked by sales. Soy-related companies include: Ralston Purina (St. Louis, Missouri) is No. 72 with $4,886 million in sales. Land O'Lakes (Minneapolis, Minnesota) is No. 109 with $3,304 million. Archer-Daniels-Midland (Decatur, Illinois) is No. 139 with $2,802 million. Central Soya (Fort Wayne, Indiana) is No. 207 with $1,744 million. And A.E. Staley Mfg Co. (Decatur, Illinois) is No. 218 with $1,656 million in sales.

Note: Cargill is not listed because it is privately owned. In 1981 Cargill's sales were about $12,000 million a year. Exxon was No. 1 on the Fortune 500 with $103,142 million in sales. Mobil was No. 2 and General Motors was No. 3.

495. Andres, Cal. 1981. The versatile soybean: Supplies two necessary food components–protein and fats–plus wide range of functional attributes. *Food Processing* (*Chicago*) 42(5):142-44, 146, 150, 152, 154, 156, 158, 163. May.
• ***Summary:*** This article is in the section titled "Ingredients handbook." Contents: Introduction. Protein: Soy flour and grits (50-52% protein), soy protein concentrate (70% protein), and isolated soy protein (90% protein or more), extremely versatile, extruded products, spun soy protein made from isolated soy protein, functional benefits of using soy protein, analogs–products resembling conventional foods in appearance, color, flavor and texture (such as breakfast strips {bacon}, whipped toppings, and imitation cheese), soy protein makes excellent use of farmlands potential to produce protein, Gallup poll shows 71% of Americans view soy protein favorably, different types of soy flour.

Soy protein suppliers (tells what kinds of products are sold by each company): ADM Foods (Archer Daniels Midland), Cargill Protein Products Dept., Central Soya Co., Dairyland Products, Dawson Food Ingredients (Subsidiary of Dawson Mills), Farmland Agriservices, Inc. (formerly known as Far-Mar-Co., Inc.), Food Ingredients, Inc. (the

U.S. "sales representative of a full-fat soy-protein flour produced in Germany), Griffith Laboratories, Kraft Foods (isolates), Lauhoff Grain Co. (soy flours and textured soy flour), Ralston Purina (regular isolates, "blends of isolated soy proteins plus other ingredients such as dairy products." "Structured isolated soy proteins are available as a fiber and as a granular product. The fiber is the frozen, hydrated form and is retort-stable with no degradation of fiber. Texture is similar to that of muscle fiber"), A.E. Staley Manufacturing Co. (The Protein People; soy flours and textured soy flours, soy protein concentrates, whipping proteins, hydrolyzed vegetable proteins), Food Protein Council (Washington, DC; has two brochures).

Soybean oil. Suppliers: Capital City Products Co. (Div. of Stokley Van Camp, Inc.), Durkee Foods (Div. of SCM Corp.), Humco Products (Div. of Kraft, Inc.), A.E. Staley.

Lecithin. Lecithin suppliers: Ross and Rowe, Inc. (Div. of ADM; regular and granulated lecithin), Central Soya, A.E. Staley. On the last page is given the full name and address of each supplier mentioned in the article.

Photos in the article show the cover of the following brochures, each available from one supplier: (1) ADM Foods: "Look where soybeans go." (2) Central Soya Co.: "Soy flours & soy grits." (3) Food Protein Council: "Vegetable protein: Products and the future." (4) Kraft: "The new soy on the block." (5) Ralston Purina: "Purina proteins: Product information."(6) A.E. Staley: "The protein people." (7) Food Protein Council: "Soy protein: Improving our food system." (8) ADM: "Food oils." (9) Capital City Products: "A complete line..." (9) Staley: "Refined oils." (10) Ross & Rowe, Inc.: "Soybean lecithin: Yelkin T,..." (11) Central Soya Co.: "Lecithin from Central Soya naturally." (12) Ralston Purina Co.: "Nutritional aspects of Ralston Purina isolated soy protein." Address: Senior Associate Editor.

496. Ralston Purina Co. 1981. Prime proteins–minus one (Ad). *Food Processing* (*Chicago*) 42(5):159. May.
• ***Summary:*** "The missing one is Ralston Purina's prime protein–isolated soy protein. It's prime because it contains all eight essential amino acids in a pattern that matches the amino acid pattern for high-quality protein established by the Food and Nutrition Board, National Academy of Sciences."

The top half of the ad contains a photo showing most of the different types of animal protein–slices of red meat, a plucked chicken, two dead fish, a glass of milk, slices of cheese and eggs, all on a cutting block.

In the lower right corner is a clip-out form to request the brochure "Nutritional Aspects of Isolated Soy Protein." Address: Protein Div., Checkerboard Square, St. Louis, Missouri 63188.

497. *Wall Street Journal.* 1981. Louisville blast suits against Ralston Purina consolidated by judge. June 8. p. 29.
• ***Summary:*** Federal judge Thomas Ballantine in Louisville consolidated 11 damage suits, totaling more than $200 million, "against Ralston Purina Co. arising from a February explosion that caused extensive damage to city streets, sidewalks and sewers." The suits allege that hexane, a flammable solvent used in processing soybeans, caused the blast.

498. Leviton, Richard. 1981. Current research is promising but more is needed: Spilling the beans on soyfood nutrition. *Vegetarian Times* No. 47. June. p. 64-65. [6 ref]
• ***Summary:*** "Longterm acceptance of soyfoods in the West will depend largely on the ability to convince nutritionists, and other protectors of our food system, that tofu, tempeh, miso and the other emerging soyfoods provide solid human nutrition superior to that of the foods they seek to replace: largely meat and dairy products.

"Back in the 1930s and '40s, soybean meal researchers discovered that heating the raw legumes would remarkably improve the nutritional value of soy meal as a livestock feed. The findings paid off handsomely for the soybean meal industry. Today soybean meal, which is still used largely for cattle feed, constitutes a $5.4 billion market (annual sales of 24 million tons at $225 per ton). Obviously the research paid off.

"Those of us who produce and promote soyfoods for human consumption (notably the products tofu, tempeh, and miso), find ourselves in a situation similar to that of the soybean meal producers of the 1930s. Our market is small (annual retail sales of about $50 million), but the potential is terrific: we need only convince everyone not already familiar with our products of how great they really are.

"Unfortunately, in an age when a high price is placed on knowledge, knowledge often comes at a high price. Although evidence suggests great potential for these lightly-processed soyfoods in terms of cost and health benefits, many of the claims made on behalf of soyfoods are conclusions based upon extrapolations from research using other soy products, often texturized vegetable protein, soy isolates and concentrates. The reason is that the industry that manufactures these other products has the money to support expensive research.

"Until recently, few researchers were willing to commit the time or money for the serious nutritional study of tempeh and tofu. Fortunately, that has begun to change. Some noteworthy researchers have come to the aid of the industry and the facts they have uncovered thus far with regards to these soyfoods are encouraging.

"What Is Known: Simple laboratory analysis reveals that tofu contains anywhere from 4% to 13% protein, with a 'Net Protein Utilization' (NPU) rating of 65. The NPU reflects the 'bottom line' value of how much of a given nutrient the body can assimilate. Tofu is 95% digestible. It's low in fats, calories, carbohydrates and contains no cholesterol.

"Tempeh can have as much as 19.5% protein, an NPU of

56, and a digestibility rating of 86% (Ed. note: See Margaret Nofzinger's article on "Tempeh and Non-Dairy Yogurt" in this issue for information on vitamin B-12 in tempeh).

"Miso's protein ranges from 13 to 20% while miso itself contains a favorable blend of easily digested sugars, minerals and vitamins. These figures reflect the short-term, immediately relevant, nutritional scorecard for soyfoods.

"Nutritionists want to understand the longer-range effects of daily consumption of these 'new' (to the West) protein staples, and this requires more complex and expensive studies.

"Soy proteins, according to Dr. Nevin Scrimshaw of M.I.T., 'are of good quality, approaching or equaling those foods of animal origin, and are fully capable of meeting the essential amino acid and protein needs of human adults.' Another researcher, Dr. Harold Wilcke, of Ralston Purina, notes, 'The results presented in actual feeding programs for infants, children and young adults clearly show that soy protein is a much better protein nutritionally for humans than would have been predicted on the basis of rat assays.'

"The conservative consensus among soy protein researchers is that the protein quality of soy may be considered nearly equal or equal, at adequate intake levels, to traditional milk proteins.

"Now, let's look at some of the specifics.

"Less Gas: Dr. Joseph Rackis, a nutritional researcher at the U.S. Department of Agriculture laboratory in Peoria, Illinois, reports that both tofu and tempeh are "essentially devoid" of flatus- (or gas-) producing activity. Writing in *Soyfoods* (Winter 1981, Vol. I, No. 4) Dr. Rackis states that the oligosaccharides in raw soybeans responsible for gas in humans, have been either deactivated or processed out in tempeh and tofu production, leaving these two foods with little flatus activity. Flatus activity is an index of how well a given food is actually digested.

"Protein vs. Vitamins: Dr. Rackis also reports on the nutritional value of immature, dry mature and sprouted soybeans, which tend to contain high levels of ascorbic acid (vitamin C) and beta-carotene (vitamin A). The protein quality of these three forms of soybeans in the raw, uncooked state is very low, regrettably, with PERs (Protein Efficiency Ratio, the standard protein value reference) for green mature soybeans of 0.77; for dry mature, 0.75; and for sprouts, 0.64. This is in contrast with cow's milk which has a PER of 2.5, generally considered a reference value.

"By comparison, moist heat treatment greatly improves the PER values (and the protein digestibility) of these forms of soybeans to values close to 80% of milk protein. The PER for heated green mature soybeans becomes 2.05; for dry mature, 2.11; for sprouts, 2.02. It becomes a nutritional trade-off, however, with sprouts which are often grown for their vitamins. You have either a high protein sprouted vegetable but lose most of the vitamins through heating, or you have a high vitamin content at the expense of poor protein digestibility. Regardless of the state of maturity (dry, green or sprouted) Dr. Rackis strongly urges consumers to cook soybeans to convert the raw protein into more digestible forms. Dr. Rackis' work and conclusions are an example of solid, useable research of soyfoods, and reflects the nutritional basis for the growth of soyfoods in the market.

"Soyfoods and Cholesterol: Another exciting area of nutritional research was reported recently by Dr. K.K. Carroll of the University of Western Ontario, Canada (published in the *Journal of the American Oil Chemists Society,* March 1981). Dr. Carroll's work deals with rabbits, protein and cholesterol, and the role of soybeans in actually lowering the blood levels of cholesterol. It's commonly known that soybeans, and therefore soyfoods, do not contain cholesterol, believed to be the major contributor to heart disease and other degenerative illnesses. What is not so commonly known is that soy protein-based diets can have a measurable impact on lowering cholesterol levels in the body. Soy protein diets yielded consistently low levels of plasma cholesterol compared to casein (milk protein) diets in Dr. Carroll's studies with rabbits. Later studies, conducted with humans, showed a small but statistically significant difference in the soy-based diet level of cholesterol. Even more recent studies (see *Vegetarian Times,* No. 44, page 12), deriving from European investigations, report that diets containing textured vegetable proteins used for eight weeks produced startling reductions in plasma cholesterol levels: 23% in men and 2.5% in women. The British medical journal *The Lancet* even ventured to recommend a soy-based diet as an alternative to traditional low fat, low cholesterol diets as preventive measures against heart diseases.

"Findings such as these are bound to stimulate market interest in and demand for soy-protein foods. However, typical of the subtleties and lack of complete agreement on nutritional studies, it must be pointed out there is not any unequivocal agreement on the role of cholesterol in causing heart disease, at least not enough to totally convince the FDA.

"Trypsin Inhibitors: Trypsin inhibitors are anti-digestive factors in raw soybeans and were implicated in the original studies that discovered the value of toasting raw soybeans. Trypsin inhibitors are believed to interfere with the normal activity of human pancreatic trypsin, a digestive enzyme. I say believed because this has never been actually demonstrated in human subjects, only in laboratory animals. In experiments with rats, prolonged trypsin inhibitor activity has been shown to develop an enlarged pancreas and reduced growth rates. Adequate heat treatment of raw soybeans destroys at least 80% of the trypsin inhibitor, an amount considered the safety threshold for humans. Tofu generally has 10% or less according to laboratory analyses.

"Dr. Irvin Liener, of the University of Minnesota, one of the key researchers in this field, has reported that, based on the pancreatic sizes of test animals, humans may actually not

be susceptible to pancreatic enlargement and reduced growth from trypsin inhibitors at all, contrary to what had been thought. While this is yet to be proved definitively, and is more of a likely extrapolation from laboratory tests, it could wipe the slate clean of a longstanding anti-nutritional aspect of soybeans" (Continued). Address: Editor and Publisher, *Soyfoods* magazine, 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

499. Garino, David P. 1981. New Ralston chief says he'll sacrifice sales to keep profit margins high. *Wall Street Journal.* July 2. p. 19, 29.
• ***Summary:*** "Pet food is by far the biggest contributor to Ralston's profits; the company controls more than 40% of the dog and cat food market." A portrait illustration shows William P. Stiritz.

500. Hooten, Dan. 1981. Dawson Mills' protein analog plant. Protein prices. Isolate markets. Functional properties desired by industry (Interview). *SoyaScan Notes.* Aug. 17. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** Dawson Mills invested $11 million in their protein analog plant. It was intended to have a capacity of 9.5 million lb/year but was actually capable of producing only about 400,000 lb/month or 4.8 million lb/year.

Soy protein prices (per lb): Flours and grits: $0.14. Concentrates: $0.31-33. Isolates: $1.02–from Ralston Purina and Grain Processing Corp. $0.90–from ADM. Note that ADM is working off inventory that they have accumulated since start-up. A number of Central Soya's former isolate customers have gone to other suppliers.

Isolate markets: (1) Health foods. (2) Infant formulas–Some doctors go to soy formulas directly to avoid potential allergy problems with cow's milk. (3) Milk products. (4) Meat emulsions–In Europe fat, water and isolate are emulsified and then frozen. This emulsion is later mixed with meat in the preparation of products that are "stuffed into casings or cans."

Japan is still a net importer (2-3 million lb/yr) of isolates.

Functional properties desired by industry: (1) Film forming ability–with strength. (2) Casein-like properties (the imitation cheese market is now about 150 million lb–uses 40 million lb of casein). Casein sells for $1.35-$1.40/lb. Address: Dawson Food Ingredients.

501. Ralston Purina Co., Protein Division. 1981. Product summary (Leaflet). St Louis, Missouri: Ralston Purina Co. 1 p. 2 panels each side.
• ***Summary:*** "Proteinability–Protein technology working for you. Lists and describes each of three different types of products:

"Isolated Soy Proteins:

"Edi-Pro A–An isoelectric, isolated soy protein (pH 4.5) for use in retorted applications such as infant foods and other heat treated products.

"Supro HD-90–An isolated soy protein with excellent nutritional properties for use in protein enrichment applications requiring protein with high density.

"Supro 350–An isolated soy protein with high acid stability designed for low pH products such as citrus pudding and similar applications.

"Supro 610–Isolated soy protein with high water absorption characteristics designed for function and fortification in a wide variety of applications.

"Supro 620–An isolated soy protein with high viscosity, emulsification and gel forming characteristics. Supro 620 performs extremely well in emulsified meat products and is available with TiO2 [titanium dioxide] tracer for use in USDA regulated meat applications.

"Supro 630–An isolated soy protein with superior dispersibility characteristics designed for a variety of hydratable dry mixes.

"Supro 640T Fortiblend–An isolated soy protein fortified with vitamins and minerals required for use in whole meat muscle augmentation.

"Supro 660–A high density isolated soy protein designed to provide smooth mouthfeel and rapid dispersibility. Well suited for use in protein fortified beverages.

"Supro 710–A low viscosity isolated soy protein with high solubility characteristics designed for application in coffee whiteners and other products requiring solubility and stability.

"Supro 710 K–An isolated soy protein with low viscosity and high solubility designed for systems requiring low sodium levels.

"Purina Protein 860–An isolated soy protein with low moisture absorption and high density characteristics. Recommended for applications requiring smooth mouth feel and low solubility where high moisture absorption is not desirable.

"Structured Isolated Soy Proteins:

"SPF 200–A high quality structured isolated soy protein fiber available in the frozen, hydrated form. It is retort stable with no degradation of fiber. Its texture is similar to that of meat muscle fiber. SPF 200 functions to fortify with protein, add texture, control shrink, control cost and is extremely bland in flavor.

"Purina Protein 220–A specially processed isolated soy protein granule with excellent nutritional, structural and functional properties. Purina Protein 220 provides chewy mouthfeel when used in coarse ground meat systems.

"Dari-Pro Products:

"Dari-Pro 35-A blend of milk proteins and isolated soy protein that provides functional characteristics similar to those of Non-Fat Dry Milk and is designed as a one to one functional milk replacer in a variety of baked goods.

"Dari-Pro 300–A highly functional blend of whey and

isolated soy protein with characteristics similar to those of Non-Fat Dry Milk designed for use in cake and related bakery systems.

"Dari-Pro for Specialized Food Systems–Highly functional spray dried blends of whey and isolated soy protein designed to function in potato granules, instant breakfasts, beverage drinks, baby foods and imitation dairy products."

502. Dunn, John R. 1981. U.S. cooperative soybean processors (Interview). Conducted by William Shurtleff of Soyfoods Center, Sept. 15. 1 p. typescript. [1 ref]
• ***Summary:*** It is now generally agreed that ADM has passed Cargill as America's leading soybean crusher–but both companies have about the same crushing capacity. According to his best information, America's top 12 soybean crushers are (as of Oct. 1979): 1. ADM. 2. Cargill. 3. A.E. Staley. 4. Central Soya. 5. Bunge. 6. Ralston Purina. 7. Gold Kist. 8. Farmland Industries. 9. Continental Grain. 10. Riceland Foods. 11. Quincy Soybean. 12. Land O'Lakes. Other leading cooperative crushers, in descending order of size, are Honeymead Products, Agri Industries, Boone Valley Processing & Marketing Assoc., and Missouri Farmers Association. All of these companies use solvent extractors.

The top 4 firms own and operate 54.5% of the processing capacity. The next 4 control 20.6%, for an 8-firm total of 75.1%. The next 4 control 11.2%, for a 12 firm total of 86.3%. Bunge, which is based in Argentina, has moved up on the list through some recent acquisitions, including a plant in Mississippi in July from Gold Kist.

Concerning cooperatives, each regional co-op is taken as a unit. They operate completely independently of each other. So it is not accurate to think of the co-ops as a whole–although they do have some areas of cooperation with one another, e.g. export sales efforts and domestic processed product sales. The operate independently on procurement and processing. The total amount of soybeans crushed by the cooperatives is probably less than that crushed by ADM or Cargill. Address: USDA Agricultural Cooperative Service (ACS), Washington, DC 20250. Phone: 202-475-4929.

503. Tompor, Susan. 1981. Sewer blast damage lingers in Louisville amid haggling over who will be blamed. *Wall Street Journal.* Sept. 16. p. 19, 29.
• ***Summary:*** After months of mostly inaction, the residents are getting irritated. Water lines and sewer lines must be repaired in a certain order. Address: Staff reporter of the WSJ.

504. Inkson, Ms.; Mann, E.J. comp. 1981. Thesaurus: Food Science and Technology Abstracts. 2nd ed. Shinfield, Reading, England: IFIS (International Food Information Service). 238 p. No index. 30 cm. First edition, 1977. [Eng]
• ***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.

505. Shorey, RoseAnn L.; Bazan, Belinda; Lo, Grace S.; Steinke, F.H. 1981. Determinants of hypocholesterolemic response to soy and animal protein-based diets. *American J. of Clinical Nutrition* 34(9):1769-78. Sept. [34 ref]
• ***Summary:*** Isolated soy protein completely replaced animal protein in a diet fed to 27 subjects for 42 days. For the responders, there was no change in total cholesterol but HDL cholesterol was lowered 15.6%. Address: Graduate Nutrition Div., Univ. of Texas, Austin, TX 78712.

506. Shurtleff, William; Aoyagi, Akiko. 1981. History of Ralston Purina Company. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 2 p. Sept. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** www.soyinfocenter.com/HSS/ralston_purina.php

A brief history of the subject. Founded in 1893. Work with soy started in 1930. Address: Lafayette, California. Phone: 415-283-2991.

507. Shurtleff, William; Aoyagi, Akiko. 1981. History of Worthington Foods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 11 p. Oct. 5. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** www.soyinfocenter.com/HSS/worthington_foods.php

A comprehensive history of the subject. Contents: Introduction. Founding in 1939 and founders: Harding, financing and duties, first product (Proast, with soy), Numete, growth of sales, Hagle joins company, Robinson leaves, Twomley's description of Hagle: "an uncommon businessman." New Developments in the 1940's: 1945 incorporation and sales to $500,000, Buller and Hartman, Boyer's 1949 visit. Acquisitions and analogs (1950-69): Acquisition of Dr. Harry Miller's International Nutrition Foundation in 1950, Soyamel (1954, 1961), new products introduced in 1950's, big break to go ahead with Boyer (1956) and Ralston Purina, how foods made, sales take off, 1962 first products and Soyameat, use of powdered isolates, acquisition of Battle Creek Foods and Madison Foods, Patties, Numete, spinning of soy protein fibers, praised in Stanford study. "The big time and then back home again" (1970's and 1980's): Acquired by Miles Laboratories of Elkhart, Indiana (March 1970), sales leap, expanded research, introduction of Morningstar Farms line 1972-74, rise and fall, reformulation of line and relaunching as cholesterol free, failure, growth of other products and of the "motivated" market, Bayer AG purchase of Miles in late 1977, uncertain future, "third generation" meat analogs (1976), ready-to-eat vegetarian entrees (1980), 1981 product list. Address: Lafayette, California. Phone: 415-283-2991.

508. Boyer, Robert A. 1981. Work with Henry Ford and soybeans (Interview). *SoyaScan Notes.* Oct. 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Floyd Radford, a secretary to Ray Dahlinger, did a lot of farm work for Dahlinger, who was a very high assistant to Henry Ford. Radford was involved with farming in southern Michigan, not with soybean processing.

Henry Ford was probably the first American manufacturer of solvent extractors. He made them for use in his factories, including his village industries. The first one was only 6 tons, but later he made a 24-ton extractor.

Henry Ford's soybean operations were conducted in various plants. The plastic molding machines were located in the glass plant within the River Rouge plant. The soybean operations in the glass plant were set up in about 1934-35. Then he decided to build the solvent extraction plant outside in the next lot. There he built a brand new building with 4 big extractors. The soybean meal produced by these extractors went into the plastics made in the glass plant. Then in the coke oven building, constructed in about 1940, Ford built a new extraction plant. He also used this plant for forming the plastic rear trunk lid.

CPC (Corn Products Company) purchased the first license to manufacture edible spun soy protein fiber under Boyer's patent; Swift purchased the exclusive rights from 1950-54. CPC was the first company to actually sell this spun soy fiber; they did it as a legal tactic in early 1950 to establish an interstate sale allowing them rights to the name they wanted to use for the product. Worthington accommodated them, and mixed the rest of the batch in with their products to use it up.

In 1955 changed their license from an exclusive to a non-exclusive. Boyer then went to Central Soya [actually probably to Glidden] in Chicago, then Ralston Purina, then Worthington to ask them to license the patent. Ralston agreed and decided to get into edible soy protein. In 1956 they took a non-exclusive license at the same time as Worthington and General Mills.

When Boyer was working with Swift & Co., they were pushing The Glidden Co. to make a food grade isolate. Before Glidden developed this edible soy protein isolate, the only alternative was casein. In Nov. 1957 The Glidden Company announced that it was building a plant to make food-grade soy protein isolates. Their product was named Promine. In 1958 Central Soya purchased The Glidden Co. and built the world's first plant to make food-grade soy protein isolate in Chicago; their Promine D was introduced in Oct. 1959. So in 1956 when Worthington Foods purchased a license to spin soy protein fibers for the health food market, the only food-grade isolate on the market was Promine made by Central Soya–which Boyer felt had a "terrible taste." For this reason, Boyer went to Ralston Purina and urged them to make an edible isolate.

Ralston Purina made the world's first edible spun protein fiber in a pilot plant from about 1956-1960. Boyer first started to consult with Ralston Purina in 1960, when they decided to scale up from a pilot plant to a commercial one in Louisville, Kentucky; he then joined their staff in 1962. Ralston Purina started selling their fiber in about 1961 or 1962; they sold most of it to Worthington. Worthington and General Mills began experimenting with their own pilot spinning units to develop prototype products, but they bought their commercial fiber from Ralston Purina. Later Worthington started to spin their own fiber because of cost and quality factors; aging between the time the fiber was produced and the time it was shipped caused a decline in quality.

Today there is a lot of soy protein spun in Holland. The isolates are probably made at the Ralston Purina plant in Belgium. Address: 632 Edgewater Dr., Apt. 731, Dunedin,

Florida 33528. Phone: 813-734-2415.

509. Boyer, Robert A. 1981. Development of meatlike products based on spun soy protein fibers. Part I (Interview). *SoyaScan Notes.* Oct. 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** This history is compiled from 5 interviews conducted with Robert Boyer from Oct. 1980 to Oct. 1981.

One day at the Ford plant in 1942, Boyer, while sampling fibers of his "soybean wool," realized that these same soy protein fibers, if made tender by omitting the protein denaturation, hardening, and insolubilization, could be used as a basic ingredient in making meatlike textured soy protein foods. Already he had developed an analog for the protein fibers that grow on the *outside* of a sheep (wool), why not develop an analog for those on the *inside*, a meatless meat or meat analog?

Throughout the years of World War II, the idea of using spun soy protein fibers as the basic of human foods, in the form of meat analogs, returned to Boyer again and again. In late 1943 The Drackett Co. in Cincinnati, Ohio (which had a fairly large soybean crushing operation and also made consumer household cleaning products such as Drano and Windex), purchased the Ford Motor Company's soy protein and protein spinning operations. Boyer went with the equipment and processes to Cincinnati. Boyer, now Drackett's director of research, told the company of his interest in producing foods from soy proteins, but Drackett was only interested in industrial products at the time. In early 1949 H.R. Drackett died; the company shut down its plant that was spinning Soybean Azlon fibers, and closed part of its protein R&D laboratories. Boyer left Drackett to work on his own.

On 28 September 1949 Boyer filed for his first patent on edible protein fiber (application serial no. 118,445). It was issued in 1951, then rewritten that year in a much broader format and issued in final form in 1954 (No. 2,682,466). According to this patent (which expired in 1971 and has come to be regarded as a classic), no one can use a man-made protein fiber in a food without violating the basic claim. The patent called for the use of various proteins (including soy, casein, and peanut protein) to make edible protein fibers that could be transformed into meat analogs or extenders that are low in saturated fats and virtually free of cholesterol.

In September 1949 Boyer took his patent idea to his first company, Worthington Foods, Inc., a small company in Worthington, Ohio, operated by a group of businessmen and doctors, that produced meat analogs and vegetarian foods primarily for Seventh-day Adventists and Adventist institutions. Boyer had now been on his own for over eight months and was almost out of money. He still wasn't sure of whether the whole idea was a screwball one or not. He later commented that if Worthington had shown no interest, he probably would have just given up then and done something else. Advised to keep away from the large meat companies, who might buy up the patent and "bury" it, he went to Worthington and disclosed his concept and a pork chop prototype. Mr. Hagle, president of Worthington, was immediately very excited with the idea, but the company was reluctant to take a license until there was a source of soy protein fiber. Harrison Evans, a top Worthington employee, later recalled: "I'll never forget the day Bob Boyer came by. They brought him down with this textured protein wrapped in a piece of aluminum foil and all it looked like was rope. Just unattractive, white... It certainly did not look like real meat."

Worthington waited, so Boyer went to Virginia Carolina Chemical Company (VCCC) in Taftville, Connecticut; they were spinning fibers for textiles and Boyer hoped they would be able to produce soy fibers for Worthington. VCCC allowed Boyer to use their protein spinning pilot plant for research; he provided his own materials. Here he made the world's first edible protein fibers, which were used to make meat analog prototypes. Incorporating egg albumen binder plus vegetable fats and flavorings into the spun fibers, he fabricated the first man-made meatless pork chops and then made hams from soy protein. After the first successful run, nearby Corn Products Company (CPC) got very interested and ended up buying the first license on Boyer's patent (an exclusive option), which gave Boyer his first income from the project. Boyer then consulted for CPC for 9 months. The first sale of commercial edible protein fiber (produced from corn gluten) was made by CPC to Worthington. Eventually, however, it was realized that corn gluten would not work well in foods because of its unpleasant and dominant flavor. The project was dropped. Continued. Address: 632 Edgewater Dr., Apt. 731, Dunedin, Florida 33528. Phone: 813-734-2415.

510. Boyer, Robert A. 1981. Development of meatlike products based on spun soy protein fibers. Part II (Interview). *SoyaScan Notes.* Oct. 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Now somewhat desperate, Boyer decided to try a meat company anyway. He went to Swift & Co. in Chicago, Illinois, in 1950 and they immediately liked these ideas and bought exclusive rights to the patent from 1950-1954 (in 1955 they converted to nonexclusive). In 1950, the war scarcity psychology still prevailed. American consumers and food produces had watched in astonishment during the war as meats became so scarce and expensive that only a few could afford them. Thus it was easy to sell the notion that even after the war, as world population continued to rise, plant proteins would play an increasingly important role in diets throughout the world. Boyer worked with Swift for five years, but in considerable secrecy. Swift told him that if their Livestock Relations Department found out that

Swift was doing research on meat analogs, "all hell would break loose." Eventually Swift made and test marketed new soy protein products. However in 1952-53 livestock producers in America were in such bad shape economically that they marched on Washington, DC, demanding a better price for their products. Swift, fearing the possibility that the media might get word of their new project and come out with headlines reading "Swift Making Synthetic Meats from Soy Protein," decided to shut down the project. None of the products was ever marketed commercially.

In 1951-52 Unilever bought a license from Boyer for spun protein isolate production throughout the rest of the world. Boyer went to England and worked with Unilever in their peanut protein isolate plant and research labs near Liverpool. Here, for the first time, his process was used in the making of sausages containing fibers of peanut protein isolate.

In 1956 Boyer returned to America and went immediately to Worthington, who had now been thinking about taking a license on Boyer's spinning patent for seven years. The first food-grade soy protein isolates were just becoming available, so the company bought the patent rights for the health food industry and asked Boyer to work with them as a consultant. Worthington eventually did more with Boyer's discovery than any company in America.

After Worthington purchased Boyer's license (for the health food trade), other large food companies followed suit: Ralston Purina, General Mills, and Nabisco. General Foods developed their own related process. In 1962 Boyer joined the research staff of Ralston Purina as a Protein Scientist; he worked there until his retirement in 1971, at which time he became a Protein Consultant for Miles/Worthington.

After General Mills took a license on Boyer's product, they built a commercial-sized fiber spinning plant at Cedar Rapids, Iowa, and developed their Bontrae line which featured Bac-O's, a spun fiber analog resembling cooked bacon bits and launched in 1965. The venture was impressive in scope and the product was a real sensation, the biggest thing that had happened to Boyer's idea to date. (The product is now made with extruded soy flour.) The whole venture had a profound effect on the thinking of other large food producing companies concerning soy protein foods. Boyer was now spending 50% of his time with Worthington and 25% each with General Mills and Ralston.

Boyer's years of research eventually began to pay off in terms of handsome royalties from his patents, of which he now had more than thirty, some shared with Ford. These lasted until the patent expired in 1971. Now any company can use the protein spinning process without having to buy a license or pay fees. In 1981 the main American companies using spun protein fibers in foods were Worthington Foods, Dawson Mills in Minnesota (which bought General Mills' equipment), Loma Linda Foods in California, and Ralston Purina. In Europe there are two companies in the Netherlands, one in Denmark (Nutana), and one in Belgium using food-grade spun protein fibers. In Japan, Nisshin Oil Mills Ltd. built the first plant to spin edible soy protein fibers in 1968. In 1976 Fuji Purina Protein Ltd., a subsidiary of Fuji Oil Co. and Ralston Purina, introduced Fujipur SP-90 spun soy protein fibers.

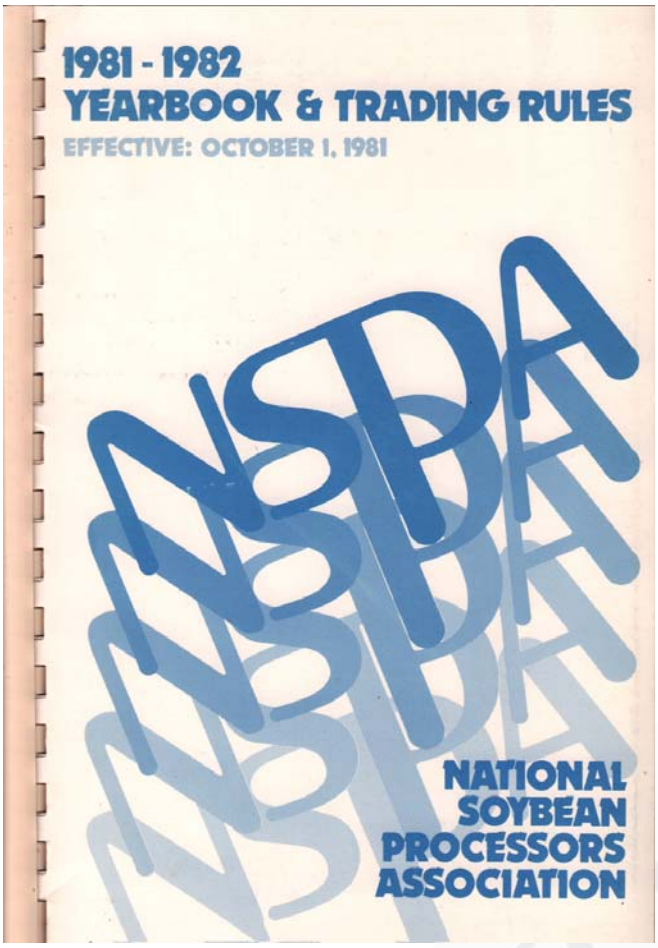
Most manufacturers of meat analogs in the U.S. agree that the general market has been disappointing, but that the idea is simply ahead of its time, which will inevitably come as meat prices continue their rapid rise. The vegetarian or "motivated" market (and especially the Seventh-day Adventist sector) showed a steady increase each year. No sales figures are available on the total market size.

When asked in 1980 how he liked the newest generation of meat analogs, Boyer replied that he found the quality disappointing, since the producers have to make compromises in equipment and processing to keep costs down. A researcher can get much better textures and flavors in his lab working by hand. Another problem is the subtle beany flavors that result from isolates and from typical defatted soy meal rather than specially defatted soy meal that can be made to contain almost no beany flavor. Boyer eats store-bought meat analogs (including bacon bits) from time to time but not as a regular part of his diet. He prefers Worthington products to Loma Linda. He likes meat, too, and also uses tofu quite a bit.

How about the future? Harkening back to the years of his work with Ford, Boyer said in 1981, "We're at the Model T stage right now with analogs. I'm impatient to get to the Lincoln Continental stage." He feels that the products still have a very bright future, and that when the price of meats rises to 10 or 20% above those of the analogs, sales will start a period of steady growth. Address: 632 Edgewater Dr., Apt. 731, Dunedin, Florida 33528. Phone: 813-734-2415.

511. National Soybean Processors Association. 1981. Yearbook and trading rules 1981-1982. Washington, DC: National Soybean Processors Association. ii + 106 + A1-12. 23 cm. Spiral bound.

• ***Summary:*** On the cover (but not the title page) is written: Effective October 1, 1981. Issued annually to all members of the association. Contents: Constitution and by-laws. Officers and directors. Executive office. Members. Associate members. Standing committees. Trading rules on soybean meal (first adopted 18 Oct. 1933). Sales contract. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}), sampling of soybean meal {at origin} (automatic mechanic sampler, pneumatic probe sampler, probe sampler), sampling of soybean meal (at barge loading transfer facilities), official weighmaster application, semi-annual scale report, manufacturers' certification–Installation of automatic sampler (at barge loading transfer facility), semi-automatic sampler certification (at barge loading



transfer facility), official referee chemists (meal). Soybean meal export trading rules: Minimum blending procedures for export meal blended at ports, sampling of soybean meal (at vessel loading facilities), manufacturers certification–Installation of automatic sampler (at vessel loading facility), semi-automatic sampler certification (at vessel loading facility). Trading rules on soybean oil (first adopted 21 May 1930). Sales contract. Definitions of grade and quality of export oils. Soybean lecithin specifications. Appendix to trading rules on soybean oil: Inspection, grading soybean oil for color (NSPA tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed), official weighmaster application, semi-annual scale report, official referee chemists (oil). Soybean oil export trading rules. Uniform soybean oil export contract. Foreign trade definitions.

The page titled National Soybean Processors Association (p. ii) states: "During the past crop year about 1,000,000,000 bushels of soybeans moved through processing plants of NSPA's 24 member firms. Approximately 50 percent of America's 1.8 billion-bushel soybean crop was bought and processed by NSPA members. Exporters account for another 36 percent of the crop, and the remainder [14%] is returned to farms for seed, feed, and residuals." Also discusses industry programs, soybean research, and international market development."

The section on officers, executive committee, and board of directors (p. 7-8) gives the name, company affiliation, and phone number of each person. Officers–Chairman: Gaylord O Coan, Gold Kist, Inc. Vice Chairman: Edward J. Cordes, Ralston Purina Co., President: Sheldon J. Hauck. Secretary: Donald H. Levinworth, Cargill, Inc. Treasurer: Lowell K. Rasmussen, Honeymead Products Co. Immediate past chairman: C. Lockwood Marine, Central Soya Co., Inc.

Executive committee: Richard G. Rypkema ('83), Agri Industries. Charles Bayless ('83), Archer Daniels Midland Co. David C. Thompson ('82), Bunge Corporation. Harold H. Leavenworth, Cargill, Inc. C. Lockwood Marine, Central Soya Co., Inc. Gaylord O. Coan, Gold Kist, Inc. Lowell K. Rasmussen, Honeymead Products Co. Kermit F. Head ('82), Missouri Farmers Assn.–Grain Div. Sewell L. Spedden ('82), Perdue, Incorporated. Edward J. Cordes, Ralston Purina Co.

Board of directors (alphabetically by company; each member company has one representative on the board): Richard G. Rypkema, Agri Industries. Thomas H. Wolfe, Anderson, Clayton & Co. Charles Bayless, Archer Daniels Midland Co. Keith Voigt, Boone Valley Coop. Proc. Assn. David C. Thompson, Bunge Corporation. Harold H. Leavenworth, Cargill, Inc. C. Lockwood Marine, Central Soya Co., Inc. Ronald L. Anderson, Continental Grain Co. Donald M. Chartier, Farmland Industries, Inc. Gaylord O. Coan, Gold Kist, Inc. Lowell K. Rasmussen, Honeymead Products Co. Kenneth J. McQueen, Land O'Lakes, Inc. Kermit F. Head, Missouri Farmers Assn.–Grain Div. Robert E. Hicks, Owensboro Grain Co., Inc. Sewell L. Spedden, Perdue, Incorporated. Wilton L. Adcock, Planters Oil Mill, Inc. Thomas L. Shade, Quincy Soybean Co. Edward J. Cordes, Ralston Purina Co. William P. Hudson, Riceland Foods, Inc. J.D. Morton, Sherman Oil Mill. Styles M. Harper, Southern Soya Corp. Kenneth A. Robinson, A.E. Staley Mfg. Corp. Preston C. Townsend, Townsends, Inc. Tyler Terrett, West Tennessee Soya Mill, Inc.

Executive office, Washington, DC: Executive Director, Sheldon J. Hauck. Director, Public Affairs: Murray C. Keene. Director, Regulatory Affairs: Rhond R. Roth. Administrative Asst.: Alicia B. Rickman. National Soybean Crop Improvement Council: Robert W. Judd, Managing Director. General counsel: Elroy H. Wolff, Sidley & Austin. Special counsel: Julian B. Heron, Jr., Heron, Haggart, Ford, Burchette & Ruckert.

Members (listed alphabetically by company; within each company, first the name of the official Association representative {who is on the Board}, followed by the other personal members listed alphabetically by surname. For example, Archer Daniels Midland Co., the company with the most personal members, has 23. After the name

of each personal member is given with his address and phone number. In the listing below, the number of personal members is shown in parentheses after the name of each company, followed by city and state of the various locations): Agri Industries–Soybean processing division (2); Des Moines, Iowa. Anderson, Clayton & Co. (4): Phoenix, Arizona, Jackson, Mississippi, Houston, Texas. Archer Daniels Midland Co. (23); Archer Daniels Midland Co. (26); Little Rock, Arkansas; Augusta, Georgia; Decatur, Illinois; Galesburg, Illinois; Granite City, Illinois; Fredonia, Kansas; Mankato, Minnesota; Red Wing, Minnesota; Kansas City, Missouri; Clarksdale, Mississippi; Fremont, Nebraska; Lincoln, Nebraska; Kershaw, South Carolina; Memphis, Tennessee. Boone Valley Coop. Processing Assn. (3); Eagle Grove, Iowa. Bunge Corporation (9); Cairo, Illinois; Danville, Illinois; Logansport, Indiana; Emporia, Kansas; Marks, Mississippi; New York City, New York. Cargill, Inc. (20); Osceola, Arkansas; Gainesville, Georgia; Cedar Rapids, Iowa; Des Moines, Iowa; Sioux City, Iowa; Washington, Iowa; Chicago, Illinois; Wichita, Kansas; Burnsville, Minnesota; Minneapolis, Minnesota; Fayetteville, North Carolina; Sidney, Ohio; Memphis, Tennessee; Chesapeake, Virginia. Central Soya Co., Inc. (11); Gibson City, Illinois; Decatur, Indiana; Fort Wayne, Indiana; Indianapolis, Indiana; Belmond, Iowa; Bellevue, Ohio; Marion, Ohio; Delphos, Ohio; Chattanooga, Tennessee. Continental Grain Co. (11); Guntersville, Alabama; Chicago, Illinois; Taylorville, Illinois; New York City, New York; Cameron, South Carolina. Farmland Industries / Far Mar Co (4); Van Buren, Arkansas; Sergeant Bluff, Iowa; Hutchinson, Kansas; St. Joseph, Missouri. Gold Kist Inc. (6); Decatur, Alabama; Atlanta, Georgia; Valdosta, Georgia. Honeymead Products Co. (3); Mankato, Minnesota. Land O'Lakes, Inc. (5); Fort Dodge, Iowa; Sheldon, Iowa; Dawson, Minnesota; Minneapolis, Minnesota. Missouri Farmers Assn.–Grain Div. (6); Mexico, Missouri. Owensboro Grain Co., Inc. (2); Owensboro, Kentucky. Perdue Incorporated (2); Salisbury, Maryland. Planters Oil Mill, Inc. (2); Rocky Mount, North Carolina. Quincy Soybean Co. (4); Quincy, Illinois. Ralston Purina Co. (8); Bloomington, Illinois; Lafayette, Indiana; Iowa Falls, Iowa; Louisville, Kentucky; Kansas City, Missouri; St. Louis, Missouri; Raleigh, North Carolina; Memphis, Tennessee. Riceland Foods, Inc. (9); Helena, Arkansas; Stuttgart, Arkansas. Sherman Oil Mill (1); Fort Worth, Texas. Southern Soya Corp. (1); Estill, South Carolina. A.E. Staley Manufacturing Co. (7); Decatur, Illinois. Townsend's Inc. (2); Millsboro, Delaware. West Tennessee Soya Mill, Inc. (1); Tiptonville, Tennessee.

Associate Members: ACLI Soya Co, White Plains, New York. Anderson Clayton Foods, Dallas, Texas. Balfour MacClaine International, Ltd., New York City, New York. Best Foods, a Unit of CPC International Inc., Englewood Cliffs, New Jersey. Canadian Vegetable Oil Processing–Div. of Canada Packers Inc., Hamilton, Ontario, Canada. Cobec Brazilian Trading & Warehousing Corp. of the U.S., New York City. Delta Cotton Oil & Fertilizer Co., Jackson, Mississippi. Durkee Foods, Div. of SCM Corporation, Chicago, Illinois (Millark M. Evak). Hunt-Wesson Foods, Inc., Fullerton, California. Kraft, Inc.; Glenview, Illinois; Memphis, Tennessee. Lever Bros Co., New York City, New York. Louis Dreyfus, Stamford, Connecticut. Maple Leaf Monarch Co., Toronto, Ontario, Canada (W.G. Milliken). Marwood Company, San Francisco, California. Overseas Commodities Corp., Minneapolis, Minnesota. Pillsbury Co., Minneapolis, Minnesota. Procter & Gamble Co., Cincinnati, Ohio. Schouten International, Inc., Minneapolis, Minnesota. Spencer Kellogg, Div. of Textron, Inc., Buffalo, New York. Alfred C. Toepfer, Inc., New York City, New York (Dierk Overheu).

Standing committees: For each committee, the function of the committee, the names of all members (with the chairman designated), with the company and company address of each are given–Export development committee, Crop Improvement Council. Meal trading rules. Oil trading rules. Safety, health, and loss prevention. Technical. Address: 1800 M. St., N.W., Washington, DC 20036. Phone: 202/452-8040.

512. Smith, Oak B. 1981. Re: Research–Wenger's accomplishments in the past 26 years. Letter to Joe Wenger, Lou Wenger, Don Wenger and Lavon Wenger at Wenger International Inc., Nov. 27. 8 p. Typed, on letterhead.

• ***Summary:*** I think we are observing an important development–"a technological revolution in food processing which may be the best and perhaps the only economic answer to the food and feed needs of the world which will see its population jump from four billion souls today to 7 billion by the year 2000."

"Extrusion cooking, of course, is but one small link in that food processing chain. I think, however, that we need to look at our own contributions towards solutions of major food problems, and hope that our past accomplishments will help point us towards equally important achievements in the future. What are those Wenger accomplishments in the past 26 years? [i.e., since 1957].

"1. We saw and understood the opportunity that extrusion cooking could give us as a company.

"2. We developed the first commercially available extrusion cooker, and it was all Wenger–we followed nobody else, copied no one, we learned to control our own (often irascible) machine.

"3. We learned how to apply moisture uniformly and how to develop temperatures with screws, with steamlocks, and with final dies.

"4. We learned the advantages of preconditioning with steam.

"5. We learned what gelatinization of starches and cereal flours was, and developed our own method of gelatinizing.

We defined gelatization, and we explained our method of gelatizing fully and quickly to the industries of pet foods, breakfast cereals, snacks, starches, and industrial processing industries. We publicized the first article written about extrusion cooking and related that to pet foods, and we made this known around the world.

"6. We learned about the toxic constituents in oilseed and pulse proteins, and studied the methods by which heat labile growth inhibitors can be controlled in soybeans, in glandless cottonseeds, and in field beans and peas.

"7. We defined growth inhibitors, and proposed to the feed and food industries the possibilities of extrusion cooking of full fat soybeans."

"9. We explained the process for the extrusion cooking of full fat soybeans for control of growth inhibitors to U.S.D.A., and we were told be U.S.D.A. that our methods would never work in control of growth inhibitors in soy which (they said) needed to be cooked for 30 minutes at 220 degrees F. to control the growth inhibitors. U.S.D.A. did subsequently back down, but only after we had shown them the Purdue [Indiana] work.

"10. We explained to UNICEF the dual capability of controlling the growth inhibitors in soybeans, while simultaneously gelatinizing cereal flours, thus producing the first extrusion cooked, cereal based, protein enriched, mixed and fortified foods for children. We demonstrated that capability to UNICEF and (later) to U.S.D.A."

"11. We developed a good and simple method of dehulling soybeans.

"12. We developed a method of adding intermediate heads, screws, and steamlocks to provide additional dwell time in the extruder.

"13. We demonstrated to U.S.D.A. the first cooking of defatted soy proteins, thus producing the first chewy, meat-like substance now called textured soy protein meat extenders. We, thereafter, demonstrated this capability to ADM, Swift, and to Ralston Purina and to others who have become the major producers of textured soy proteins around the world.

"14. We developed a secondary cooling and forming extruder, which in turn brought us into the production of third generation snacks, breakfast cereal flakes, and textured soy meat analogs.

"15. We demonstrated to the world our ability to make second generation snacks at unheard of capacities, and with a versatility which no competitor could approach."

"21. We studied and mastered our ability to process foods at the maximum capacity per hour to a preselected degree of cook of any extrusion cooker manufacturer in the world. We did so with much less electrical energy and much less steam per ton of product. The economics of these achievements are probably the largest single reason why people buy Wenger equipment today, to the exclusion of others.

"22. We developed, perfected, and patented Uni-Tex, a product which is more like the structure, appearance, and mouthfeel of meat than any man-made product in the world. We have not done as well commercially with this product as it merits, but that is only because of inability to locate good meat-like flavors which will stand the temperatures of extrusion. We will find such flavors, and we will also apply flavors externally (which could not be used in soups or stews), but which could be used in casserole dishes, curries, ethnic foods, etc.

"23. We developed our first small machine in 1962, and managed to persuade the major food companies of the world to install the X-25 (and more recently the X-20) as a research and development machine in this country and abroad."

"25. We have greatly improved our ability to produce, shape and continuously cook, shape and dry third generation snacks. This represents one of the best potentials for future business for us, in my opinion.

"27. We have mastered the processing arts of making dry expanded pet foods, soft moist, and semi-moist pet foods and fish foods. We have maintained our dominant position in pet foods, while developing dominant postures in the production of snacks, textured soy, breakfast cereals, instantized soups, and cereals processed for industrial purposes." Address: [Chairman, Wenger International, Inc., 2400 Pershing Rd., Kansas City, Missouri]. Phone: (816) 221-5084.

513. Bannar, Robert. 1981. Extended ground beef without a 'beany' taste: ground beef extended with 23% textured, isolated soy protein results in a product that is lower in fat and calories, higher in moisture content. *Food Engineering* 53(11):87. Nov.

• ***Summary:*** "Faced with the price problems of supply-and-demand, beef processors are constantly on the lookout for methods of reducing costs.

"One such method-using soy protein as a beef extender-aroused immediate interest when first introduced. but quickly fell into disfavor when consumers complained of a 'beany' taste in the cooked product."

But now Ralston Purina's Protein Division (St. Louis, Missouri) has developed PP 220, which has no problems with 'beany' taste and should result in a minimum savings of 20¢ per pound compared with all-meat products.

514. Becker, Frederick F. 1981. Inhibition of spontaneous hepatocarcinogenesis in C3H/HeN mice by Edi Pro A, an isolated soy protein. *Carcinogenesis* (*London*) 2(11):1213-14. Nov. [11 ref]

• ***Summary:*** Protease inhibitors block cancerous tumors in mice. Address: M.D., Dep. of Pathology, The Univ. of Texas, Anderson Hospital and Tumor Inst. at Houston, 6723 Bertner Ave., Houston, TX 77030.

515. Ralston Purina Company. 1981. Annual report 1981. St.

Louis, Missouri. 52 p. 28 cm.
• ***Summary:*** Under "Legal" (p. 42) we read: "Various claims and legal proceedings arising in the course of business are pending against the Company and certain of its subsidiaries seeking monetary damages and other relief. Included in such proceedings are a criminal investigation and consolidated civil proceedings seeking compensatory and punitive damages in the United States District court for the Western District of Kentucky, related to series of explosions is the Louisville, Kentucky sewer system in February 1981. Those proceedings involve highly complex issues of fact and law, are in early stages, and may proceed for protracted periods of time..."

Note: As a result of this explosion, Ralston Purina decided to get out of the soybean processing business. In Oct. 1984 it sold six of its soybean plants to Cargill. Address: St. Louis, Missouri.

516. Wolf, Walter J. 1981. Foreign travel report. Peoria, Illinois. 4 p. Dec. 18. Typed, with signature.
• ***Summary:*** "Country visited: Japan, Oct. 10-21, 1981. Purpose of trip: (a) Participate in the U.S./Japan Cooperative Program in Natural Resources (UJNR), Protein Resources Panel Meeting; (b) participate in UJNR panel study tour; (c) visit research institutes and industrial laboratories working on soybean proteins; and (d) participate in symposium on soy protein foods. Summary: The UJNR meeting in Tsukuba included 10 presentations by seven Japanese research workers from six different research institutes and three U.S. scientists from three USDA regional research centers. Topics discussed included... (f) single cell protein production from soybean cooking waste waters; (g) soybean storage; (h) food uses of soy protein; and (i) nutritional evaluation of soy proteins. The study tour included a visit to a miso and soy milk factory which was impressive and confirms earlier reports that soy milk has become very popular in Japan in the past 5 years. Visits to industrial laboratories revealed that soy proteins are now used in a large variety of foods. Flavor is one of the last problems holding back development of soy protein-based foods."

The UJNR program, initiated in 1964, plays an important role in implementing the policy of scientific cooperation between the United States and Japan. The protein panel was organized in 1968, and there are now 17 different panels in UJNR.

Dr. Ebine reported that about 790,000 metric tons (29 million bushels) of soybeans are used in traditional Japanese foods–miso, natto, tofu. Organizations visited included Okazaki Marusan Co. Ltd (makes miso, soy milk, and soy yogurt), Research Institute for Food Science of Kyoto University at Uji, Nisshin Oil Mills Ltd., Ajinomoto Co., Inc., Fujipurina Protein Ltd. (Fuji Oil Co. has a joint venture with Ralston Purina Co. for the manufacture and importation of soy protein isolates. On the morning of Oct. 19, 1981, Dr. Wolf visited with Mr. Saburo Kikuchi and Dr. Hitoshi Taniguchi of Fuji Oil Co., Ltd. "Again I was able to sample a large variety of foods containing soy proteins. According to Mr. Kikuchi, 'the flavor problem is the last remaining obstacle to successful utilization of soy protein in Japanese foods").

The report ends as follows: "In the afternoon of October 19, I participated in a symposium entitled 'New Soy Protein Foods Today and Tomorrow' along with four Japanese speakers. Over 250 people attended and an additional 50 persons were turned away because of lack of space in the meeting room. The other speakers dealt with nutritional studies of soy proteins and their potential uses in foods. Professor Kazuyoshi Okubo, Yamagata University reviewed his nutritional studies on soybean saponins and gave a detailed coverage of our earlier studies on the chemistry of soy saponins. Professor Okubo has evidence that saponins have a cholesterol lowering effect, although other workers have not found such effects on ingestion of saponins. Following the symposium, a number of Japanese companies displayed their food products based on soy proteins. Soy milks were a prominent part of the exhibit. The symposium was organized by eight different organizations concerned with food uses and nutritional properties of soy proteins." Address: Leader, Meal Products Research, Oilseed Crops Lab., Northern Regional Research Center, Peoria, Illinois 61604.

517. *Commercial-News* (*Danville, Illinois*). 1981. Officials probe Lauhoff blasts. Dec. 22. p. 1, 3.
• ***Summary:*** Workers are still trying to determine the cause of the explosions and fire Monday at Lauhoff Grain Co. that sent 17 workers to hospitals and rocked downtown Danville. One suspect is "hexane, a highly flammable liquid used in extracting oils from corn and soybeans at the plant." Emergency workers continued to monitor levels of hexane in the sewer system near the plant. "Officials feared a repeat of an explosion that occurred in Louisville, Kentucky..." [on 13 Feb. 1981 at the Ralston Purina Co. soybean solvent extraction plant].

Lauhoff employs 400 persons at the plant and office, including 45 in the soybean processing plant where the explosion occurred. Fifteen people were injured, four seriously.

Large photos show: (1) An aerial view from directly above the plant shows the wreckage atop the soybean extraction plant. (2) Part of a metal wall blown out by the force of the explosion. An updated list of the injured and the condition of each is given.

518. *Wall Street Journal.* 1981. Ralston Purina Co. indicted on 4 counts in Louisville blasts. Dec. 31. p. 14.
• ***Summary:*** A federal grand jury in Louisville "indicted Ralston Purina Co. on four counts of violating environmental

laws in connection with explosions last February in the city's sewer system.

"The Justice Department said the blasts were caused by the chemical hexane, which leaked into the sewer system from Ralston's soybean-extraction plant,..."

"The four-count indictment carries a maximum total fine of $62,500." In addition, "the company still faces millions of dollars of potential damages in civil suits."

519. **Product Name:** Supro 630, Supro 660 Fortiblend, 710, SPF200, Purina Protein 220 and 500E.
Manufacturer's Name: Ralston Purina Co. Protein Div.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1981.
How Stored: Shelf stable.
New Product–Documentation: Soya Bluebook. 1981. p. 62. Product leaflet. 1981. Supro 630 is an instantized (lecithinated) isolated soy protein. It can be easily dispersed with minimum agitation. Ingredients are isolated soy protein and lecithin.

Letter from Catherine M. Richardson of Ralston Purina to Gary Barat of Legume. 1984. June 18. "Purina Protein 200 is a high quality, structured isolated soy protein fiber in frozen, hydrated form. This elongated filament-like fiber [i.e. spun protein fiber] is designed to simulate muscle fibers of poultry and seafood. Purina Protein 200 is manufactured at a pH of 5.5, which is at the point of minimum water-holding capacity. Purina Protein 200 should, therefore, be buffered with sodium carbonate (food grade) to elevate the pH between 6 and 7 to provide a tender and soft product." Note that this adds sodium to the product.

Note: Talk with Robert Davis of Ecotrition. 1993. Feb. 19. SPF200 is now named 200E, a spun soy protein fiber, sold frozen in filaments 6-7 inches long.

520. Altschul, Aaron M.; Wilcke, Harold L. eds. 1981. New protein foods. Vol. 4. Animal protein supplies, Part B. New York, NY: Academic Press. xix + 378 p. Index. 24 cm. [500+* ref]
• ***Summary:*** Contents: List of contributors. Preface. Animal production and consumption: 1. The upper limits of livestock production, by Ralph W. Phillips. 2. Government policy and the production of animal protein: An international perspective, by G. Edward Schuh. 3. The nutritional and metabolic impact of variable protein intake in man, by M.K. Fordyce and G. Christakis. 4. Developments in pork production, by Wilson G. Pond. 5. Issues in poultry production, by John L. Milligan and Harold L. Wilcke. 6. Small ruminants as food producers, by H.A. Fitzhugh. 7. Amino acid fortification, by G. Richard Jansen. 8. Microorganisms as feed and food protein, by Park W. Waldroup. 9. Noncompetitive sources of carbohydrates for animal feeding, by John K. Ward. 10. Recycling of animal wastes by feeding, by J.P. Fontenot.

Commentary on the protein problem: 11. Protein–Requirements, availability, preferences, by Harold L. Wilcke and Daniel T. Hopkins. 12. Protein food models, by Aaron M. Altschul and Lyle P. Schertz. Address: 1. Dep. of Community and Family Medicine, Georgetown Univ. School of Medicine, Washington, DC 20007; 2. Ralston Purina Co., St. Louis, Missouri 63188.

521. Altschul, Aaron; Schertz, Lyle P. 1981. Protein food models. In: A.M. Altschul and H.L. Wilcke, eds. 1981. New Protein Foods. Vol. 4. Animal Protein Supplies, Part B. New York: Academic Press. xix + 378 p. See p. 335-63. Chap. XII. [52* ref]
• ***Summary:*** Contents: Introduction. Nutrition framework: Joint outcomes from food consumption (nutrition and pleasure), schematic diagram (income, consumption, and nutrition). Food concepts: Application to regions I and II: Introduction, solutions within the prevailing food culture, solutions outside the prevailing food culture. Food concepts: Application to regions III, IV, and V. General properties of technological solutions in matters relating to food and nutrition. Comment. References.

"Over 400,000 preschool children [in Sri Lanka] receive Thriposha, a fortified food based on corn and soybeans made from locally produced grains that is processed in Colombo, Sri Lanka. A factory in Chihuahua, Mexico produced (in 1980) 300 tons/month of soy bean flour added as a protein fortificant to corn flour for tortillas. Additional flour is sold in commercial markets as an inexpensive substitute for eggs in baked goods and as an extender for fluid cow's milk. Another factory in Chihuahua is producing soy-fortified tortilla flour, and corn-soy and oat-soy beverage base products." (p. 351). Address: 1. Dep. of Community and Family Medicine, Georgetown Univ., School of Medicine, Washington, DC 20007; 2. Economics & Statistics Service, USDA, Washington, DC 20250.

522. Anton, J.J. 1981. Marketing plant proteins in North America–I. In: D.W. Stanley, E.D. Murray, and D.H. Lees, eds. 1981. Utilization of Protein Resources. Westport, CT: Food & Nutrition Press, Inc. 403 p. See p. 370-76. Chap. 20.
• ***Summary:*** Introduction. Plant protein sources. Marketing perspective. Current situation. Economic trend. Regulatory status. Future implications.

"In the U.S. over 40% of the protein is consumed as meat, poultry and fish, compared to 16% for the rest of the world. On the other hand, almost half the world's proteins is derived from grains, but in the U.S. grain-derived protein represents less than 18% of that consumed. Dairy proteins in the U.S. are twice the level of the world average, while just the opposite is true for peas, beans, nuts and oilseeds...

"The U.S. soy protein industry consists of 12 organizations that are basic supplies of soy protein products.

In 1976, the industry produced 625 million pounds of food grade material. This is calculated on a 50% flour equivalent basis. Sixty-three percent of this production was soy flour and related products, while nearly 22% was isolated soy protein." Address: Div. Vice President and Director, Marketing, Protein and Dairy Food Systems Divisions, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63188.

523. Bodwell, C.E.; Adkins, J.S.; Hopkins, D.T. eds. 1981. Protein quality in humans: Assessment and in vitro estimation. Westport, Connecticut: AVI Publishing Co. xxi + 435 p. Index. 23 cm. Proceedings of a conference and workshop held 23-26 March 1980 at Warrenton, Virginia. [800* ref]

• ***Summary:*** Contains 21 chapters in 4 parts by various authors. Several of these are cited separately. Contents: Contributors. Preface. Part I: The importance of protein quality (Chapters 1-6). Part II: Assessing protein nutritive value in humans (Chapters 7-11). Part III: In vitro methods for assessing protein nutritional value (Chapters 12-21). Part IV: Talk force reports and conference overviews. List of participants. Address: 1. Chief, Protein Nutritional Lab., Beltsville Human Nutrition Research Center, Human Nutrition, SEA, USDA, Beltsville, Maryland; 2. Howard Univ., Washington, DC; 3. Ralston Purina Co., St. Louis, Missouri.

524. Cleary, David Powers. 1981. Great American brands: The success formulas that made them famous. New York, NY: Fairchild Publications. xii + 307 p. See p. 239-44. Illust. 24 cm.

• ***Summary:*** The unnumbered chapters in this book are listed alphabetically by brand. The chapter titled "Ralston Purina Foods and Feeds: 'Find the right foundations and build them,'" tells the story of how William H. Danforth brought the Ralston brand name into his Robinson-Danforth Company, formed in 1894.

Will Danforth always recalled that as a boy, he was sickly. He wanted to be part of the group, but never quite made it. Then one day a school teacher "stood him up in front of everybody and 'dared' him to become the healthiest boy in the class." He decided to take the dare, and it transformed his life–and later his business. He grew up in Charleston, Missouri. Another vivid childhood memory was of the Brown family as they came into town, everyone dressed in red and white checkerboard pants, shirts, and dress–all made from the same inexpensive bolt of cloth.

In 1894, two years after graduating from Washington University in St. Louis, Missouri, at age 24, he formed the Robinson-Danforth Commission Company in St. Louis with two church friends; it was a "hand shovel horse and mule feed operation."

Advancing from bookkeeper to top salesman, he married Adda Bush. By the spring of 1896 Danforth had become president of the small company, and on May 26 of that year he became the majority stockholder, by buying out the interest of William Andrews. The very next day a tornado completely destroyed the business.

His good character and work ethic earned him a bank loan and by 1898 the business was flourishing again.

Once-sickly Danforth, now a strong and healthy man, wanted to add a new kind of "health cereal" to his product line. He met a Kansas miller who had devised a way of making a whole wheat cereal yet preventing the wheat germ from turning rancid. Danforth reasoned that the germ, part of the whole, natural kernel, must be important to good health. So he arranged to package the miller's cracked wheat for (initially) grocers and others in St. Louis. From his company's slogan, "where purity is paramount," he coined a new name for the health cereal: Purina.

"At the same time, Danforth was being deeply impressed by the spectacular success of Dr. Albert Webster Edgerly who, as 'Dr Ralston,' had written an electrifying book entitled *Life Building* and whose followers, now banding together in health clubs, numbered some eight hundred thousand. Dr. Ralston was urging the use of only the pure, whole wheat, complete with germ. Will Danforth was soon discussing his new Purina product with Dr. Ralston, and the two were agreeing on terms under which the product would be renamed Ralston Wheat Cereal and would carry the famous doctor's endorsement. By 1902 the names Ralston and Purina had become so widely known that the name of the firm was changed to Ralston Purina Company."

Note: The above paragraph can be misleading. Webster Edgerly was not a well-known person, largely because he wrote all his many books under pseudonyms. In 1891 he started using the pseudonym Everett Ralston for his first two books: *The Ralston Health Club,* and *The Ralston Brain Regime.* In 1892 he changed his pseudonym to Edmund Shaftesbury. He also wrote books about subjects such as elocution, personal magnetism, etc. In 1920 (p. 3) he wrote: "The Ralston Health Club will soon be forty-four years old" suggesting that it was founded in the 1870s. Yet we know of no evidence that it existed before 1891. Nor are we aware of any evidence that Edgerly was ever a "Dr." or that he ever used that title. Moreover, there was no such person as "Dr. Ralston," although one can easily get the impression that there *was* from the above and from Edgerly's books.

Photos (p. 241) show: (1) The front of an early box of Ralston Wheat Food, showing the simple, graphic checkerboard design that won it swift national recognition. (2) An ad titled "Ralston Purina Miller" from the Ralston Purina Co. (St. Louis). (3) A stylish Ralston Purina wagon pulled by two white horses. The checkerboard design appears on both the sides of the wagon and on the horses' harnesses.

525. Ralston Purina Co., Protein Division. 1981. Industrial

proteins: Technical bulletin, St Louis, Missouri: Ralston Purina Co. 18 + iii p. 28 cm.
• ***Summary:*** Contents: I. Introduction. II. ProCote in pigmented coatings. III. Purina Protein P. IV. Laminating adhesives.

Page 1: "Ralston Purina, one of the world's largest and most experienced protein-based companies, has processed soybeans since 1931 and has manufactured protein isolates since 1958."

526. Wilcke, Harold L.; Hopkins, Daniel T. 1981. Protein–Requirements, availability, preferences. In: A.M. Altschul and H.L. Wilcke, eds. 1981. New Protein Foods. Vol. 4. Animal Protein Supplies, Part B. New York: Academic Press. xix + 378 p. See p. 307-334. Chap. XI. [25 ref]
• ***Summary:*** Contents: Introduction. Determination of protein requirement: Factorial method, nitrogen balance. Correction for protein quality. Controversy concerning protein requirements. Requirement expressed as protein concentration. Availability of protein. Availability of fat. Food preferences. Concluding comments. References. Address: Ralston Purina Co., St. Louis, Missouri 63188.

527. Windish, Leo G. 1981. Jacob Hartz, Sr.: Pioneer seedsman, soybean processor, trailblazer and crusader in the Midsouth (Document part). In: Leo Windish. 1981. The Soybean Pioneers: Trailblazers, Crusaders, Missionaries. Galva, Illinois: Published by the author. viii + 239 p. See p. 91-95. Chap. 18.
• ***Summary:*** A good history of this pioneer seedsman. "Few soybean pioneers worked harder than Hartz to promote soybeans in the south." "As early as 1925 the Hartz-Thorell Co. brought in forage types of soybeans and, with the assistance of the People's National Bank, gave soybeans to key farmers on a trial basis to find out if they were suitable for production in Arkansas county. The forage varieties were used principally for hay, silage, and for turning under as a green manure crop. Hartz had several motives in mind in inaugurating a new crop in the area." First, he saw at a very early date that rice farmers in the area "were badly in need of a crop to help change the rotation, help rid the land of the plague of watergrasses, and, perhaps of even greater importance, to restore nitrogen to the soils." Second, Hartz-Thorell was in the farm machinery business and wanted to create a need and demand for row-crop equipment.

Among the more popular soybean varieties in the South in the early 1930s were Otoosan, Virginia, Laredo, Biloxi, and Mammoth Brown. Soybeans seemed to be an ideal crop for rotating with rice, and they gave the rice farmer a second cash crop.

"Production of soybeans for seed and forage in Arkansas county continues to grow in the early 1930's, and it was necessary for marketing facilities to be provided, rather than storage on the farm and hit-and-miss buying and selling. The Hartz-Thorell Supply Co. in 1936 undertook building the first elevator, principally for seed, in time for the fall harvest." This elevator, with a capacity of approximately 70,000 bushels, was completed at a cost of $40,000 in time for the harvest. By 1937 more than 60,000 acres were planted to soybeans in the Stuttgart area. Hartz said: "From the start we promised our farmers a cash market for all beans they would bring to us in marketable condition and suitable for seed purposes."

"Hartz shipped the first carload of soybeans for processing and milling purposes in June 1937, and Hartz reported in an address later that they expected to ship 25 carloads or more above seed requirements."

In 1937 Hartz predicted in an address: "In my opinion, I see soybeans as one of the major crops in the South in the next ten years." Note: He was one of the first to realize this, and his prediction came true. "Our basis of prediction for soybeans being one of the major coming crops of the south was based on three fundamental facts: First the adaptability of the plant in all cotton- and corn-growing sections of the south; second, the recognized value of soybeans by farmers as a land-builder and forage crop; and third, the cottonseed crushing industry of the south was highly over-industrialized and was clamoring for an auxiliary product which would keep their plants operating through the off-season and slack periods. This situation was even more pronounced since the Farm Bill was passed, curtailing the cotton acreage about one third."

Jacob Hartz worked closely with his friend George Heartsill Banks, who was director of field service for the Arkansas Cotton Growers Cooperative Association from 1921 to 1926 in Little Rock, Arkansas. He was Director in Charge of the Rice Branch Experiment Station at Stuttgart, Arkansas, from 1926 to 1937. He was with Ralston Purina Co. at Osceola, Arkansas and Kansas City, Missouri, from 1937-1946. Banks liked to refer to soybeans "as being the triple-threat crop of legume plants, first as a soil builder, second as a forage crop, and third as a grain crop."

In 1965 Hartz had 110 certified growers, primarily in Arkansas, supplying the company with certified soybean seed. Address: 101 Exchange St., Galva, Illinois 61434.

528. Windish, Leo G. 1981. Archer-Daniels-Midland Company, Inc.: Pioneer soybean processors who rank among the giants in the industry (Continued–Document part III). In: Leo Windish. 1981. The Soybean Pioneers: Trailblazers, Crusaders, Missionaries. Galva, Illinois: Published by the author. viii + 239 p. See p. 97-103. Chap. 19.
• ***Summary:*** Continued: "Had it not been that most of the extraction and processing facilities were new and at top efficiency, ADM would have fared far worse during the period when marketing of soybean products was so seriously handicapped by economic factors. There were only 33 days during the 1953-54 crop year when soybean oil and meal

together brought a better price than soybeans themselves. In 1955 ADM lost money on its basic soybean processing. Nevertheless, throughout these years ADM's upgraded soy products continued to produce a profit.

"And thus another chapter in the pioneer history of soybean processing has been added, on the part of the Archer-Daniels-Midland Company. Their innovations and added capacity helped greatly to expand the growth of the soybean and its products (17).

"Back in 1926, the William O. Goodrich Co. was acquired by ADM... oil from soybeans and other vegetable seeds, using a Scott batch-extraction system. In 1933, Shreve M. Archer sent a representative to Europe to study the major solvent extraction plants, and the next year started a 150-ton-a-day Hildebrandt continuous solvent extraction unit, thus becoming the first in the country to process beans by that process. Walter Flumerfelt, then a successful processor in Waterloo, Iowa, had operated a small solvent plant at Monticello, Illinois for two years beginning in 1929. It was the first actual business venture of this type and Flumerfelt's patent on continuous solvent extraction was later used on wheat-germ extraction. Much helpful information came out of the Monticello venture.

While Archer-Daniels-Midland Co. began processing by expeller in 1929, their big push in the industry came with entrance into the solvent extraction field. They were first in volume production and merchandising of this type of 44 percent protein meal. In research work and merchandising of solvent extracted soybean oil meal, long popular in Europe, they spent a fortune of substantial proportions. In this project alone there is an interesting story that has yet to be written as a guide to other industries. The following information was taken from pages 27-30, Chapter 4, titled The Big Drive Starts, from the book *Soybeans, Gold from the Soil.*

"At the outset the new solvent product was placed on consignment with all types of dealers and distributors over a wide area. Said Whitney Eastman, ADM vice president: 'We might just as well have placed it on the shelves of jewelry stores in Iceland.'

"Years of intensive sales plugging and skillful merchandising policies brought about the present-day acceptance and a growing demand that absorbs a larger volume each year, Long before the Goodrich Co. was acquired by Archer-Daniels-Midland Co., it had studied the refinement of Manchurian soybean oil and in the early 1920's clarified soy oil was developed, along with a number of other special oils. This was a forward step of some consequence.

"A Very Close Call: Only tariff protection saved the soybean industry from being nipped in the bud and permitted manufacturers to expand the grower's market. Even before the industry was developed there was a group of vegetable-oil processors and agriculturists seeking domestic protection from the Manchurian inroads, and progress was made after the tariff act of 1913. For the next eight years 'free traders' sought to destroy this protection. In these battles Whitney Eastman took an active part. In 1921 this small group fought through a duty of 20 cents a gallon on cottonseed and soybean oils, increases of taxes on some other competing oils, and a duty lift to 30 cents per bushel on flaxseed. There were further battles and further gains in 1922, 1930, and 1936, until the soybean farmer felt at least his expansion program could not be destroyed overnight by defective tariff rates.

"During the five years of the legislative drive beginning in 1930, Whitney Eastman had served as president of the processor's association. His company meanwhile moved ahead to the position it now holds as one of the giants in the industry. Other major companies which entered the field about that time were Allied Mills & Co. and Ralston-Purina Co., which entered the field in 1930 and at one time was the largest single consumer of soybean meal. Spencer Kellogg & Co. stepped into the industry in 1935 under the direction of Howard Kellogg, Jr., and Swift & Co. began operations in 1937 with one of their larger early plants located in Champaign, Illinois.

"Processors never lacked for courage. Even during the stock market crash in October, 1929, new soybean processing plants were being launched. Among them were Standard Soybean Mills and the Iowa Milling Co." Address: 101 Exchange St., Galva, Illinois 61434.

529. Windish, Leo G. 1981. Eugene D. Funk, Sr.: Pioneer seedsman and the nation's second pioneer soybean processor. An outstanding agriculturist (Continued–Document part II). In: Leo Windish. 1981. The Soybean Pioneers: Trailblazers, Crusaders, Missionaries. Galva, Illinois: Published by the author. viii + 239 p. See p. 71-79. Chap. 16.

• ***Summary:*** (Continued): "To recap the story of Funk Bros. soybean processing operation, the original production of Funk Bros. began in 1924 with a capacity of from 300 to 350 bushels per day using the original two expellers. A third was added in 1927, and two more in 1929, making a total of five No. 1 type units with a total capacity of 800 bushels per day. About 1932, two R.B. type Anderson expellers were added to further increase the capacity. By now the processing capacity had grown to 1300 bushels. Later two Super-Duo expellers were added, bring the daily capacity to 2,000 bushels.

"Funk Bros. were indeed pioneer soybean processors. They provided the farmers a continuous market for their soybeans from 1924. They responded quickly in increasing their capacity to take care of the added volume. It is believed that Funk Bros. were the first to offer farmers an opportunity to bring in their beans and take back in trade, soybean oil-meal on a barter basis.

"In order to meet the emergency during the World War II years Funks again increased their milling capacity when our government was asking for an all-out effort by increasing soybean production, astronomically. A new solvent plant

for soybeans was installed in 1951 and began operations in January of 1952.

"Mr. Delmar Walker of the younger group joined the company after having trained as a chemical engineer at the University of Tennessee. He saw active duty as a naval officer on an L.S.T. from Guam to Japan. He held a position as a chemical engineer with the Argo plant of Corn Products from 1946 to 1950. During this time, he also found time to acquire his master's degree in business administration from the University of Chicago. After a year at Owensboro, Kentucky, he accepted a position with Funk Bros. in charge of the solvent soybean plant when it opened.

"Among the largest users of soybean meal during those days were Ralston-Purina (perhaps the world's largest), Allied Mills, Arcady Farms Milling Co., Hales and Hunter, and others. Proctor and Gamble, Lever Bros., Glidden, Swift and Company. Anderson & Clayton, and others refined crude or undefined oil such as that produced by Funk Bros. into vegetable oil, shortening, margarines, and paint products.

"Thus, the decision by Funks to install a soybean processing plant in 1924 was a hallmark decision. It gave greater diversification to the seed business. It seems ironical in agricultural history that the sudden rise of the soybeans to prominence as a cash crop in the 1920's and 1930's so closely paralleled the spectacular advancement in hybrid corn. (14)

"Eugene D. Funk, Sr. was a recognized leader in the expanding development of both crops so essential to American farmers. Funk became one of the most widely known agriculturists of his time. Again, Gene Funk led in an effort to better conditions for the farmers in the Corn Belt.

"As this manuscript is being written, both soybeans and corn lead in grain exports. Agricultural exports are expected to top $43 billion for 1980. The writer vividly recalls those times when Mr. Funk, Sr. visited the University of Illinois South Farm on field days. It was during that era, that it was our pleasure to make the acquaintance of this kindly, affable gentleman whose dynamic influence made such an impact on American agriculture during this century." Address: 101 Exchange St., Galva, Illinois 61434.

530. Stone, Dave. 1982. History of Ralston Purina's work with edible soy protein products (Interview). Conducted by William Shurtleff of Soyfoods Center, Jan. 13. 1 p. transcript.
• ***Summary:*** 1961–Ralston Purina made its first edible soy protein product, a soy protein isolate.

In the mid-1960s Ralston started to make a textured soy flour, Supro-50. They still make this but do not emphasize it much.

1962 Oct.–Ralston introduced its first spun soy protein fiber (named Textured Edi-Pro).

1970–Ralston opened Purina Protein Europe, in Brussels. This was a sales and marketing office that imported Ralston Purina products from the U.S. It is still going great.

1972–Ralston introduced its first soy/dairy blend (Dairy-Pro).

1974–Ralston Purina started its joint venture (named Fuji Purina) with Fuji Oil Co. of Japan; it is still in operation.

1977–Ralston introduced its first textured soy protein isolate; it was in granule form.

1979–In Ieper, Belgium, Ralston opened a plant making a line of soy protein isolate products made from soybean flakes purchased on the open market in Europe.

Edi-Pro was an isolated soy protein.

Ralston's protein division buys its raw materials from the Ralston Commodities Group. Address: Protein Div., Ralston Purina Co., St. Louis, Missouri. Phone: 314-822-3187.

531. Ralston Purina Company. 1982. First quarter report to shareholders. Three months ended Dec. 31, 1981 and annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 16 p. 22 cm.
• ***Summary:*** "Last month, the Board of Directors declared a quarterly dividend of 19½¢ a share on the Company's Common Stock. This equals an annual rate at 78¢ per share, up from 72¢. The Board also authorized a program now in progress, to acquire up to 6½ million shares, or approximately six percent, of the Company's Common Stock."–William P. Stiritz. Address: St. Louis, Missouri.

532. Lauser, Greg C. 1982. History of Cargill's involvement in the soybean processing industry. Minneapolis, Minnesota. 5 p. March 15. Unpublished manuscript.
• ***Summary:*** Soybean processing: "1942–Cargill entered the soybean processing business with the acquisition of expeller plants in Springfield, Illinois (sold in 1950), and Cedar Rapids (east), Iowa. Note: These two plants were purchased from Ike Sinaiko and Joe Sinaiko respectively, but probably in 1943.

"1943–Cargill acquired Plymouth Processing Company's plant and grain elevator at Ft. Dodge, Iowa (sold in 1971 [to Land O'Lakes]).

"1945–The company acquired from Honeymead solvent extraction plants in Spencer and Cedar Rapids (west), Iowa. The solvent-extraction process is used in modern plants today.

"1946–Cargill acquired the Washington, Iowa, soybean crushing plant and began crushing flax seed at a plant it built at Port Cargill in Savage, Minnesota. The same year, the company acquired from the Falk Corporation a flax processing plant in Minneapolis. Since 1967, that plant also has been crushing sunflower seeds.

"1947–The company opened a soybean crushing plant at Savage, Minnesota.

"1950–Cargill built its first plant specifically designed to crush soybeans in Chicago to serve domestic oil and meal markets. In 1956, a refinery was built adjacent to the

crushing plant that produces industrial refined non-edible oil used in paints and other protective coatings and in vinyl products. Cargill also acquired a flax crushing plant in Philadelphia that was closed as a crushing plant in 1953.

"1957–Cargill opened a soybean processing plant in Memphis, Tennessee. A second plant was added adjacent to the first in 1970.

"1959–Cargill expanded the scope of its soybean crushing activities to the Southeast by opening a facility in Norfolk, Virginia, and acquired a plant in Sioux City, Iowa, from Sioux Industries.

"1960–The Wichita, Kansas soybean crushing plant was acquired from the Soy Rich Company.

"1961–The company acquired the Des Moines, Iowa soybean crushing plant from Spencer-Kellogg Co. In 1967, Cargill opened its first domestic salad oil refinery adjacent to this crushing plant.

"1965–Cargill began crushing soybeans overseas at its new plant in Tarragona, Spain.

"1968–The company opened a second overseas crushing plant in Amsterdam, the Netherlands.

"1970–A third seed crushing plant [named Soja-France, with Dominique de Clerq as chairman of the board and general manager] was opened at St. Nazaire, France. A crushing plant at Reus, Spain, also was added in 1970 and Australian cottonseed crushing operations were acquired in 1972.

"1967–The company opened the Gainesville, Georgia, soybean processing plant. A refinery, Cargill's first to produce hydrogenated or "hardened" oil for the Southeastern food manufacturing industry, was built adjacent in 1979.

"1970–Cargill built the Fayetteville, North Carolina, crushing plant and a refinery was added in 1976.

[1971–Soybean crushing plant at Fort Dodge, Iowa, sold to Land O'Lakes.]

"1973–Soybean processing complex began operations at Ponta Grossa, Brazil.

"1975–Acquired plant in Osceola, Arkansas.

1976–Soybean plant was built at Barcelona, Spain.

"1977–Soybean plant constructed and operations began at Brest, France.

"1978–The company opened a soybean processing plant in Sidney, Ohio, to serve domestic meal and oil markets. This facility was the company's first soybean processing plant designed to burn coal as its source of power.

"1980–Construction began on vegetable oil refinery adjacent to Wichita soybean crushing plant and operations started in late 1981. A crushing plant also was acquired in Antwerp, Belgium.

"1981–Company acquired a soybean crushing and vegetable oil refinery complex in Hartsville, South Carolina.

"1982–Cargill acquired a soybean crushing plant in Monte Alto, Brazil.

"Summary. Soybean Crushing: The company now operates soybean processing plants in the United States, the Netherlands, Belgium, France, Spain, Brazil. The plants range in capacity from 20,000 to nearly 120,000 bushels a day. In the U.S., the company operates 15 plants in Iowa, Illinois, Minnesota, Kansas, Virginia, North Carolina, South Carolina, Tennessee, Georgia, Arkansas and Ohio. It operates 6 U.S. refineries located in Gainesville, Georgia; Fayetteville, North Carolina; Des Moines, Iowa; Hartsville, South Carolina; Chicago, Illinois and Wichita, Kansas."

In a cover letter to William Shurtleff, Greg says: "I'd now like to answer the specific questions you posed in you letter:

"1. Ralston Purina is the largest animal feed producer, according to *Feedstuffs* magazine.

"2. Will Cargill is the focus of Cargill's early history because he was the founder and is generally regarded as the most innovative and enterprising, while his brothers' skills in administration and finance served the company well.

"3. Nutrena Mills were headquartered in Kansas City, Kansas, when they were acquired in 1945. While they may have used Cargill soybean meal in their animal feeds, it is highly unlikely because of the transportation costs between Kansas City and the nearest Cargill crushing plants at the time in Ft. Dodge and Washington, Iowa. Nutrena probably had closer sources of supply for meal.

"4. I've addressed the seeming contradictions you mentioned in the attached, edited version of your copy." Address: Public relations, Cargill, P.O. Box 5625, Minneapolis, Minnesota 55440.

533. Tally, Gene. 1982. The Coca-Cola Company's work with soymilk in Brazil (Saci) and Mexico (Samson) (Interview). Conducted by William Shurtleff of Soyfoods Center, April 2. 2 p. transcript.

• ***Summary:*** The Coca-Cola Co.'s (CCC) first protein drink was a whey product in Surinam–the forerunner of Sansom in Mexico. Gene is quite sure that none of the early Samson products contained soy. The trademarks say that the protein source can be whey or soy but all have been whey.

CCC has never marketed a soy based beverage outside of Brazil–where they marketed Saci. Coke's first financial success with a protein fortified beverage was with whey Samson in Mexico. In Brazil, soy Saci was a financial disaster. After inflation gets under control in Brazil, CCC will try a joint venture there with mass market retail soymilk. They will steer clear of government programs such as the school feeding program.

In Japan, Fuji Purina does not like to produce soy protein isolate because the effluent causes environmental problems and expenses. They do make some but they buy most of what they use or sell from Ralston Purina in the USA. Address: Coca-Cola Co., Atlanta, Georgia.

534. Eldridge, Arthur C. 1982. Determination of isoflavones

in soybean flours, protein concentrates, and isolates. *J. of Agricultural and Food Chemistry* 30(2):353-55. March/April. [9 ref]
• ***Summary:*** These commercial soy products have high estrogenic activity. Their total and individual isoflavone content was determined by high-performance liquid chromatography. Dehulled, defatted soybean flours (10 samples) contain the following mean isoflavone content (mg/100 gm): Genistin 119.8, daidzin 61.7, daidzein 32.8, genistein 26.6, glycitein 7-Beta-glucoside 12.9. The total of these numbers is 253.8. The same isoflavones were found in soy protein concentrates and isolates but in decreased amounts.

Preparation of extracts: Ground defatted soybean flour was extracted with several solvents. Refluxing with 80% methanol gave the maximum extraction and most reproducible results.

Of the commercial soy flours used, one was a true soy flour (Nutrisoy 7B, made by ADM), and eight were textured soy flours: TVP (unflavored, ADM), Textratein (Cargill), Centex 300, 300L, 400, and 400 SL (Central Soya Co.), Mira Tex (Staley), and Promote III, SL (Griffith Labs).

The soy protein concentrates tested were: Response (Central Soya Co.), Food protein concentrate (Swift & Co.), Pro Con 2000 (Staley), Promosoy 100 (Central Soya), and GL-301 (Griffith Labs). GL-301 had the highest total isoflavone content (317) and Promosoy 100 had the lowest (16)–a dramatic difference. Those with the highest isoflavone content were prepared by aqueous leaching of defatted soybean flours, whereas those with the lowest content were prepared by extracting hexane-defatted soybean meals with alcohols, which removed some of the isoflavones from the meal.

The soy protein isolates tested were: Edi Pro N, Edi Pro A, Supro 610, 620, and 710 (all made by Ralston Purina Co.). Supro 710 had the highest total isoflavone content (132) and Supro 620 had the lowest (105)–a relatively small difference. Address: Northern Regional Research Center, Peoria, Illinois.

535. Ralston Purina Company. 1982. Report to shareholders for the second quarter and six months ended March 31, 1982. Checkerboard Square, St. Louis, MO 63164. 8 p. 22 cm.
• ***Summary:*** "Outlook: As we are all too painfully aware, worldwide economic conditions have been difficult and the overall economic outlook remains uncertain." Address: St. Louis, Missouri.

536. Garino, David P. 1982. Ralston Purina, out of favor with analysts in recent years, begins to win some converts. *Wall Street Journal.* June 16.
• ***Summary:*** "A favorite through most of the 1970s, Ralston lost a good many admirers in the latter part of the decade because of a drop in dog-food market share and write-offs for 232 Jack in the Box fast-food restaurants east of the Mississippi and Green Thumb floriculture operations."

537. Armstrong, D.; Richert, S.H.; Riemann, S.M. 1982. The determination of isolated soy protein in raw and pasteurized meat products. *J. of Food Technology* 17(3):327-37. June. [17 ref]
• ***Summary:*** "With the growing use of soybean proteins in meat products, the need for a competent method of their detection and quantification has also grown."

"Sodium dodecyl sulfate-polyacrylamide gel electrophoresis was used to determine the isolated soy protein content in raw and pasteurized meat products. This method determined soy protein (±0.5%) by using an internal standard protein (haemocyanin) to compensate for variations in the meat. The detection limit for meat products was 0.5%. Several possible meat and non-meat interferences were examined and none were found to interfere. The assay cannot be used on retorted products." Address: Ralston Purina Company, Checkerboard Square, St. Louis, Missouri 63188.

538. Goldberg, Andrew P.; Lim, A.; Kolar, J.B.; Grundhauser, J.J.; Steinke, F.H.; Schonfeld, G. 1982. Soybean protein independently lowers plasma cholesterol levels in primary hypercholesterolemia. *Atherosclerosis* 43(2/3):355-67. June. [32 ref]
• ***Summary:*** Isolated soy protein completely replaced animal protein in a diet fed to 12 human subjects for 42 days. Total cholesterol was lowered 3.5% and LDL cholesterol was lowered 6.0%. Address: 1-4,6. Lipid Research Center, Dep. of Preventive Medicine and Medicine, Washington Univ. School of Medicine, St. Louis, Missouri; 5. Ralston Purina Scientific Laboratories, St. Louis.

539. Ralston Purina Company. 1982. Report to shareholders for the third quarter and nine months ended June 30, 1982. Checkerboard Square, St. Louis, MO 63164. 8 p. 22 cm.
• ***Summary:*** The company declared a dividend of 19.5 cents per share to shareholders of record on 2 Aug. 1982. It will be paid on 10 Sept. 1982.

"The lower volumes, combined with unfavorable soybean crushing margins and the devaluation of the Mexican peso during the second quarter, resulted in a substantial decline in operating profit of Agricultural Products for the nine months;..." Address: St. Louis, Missouri.

540. Garey, C.L. 1982. Chemical engineering: Analyzing use of soy protein binders in coating formulation. *Paper Trade Journal* 166(17):41-44. Sept. 15. [5 ref]
• ***Summary:*** Discusses the production and properties of paper coatings containing soy protein binders, coating preparation, and additives. Address: Manager, Coating Research Polymer Div. of Ralston Purina Co.

541. *Wall Street Journal.* 1982. Quaker Oats to buy Ralston's pet-foods business. Oct. 5.
• ***Summary:*** "Quaker Oats said the operations have annual sales of about $120 million and include pet-food plants in West Germany, Holland and France."

542. **Product Name:** Soya System Professional Hair Care Products [Formula One Shampoo for dry to normal scalp skin and hair, Formula Two Shampoo for oily scalp, Formula Three Deep Cleansing Shampoo for oily scalp, Ultra-deep reconstructor (Conditioner)].
Manufacturer's Name: Soya System.
Manufacturer's Address: 10734 Trenton Ave., St. Louis, MO 63131. Phone: 314-428-0004.
Date of Introduction: 1982 October.
Ingredients: Formula One Shampoo: Water, sodium lauryl sulfate, amphoteric-2, hydrolyzed soya protein, soybean oil, sesame oil, almond oil, palm oil, quaternium-15, fragrance, glyceryl palmitate, D&C Yellow #10.
Wt/Vol., Packaging, Price: 4 oz, 8 oz, 16 oz, and 32 oz plastic bottle.
How Stored: Shelf stable.
New Product–Documentation: Leaflet sent by American Soybean Assoc. 1990. Jan. 22. Talk with Jim Costello, owner and founder. 1990. Jan. 24. The company was founded in 1981 and the first products were sold in Oct. 1982. These were 3 shampoos and a conditioner. They now have 12 products. He sells to beauty supply houses (wholesale distributors), who sell to individual salons. He does not sell by direct mail. The hydrolysed soy protein was developed by Ralston Purina, but it was too expensive for Ralston to use. Costello's chemist has a friend at Ralston Purina in St. Louis. They worked together to create the product. Sales are growing every year; last year they were about $800,000. His products use soya protein instead of animal protein, because soya protein unquestionably gives a much better quality product, but it costs more. Hydrolysed soy protein costs $4-$6/lb compared with $0.25-$0.50/lb. Soy is a much better protein source than animal proteins, which are only 40-45% pure (active, usable protein); the rest is waste products. Hydrolysed soy protein is 80-90% pure. All his products work instantly and have no undesirable coating (which dulls the hair and weighs it down)–most other products can't do both those things. He suggests I try Formula One Shampoo. His best seller is Soya Sensation (Perm), followed by Formula 1.

Label. 1990. Feb. 12. Bottle of Formula One. Plastic 8-oz. bottle. Black and orange on white. 7 inches tall. 2.25 inches in diameter. "Soya System reconstructive shampoo for dry to normal scalp and hair is the first shampoo to use a revolutionary hydrolyzed soya protein. Formulated from all natural ingredients. Professionally formulated for dry and chemically treated hair. Skin cleanser. Prevents flaking and dryness. Has balanced pH 4.5–5.5 (the range of healthy hair and scalp). Contains RNA and DNA. Hydrolyzed soya protein penetrates damaged hair. Non-coating. Restores hair's lost emollients, pliability and sheen. Gives hair fullness manageability. Contains no harmful chemical preservatives. Directions–Since Soya System is concentrated, use only the size of a dime. Apply to wet hair, work into rich lather using the palms of the hands. Rinse. Repeat if necessary."

Soyfoods Center shampoo test. 1990. March 8. This shampoo has a dominant coconut aroma combined with many other aromatic essences. Thick in consistency, it leaves the hair so clean and silky that it does not stay in place well after being combed.

543. Ralston Purina Company. 1982. Annual report 1982. St. Louis, Missouri. 42 p. 28 cm.
• ***Summary:*** Page 8: "We operate 63 feed manufacturing facilities in the United States and 59 feed plants in 11 other countries."

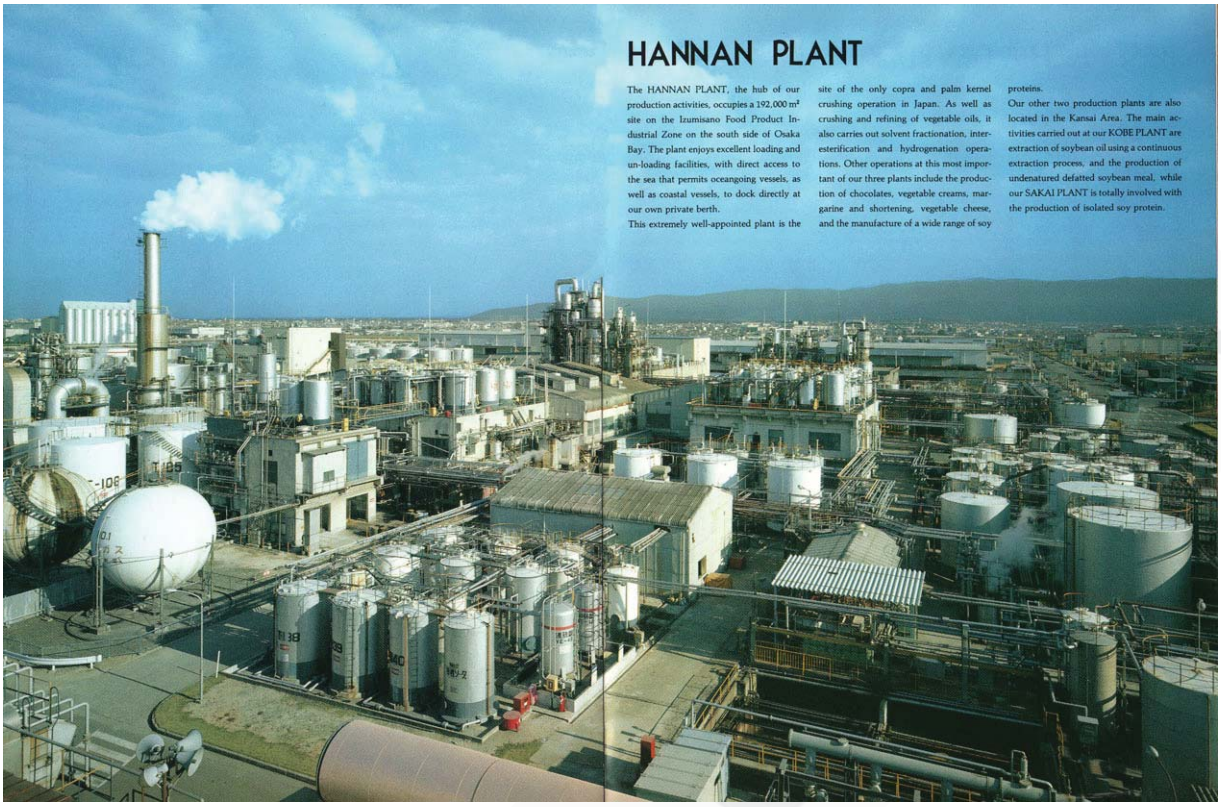
Page 12: Paul Hatfield is president of Ralston Purina's Diversified Businesses. "... during the year, usage of our protein products increased considerably." "Our soy-based polymer products are used in paper and paperboard coatings."

"Our Protein Technologies Division operates two food protein plants in the United States and two abroad. Our food protein business is conducted in 30 countries, serving primarily the food processing industry. About 80 percent of our food protein business is conducted outside the United States. Our protein-based polymers are manufactured at one facility in the United States and are sold to the paper and paperboard industry, principally in the United States." A color portrait photo shows Paul H. Hatfield.

Note: This is the earliest document seen (Aug. 2020) that mentions Ralston Purina's "Protein Technology Division." Address: St. Louis, Missouri.

544. **Product Name:** [Purina Protein Soy Flour, Cargill Soy Flour, and Cargill Textratein].
Manufacturer's Name: Interfood Deutschland GmbH. Div. Interfood Luxemburg SAH.
Manufacturer's Address: Goldgrubenstr. 6A, 6380 Bad Homburg, West Germany.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 61, 66; 1986. p. 86. Address is now Louisenstr. 115, 6380 Bad Homburg 1, W. Germany.

545. **Product Name:** Supro DD90.
Manufacturer's Name: Ralston Purina Co. Protein Div.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1982.



New Product–Documentation: Soya Bluebook. 1982. p. 64.

546. Fuji Oil Co. Ltd. 1982. Annual report. Nihon Seimei Midosuji Hachiman-cho Building, 6-1 Hachimancho, Minami-ku, Osaka 542, Japan. 20 p. 29 cm. [Eng]

• ***Summary:*** Historical highlights:

"1950–Fuji Oil Co., Ltd. established with a capital of ¥3,000,000 -

"1950–Fuji Oil acquired Osaka Plant and began Rice Bran & Soybean Crushing Operations

"1951–Inaugurated the first successful Copra Crushing-Extraction Operation in Japan

"1954–Inaugurated the first successful Palm Kernel Crushing-Extraction Operation in Japan

"1954–Perfected the first Solvent Fractionation Technology in Japan

"1955–Acquired Kobe Plant

"1955–Installed Solvent Fractionation Equipment and began production of Hard Butters

"1960–Installed Continuous Solvent Extraction Equipment and began Soybean Extraction at Kobe Plant

"1961–Shares listed on the Second Section of the Osaka Stock Exchange

"1963–Inaugurated Cocoa Bean Crushing Operations

"1964–Perfected Technology for production of Butter-like Fats by Interesterification of Vegetable Oils

"1966–Developed Technology for production of Isolated Soy Protein

"1967–Began production of Vegetable Creams & Coffee Whiteners

"1967–Began production of Isolated Soy Protein at Osaka Plant

"1968–Started construction of an entirely new production complex to be known as Hannan Plant

"1968–Began production of Margarines

"1969–Began production of Textured Soy Protein at Osaka Plant

"1969–Inaugurated Operations at Hannan Plant

"1971–Closed Osaka Plant

"1973–Shares listed on the First Section of the Osaka Stock Exchange

"1973–Participated in the Establishment of POPM (Palm Oil Products (M) Bhd.) in Malaysia

"1974–Started Marketing Soy Protein Products

"1974–Participated in the Establishment of SIOM (Southern Islands Oil Mill Corp.) in the Philippines as a source of supply of Copra and Coconut Oil

"1974–Established Fuji Purina Protein Co., Ltd. in Japan jointly with Ralston Purina Co. of the USA. Fuji Purina Protein Co., Ltd. later changed its name to FPPM Ltd.

"1974–Began production of Structured Soy Protein

"1974–Capital Participation in AFP (Alberta Food Products), a Rapeseed Crushing Operation in Canada

"1977–Established a new Fuji Purina Protein Co., Ltd. (FPP) in Japan as a reorganized joint-venture with Ralston Purina Co.

"1978–Shares listed on the First Section of the Tokyo

Stock Exchange

"1979–Sponsored the Soy Protein Nutrition Research Group

"1979–Sold SIOM to a state-operated organ of the Philippines

"1980–Started Marketing Vegetable Cheese

"1980–Inaugurated the Fujisanie Plaza for Promotion of Joint Manufacturer-Customer Research and Development

"1981–Convertible Bonds issued.

Sales: A pie chart (p. 3) shows that Fuji Oil Co. has 4 different sources of revenue / sales, totaling 73.5 million yen in 1981 (preliminary): (1) Processed oils & fats products 35.0%. (2) Confectionery oils & fats products 31.8%. (3) Protein and protein products 17.0%. (4) Oils & fats, oil cakes and meals 16.1%.

Fuji Oil Co.'s three types of modern soy protein ingredients are Fujipro (isolated soy proteins), Fujipure SP (structured soy proteins), and Fujinik (textured soy proteins) (see p. 13).

Contents: Cover. A message from the president. Historical highlights, incl. 10-year bar graph of corporate sales, equity, and net profit. Company outline (with 2-page photo of the Hannan Plant). Raw materials & Products. Oils & fats. Confectionery products. Soy protein. Hannan plant ("the hub of our production activities, occupies a 192,000 square meter site on the Izumoisano Food Product Industrial Zone on the south side of Osaka Bay"). Research & development. Fujisanie Plaza (two of them: One in Osaka and one in Tokyo). International activities. Overseas offices: New York, USA. London, UK. Abidjan, Cote d'Ivoire. Address: Osaka, Japan.

547. Soy Protein Council. 1982. Soy protein: Improving our food system. Washington, DC. 6 p. Bulletin 1/82/5000.
• ***Summary:*** An 1-page (front only) insert in this 1982 printing (5,000 more copies were printed in Jan. 1982) gives the name, address, contact information, and soy protein products made by each current manufacturer: ADM, Cargill, Central Soya Co., Grain processing Corp., Honeymead Products, Kraft, Inc., The Procter & Gamble Co., Ralston Purina Co., and A.E. Staley Manufacturing Co. Address: 1800 M Street, N.W., Washington, DC 20036. Phone: 202-467-6610.

548. Ralston Purina Company. 1983. First quarter report to shareholders. Three months ended Dec. 31, 1982. And annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 19 p. 22 cm.
• ***Summary:*** Page 1: "At its regular January meeting, your Board of Directors declared a quarterly dividend of 21 cents a share on the Company's Common Stock, up from the 19.5 cents rate of the previous quarter." William P. Stiritz, Chairman and Chief Executive Officer. Address: St. Louis, Missouri.

549. Patton, Greg. 1983. Modern soy protein products (Interview). *SoyaScan Notes.* Feb. 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The biggest market for soy protein isolates in the U.S. today is in health-food protein powders. Many of the big manufacturers of these are in Hayward, California: Natural Formulas, Natural Protein Products, Shamrock, Cambridge Diet, etc. Isolates are not used much in meat pumping, sausages, etc. ADM and Ralston Purina both make isolates. Greg and Clyde Boismenue are competitors, and both know the industry very well.

Central Soya's "Response," a textured soy protein concentrate, is the Cadillac of textured soy protein products. Much better than TVP, it is excellent in patties and meat loaves. Using Response in a reformulated hamburger need not cost any more than using TVP, since it hydrates at a 4:1 ratio and more can be used since it has less soy flavor and causes less flatulence. It costs $0.50/lb versus $0.30 for TVP. Address: 8707 San Leandro St., Oakland, California 94621. Phone: 415-638-5223.

550. Ralston Purina Company. 1983. Report to shareholders for the second quarter and six months ended March 31, 1983. Checkerboard Square, St. Louis, MO 63164. 6 p. 22 cm.
• ***Summary:*** "To our shareholders:... Stock Acquisition: We have completed the previously announced program calling for the acquisition, in open market transactions, of 5,000,000 shares of the Company's outstanding common stock. Currently there are 98,099,650 shares outstanding.

"Dividend Declared: At its regular March meeting, your Board of Directors declared a quarterly dividend of 21¢ per share on the Company's common stock, payable on June 10, 1983, to shareholders of record at the close of business on May 2, 1983.

"Outlook: The Company's earnings for the first six months of this fiscal year are gratifying because they represent strong contributions from all of our core businesses. While we caution against projecting fiscal 1983 earnings based on six months results, we believe that 1983 will be a good year for Ralston Purina Company.

"William P. Stiritz

"Chairman and Chief Executive Officer

"May 13, 1983." Address: St. Louis, Missouri.

551. Johnson, Dale. 1983. Statistics on soy protein production. Full-fat soy flour. Dawson Mills and Loma Linda. Central Soya (Interview). *SoyaScan Notes.* May 23. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** Estimates of soy protein production: Textured soy proteins (flours or concentrates) 150-200 million lb/year. Isolates 120-150 million lb/yr, including: Ralston Purina (doing very well), ADM (having lots of problems), and Grain Processing Corp. ("sold out"). Much of the isolate made

in the USA is being exported for use in meat products in Europe and Africa. About 10-20 million lb/year of the non-exported isolate is used to make infant formulas in the USA by Mead Johnson, Ross Laboratories, and Syntex (Borden operation). A large amount of textured soy flour is still going into pet foods. Prices (dollars/lb): Soy flours $0.13. Soy protein concentrates $0.40-0.60 (lower priced are for calf starters). Soy protein isolates $1.10 to $1.35.

Full-fat soy flour: There is no significant production in the USA; in the past, production was several hundred tons/month. Some is imported from Germany (Lucas Meyer).

Dawson Mills: As of June 1, they will discontinue production of soy flour and grits, and textured soy flour. Loma Linda (California) purchased one of their two isolate spinning lines and was trying to have AMPI [American Milk Products, Inc.] run it for them [in Minnesota] using isolate purchased from elsewhere. Dale is not sure of the status of this project. Dan Hooten, formerly with Dawson Mills, is now apparently involved in sales of dairy products at Land O'Lakes (now located in Eau Claire, Wisconsin).

Central Soya is no longer using their steam texturization process. Address: Food Ingredients (Minnesota), Inc., 2121 Toledo Ave. North, Golden Valley, Minnesota 55422.

552. Hooten, Dan. 1983. Estimate of soy protein isolate capacities in the USA (Interview). *SoyaScan Notes*. May 24. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** He estimates the total capacity to be 100-110 million lb/year, with individual company capacities as follows (in million pounds per year): Ralston Purina 70 at three plants (Pryor, Oklahoma 30; Memphis, Tennessee 20; Louisville, Kentucky 20). ADM 20-25. Grain Processing Corp. 14-15. Address: Industrial Sales, Land O'Lakes, Eau Clair, Wisconsin.

553. *Food Processing* (*Chicago*). 1983. Isolated soy protein / ground beef system cuts fats 25%, calories 18%: ingredients, honors. July. p. 68.
• ***Summary:*** A positive review of the Purina Protein 220 / Menu Maker® ground beef system. A color photo shows a cub of Menu Maker cut crosswise into halves.

554. Ralston Purina Company. 1983. Report to shareholders for the third quarter and nine months ended June 30, 1983. Checkerboard Square, St. Louis, MO 63164. 8 p. 22 cm.
• ***Summary:*** The company declared a dividend of 21 cents per share to shareholders of record on 1 Aug. 1983. It will be paid on 9 Sept. 1983.

"Our domestic pet food and cereal business contributed substantial earnings gains over the prior year due to improved margins on slightly higher unit sales." Protein Technologies had improved earnings on higher sales volumes. Address: St. Louis, Missouri.

555. Brennan, Thomas J. 1983. Re: Soybean production in Austria. Letter to William Shurtleff at Soyfoods Center, Sept. 30. 2 p. Typed, with signature on letterhead.
• ***Summary:*** The closed door policies of the region make information gathering a difficult, if not impossible, task. Two soybean specialists in the region are: (1) Dr. Jerzy Szyrmer, Plant Breeding and Accilimatization Inst., Radzikow, Poland. He has been attempting to develop soybean varieties for home production and consumption; he has no commercial interests at all. (2) Prof. Dr. Victor F. Lishchenko, or his assistant, Dr. Leonid Kolesnikov, Food and Agriculture Dep., Inst. of U.S. and Canada Studies, 2-3 Khelbny per., Moscow, USSR. Lishchenko has just published a book in Russian on soybeans in the USSR.

"Now to address some of your questions. What causes swings in production and imports of soybeans and products? That is difficult to answer. Initially I would say imports are directly related to hard currency availability. The scientists and livestock production people recognize the value of soybeans, but don't control the purse strings. That's the central bank or foreign trade organizations. Soybean purchase requests go in the basket with all other import needs.

"Production swings are often caused by weather or disease. More commonly, however, I would attribute changes to government attitudes. For example, in Yugoslavia producers are paid nearly $400/MT (metric ton = 1000 kg) to raise soybeans while they could buy C.I.F. at about $250/MT. Soybean production has increased, but so has corn and wheat production. These products are now bartered for beans and meal. If hybrids could be developed, Hungarian production would soar, as corn production did in the 70's. They want to grow soybeans, however, at this time, it is still more profitable to grow corn and small grains. The value of the crop per hectare far exceeds soybeans' potential value. Certain state farms which have produced beans in the past want to increase production; however, the central government discourages this by setting low prices. Three or four years ago the attitude was different and soy production was encouraged. Talk to Bob Bergland about the Farmland / Eaton proposal for a soy crushing plant in Hungary.

"Statistics on soy protein utilization are hard to come by. Imports are usually handled by the Ministries of Food, where I have few contacts. Sales are also controlled by a small number of companies, e.g., Ralston, ADM, Staley, etc., which are not prone to reveal figures. USDA at one time listed TSP [textured soy protein] sales, but I haven't seen any statistics for 1982 or 1983." Address: Gatterburggasse 18/2/3, A-1190, Vienna, Austria. Phone: 37-41-18.

556. *Herald and Review* (*Decatur, Illinois*). 1983. Inventor sees use for TVP. Oct. 7. p. 14.
• ***Summary:*** William T. Atkinson, the inventor of TVP, retired in 1976 as "senior research chemist for the Decatur-

based Archer Daniels Midland Co. At age 72, he is a consultant to ADM. In 1970, he patented the TVP process... He later assigned the patent to ADM. Many companies, including A.E. Staley Mfg. Co., Cargill and Ralston-Purina, have purchased rights to use the process. The first products using the TVP process were sold in the early 1960s. They did not become common in grocery stores until the 1970s... Since about 1950, Atkinson had been researching ways to convert soybeans into food for human consumption...

"In 1935, the Detroit native went to work for Henry Ford. He and other researchers in Ford's Greenfield Village developed a soybean-based fiber which was used for such products as automobile upholstery, clothing and, during World War II, felt... The soybean operation, and Atkinson's services along with it, were sold in 1943 to The Drackett Co. and moved to that company's Cincinnati, Ohio, facility. Atkinson began working for ADM in 1957 when it purchased Drackett's agricultural division. He moved to Decatur in 1969. Drackett shifted its soybean research efforts to food applications in about 1950. This was because of the development of new synthetic fibers which were superior to soybean-based fiber in making clothing and other non-food products. As a result, Atkinson's research effort shifted." A photo shows Atkinson. Address: 852 Karen Dr., Decatur, Illinois 62526. Phone: 217-877-9048.

557. Tsai, Alan C.; Mott, E.L.; Owen, G.M.; Bennick, M.R.; Lo, G.S.; Steinke, F.H. 1983. Effects of soy polysaccharide on gastrointestinal functions, nutrient balance, steroid excretions, glucose tolerance, serum lipids, and other parameters in humans. *American J. of Clinical Nutrition* 38(4):504-11. Oct. [29 ref]

• ***Summary:*** The typical "Western diet" is known to be relatively low in fiber. It has been implicated as a contributing factor in the development of several chronic diseases such as diabetes, coronary heart disease, cancer of the colon, and obesity. This diet-controlled study with a cross-over design was conducted to determine the effect of soy polysaccharide on gastrointestinal functions, nutrient balance, steroid excretion, blood lipid levels, postprandial serum glucose response, and other blood parameters in healthy, active male human subjects. 14 college students participated voluntarily and there were two 17-day feeding periods. Blood samples from the beginning and end days of each period showed no changes in serum lipid levels or other blood parameters from soy polysaccharide supplementation. There was a significant increase in fecal wet weight and fecal water content, but no changes in total dry weight, fecal neutral steroid, bile salt, protein, or mineral contents. Glucose tolerance tests conducted during the end period showed that supplementation of soy polysaccharide may result in some improvement in glucose tolerance response. Address: Human Nutrition Program, School of Public Health, Univ. of Michigan, Ann Arbor, MI 48109; and Michigan State Univ.; and Ralston Purina.

558. Atkinson, William T. 1983. History of work with soybeans and soyfoods, and the invention of TVP (Interview). Conducted by William Shurtleff of Soyfoods Center, Nov. 26. 6 p. transcript.

• ***Summary:*** In 1935 he began to work on soybeans with Robert Boyer under Henry Ford. He isolated proteins from the soybean and attempted to manufacture Azlon, an artificial wool, from spun soy protein fibers. Atkinson did the developmental work and spun the original soy protein fibers. Boyer's work was to maintain the research lab and staff for Henry Ford, who made his office in the building. Henry Ford at that time was chairman of the board and had a lot of time to devote to agricultural research. His son, Edsel, was president of the company.

From 1935 to 1949 he worked with soy protein fibers to make fabrics, and developed molded industrial plastics. In 1949 he made a major switch to developing foods made from soy protein. Starting in 1949 he developed a food grade isolated soy protein in powdered form at Drackett. He thought it was an excellent product with potential applications in products such as Gerber's Baby Food, malted milks, etc. This was the original food-grade isolated soy protein. After a lot of market research they found that nobody was interested in a food grade soy protein, even if it tasted good, and was the right color and price.

Atkinson began to work at ADM in 1957 when ADM purchased Drackett's Agricultural Division. In 1958-59 ADM started selling this soy isolate to Consolidated Foods in Texas; it was quite satisfactory and practical. In about 1959 ADM made the mistake of selling about 25 pounds of it to some company that was working with Pillsbury to incorporate soy protein isolate granules into a chili product for Pillsbury. One year later they received notification from Swift and Ralston Purina that the product could no longer be patented because a year had elapsed since it was first sold. Discouraged, they began research on other ways of making foods from defatted soy flakes.

In 1961 he started extruding his isolated soy protein into plexilamellar material. Initially he used a rubber extruder, then changed to a plastics extruder. But ADM failed to patent the extruded isolates since they were basically a commodities company with little knowledge in this patent area. No patent attorney or department was connected with the research group until about 1963.

Work on extrusion of defatted soy flakes started in about 1961.

Note: As of May 1991 William Atkinson was still alive but he had Alzheimer's disease and was unable to talk. Address: 852 Karen Dr., Decatur, Illinois 62526. Phone: 217-877-9048.

559. Leviton, Richard. 1983. Report of soyfoods research

and speaking trip to Europe with American Soybean Assoc., Oct. 8–Nov. 15, 1983. Colrain, Massachusetts. 82 p. Unpublished typescript. 28 cm.
• ***Summary:*** Describes visits to or discusses: ASA Belgium (Dennis Blankenship, Rita Batens, Michael Martin), Parma, Euvepro Conference, Parmalat, Guy Coudert and Dr. Sabin president of ONIDOL, Anuga, Jonathan, Société Soy (Bernard Storup, Jean de Preneuf), Le Bol en Bois, Budapest (Hungary), Agrimpex (Hungary), Migros, Sojalade / Die Genossenschafts Tofurei (Verena Krieger), Galactina, Soyana (Walter Daenzer), Alpro (Belgium; Philip Vandemoortele and Christian Daems), Aarhus retail stores (Denmark), Witte Wonder, Manna, Cauldron Foods Ltd. (Phillip Marshall, Peter Fagan). Contains a directory of principal people contacted, listed by country. Those not mentioned above are: England: Wild Oats Wholefoods (Mike & Loes Abrahams), British Arkady Co. (Bill Pringle), Sunworld Inc. (David White), Health Foods Manufacturers' Association (Britain). Belgium: ASA, Le Paradoxe (Dota Figuera). China Trading, Ralston Purina (A.G. van der Horn), Premier Foods (Pauline Six Chan). Italy: Cargill SpA (Claudio Rocchietta), Parmalat SpA (Dr. Alberto Rota, Mr. Barilla), ASA (Sergio Monari). France: Robert Bonneterre, Aux Rayons Verts. Germany: European Federation of Health Products Manufacturers (Wolfgang Reinsch, Bad Homburg). Hungary: Central Food Research Inst. (Balint Czukor), Agrimpex (Potori Karoly). Denmark: Danish Turnkey Dairies, Det Gronne Kokken. Netherlands: Witte Wonder Products (Niko van Hagen), Manna (Hans den Hoed), Albert Heijn Supermarkets, Dutch Seed Crushers & Oil Processors Assoc. (Dr. C.J.M. Meershoek). Switzerland: Sojalade (Verena Krieger), Soyana (Walter Daenzer). Austria: Tom Brennan.

Bound in the back of the report are photocopies of labels and promotional materials (graphics) from the following companies: Witte Wonder, Société Soy (Cerny), Cauldron Foods, Manna, Dansk Tofu (Sdr. Vinge Gl. Mejeri, 8860 Ulstrup), Sojalade, Bonneterre, Mutter Erde, Genossenschaftstofurei Engel (Dorfplatz, Ottenbach).

Note: This is the earliest document seen (May 2005) that mentions Parmalat in connection with soy.

Migros (p. 18-19) is Switzerland's biggest supermarket / department store; it sells some whole wheat products. Consumers oppose them for their size, but they attract foreign customers. Natural foods people are very political; they are opposed to Third World imports. Migros is expected to start selling tofu soon. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

560. Ralston Purina Company. 1983. Annual report 1983. St. Louis, Missouri. 38 p. 28 cm.
• ***Summary:*** Inside front cover: "About 56,000 employees around the world produce the many products that bear the red and white Checkerboard design, the company's principal trademark since 1900."

Page 22: Sales of soy protein products were: $113.5 million in 1981, $132.4 million in 1982, and $144.3 million in 1983. Address: St. Louis, Missouri.

561. Scrimshaw, Nevin S.; Wayler, A.H.; Murray, E.; Steinke, F.H.; Rand, W.M.; Young, V.R. 1983. Nitrogen balance response in young men given one of two isolated soy proteins or milk proteins. *J. of Nutrition* 113(12):2492-97. Dec. [11 ref]
• ***Summary:*** "The protein nutritional value of two isolated soy proteins was compared with that of dried skim milk proteins in healthy young men."

"It is concluded that well-processed isolated soy proteins are indistinguishable from milk as a protein source for maintenance of short-term N [nitrogen] balance in adult human nutrition." Address: MIT; Ralston Purina.

562. Wayler, Alan H.; Queiroz, E.; Scrimshaw, N.S.; Steinke, F.H.; Rand, W.M.; Young, V.R. 1983. Nitrogen balance studies in young men to assess the protein quality of an isolated soy protein in relation to meat proteins. *J. of Nutrition* 113(12):2485-91. Dec. [15 ref]
• ***Summary:*** "Thus, the protein quality of the isolated soy protein appears to be comparable to that of animal protein sources such as milk and beef." Address: 1-3, 5-6. Lab. of Human Nutrition, Dep. of Nutrition and Food Science, Massachusetts Inst. of Technology (MIT), Cambridge, Mass 02139; 4. Ralston Purina.

563. **Product Name:** Supro 660. Renamed PP660 by Nov. 1987.
Manufacturer's Name: Ralston Purina Co. Protein Div.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1983.
New Product–Documentation: Product leaflet. 1983. Supro 660 is an instantized (lecithinated) isolated soy protein. It can be easily dispersed with minimum agitation. Ingredients are isolated soy protein and lecithin.

564. Aarons, Theodore. 1983. Infringement against Schapiro patent #3,988,511, "Preparation of Water Dispersible Protein Products." Berkeley, California. 3 p. Unpublished manuscript.
• ***Summary:*** Instantized (lecithinated) [isolated] soy protein is widely sold at retail stores. The three major manufacturers are ADM, Grain Processing Corp., and Ralston Purina (makers of Supro 630 and 660, which contain 91% protein and 0.5% lecithin). Ralston had an estimated 75% of the market in 1976. The market size in the USA is estimated to be at least 20 million lb a year. In 1983 Shaklee retailed 7 million lb, Fillmore Foods 4 million and Natural Formula 0.5 million. Other large retailers include General Nutrition, ABCO Labs (Concord, California), Winning Labs (Costa

Mesa, CA), Shamrock Labs (Dublin, CA), Bestline products (Elk Grove, Illinois), National Vitamin (Hollister, CA), etc.

The Ralston Purina Annual Report (30 Sept. 1982) stated that the company's sales of soy protein were $144 million.

According to U.S. Dept. of Commerce figures, approximately 550 million lb of edible soy protein meal were produced in 1983; 44% of this meal is protein. Address: Protein Research Assoc., Berkeley, California.

565. Decker, C.D.; Holt, S.K.; Westerling, D.B. 1983. Gelling proteins. In: Roy E. Martin, ed. 1983. Third National Technical Seminar on Mechanical Recovery & Utilization of Fish Flesh. Washington, DC: National Fisheries Inst. vii + 581 p. See p. 324-47. Held 1-3 Dec. 1980 at Raleigh, North Carolina. [9 ref]

• ***Summary:*** Reviews studies concerning the use of isolated soy protein with minced fish in some Japanese food products. Minced fish is the basis for surimi, a wet fish protein which is the major ingredient in various traditional Japanese fish paste products–such as kamaboko. Alaska pollock is the fish used to make surimi. When properly manufactured, isolated soy protein can have excellent gelling properties. It has been commercially successful in gelling minced fish in Japan. Ralston Purina has worked with Fuji Oil Co. of Japan in developing products. Address: Ralston Purina Co., St. Louis, Missouri.

566. Ralston Purina Company. 1984. First quarter report to shareholders. Three months ended Dec. 31, 1983. And annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 19 p. 22 cm.

• ***Summary:*** Page 1: "At its regular January meeting, your Board of Directors declared a quarterly dividend of 23 cents a share on the Company's Common Stock, up from 21 cents the previous quarter." William P. Stiritz, Chairman and Chief Executive Officer. Address: St. Louis, Missouri.

567. Young, Vernon R.; Puig, M.; Queiroz, E.; Scrimshaw, N.S.; Rand, W.M. 1984. Evaluation of the protein quality of an isolated soy protein in young men: relative nitrogen requirements and effect of methionine supplementation. *American J. of Clinical Nutrition* 39(1):16-24. Jan. [26 ref]

• ***Summary:*** The protein nutritional value of an isolated soy protein (Supro-620) was evaluated in a series of nitrogen balance studies in healthy young male students at the Massachusetts Institute of Technology.

"No beneficial effects of methionine supplementation were observed when the test nitrogen intake level was 128 mg N/kg/day. These results indicate that for healthy adults, the isolated soy protein is of high nutritional quality, comparable to that of animal protein sources, and that the methionine content is not limiting for adult protein maintenance." Address: Dep. of Nutrition and Food Science, and Clinical Research Center, MIT, Cambridge, Massachusetts 02139.

568. Young, Vernon R.; Wayler, A.; Garza, C.; Steinke, F.H.; Murray, E.; Rand, W.M.; Scrimshaw, N.S. 1984. A long-term metabolic study in young men to assess the nutritional quality of an isolated soy protein and beef proteins. *American J. of Clinical Nutrition* 39(1):8-15. Jan. [14 ref]

• ***Summary:*** This study followed 8 young adult men for 84 days in a metabolic (nitrogen balance) experiment. One group was given isolated soy protein and another group was given beef proteins.

"These observations confirm the prediction, derived from previous short-term N balance studies, that the nutritional quality of isolated soy protein is high and this plant protein can serve as the sole source of essential amino acids and nitrogen for protein maintenance in adults." Address: Dep. of Nutrition and Food Science, and Clinical Research Center, MIT, Cambridge, Massachusetts 02139.

569. Calvert, Francis E. 1984. Work with Ford and Drackett on soybeans (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 19. 3 p. transcript.

• ***Summary:*** Francis (Frank) Calvert was first introduced to soybeans after he went to Detroit. In about 1931, Ford arrived at the Chemical Plant in Greenfield Village (also a lab and a pilot plant), with a 20 pound sack of soybeans. He threw them on the workbench and said, "More people eat these than anything else. There must be something awfully good about them. Why don't you fellows find out what it is." They were already doing research on agricultural wastes and chemurgy, on almost every crop you could think of.

Their first problem was getting soybeans. There were none available. Within the next year or two they planted thousands of acres themselves. Ford plowed up a big field and planted quarter acre plots with different varieties. It was an enormous quantity. Even though they didn't know what to do with them, it was Ford's style. He did nothing small. They raised hundreds of quarter acre plots, testing different varieties.

Dr. Edsel Ruddiman, after whom Edsel Ford was named, was a nutritionist and pharmacologist. He ran the food laboratory and made lots of the foods served in the Ford cafeteria to Ford employees. They were first sold as samples, but didn't sell well because of the flavor. From about 1932-33, the products included soy milk, soy cheeses, and soy ice cream and sherbets. Soynuts were also made in a counter-current fryer in rectangular buckets on a chain. The employees ate most of the products and tourists consumed some. Food was also served from the kitchen at the Wayside Inn in the village. Products were provided as a snack, but most were given as samples, and a few were sold.

Both Atkinson and Calvert, research chemists, reported to Boyer. Calvert left Ford in 1938 and went to Drackett.

Boyer and Atkinson left later to do work on soy-based plastics.

ADM bought The Drackett soybean crushing plant in about 1957. Calvert went with ADM for about 5 years, until 1960-61. From 1962-74, he worked for Ralston Purina. In December 1958 Ralston purchased Procter & Gamble's plant in Louisville, Kentucky, and were already somewhat involved with isolates; they began working with foods after 1962.

Ralston went into dietary products and infant formulas in about 1963-64, supplying soy protein isolates to most of the infant formula manufacturers such as Miles and Wyeth Labs. Ralston, Loma Linda and Worthington were the biggest suppliers of infant formula from 1962-74.

Don Walker, Vice President of Ralston Purina, took a strong interest in soy protein. Ralston took the lead primarily because of the strong interest and leadership of Hal Dean, then Chairman of the Board and CEO. Dean was the key motivating force from the early 1960s. He firmly believed in and supported soy protein development.

Ford was the father of the soybean industry in the U.S. He had an impact just through his interest in soybeans. He planted soybeans and promoted and merchandised them in the same way he promoted the industrial barn at the World's Fair in Chicago. Ford set up an extraction plant and actually extracted oil and molded gearshift balls at the Industrial Barn at the Fair. People couldn't believe their eyes! Ford was the single largest soybean grower in the U.S. at that time.

Note: Frank Calvert passed away in about 1986. Address: 1513 Northlin, Kirkwood, Missouri 63122. Phone: 314-822-3187.

570. Ralston Purina Company. 1984. First quarter report to shareholders. Annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 12 p. 22 cm.
• ***Summary:*** For the three months ended Dec. 31, 1984. Six of the company's soybean crushing plants were sold to Cargill, Inc. The seventh, at Memphis, Tennessee, was closed. "This action removes the company from a commodity business and frees up cash for other investment" (p. 7). Address: St. Louis, Missouri.

571. Wolf, Walter J. 1984. The main uses for the various modern soy protein products in America (Interview). *SoyaScan Notes.* March 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The following, listed within each category in approximate order of importance, are the main uses of modern soy protein products in the USA:

Soy protein concentrates: Processed meat products, including sausages, meat loaves, turkey loaves, salisbury steak in TV dinners (ground beef vs. sausages). Works as a binder and extender.

2. Isolates. Infant formulas (he does not know if pumping hams {by injecting an isolate solution} is yet legal in the USA; ask Ralston Purina). Is it legal in Europe? Coffee whiteners and other dairy analogs (including infant formulas), for example blend with cheese whey to replace nonfat dry milk (NFDM; most may be soy flour). Meat is a fairly big use.

3. Textured soy flour. Ground beef extender or atop pizza as a ground beef substitute or extender. Imitation bacon bits used in salad bars. All bacon bits are now made from textured soy flour, not spun isolates. Cargill is a big maker of imitation bacon bits. He thinks they supply General Mills who sells them as Bac*O's. He does not know who makes them for McCormick. So there are two sellers.

4. Textured concentrates are used mainly in higher quality meat products. Lots used by the military in extended beef. (Does military now also use textured soy flour?).

5. Jet Cooked Textured Isolates. Meat extender or replacer? They are chewy. More expensive foods. Jet cooked isolates are typically sold frozen; check. Not the typical thermoplastic extrusion. He is not sure if Worthington or anyone else makes textured isolates in the form of spun protein fibers.

6. Modified isolates are extensively hydrolyzed with pepsin (they are almost hydrolysates) and used in candies? He thinks the isolates used in whipped toppings are not hydrolyzed. Check. Whipped cream replacers are NOT hydrolyzed. He is not positive. Ask Gunther. A lot of them replace sodium caseinate with soy isolates to reduce sodium.

Question: Which of these products is most widely used in sausages? Concentrates and soy flour, he thinks.

One good but expensive source of information about industry and market statistics is Frost & Sullivan Reports: F&S Inc. 106 Fulton St. New York, NY 10038. Winter of 1982 titled "Protein Ingredients Market in the U.S." ($1100). Another is "New Food Ingredients in Europe" (Sept. 1981; $1250). He'll send me copy of flyer. In the contents are the estimated market shares of soy protein ingredient producers. They also did one ten years ago. The probably get their information from retired people in the industry. Address: Northern Regional Research Center, Peoria, Illinois.

572. Wolf, Walter J. 1984. The soy protein isolate industry in America in 1983 (Interview). *SoyaScan Notes.* March 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Wolf talked with Dan Hooten who is now with Land O'Lakes, but who used to be with Dawson Mills. Land O'Lakes bought Dawson Mills several years ago. The following are Hooten's estimates of the capacities of America's largest isolate manufacturers in 1983:

Ralston Purina, 70 million lb/year. The company has 3 plants: Prior, Oklahoma, 30 million lb/year. Louisville, Kentucky, 20 million lb/year. And Memphis, Tennessee, 20 million lb/year.

ADM (Archer Daniels Midland), 20-25 million lb/year.

Grain Processing Corp., 14-15 million lb/year.

Thus the total capacity of the top 3 U.S. companies is 104-110 million lb/year (47,200 to 49,800 metric tons/year). Some of these isolate products are exported. A.E. Staley Mfg. Co. began to make isolates about 1 year ago. Hooten does not know their capacity. Address: Northern Regional Research Center, Peoria, Illinois.

573. Shurtleff, William; Aoyagi, Akiko. 1984. History of soy protein concentrates, isolates, and textured soy protein products. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 25 p. March 4. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** www.soyinfocenter.com/HSS/protein_concentrates.php

A comprehensive history of the subject. Contents: Definition of types of products. Part I: History of modern soy protein products from origin to 1964. Soy protein isolate: Tofu, Nagel in New York 1903, Beltzer in 1911, Ajinomoto in 1919, Cone and Brown patent in 1928, Glidden (first plant in U.S. for production of industrial grade soy protein isolate) in 1935, first study of use of soy isolates in food (Woodruff at University of Illinois, 1938), Glidden first company in the West to produce a soy protein isolate for use in food (1939, enzyme-modified), Glidden first with large-scale production of non-enzyme modified isolates (1957), Worthington Foods introduced Soyamel in 1952 (first soymilk based on isolate). Soy protein concentrates: First developed and introduced in Germany in 1925, first commercial food-grade concentrates and first patent from Griffith Laboratories in 1959. Textured soy protein products: Developed in China 1,000 years ago, made from tofu or yuba, earliest Western meat analogs developed by John Harvey Kellogg about 1896 (without soy), first synthetic industrial protein fiber (Lanital, made from casein) introduced in Italy 1936, first industrial (non-food) soy protein fibers in 1938 from Robert Boyer of Ford Motor Co. (used for upholstery), Boyer got patent for use in food (1951), rights purchased by Worthington, Dr. Harry Miller's soya loaf in 1939, Worthington first to produce a meat analog based on spun soy protein fibers in 1960, textured soy flour (TSP or TVP) introduced as food ingredient in U.S. in 1964.

Part II: History of modern soy protein products in the U.S. from 1965 to 1981. 1964 Belden report from Harvard Business School *Protein Paradox.* Commercial Protein Foods Studies Program of the U.S. Agency for International Development (AID) encouraged U.S. firms to develop protein foods for the Third World in 1967. General Mills Bac-O's test marketed 1966. Producers. February 1971 breakthrough when USDA authorized use of TVP in school lunch programs. 1972 *Soybeans. Chemistry and Technology,* edited by Smith and Circle, contained all the research on nutrition and processing up to that time. 1973 high beef prices led to beef-soy retail blends. Appearance of TSP cookbooks, starting in 1971. First World Soy Protein Conference held in Munich, Germany, in 1973. In 1974 Miles Laboratories/Worthington Foods introduced Morningstar Farms meat analogs, the first soy protein meat analog entrees marketed to mainstream America. Textured soy concentrates and other concentrate developments. New developments with isolates. New flavorings. New textured soy flour development. 1978 Keystone Conference on soy protein and human nutrition sponsored by Ralston Purina. Problems with government regulation.

Part III: History of modern soy protein products outside the U.S. and Europe (1960-1981): Japan. China. Other Asia: Philippines, India, Sri Lanka. Latin America: Colombia, Mexico. Address: Lafayette, California. Phone: 415-283-2991.

574. Stone, Dave. 1984. Ralston Purina's work with soy (Interview). Conducted by William Shurtleff of Soyfoods Center, March 7.

• ***Summary:*** Ral-Con was a joint venture with Continental Can, now disbanded. Ralston now makes the product on its own. It's not a spun fiber like Worthington's. It is a "structured protein isolate" that comes is fibrous strands. Color is light buff to white, sold frozen, in 50 lb. boxes. The strands are of various lengths. The most common applications are in poultry (white poultry roll) and seafood (crab salad).

"Granular isolate" is called Purina Protein 220. Its an extruded product, but don't call it jet cooked. They would never use these terms; 90% protein on a dry-weight basis (DWB); 88% protein on an as-is basis. When hydrated its semi-translucent, chewy. The principle application is in ground beef. Ralston is the only company in the industry making this or a textured isolate. Much improved Flavor over textured soy flour.

Textured soy flour. Most of their dry and semi-dry pet foods are extruded products. Not all soy flour; soy flour is part of some of them. Talk to Jim Reed 314-982-2261. They also have a textured soy flour line that is a very minor part of their business. "Frankly we think its cave man technology. We're not interested in making a big issue out of it." Made in plants completely separate from and totally unrelated to the pet food products. It is made by their protein division which is totally different from Pet Food Div. The focus of their protein division is soy protein isolates; in one of the plants they have a textured soy flour operation. Supro-50 is their brand. Dave is not aware of formulation of pet foods. Two Separate divisions. Ask Jim Reed. Is it the primary protein source? Is soy in all their products?

Ralston left the Food Protein Council for "reasons of divergent focus." There are basically only 3 big producers of isolates. One of these, ADM, which gives more emphasis to its textured soy flour. Staley makes the "old Gunther whippable proteins." ADM has lots of ego invested in soy

flour. So basically you have a lot of people most interested in promoting soy flour. Ralston believes this is very primitive technology and believes the industry will hurt itself as long as it advocates using soy flour in foods, which lowers their quality. Now USDA requires that it be called "textured soy flour" When did they start doing that? At least a year ago. The two terms ISP and SPI are interchangeable legally. Ralston prefers ISP of the two, because the emphasis is on the word "protein." "Isolated" sounds very chemical or foreign. Ralston would like to call it "soy protein" since its 90% protein. The other terms would be soy concentrate and soy flour. Nice! What is the difference? He says the difference is NOT dietary fiber but carbohydrates. He says fiber is removed from concentrates. But carbohydrates are the main thing removed in going from flour to concentrate. Recheck Smith & Circle, Wolf & Cowan.

Food Protein Council: Industry should be taking a position of advancing technology: Getting people like the USDA, in regulatory and purchase programs, to consider the best available ingredient. Half the members emphasize low cost. Narrow thinking of Council to focus on meat, not the whole food system.

ADM, GPC, Ralston petitioned for the removal of titanium dioxide. There is little competition between plain isolates and textured concentrate. Textured isolate is NOT a relatively small part of total business. Isolate flavor significantly better than concentrates at 20% extension of meat. But in many applications, such as dairy, concentrates have no role. He agrees isolate growth looks promising.

In 1960 Ralston started isolates at their Louisville, Kentucky plant.

The Fuji joint venture started about 1973. It is still very much alive, with Fuji providing the Asian Marketing. Only product made there is the "frozen fiber." The dry isolates are all made in the USA since its cheaper. He is not aware of any pollution problem; never heard it mentioned. Too expensive to ship frozen fiber to Japan. Frozen fiber is used mainly in seafood products.

New trends. Blood lipid research. They have a little folder on it. He'll send it. Ken Carroll and Sirtori. Using plant instead of animal protein lowers serum cholesterol and reduces atherosclerosis. Clinical studies individual with hyperlipidemia. Consumed as part of a modified diet. They have data from Carroll and Others. They cite references. The Big problem is the average dietitian does not believe soy proteins are a complete protein. They still think all vegetable proteins are "incomplete." They are trying to communicate to various publics the efficacy of this protein. No other new directions.

New Regulations. Prior to these in ca. Feb 1983 the only product allowed in the School Lunch program was textured soy flour. Now concentrates and isolates can be used. Only School Lunch. He has a brochure on it he'll send, Done by USDA Food and Nutrition Service. The old FNS 219 regulation. Use textured isolates in ground beef. Still not use that much textured isolate. Not small but not half. The dry granule.

There are many buyer mentalities. Some only buy beef. Some add only 1-2% TSP. Some use max 30% TSF to save as much money as possible. Some want "all beef quality" but would like to save a little. They point the blood lipid advantages. They might save 10-15% but he is not sure. The real determinant is how much they pay for their meat. Address: Manager, Marketing Communications, Ralston Purina Co., Protein Div., St. Louis, Missouri.

575. *Post-Dispatch* (*St. Louis, Missouri*). 1984. Week's business in review: Ralston Purina Co. announced plans to build... April 21.
• ***Summary:*** "... a five-story office building and develop a 4½-acre park on its Checkerboard Square property." A artists rendering shows the proposed design.

576. Ralston Purina Company. 1984. Second quarter report to shareholders and six months ended March 31, 1984. Checkerboard Square, St. Louis, MO 63164. 8 p. 22 cm.
• ***Summary:*** Page 1: "Shareholder news: Checkerboard Square Expands: Plans to expand and enhance the Company's Checkerboard Square headquarters complex were recently unveiled to employees and the St. Louis community. Plans call for an addition of a five-story office building and an improved working environment for the more than 2,400 employees at Checkerboard Square.

"William Stiritz, Chairman and Chief Executive Officer, said the $15 million project is a statement of Ralston's commitment to its employees and to the City of St. Louis. He said, 'This project will accomplish several key objectives. It will allow us to consolidate a large number of employees who currently occupy leased office space at other locations away from Checkerboard Square. Also, with the addition of the 4½ acre wooded area, we can offer employees a suburban-like setting in the heart of St. Louis' inner city which is undergoing one of the most dynamic and exciting periods in its history. As a result, we will benefit from a better work environment and accompanying productivity gains.'

"Construction on the expansion project will begin this summer and last approximately 18 months.

"Ralston Receives Dively Award: The Company has been selected from more than 60 nominees as the recipient of the first annual George S. Dively Award for Corporate Leadership in Urban Development. The Company's LaSalle Park Redevelopment Project was cited by George Dively, Chairman Emeritus of the Harris Corporation, for whom the award is named, as 'an example of outstanding corporate dedication to revitalization of an urban neighborhood.'

"The Dively Award carries a $25,000 stipend which provides five graduate fellowships for outstanding students

in the field of urban development. The Company has selected Cleveland State University [Cleveland, Ohio], Georgia State University, Rutgers University [New Jersey], St. Louis University and the University of Louisville [Kentucky] to receive equal portions of the stipend.

"General Counsel Change James M. Neville, Corporate Vice President and Secretary, has been elected General Counsel. This follows retirement plans announced by John P. Baird, Senior Vice President and General Counsel." Address: St. Louis, Missouri.

577. Wolf, W.J. 1984. Present status of edible soybean protein products in the United States. In: S. Wong, et al., eds. 1984. Proceedings of the Second U.S.-China Soybean Symposium. Washington, DC: USDA OICD. xix + 464 p. See p. 169-92. [30 ref]

• ***Summary:*** Contents: Introduction. Protein products: Grits and flours, concentrates, isolates, textured products, traditional Oriental soyfoods. Processing: Grits and flours (full-fat flours, defatted grits and flours), protein concentrates, protein isolates, textured protein products (flours, concentrates, isolates), Oriental products. Producers and production estimates: Producers. Food uses of soybean proteins: Functional uses, nutritional uses, factors limiting food uses, soy flour and grit uses, concentrate uses, isolate uses.

Table 2 shows "U.S. producers of edible soy protein products" in tabular form. The companies are listed alphabetically:

ADM: Flours, concentrates, isolates, textured flours, textured isolates.

Cargill: Flours, textured flours.

Central Soya: Flours, concentrates, textured flours, textured concentrates.

Farmland Industries: Flours, textured flours.

Grain Processing Corp.: Isolates

Griffith Laboratories: Concentrates, textured flours.

Honeymead Products: Flours.

Lauhoff Grain: Flours, textured flours.

Ralston Purina: Isolates, textured flours, textured isolates.

A.E. Staley Manufacturing Co.: Flours, concentrates, isolates (b), textured flours, textured concentrates.

Worthington Foods, Inc.: Textured concentrates (c), textured isolates (d).

a = Flours (untextured) includes grits and flakes

b = Regular and protease modified forms.

c = Meat analogs containing soy protein concentrate plus isolate.

d = Meat analogs containing spun soy protein isolate.

Table 4 shows annual production estimates (in metric tons or tonnes, obtained from industry sources for 1982), and selling prices (as of May 1983) for edible soybean protein products in the USA: Defatted soy flour and grits 159,000 tonnes ($0.32-$0.33/kg), textured soy flours 43,000 tonnes ($0.59-$0.77/kg), soy protein concentrates 36,000 tonnes ($0.88-$1.32/kg), textured soy protein concentrates 4,000 tonnes ($1.32/kg), soy protein isolates 41,000 tonnes ($2.42-$2.97/kg). Address: ARS/USDA.

578. Richardson, Catherine. 1984. Re: Ralston Purina's isolated soy proteins. Letter to Mr. Gary Barat, Legume, Inc., 170 Change Bridge Road, Suite D-52, Montville, NJ 07045, June 18. 2 p. 28 cm.

• ***Summary:*** "Dear Gary: It was a pleasure talking with you. I'm only sorry I didn't have more time to further discuss our isolated soy proteins, as well as some of our new product developments.

"Please allow me to further expand upon our conversation concerning Ralston Purina's isolated soy proteins.

"Ralston Purina has over twenty isolated soy proteins, each formulated to meet a variety functional criterion. Our isolated soy proteins are over 90% pure protein and with Purina Protein technology, virtually all the carbohydrates which can cause indigestion and contribute to soybean taste–have been removed.

"By contributing virtually pure protein, our isolated soy protein helps control calories in weight loss or controlled caloried [sic] foods. In addition, isolated soy protein can help you provide low cholesterol or cholesterol-free, pareve products.

"To detail some of our isolated soy proteins that are applicable for meat and dairy analogs, allow me to begin with the isolated soy protein you seemed to show a definite interest in.

"As we discussed, Purina Protein 200 is a high quality, structured isolated soy protein fiber in frozen, hydrated form. This elongated filament-like fiber is designed to simulate muscle fibers of poultry and seafood.

"Purina Protein 200 is manufactured at a pH of 5.5, which is at the point of minimum water-holding capacity. Purina Protein 200 should, therefore, be buffered with sodium carbonate (food grade) to elevate the pH between 6 and 7 to provide a tender and soft product. Buffering is accomplished by combining sodium carbonate, 0.5 to 1.0% of the fiber weight, with the formula, which is 10-15% of the fiber weight (as a starting point). This carbonate solution is then added to the Purina Protein 200 fiber and mixed for several minutes. Please note the enclosed experimental formulation for using Purina Protein 200, as well as the instruction sheet for use of Purina Protein 200. A five-pound sample of Purina Protein 200 with a packet of sodium carbonate, are being shipped to you under separate cover.

"I am also sampling you our developmental tofu-like product. This product is similar to tofu in taste and texture. The directions for mixing are as follows:

"1. Mix 70.0 g. of the Tofu mix with 430 ml. (1-3/4

cups) of water in a food blender for one minute.

"2. Slowly bring the mixture to a boil. Remove from heat immediately.

"3. Quickly stir in 3.0 g. coagulant and pour the mixture into molds. Let set at room or refrigerator temperature.

"Gary, please keep in mind that this mix is not yet commercially available and is still in the developmental stages.

"In addition to Purina Protein 200 and our tofu-like product, we also have isolated soy proteins that can be used by themselves, as well as in conjunction with tofu. Purina Protein 620 is an isolated soy protein with high viscosity, emulsification and gel-forming characteristics. A 4:1 ratio (H20:PP 620) will set to a rubbery gel in 15 minutes. Purina Protein 620 is ideal in systems that require a good emulsifier, as well as a texture forming isolated soy protein.

"Another isolated soy protein that performs well in non-dairy frozen dessert, sour cream, creamer, mousse, etc., is Purina Protein 710. A 4:1 solution (H20:PP 710) is pourable. Purina Protein 710 has a very smooth mouthfeel, as well as excellent whipping properties, making it an excellent isolated soy protein to incorporate in dairy-like desserts. Please note the enclosed sample formulation for experimental frozen dessert. Samples of Purina Protein 620 and Purina Protein 710 are being shipped under separate cover.

"I am well aware of the fact that my brief attempt of describing some of Ralston Purina's isolated soy proteins may leave you with quite a few questions, therefore, please note the enclosed literature that contains additional information on the products discussed, as well as on our general line of isolated soy proteins. Also enclosed are brochures on nutritional studies, that may be of some value in working with the dietary/healthy market.

"Gary, I would be most interested in meeting with you during your trip to St. Louis. I would appreciate the opportunity of demonstrating our products to you, as well as giving you the opportunity to meet with some of the people in the Protein Division at Ralston Purina. Perhaps, in our next conversion, we can make arrangements for a visit.

"I will be calling you to make sure that you received the samples. Should you have any questions before then, please feel free to contact me at 800/325-7108. I look forward to working with you.

"Sincerely," Address: Ralston Purina Company, Account Representative, Protein Div., Checkerboard Square, St. Louis, Missouri 63188.

579. Seo, A.; Morr, C.V. 1984. Improved high-performance liquid chromatographic analysis of phenolic acids and isoflavonoids from soybean protein products. *J. of Agricultural and Food Chemistry* 32(3):530-33. May/June. [15 ref]

• ***Summary:*** Discusses: defatted soy flakes, soy protein isolates (Ralston Purina Co.), daidzein, genistein, some phenolic compounds. Address: Dep. of Food Science, Clemson Univ., Clemson, South Carolina 29631.

580. Weaver, Connie M.; Nelson, Nancyann; Elliott, James G. 1984. Bioavailability of iron to rats from processed soybean fractions determined by intrinsic and extrinsic labeling techniques. *J. of Nutrition* 114(6):1042-48. June. [26 ref]

• ***Summary:*** Soybean hulls may be used as a ingredient in breads. Address: 1-2. Dep. of Foods & Nutrition, Purdue Univ., West Lafayette, Indiana; 3. Central Research Div., Ralston Purina Co., St. Louis, Missouri 63164.

581. Yang, Angel A.; Vander Zanden, Robert J. Assignors to Ralston Purina Company. 1984. Basal material for the preparation of tofu. *U.S. Patent* 4,460,613. July 17. 6 p. Application filed 1 Nov. 1982. [6 ref]

• ***Summary:*** "Abstract: A process for the production of a dried basal material used for the preparation of a soy based cheese food particularly tofu is set forth wherein a slurry of a soy protein material is formed followed by heating such slurry to a temperature of at least about 220º F. and the retention of such slurry in heated condition under positive pressure for at least a few seconds up to about a few minutes. Following heating of the slurry, the slurry is cooled and mixed with an edible oil which is added to said protein material in an amount sufficient to improve the whiteness of products which are produced with the basal material. The oil is preferably added to said soy material in a proteinaceous solids to oil ratio of between about 5 to 0.2:1. The mixture of oil and soy protein material is dewatered preferably by spray drying and then blended with other ingredients of a basal mix thereby forming a basal material for the production of soy cheese or tofu which has unusual characteristics. The present process provides an easy means of forming a starting material for tofu or soy cheese with an improved degree of whiteness over prior art starting materials and of a comparable texture to conventionally produced tofu or soy cheese." Address: Ralston Purina.

582. *Food Processing* (*Chicago*). 1984. Plants & laboratories [Far-Mar-Co]. July. p. 18.

• ***Summary:*** In a patent infringement case involving textured soy flour, a U.S. District Court in Wichita, Kansas, has ruled in favor of Ralston Purina Co. (St. Louis, Missouri). The court issued an injunction against Far-Mar-Co, Inc. (Kansas City), to prevent it from making or selling this textured soy product. The court also found Far-Mar-Co guilty of international patent infringement.

583. *Food Processing* (*Chicago*). 1984. Plants & Laboratories: A U.S. District Court has ruled in favor of Ralston Purina Co.,... July. p. 18.

• ***Summary:*** "... St. Louis, Missouri, in a patent infringement

case involving the company's textured vegetable protein processed product. The court issued an injunction against Far-Mar-Co, Inc., Kansas City, from further manufacturing or selling its soybean-based product."

Far-Mar-Co was also found guilty of international patent infringement.

584. Ralston Purina Company. 1984. Third quarter report to shareholders and nine months ended June 30, 1984. Checkerboard Square, St. Louis, MO 63164. 8 p. 22 cm.
• ***Summary:*** Page 1: "Ground Broken for Checkerboard Square Expansion: Over 3,000 employees and their families recently helped celebrate the official groundbreaking..." Address: St. Louis, Missouri.

585. *Record Stockman* (*Denver, Colorado*). 1984. Comment: We are appalled [Editorial criticizing Checkerboard Farms TenderLean from Ralston Purina]. Aug. 9.
• ***Summary:*** "Ralston Purina, which realizes untold millions each month in sales of livestock feed, supplements and supplies to American ranchers and farmers, is pioneering the sale of a product that is 75 percent ground beef and 25 percent soy protein to be called Checkerboard Farms TenderLean.

"This is not exactly a new innovation, since most institutional food services, sports stadium concessionaires and others trying to serve a hamburger on the cheap have been selling such a product for several years.

"These products are characterized by an almost total lack of flavor or juiciness as the soy protein soaks up the moisture. Certainly for most consumers they have made the sales of ketchup, mustard, raw onions and pickle relish boom.

"Presumably Ralston Purina has found some new innovation that makes soy protein taste like beef, since they call their extender 'isolated soy protein.' They pitch it at what they call 'the Active Lifestyle consumer who wants a satisfying ground beef product that delivers less fat and cholesterol and fewer calories than USDA standard ground beef.' Currently TenderLean is available only on a test market basis in Milwaukee.

"There is a weak argument to be made that this product is helpful to the beef industry since it does still contain 75 percent beef. Midwest beef producers also raise soybeans, so the product does help keep the agricultural economy strong, if it sells.

"We believe this argument pales by comparison with the damage Ralston Purina is doing by putting in with the Diet-Health critics of red meat. They are admitting, in so many words, 'that beef may be fat, high in calories and unhealthful, but here's away to eat a little of it with less damage–kind of like putting filters on your cigarettes–its still damaging to your health, but maybe you won't get cancer or emphysema quite as quick this way.'

"We believe that a vast majority of the red meat industry is unwilling to concede that there is any health risk in eating beef, and for a major cornerstone of that industry like Ralston Purina to hint that this could even possibly be the case, is a major breach of faith with the livestock producers from whom they have realized a substantial portion of their revenues over the years."

A photo at the bottom shows 2 chubs of TenderLean, one partly sliced. In the foreground are hamburgers on a grill.

586. *Feedstuffs.* 1984. Ralston Purina to introduce new beef product [Checkerboard Farms Tenderlean]. 56(33):3, 41. Aug. 13.
• ***Summary:*** This product which is "part beef and part soy protein will be aimed at the 'active lifestyle' consumer." A photo shows the product in chub form next to a hamburger.

587. *Beefweek* (*Macon, Georgia*). 1984. It'll fry... but will it fly? Editor's viewpoint. Aug. 20. p. 6.
• ***Summary:*** Ralston Purina Co. has introduced Tenderlean, a mixture of 75% ground beef and 25% soy protein. It is targeted at the "active life-stylers," who turn to ground beef because it is quick and easy to serve, and who say they want less fat, less cholesterol, and fewer calories. This product will contain 50% less fat, 25% less cholesterol, and 37% less calories. "Researchers at Ralston Purina, certainly among the best anywhere, contend that it will be the first fresh meat product to bear nutritional labeling, that shelf-life will surpass present ground beef products, and that 'brand' advertising will put an upbeat to beef selling." Test marketing will start soon.

588. *Beefweek.* 1984. TenderLean. From Checkerboard Square: A jump into a new kind of beef-soy product. Aug. 20. p. 17.
• ***Summary:*** The product is now being test marketed in Milwaukee. It will be priced comparably to ground chuck, but will have less calories and cholesterol. Address: Macon, Georgia.

589. Koellermeier, Dave. 1984. [Comments on editorial criticizing Checkerboard Farms TenderLean from Ralston Purina] (Letter to the editor). *Record Stockman* (*Denver, Colorado*). Aug. 23. [1 ref]
• ***Summary:*** "A 1982 report by the Special Advisory Committee of the National Cattlemen's Association, entitled 'The Future of Beef,' noted that the meat industry has entered a mature stage over the last 20 years, with per capita consumption of meat, including beef, leveling off at about 200 pounds per year. In the last decade, per capita annual beef consumption has fallen from 94 pounds to only 77 pounds. The report concluded that two of the key factors in achieving beef industry growth in this highly competitive situation are 'development of new beef uses and

beef products, and capturing a greater share of the available market for meat.'

"'The industry will have to become more market-oriented in all respects–determining consumer wants and needs, and then improving product acceptance through information and promotion programs aimed at different market segments.' the NCA report concluded. The bottom line is that when it comes to meat purchases, the industry must respond to consumer demand.

"The industry recently embarked on an ambitious effort to clearly define consumer attitudes toward meat. An extensive study, sponsored jointly by the National Live Stock and Meat Board and the American Meat Institute, showed that meat buying habits divide consumers into five distinct categories: 'Meat Lover.' 'Creative Cook,' 'Price Driven,' 'Active Lifestyle' and 'Health Oriented.'

"The study clearly identified the 'Active Lifestyle' consumer–young, affluent and on-the-go–as a prime meat industry target. The study showed that 25 percent of those in the 'Active Lifestyle' segment are reducing the amount of meat they consume because of diet/health concerns. It also indicated that 65 percent of these consumers are concerned about the fat content of meat, 34 percent about cholesterol, and 43 percent about calorie content.

"Purina developed Checkerboard Farms TenderLean in an effort to reverse this trend to reduced beef consumption. This unique product contains 75 percent, American-produced lean ground beef blended with a new form of isolated soy protein that in no way alters the good taste, appearance or cooking qualities of the meat. The result is a satisfying ground beef product that meets the 'Active Lifestyle' consumer's demand for less fat and cholesterol and fewer calories.

"We strongly believe Checkerboard Farms TenderLean can help reestablish fresh ground beef as a dietary staple among 'Active Lifestyle' consumers who are attracted to its taste, appearance and cooking convenience, but who have been steadily reducing beef consumption due to a fairly high level of concern about diet/health issues." Address: Product Group Director, Cattle Chow Marketing and Liquid Technology, Ralston Purina Co., St. Louis, Missouri.

590. Malone, Matt. 1984. Farmland [Agriservices] sold its textured soy flour operation to PMS Foods, Inc. (Interview). *SoyaScan Notes.* Aug. 27. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** The sale took place in August 1983. PMS makes Ultra-Soy textured soy flour under license from Ralston Purina Co. Address: Farmland, Hutchinson, Kansas. Phone: (316) 663-5711.

591. Williams, John D.; Guyon, Janet. 1984. ITT signs pact to sell baking unit to Ralston: proceeds of Continental sale at $475 million would be used to cut parent's debt. *Wall Street Journal.* Aug. 31.
• ***Summary:*** Ralston Purina has been selling off unprofitable operations since William Stiritz became chairman and CEO in July 1981.

"Despite the fast growth in recent years of variety breads [such as whole wheat] that compete with Wonder," Wonder Bread remains that best-selling bread in the USA. Address: Staff Reporters for the WSJ.

592. **Product Name:** Checkerboard Farms TenderLean (Mixture of 25% Isolated Soy Protein and 75% Ground Beef).
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164.
Date of Introduction: 1984 August.
Ingredients: 75% lean beef, 25% isolated soy protein.
Wt/Vol., Packaging, Price: 1.5 or 3 lb plastic, vacuum-sealed chub packs (sausage shaped).
How Stored: Refrigerated.
Nutrition: 4 oz. Tenderlean (vs. ground beef): Calories 240 (380), protein 21 gm (17.5 gm), fat 17 gm (34 gm), cholesterol 60 mg (80 mg), moisture 74 gm (61 gm).
New Product–Documentation: Register (Des Moines). 1984. Aug. 16. "Ralston hopes beef, soybeans mix." Beefweek. 1984. Aug. 20. p. 17. Product contains 75% American lean beef and 25% soy protein, and has 50% less fat than the USDA standard for ground beef. The first fresh meat product to bear full nutritional labeling. The product is targeted at "Active Lifestyle" consumers who eschew fat and cholesterol in beef. Missouri Beef Cattleman (Kansas City, MO). 1984. Sept.

As of June 1985 Ralston is test marketing Tenderlean in Milwaukee, Wisconsin–says Fritz Schwarz, consultant.

593. American Soybean Assoc. ed. 1984. First European Soyfoods Workshop, Proceedings. Brussels, Belgium: ASA. 129 p. Held Sept. 27-28 at Amsterdam, Netherlands (Krasnapolski Hotel). No index. 30 cm. [38 ref]
• ***Summary:*** Contains 9 papers, mainly on soyfoods in Europe. A directory includes company name, person's name, and address for the conference's 105 participants. Organizations represented include Caderas de Kerleau, Aarhus Oliefabrik (Aarhus C, Denmark), Aixagri, Alfa-Laval, Alfa-Laval Food (John Wilson), Alpro N.V. (Ph. Vandemoortele, Ch. Daems), Alpura Koreco Ltd., Aros Sojaprodukter (Ted Nordquist), BRT, Cargill (R. Sevink, Amsterdam, Netherlands), Cauldron Foods Ltd. (Mr. Marshall, Mr. Fagan), Centraalbureau Voor Schimmelstruct, Centro Studi Proteini Vegetali, CETIOM ONIDOL (Emmanuel Prudom, Toulouse, France), Chemex, Comite Eetbaar Plantaardig Eiwit (Hague, Netherlands), Consumers' Association, Condimenta, Cooperative Occitane, Danish Turnkey Dairies Ltd., Delisana Natuurvoeding, Deutsche

AMERICAN SOYBEAN ASSOCIATION

FIRST EUROPEAN SOYFOODS WORKSHOP

SEPTEMBER 27-28, 1984

KRASNAPOLSKI HOTEL

AMSTERDAM

Gesellschaft für Ernaehrung [2 different addresses], DE-VAU-GE Gesundkostwerk (Dr. W. Lubosch), Dragon & Phoenix Ltd. (Donald Lysen), E & R Chemicals, Edelsoja GmbH (K.O. Tielker), E.M. Chajuss Ltd. [Daniel Chajuss], Fa L.L. Frank (Missendorp de Bie), Fed. Nat. Syndicats De Dietetique, F.I.M. Houterman, Food Industries, Food Manufacture, F.M. Lin, Galactina Ltd. (P. Speck), Gebruder Bauermeister, Gemint, Giulini Chemie, Goorden Import Cy, Henselwerk GmbH (Rolf Berger), Heuschen (Mr. Heuschen, Deurne, Netherlands), Itona Products Ltd. (Mr. and Mrs. Hampson), Ivel, Keuringsdienst Voor Waren, Libelle, Lucas Meyer (Axel Schulte), Masterfoods, Melkunie Holland, Niticel B.V., ONIDOL (Guy Coudert), Paksoy TIC, Paul's Tofu (Paul Jones), PFW Nederland BV, Plumrose FDD, Premier Foods, Purina Protein Europe (A.G. van der Horn & Willy Naesens, Zaventem, Belgium), Royal Neth. Dairy Federation, Ruitenberg N.V., Sanico N.V., S.G.A. Flavours, SIO [Societe Industrielle des Oléagineux, Marie Gérard, Nanterre, France], Sopad Nestlé (Mr. Rolland, France), Sojadoc (A. Lacombe, P. Roger, Mr. Henras & Mr. Attié; St. Paul, 81140 Penne du Tarn, France), Sojaquelle (Wolfgang Furth-Kuby), Solnuts B.V. (J. Liebregts), Soy (De Preneuf, Cerny, France), Staley Intern[ational], Stern Chemie (Volkmar Wyviol, Hamburg), UNCAA, Union Deutsche Lebensmittelwerke [Hamburg], Univ. of Strathclyde [Glasgow, Scotland], Vamo Mills (B. Cleenewerck, Ghent, Belgium), Verstegen Specerijen, V.D.SP.V.B.A., Wenger International (I. Ben Gera, Antwerp, Belgium).

Registered on Sept. 27. Naarden Intl., Protevit, Wessanen, Mr. Karas & Mr. Drosihn [Soyastern–From Germany, not Turkey].

A note in the Nov. 1984 issue of *Soya Foods* (ASA, Europe) (p. 2) stated that the workshop was attended by 105 people from 14 countries, and was considered to have been very successful.

Note 1. This is the earliest published document seen (May 2015) concerning Sojadoc of France.

Note 2. E.M. Chajuss is the name of Daniel Chajuss' father. He and his son founded Hayes Ashdod Ltd. "E.M. Chajuss Ltd." is a limited or incorporated company that was jointly owned by Daniel and his father. Daniel Chajuss attended this Soyfoods Workshop as a "delegate" of E.M. Chajuss Ltd. company.

Note 3. This is the earliest document seen (March 2020) that mentions Wessanen of the Netherlands. Address: Brussels, Belgium.

594. *Stockgrower.* 1984. Facts about Checkerboard Farms TenderLean. Sept.

• ***Summary:*** Consumers can be divided into five groups based on their meat buying habits: Meat Lover, Creative Cook, Price Driven, Active Lifestyle, and Health Oriented. "According to the National Livestock and Meat Board, 27% of those on the "Active Lifestyle" segment are reducing the amount of meat they consume because of diet/health concerns. 65% of them are concerned about the fat content of meat, 34% about cholesterol, and 43% about caloric content."

Tenderlean is the first fresh-ground beef product containing 75% lean ground beef with a unique, new isolated soy protein. It is available only in Milwaukee on a test basis. It is the first fresh-meat product to bear full nutritional labeling. Comparing 4 ounces of USDA standard ground beef with Tenderlean: Calories: 380 vs. 240. Total protein: 17.5 gm. vs. 21.0 gm. Fat: 34.0 gm vs. 17.0 gm. Cholesterol: 80.0 mg vs. 60.0 mg. Address: Rapid City, North Dakota.

595. Cook, Fred. 1984. World production of isolated soy protein (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 1.

• ***Summary:*** You can use two approaches to get an estimate: (1) Best guesses at capacity. (2) Using US export stats and all exports.

Both ways yield ca. 217-218 million lb.

He got Japanese figures from his consultant. Including China, Brazil is making some and expanding. #1 is USA, including a little made by Staley. #2 is Belgium? #3 is Japan. #4 is Brazil made by Bunge/Samrig. Very small amount made in India by Tata/Sadawa? Mills, plus 2 other mills planning to start.

China = 0.5-2.0 million lb. Total = 217-18 million lb.

Q = Who are main makers in Japan?

Q = Is Japan bigger than Belgium?

He heard a rumor that there is a second isolate plant in China. Two Japanese companies involved. Fuji and Nisshin? Address: Ralston Purina.

596. Cook, Fred. 1984. Ralston Purina's production of isolated soy protein (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 1.

• ***Summary:*** Total US isolate exports are known. Assume 80% Ralston. Add to that Ralston's Belgium production. That is an enormous plant! Minimum 30 million lb/yr. Perhaps as high as 60. They make it there to avoid EEC duties or shipping. Exports out of Belgium are also very large. Not only the famous Ralston-USSR contract (Ralston ships them about 30 million lb/yr, from both Belgium and US) but also to EEC countries.

Exports from Belgium (what is made there plus some imports) may very well be over 50 million lb. Very big.

Now, if you figure 80% of US exports plus the Belgian plant, then read the annual report which states that 80% of their protein business (sales?) is done overseas (= probably produced + shipped overseas). This gets back to a Ralston total volume of 95-100 million lb. This ties back to the figure I heard from Kolar in 1980? of 100 million. But that should have gone up. Alfa Laval just supplied them with a new drier in Belgium. Thus we can get at the total from two

approaches. Final is higher than I am but not as high as he was initially.

He has added some figures to the worldwide sheet, as textured isolates and concentrates in Japan.

He thinks Japan does about 13,000 tonnes (metric tons) of isolates and concentrates and 13,000 tonnes of textured soy flour (TSF) and related products. He is not sure of these isolate figures.

Actual production of soy protein isolates

60 million lb at Prior, Oklahoma for Ralston

50 million lb at Memphis, Tennessee for Ralston

10 million lb at Chicago, Illinois, for ADM

12 million lb at ? for Grain Processing Corp. Address: Ralston Purina.

597. *Wall Street Journal.* 1984. Ralston signs to sell 6 soybean facilities to Minnesota firm. Oct. 19. p. 49, col. 1.
• ***Summary:*** The plants were sold to Cargill. The move is part of Ralston Purina's attempt to move away from commodity based businesses to higher-margin consumer goods. The seventh mill, in Memphis, Tennessee, is reported to be permanently closed.

We are not told where the plants were located except that they are in the Midwest and Southeast.

The soybean industry has been unprofitable for the past three years as a result of lagging export demand and excess capacity.

Cargill, a closely held firm "which doesn't have to report earnings on a quarterly basis to shareholders, is in a better position to withstand several more years of slack profit in the cyclical commodity business, an executive from a competing company said.

"Cargill said the industry will probably suffer from excess capacity for several more years. 'We believe in the long-term potential of soybean processing.' a Cargill spokesman said."

598. Walter, John. 1984. An experiment in packaging. *Successful Farming in the South* 82(11):B14. Oct.
• ***Summary:*** About Ralston Purina's Checkerboard Farms TenderLean, a food product which contains 75% ground beef and 25% "isolated soy protein." Purina says its intent is to increase beef consumption by appealing to the diet / health conscious consumer.

A photo shows a patty next to a chub of TenderLean. Address: Assoc. Beef Editor.

599. Cahalan, Steve. 1984. Staley created market. *Herald & Review* (*Central Illinois*). Nov. 14. p. A3.
• ***Summary:*** "In large part, Decatur owes its title of 'Soybean Capital of the World' to Augustus E. Staley Sr., founder of A.E. Staley Mfg. Co. which in turn founded the U.S. soybean processing industry in the early 1920s.

"The title was promoted by the late Henry H. Bolz, longtime general manager of the Association of Commerce. He said the title was justified because Staley almost single-handedly encouraged farmers to grow soybeans and provided the first and most dependable market.

"Staley was born in 1867 on a farm near Julian, North Carolina, and at age 17 became a traveling salesman of such products as starch, baking powder and flavoring extracts.

"After 15 years as a traveling salesman, he started his own starch business in Baltimore. He purchased the former Wellington Starch Co. plant in Decatur in 1909 and moved to the city.

"The company survived tough times after World War I and gradually expanded.

"Staley opened his first soybean processing plant in 1922 in Decatur, after urging farmers to grow soybeans.

"He put together a traveling promotional and educational 'Soil and Soybean Special' train which traveled through Central Illinois in 1927.

"The special train of six cars and an engine had exhibits about soybean planting, cultivation, processing and uses; motion picture theaters, and a lecture car.

"The U.S. Department of Agriculture, University of Illinois College of Agriculture and Southern Illinois State Normal University at Carbondale helped put the exhibits together.

"In the 1930s, Staley envisioned using refined soy bean oil in foodstuffs instead of just using the crude oil as a substitute oil in paints and soaps. He also convinced feed formulators to use the protein-rich meal in their feed mixes.

"Asked in the late 1930s what his hobby was, he answered, 'Soybeans, I guess. They're my baby.'

"He first became interested in soybeans as a boy, after his father had been given some soybeans by a missionary who had returned from China. The city's major processors and the production from the surrounding area led to the grain trade pricing soybeans and bean products 'F.O.B.' Decatur. That designation provided the official stamp of approval to Decatur's "soybean capital" claim.

"Decatur now has just two soybean processors, down from five in 1953.

"They are Staley and Archer Daniels Midland Co., the world's largest until Cargill Inc. recently purchased the soybean facilities of Ralston Purina."

A portrait photo shows Mr. A.E. Staley. Address: Herald & Review Farm / Business Writer.

600. Ingram, Ron. 1984. Analysts: Staley to drop soybeans. *Herald & Review* (*Central Illinois*). Nov. 14. p. A3.
• ***Summary:*** "A.E. Staley Mfg. Co.'s review of its soybean operations is seen by market analysts as another move by the Decatur firm away from total dependence on agribusiness for its profits.

"'They're throwing in the towel. They've given up hope of the soybean business coming back to an adequate return

on investment,' said David Goldman, a vice president with E.F. Hutton & Co. Inc., New York.

"'Long term, maybe this (soybean crushing) doesn't fit any longer' in Staley's plans, said Craig Carver, a vice president with A.G. Edwards & Sons Inc., St. Louis.

"If Staley should sell its soybean operations, both analysts agreed it would be a positive move for the company.

"'The soybean crushing business in good times tends to be quite volatile, and we haven't had many good times in the last few years, Carver said. 'Staley has gotten the reputation for running that business pretty conservatively and that eliminates a lot of profit opportunities. You have to manage the business aggressively to take advantage of swings in the markets.'

"Goldman said it appears Staley sees there has been a fundamental change in the soybean processing business which has permanently reduced the profit potential for soybeans.

'If you'll pardon the pun, all of their soybean earnings didn't amount to a hill of beans anyway,' he said. 'It's been a drag on earnings. It's been a drag on return.

"Goldman said Staley should be able to 'get some cash for it, even if they have to write off something' to do so.

"Referring to Staley's recent merger agreement with CFS Continental Inc., nationally the No. 2 food service industry supplier, Goldman said the acquisition will help Staley restructure into high-growth and high-return areas. `When it's all over they will be less of an agricultural company than they were.'

"Carver said last week's announcement by Pepsico and Coca Cola to use 100 percent high-fructose corn sweetener–a major Staley product–in their colas may have helped Staley toward a decision to review its soybean operations.

"Fructose will make the whole corn milling industry some good margins as a result of the major bottlers' decisions, Carver said. Carver said there are some potential buyers for Staley's soybean operations, among them Central Soya of Fort Wayne, Indiana; Conagra Inc. of Omaha, Nebraska, or Continental Grain Co. of New York.

"He also suggested Decatur-based Archer Daniels Midland Co. could buy part of Staley's milling capacity, but could not acquire it all without getting in trouble with the U.S. Justice Department over antitrust violations.

"Goldman said ADM is 'up to something sneaky.' He said between June 30 and Sept. 30 ADM's cash position increased to $1 billion from $300 million, strongly implying the company is preparing to make a major acquisition.

"'I wonder if they may have known something about Staley,' Goldman said.

"Richard E. Burket, ADM vice president and assistant to the chairman, declined Tuesday to comment on Staley's announcement that it is reviewing soybean operations.

"Burket acknowledged ADM was aware of the action and added, 'At this time we don't know what we might be able to do.'

"ADM is the second-largest U.S. soybean processor. It held the No, 1 ranking until recently when Cargill Inc. of Minneapolis, Minnesota, acquired the mills owned by Ralston Purina Co. of St. Louis [Missouri]. The acquisition pushed Cargill into the top spot among U.S. soybean processors." Address: Herald & Review Farm / Business Writer.

601. *Food Engineering.* 1984. Is this beef/soy combo better than beef? This new beef/soy-protein combo claims more total-protein than standard ground beef, less fat, calories, and cholesterol [TenderLean from Ralston Purina]. 56(11):71. Nov.
• ***Summary:*** A large photo shows two chubs of Tenderlean–one cut crosswise, the other uncut. It bears this caption: "This beef / soy protein combination looks, cooks and tastes like standard ground beef, and can be used in any ground beef recipe."

602. Ralston Purina Company. 1984. Annual report to shareholders 1984. St. Louis, Missouri. 40 p. 28 cm.
• ***Summary:*** In the financial section, under "Raw materials" we read (p. 17): "The Company has entered [in Oct. 1984] into a preliminary agreement with Cargill, Inc. to sell six of the Company's seven soybean plants. On completion of the sale, the Company will purchase all of its soybean meal requirements for animal and poultry and poultry feeds, pet foods, and soy protein products from outside soybean processors. This should not materially affect the cost of soybean meal to the Company." Address: St. Louis, Missouri.

603. Associated Press (AP). 1984. Farmers upset at proposed soybean facility sale. *Morning Herald* (*Durham, North Carolina*). Nov. 20.
• ***Summary:*** North Carolina farmers say they are afraid that the proposed sale of a Ralston Purina Co. soybean crushing plant in Raleigh to Cargill might give Cargill a near monopoly on the state's soybean market.

Ralston Purina wants to sell soybean crushing plants in six states to Minnesota-based Cargill, which may be the world's largest agribusiness company. Address: Herald staff writer.

604. *SoyaScan Notes.* 1984. Chronology of soybeans, soyfoods and natural foods in the United States 1984 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. A highly influential 10-year, $150 million study released by the National Heart, Lung, and Blood Institute in Washington, D.C. proves for the first time a direct relationship between high blood cholesterol and the risk of heart attack, the nation's number one killer.

Jan. Legume, Inc. launches an all-natural line of cholesterol-free low-calorie Italian and international gourmet tofu-based frozen entrees in stylish full-color packages: Tofu Tetrazzini, Cannelloni Florentine, Vegetable Lasagna, Tofu Bourguignon, Sesame Ginger Stir-fry, Stuffed Shells Provencale, Tofu Manicotti, and Tofu Lasagna. Jan. Eden Foods becomes the sole import agent for Muso Shokuhin in the United States.

Feb. 25. *Soymilk Industry and Market: Worldwide and Country-By-Country Analysis*, by Shurtleff and Aoyagi published by Soyfoods Center. 177 pages, 640 references. $350.

Feb. Marusan-Ai, Japan's second largest soymilk maker and one of the five largest miso makers, starts to market tempeh. They publish a 27-page tempeh booklet and by May are producing 30 tonnes (66,000 lb.) of tempeh a month, making them the largest tempeh manufacturer in the world. During 1984 at least five Japanese food companies are making tempeh, leading to a mini-boom of this soyfood which was first sold commercially in Japan in 1983.

March 2. Based on responses to his Oct. 1983 survey, Tom Timmins drafts preliminary 3-page tofu standards (2 pages of which are microbiological standards) that he circulates to the Soyfoods Standards Committee, inviting comments. On March 6 Wm. Shurtleff of Soyfoods Center expands these, keys them into the Center's word processor, and returns them to Timmins.

March 2. Problems start between Eden Foods and the U.S. Food and Drug Administration (FDA). FDA sends Eden a strongly worded letter citing eleven claims in Eden's brochures that the agency considers erroneous, including the company's apparent endorsement of Edensoy as an infant formula. FDA asks Eden to recall the brochure in which Edensoy is promoted as "Good for Babies." An infant became ill due to copper deficiency on an Edensoy diet.

March 8. Soyfoods Association of America members have 12 pages of impressive color advertisements and information about soyfoods and the Association in Natural Foods Merchandiser, in preparation for the NFM Anaheim Natural Foods Expo in March. Full-page color ads by Legume, Erewhon shoyu, Vitasoy, San-J, Tofutti, Edensoy, and Pure & Simple soy sauce.

March 11-13. At the Natural Foods Expo at Anaheim, the Soyfoods Association organizes the first Soyfoods Pavilion, a 16-booth cluster of soyfoods companies and products, which is the hit of the Expo and a show of strength for the industry. Lots of delicious free food draws throngs from the 9,000 Expo attendees.

March 11. At Anaheim, Vitasoy launches its first designed-for-America soymilk, in natural, coconut, and chocolate flavors, each sweetened with maple syrup, and imported from Hong Kong. Many subsequent eye-catching, health-oriented full-page color ads are run in national health magazines.

March 29. First draft of the Tofu Standards, 15 pages double spaced, is compiled by Shurtleff. Timmins allocates $2,000 to retain two Washington, DC, attorneys who are specialists in foods and regulations to assist the committee in developing professional standards. The draft is circulated to 38 people who are asked to respond to a poll on 14 key issues.

March 29. The term "second generation" products is first applied to soyfoods by Wm. Shurtleff in the new tofu standards. A computer-related term indicating one step more advanced, it quickly replaces the term "secondary," which has a slightly negative connotation.

March. American Soybean Association's Belgium Office publishes the first issue of *Soya Foods*, a 6-page newsletter edited by Michael Martin, Protein Market Development Manager. It will be issued three times a year in English, French, Dutch, and Italian. This is a completely new direction for ASA in the Western world... but it doesn't last long.

April 7. *Soyfoods Industry and Market: Directory and Databook 1984* (4th ed.) by Shurtleff and Aoyagi published by Soyfoods Center. 215 pages, $95.

April 13. Richard Leviton resigns as co-director of *Soyfoods* magazine and decides to discontinue his active involvement in the U.S. soyfoods movement. He plans to go to England to write a novel about King Arthur; he leaves in late April.

April 20. *Tofu, Tempeh, & Other Soy Delights*, by Camille Cusumano published by Rodale Press. It is widely and positively reviewed by national media.

April 27. The term "soymilk" is legalized for use in Canada, after a lengthy and expensive court battle by Victor Food Products. The court ruled that this is the "common and ordinary term" for the product, used since about 1918 in scientific articles and commerce. Thus it cannot be squelched by dairy interests.

April. New England Soy Dairy, America's largest Caucasian-run tofu manufacturer, changes its name to Tomsun Foods, Inc.

May. *Nutritional Cooking with Tofu*, by Christine Liu published by Graphique Publishing in Michigan.

May. American Natural Foods (formed in Jan. 1984 by John Troy, creator of miso-containing Hot Stuff) has a private stock offering that raises $150,000. In October ANF debuts a line mainstream American sauces and seasonings, each featuring miso, that are delicious and beautifully marketed.

May. *Die Tofu Kueche* (The Tofu Kitchen), by Verena Krieger, Swiss soyfoods pioneer, published by Tanner + Staehelin Verlag in Zurich. 171 pages with many photos.

June 7. "Tofu" by Barbara Hansen and "Tofu: Americanization of a Soy Food" by Karen Gillingham published in the *Los Angeles Times*.

June. Landstrom Distributing Co. of San Francisco,

files for Chapter XI bankruptcy. Keene Distributors of Texas, and Collegedale of Tennessee, both profitable, well-run companies, are also pulled under, innocent victims of the Landstrom collapse. All three units were owned by Nutritional Foods, Inc. and all were major natural / health foods distributors. These bankruptcies seriously hurt the natural foods industry as well as many individual companies; sales and confidence plummeted nationwide. In late 1984 Fillmore Foods purchased Landstrom, and Balanced Foods purchased Collegedale and Keene.

June. Migros, Switzerland's largest supermarket chain, launches Tofu Nature, its own brand of tofu, made at Conserves Estavayer S.A., with widespread publicity and excellent product information on both tofu and soybeans. It is sold in the same section as dairy products and eggs. The launch is considered a great success; supply is not able to catch up with demand until late December.

June. *The Book of Soybeans,* by Tokuji Watanabe and Asako Kishi published by Japan Publications. 191 p.

June. *Using Tofu, Tempeh & Other Soyfoods in Restaurants, Delis & Cafeterias,* compiled by Shurtleff & Aoyagi, published (comb bound; 181 p.) by Soyfoods Center.

July. Kikkoman completes its second major shoyu (Japanese-style soy sauce) plant outside Japan, in Singapore. The 18,000 square meter factory, with a capacity of 3,000 kl (792,500 gallons) a year and 40 employees, costs $14 million. It will make shoyu and teriyaki sauce. Official opening ceremony was Nov. 21.

July. The requirement in effect since 1965 that isolated soy protein used as an ingredient in meat and poultry products must contain titanium dioxide as a tracer, is removed from federal meat and poultry products inspection regulations, following a petition by ADM, Grain Processing Corp., and Ralston Purina.

July 9. "Its Trendy, Tasty and Tofutti" (2/3 page) by J.D. Reed published in *Time* magazine (U.S. circulation 4.3 million). Probably the biggest media coverage for tofu in U.S. history. Tofutti hits the big time!

July 17. *History of Tempeh,* by Shurtleff and Aoyagi published by Soyfoods Center. 102 pages, including 375 references. Continued.

605. *SoyaScan Notes.* 1984. Chronology of soybeans, soyfoods and natural foods in the United States 1984 (Continued–Part II) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: July 26. At the NNFA (National Nutritional Foods Association) show in Atlanta, Georgia, Great Eastern Sun rolls out Ah Soy, its new line of soymilk imported from Saniku Foods in Japan, in vanilla, chocolate, and plain flavors, in foil retort pouches. After the show, the Soyfoods Association board meets. Steve Snyder replaces Michael Austin as director of SAA. The next day, SAA directors Snyder, Burke, and Barat travel to St. Louis, Missouri, to meet with the staff of the American Soybean Association to discuss possible areas of mutual interest. ASA appears friendly and open minded, and offers to discuss specific future joint projects. A potential line of communication is opened.

July 30. *People* magazine (circulation 2.8 million) article on Tofutti titled (ineptly) "A Happy Zealot Turns Curd (Yuck!) into a Creamy Treat."

July. "The Soyfoods Industry: Growing Like a Beanstalk" by B. Bialick published in *Whole Life Times.*

Aug. 9. The last issue of Soyfoods magazine (No. 10) arrives, with its first color photo on the cover. 7,000 copies printed at a cost of $11,200. Doug Fiske of Encinitas, Calif., a professional editor and publisher, did a fine job. Magazine's focus has been changed from production to marketing of soyfoods.

Aug. 12-17. World Soybean Research Conference III held at Iowa State University. Heavy emphasis on soybean production and agronomy; relatively little new material on soyfoods. Soyfoods movement is not represented.

Aug. 20. Ralston Purina introduces Checkerboard Farms TenderLean, America's first branded ground beef product consisting of 75% ground lean beef and 25% textured soy protein isolate. Some meat journals are harshly critical and many meat departments refuse to carry it. Ralston withdraws the product.

Aug. 24. Westbrae Natural launches WestSoy Natural, a plain soymilk similar to Ah Soy but lower in price and made with organic ingredients. Imported in a foil pouch from Saniku Foods in Japan, it is the company's first soymilk.

Aug. 31. San-J International Inc. announces that it will construct a soy sauce plant (44,000 square foot, $5 million) in Virginia on a 27-acre site just north of Colonial Heights.

Sept. Chico-San, Inc. introduces unpasteurized miso in a revolutionary "Pressure Release Package," a plastic bag with a one-way valve that allows the escape of the carbon dioxide produced naturally during fermentation.

Sept. 9-14. Gloria Vanderbilt announces that she, in conjunction with Dolly Madison and Frusen Gladje, will launch a tofu ice cream.

Sept. 27-28. First European Soyfoods Workshop held in Amsterdam, The Netherlands, at the Grand Hotel Krasnapolski, organized by the American Soybean Association's Belgium office. ASA reports attendance as 105 people from 14 countries, but participants report a maximum of 50 participants. Talks on tofu, soymilk, tempeh, distribution, and microbiological standards, all later published in the Proceedings. There is a large Expo with soymilk equipment from Alfa-Laval and Soya Technology Systems prominently featured. A very successful event, and another ASA first!

Oct. *The Tofu Gourmet* by Linda Barber and Junko Lampert published by Kodansha in Menlo Park, CA. 129 p.

Many color photos.

Oct. 15. "Here Tofutti, There Tofutti," a full-page, very positive article with 2 color photos published in *Newsweek* magazine (circulation 3 million).

Oct. 23. The joint managing directors of the International Food Information Service, owners of Food Science and Technology Abstracts (FSTA, the world's largest, oldest, and most widely used food-related computerized database) visit William Shurtleff at The Soyfoods Center to discuss putting the 6,500 bibliographic records in The Soyfoods Center Library into FSTA, thus making this information available worldwide. Both parties are very interested in the project but technical problems remain to be solved.

Oct. Westbrae Natural Foods launches Malted's, billed as "thick and rich non-dairy soy delights." Marketed like a milkshake and imported from Japan in a foil pouch, they come in three flavors: vanilla, carob, and cocoa-mint.

Oct. Three member team from Plenty Canada spends one month in Sri Lanka, funded by the Canadian International Development Agency, studying the country's soyfoods program. They learn, teach, and introduce tofu ice cream.

Nov. 13. A.E. Staley Manufacturing Company, America's oldest existing soybean crusher, announces that its soybean crushing operations are for sale.

Nov. 20. Tofu Time's first Tofutti Shop opens in uptown Manhattan, New York. A fast-food retail outlet with a slick, red-and-white plastic, almost gaudy, decor.

Nov. 16. Chico-San Inc. is purchased by H.J. Heinz Co., largely for its rice cake business.

Nov. 21. After years of searching, William Shurtleff, with help from Nancy Florida in Java, discovers an 1815 reference to tempeh in the *Serat Centini,* from the Court in Solo, Java. This pushes the earliest reference to tempeh back 60 years and has it originating in Indonesian rather than in Dutch culture.

Nov. 30. America's first Tofu Standards are issued by the Soyfoods Association's Tofu Standards Committee, in part to help stem the rising tide of products bearing the name "tofu" that contain little or no tofu.

Nov. Galactina, a Swiss manufacturer of soymilks since 1969 (they make Vita Drink / Enteroform, a soymilk sold to in vanilla, chocolate, and strawberry flavors to the dietetic and pharmaceutical markets for tube feeding), starts test marketing tofu in Swiss supermarkets. An attractive recipe booklet is attached to each packet, which is pasteurized for a 6-week shelf life.

Dec. Excellent, 19-page cover story on "Soymilk and Soyfoods," published in the prestigious *Journal of the American Oil Chemists' Society.* 1984 is the Society's 75th anniversary.

Dec. Ralston Purina, in its 1984 annual report, notes: "The Company has entered into preliminary agreement with Cargill, Inc., to sell six of the Company's seven soybean [crushing] plants." It also reported strong, steady growth in sales of soy protein products, from about $98 million in 1980 to $152 million in 1984, for an 11.5% compound annual growth rate (but only 4.5% after adjusting for inflation).

Dec. Gloria Vanderbilt's Glace, a soy-based nondairy ice cream, starts being test marketed in Los Angeles, in nine flavors.

Dec. A poll of readers by *Vegetarian Times* magazine finds that 53.1% of readers used tofu one or more times during the past 7 days; 29.4% used it 3 or more times.

Dec. 31. Brightsong Light Foods in Petaluma, California, receives the first funds of a $500,000 equity investment from a Hong Kong investor, who had seen an article praising Brightsong in *Venture* magazine. Brightsong greatly expands its product development and promotion.

* American Soybean Assoc. phases out its Human Nutrition Dept., headed for years by Judy Trujillo.

* Chicago Board of Trade [Illinois] starts trading options contracts on soybean futures. Continued.

606. *J. of the American Oil Chemists' Society.* 1984. From Washington: Japanese approval to save Ralston shipping, storage costs. 61(12):1778. Dec. [2 ref]

• ***Summary:*** "The Japanese government has given Ralston Purina Co. a 'seal of approval' on soy protein, a move which the company believes will help it increase its share of the $150 million-a-year Japanese market for such proteins. Currently, Ralston Purina exports about $10 million a year in vegetable proteins to Japan."

This move will eliminate the need for dockside inspection of each shipment arriving in Japan, resulting in a savings of approximately 40 per cent in shipping and storage costs.

For more information see: *Wall Street Journal,* Sept. 25, 1984, and Food Institute Report, Sept. 29, 1984, pp. 11-12.

607. **Product Name:** [Proti {Soymilk}. Later renamed Purana].
Foreign Name: Proti, Purana.
Manufacturer's Name: Ralston Purina España, S.A.
Manufacturer's Address: c/ Aribau, No. 125, 08021 Barcelona, Spain. Phone: (93) 202 21 25.
Date of Introduction: 1984 December.
Wt/Vol., Packaging, Price: Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Color photo on cover of Journal of the American Oil Chemists' Society. Dec. 1984, and on page 1784 of the same issue. Front panel shows stylized rolling hills planted to soybeans, with a blue sky overhead. Blue on yellow letters at top of package state: Bebida 100% vegetal (100% non-dairy beverage). At the bottom is written: "No colorings or preservatives."

Talk with European soymilk producer. 1990. April 19.

This product is made and packaged in Spain. It is distributed by a company that is linked with Ralston Purina and that distributes Purina Protein products. This soymilk is based on isolated soy proteins and produced in a dairy. It has had some success because it was the first soymilk available in Spain at a reasonable price, in part because they have custom/tariff protection.

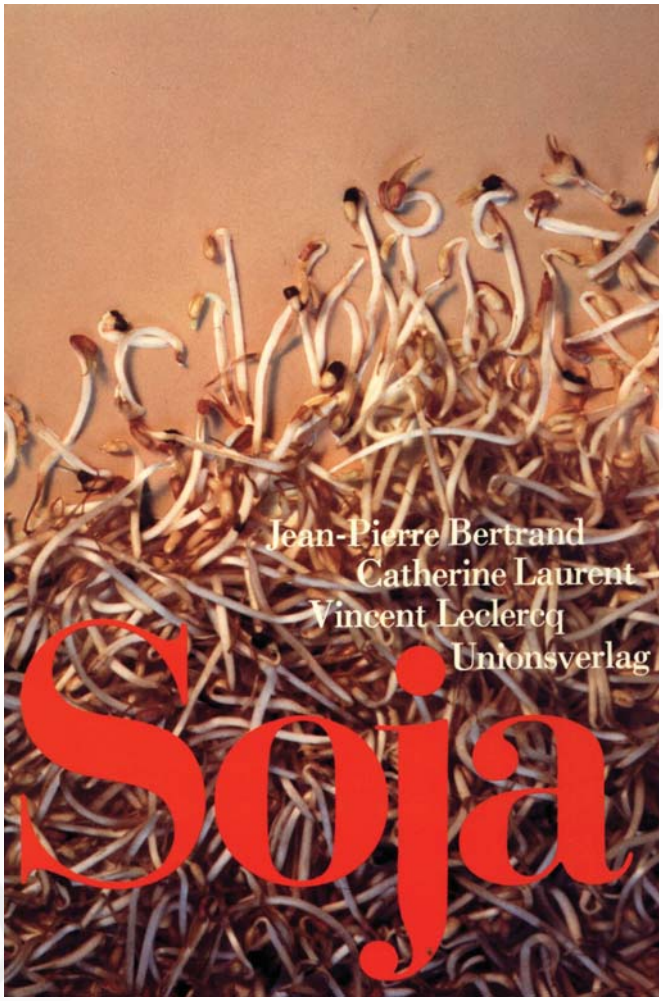
Letter (fax) from Hernadette Dechamps, American Soybean Assoc., Madrid. 1990. May 23. "The only company known to be manufacturing soymilk now in Spain is Ralston Purina España, S.A. (gives address and phone). The product, previously named Proti, is currently sold under the name of Purana."

608. Whalen-Shaw, Michael. 1984. [Soy proteins for controlling coating structures]. *Wochenblatt fuer Papierfabrikation. Fachzeitschrift fuer die Papier-, Pappen- und Zellstoff-Industrie* 112(14):497-501. [Ger]*
• ***Summary:*** Modified protein coatings containing kaolin, calcium carbonate, and butadiene-styrene rubber for paper and paperboard. Address: Ralston Purina Corp., St. Louis, Missouri.

609. Bertrand, Jean-Pierre; Laurent, Catherine; Leclercq, Vincent. 1984. Soja. Aus dem Franzoesischen von Felicitas Schaetzl [Soya. Translated from the French by Felicitas Schaetzl]. Zurich, Switzerland: Unionsverlag. 130 p. Illust. No index. 21 cm. Reprinted in 1988. [8 ref. Ger]
• ***Summary:*** A German translation of *Le Monde du Soja* (1983), this book gives a very good overview (from the French point of view) of the development of the soybean plant in the context of world agriculture. However it suffers from lack of an index.

Contents: 1. The soybean in the world economy: Portrait of a "sacred grain," soybean meal / cake–a high-value feed, soy oil–from diesel motors to ice cream, soy protein–the industrialized protein. Sidebar, by Verena Krieger: Soymilk and tofu, miso, tamari, shoyu and soy sauce, tempeh, soy sprouts. Producers and users. 2. The soya complex: Consumers and producers without power, the producers–a club with contradictions, the multinationals in the middle of the soya chain (a profile of each of the largest multinationals: ADM {USA}, Bunge & Born {Argentina}, Cargill {USA}, Central Soya {USA}, Continental Grain {USA}, Louis Dreyfus {France}, Ralston Purina {USA}, A.E. Staley {USA}, Unilever {England/Holland}, p. 30-31), the international wholesale business, the commodity exchange as a barometer.

3. How prices are determined: Subsidy politics in the USA, price guarantees in Brazil, the price of soybean meal and soy oil. 4. From sacred bean to soya complex–a look back: Colonial times, Europe becomes curious, the American soya complex is born, the struggle over margarine, soybean meal becomes successful, the war as a big opportunity, soya



conquers America, soya against cotton–the oil battle.

5. Soya from the Americas conquers the world: The Marshall Plan–the first clever offensive, Public Law 480–food aid with a club-foot, trade pressure under the banner of free trade. 6. The politics of the importing countries: U.S. soya vs. EU cereal grains, France–the model of protein dependency, in the maze of European agrarian politics, Japan–the free way for imports. 7. The embargo of 1973–Trade war and crisis: the exchange awakens.

8. Brazil–The new soybean giant: The export sector is nursed back to health, credit–but not for everyone, the export boom, the equal weight problem. 9. The newcomers–Argentina and Paraguay. Paraguay, a little appendage of Brazil?, startup difficulties in Argentina, help for Soviet stock-farming.

10. The new questions: The Eastern Bloc in the conflict of goals, industrial comeback of the soybean in China, developing countries–meat and oil for the poor? 11. The reverse side of the "Soya Model:" Brazil–Flight from the land, dependency, and hunger, Tunisia–adulterated olive oil, Senegal as loser in the peanut / soya battle, a model of supply dependency.

12. Which alternatives? A "protein plan" in the European Union, better utilization of the green forage stock, industrial amino acids–a way out / escape? 13. Plant- vs. animal protein: Industrial soya protein–food of the future?, the Third World, a large market with the ability to pay, a future with contradictions.

Figures: (1) The various basic ingredients and commodities that can be made from the soybean (p. 11). (2) Overview of the use of soybeans and soy products (p. 14-15). (3) Soybean production and trade worldwide, 1980/81, Sept. to Oct., in million metric tons. (4) German newspaper headlines concerning soybeans, 1983-84 (p. 36). (5) Map of worldwide soybean trade, 1935-1939, in 1000 metric tons (p. 46). (6) Map of worldwide soybean trade, 1948-1949, in 1000 metric tons (p. 59). (7) Map of worldwide soybean trade, 1980, in 1000 metric tons (p. 63). (8) Graphs of soybean exports, from USA, from Brazil, from Argentina (p. 83). (9) Bar graph–Yield of protein in kg of protein per ha: Soybeans 7,900. Alfalfa 7,200. Potatoes 5,000. Maize 4,500. Poultry 1,200. Pork 800. Milk 700. Beef 600 (p. 120).

About the authors:

Jean-Pierre Bertrand, an agronomist (*ingénieur agronome*) and economist, is a research fellow at the French National Institute for Agricultural Research (*Institut national de la recherche agronomique, INRA*).

Catherine Laurent, a veterinarian and economist, is the author of a doctoral thesis on the soybean industry (*filière du soja*). Vincent Leclercq, an agronomist (*ingénieur en agriculture*) and economist, is a research associate at the INRA, for the International Economics Laboratory in Montpellier (*Laboratoire d'économie internationale de Montpellier*). He is also a member of Solagral, which stands for Agro-Food Solidarity (*Solidarités agro-alimentaires*). Address: France.

610. Soy Protein Council. 1984. Vegetable protein products in child nutrition programs. An explanation of new opportunities and regulations (Brochure). Washington, DC. 4 p. 28 cm.

• ***Summary:*** "Introduction–History: Vegetable protein products (VPP) have been authorized through FNS Notice 219 since 1971 as an alternate food to meet part of the meat/meat alternate requirement of the meal patterns for the child nutrition programs. This notice established specific requirements and guidelines for the use of VPP based on the technology available at that time. The use of VPP to meet FNS Notice 219 was limited mainly to textured soy flours with 50 percent protein and allowed for a maximum moisture content for hydrated VPP of 65 percent.

"Developments in food technology since that time have created new types of VPP which schools can now use in addition to products which have been used in the past. These products include isolates and concentrates. Recognition of these technological advances allows for greater flexibility in food formulation by offering school foodservice operators the option of using improved vegetable protein ingredients which result in menu flexibility and increased value for their food purchase dollars.

"What is VPP? (Substitute Food): A VPP is a food which may be used to resemble and substitute, in part, for meat, poultry or seafood. A VPP used in this manner may contain flours, concentrates or isolates, or any combination of these as ingredients along with added nutrients, colors, flavors, etc.

"How do the New Regulations Compare to FNS Notice 219?" A table compares 9 provisions of each.

"Can I use FNS Notice 219 and the new regulations interchangeably? No. Schools using VPP which meet FNS Notice 219 must use these products in accordance with FNS Notice 219. Likewise, VPP which meet the new regulations must be used according to these regulations.

"When is the final effective date? All schools must use the new VPP regulations by February 7, 1984.

"I understand that the 'texture' requirement for VPP has been eliminated. Why? The intent of this requirement was to ensure that a hydrated product resembled the physical characteristics of the meat, poultry or seafood it replaced. Recent advances in the technology of VPP make it unnecessary to impose such a requirement. Other methods are, and may be, used to produce structure where appropriate.

"How is VPP used as an alternate food in the school lunch program?

"+ Vegetable protein products must be prepared in combination with meat, poultry or seafood.

"+ A fully hydrated vegetable protein product may not exceed 30 parts to 70 parts uncooked meat, poultry or seafood.

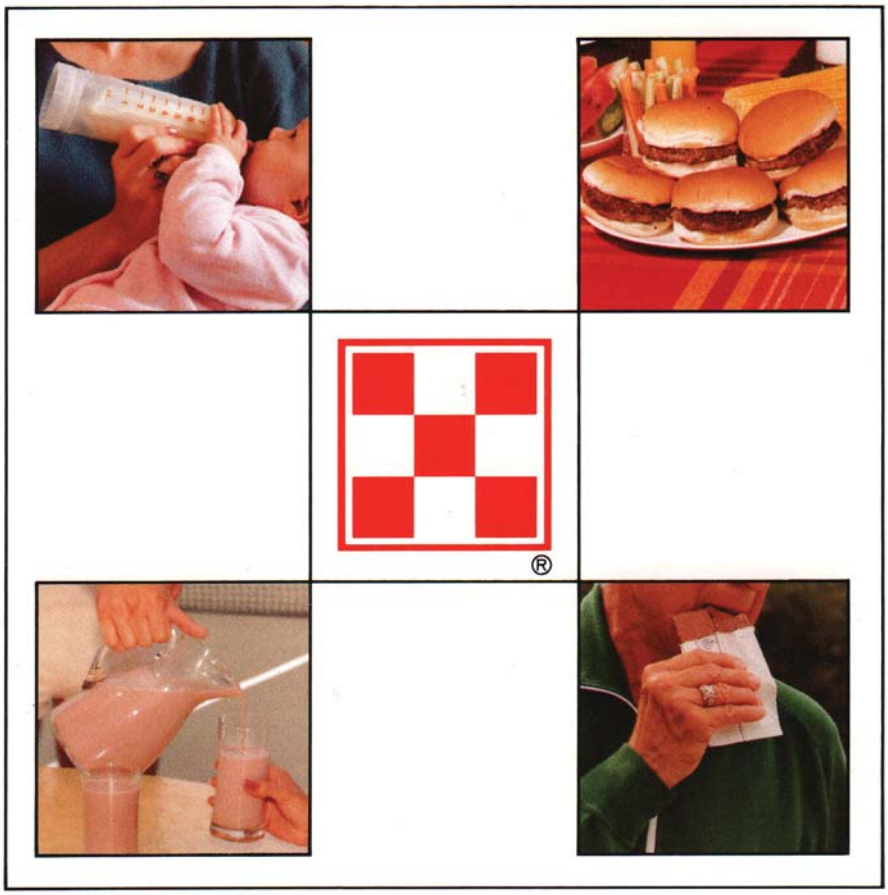
"+ Vegetable protein products may be used in the dry, partially hydrated or fully hydrated form in combination with meat, poultry or seafood.

"+ Vegetable protein products must resemble and substitute for meat, poultry or seafood. Substitute refers to a VPP whose presence in another food results in a smaller amount of meat, poultry or seafood. It does not refer to a VPP used to substitute for a starch. The VPP may resemble the meat, poultry or seafood at any point of preparation. If the VPP in the finished food looks like, tastes like, etc., the meat, poultry or seafood with which it is combined, the resemblance criterion is met.

"What food products provide the best opportunities for using VPP as an alternate food? Examples of products in which a VPP can be used as an alternate food include, but are not limited to, beef patties, chicken patties, pizza toppings, chili, meat loaf, tuna salad, and taco fillings.

"When can VPP not be used as an alternate food for credit? Vegetable protein products cannot be used as an alternate food when substituting for a starch, as in foods such as pizza crust or as a breading on a meat, poultry or seafood

Good Eating:



The Value of Isolated Soy Protein

product. Also, VPP cannot be used as an alternate food when used as functional ingredients such as binders in products (i.e., binders in meat products) and thickening agents in sauces. However, this does not prevent the use of VPP in the products, such as pizza crust, in the child nutrition programs."

Note: This brochure continues on two more pages. Address: 1800 M Street, N.W., Washington, DC 20036.

611. Ralston Purina Co., Protein Div. 1984? Good eating: The value of isolated soy protein (Leaflet). St. Louis, Missouri: Ralston Purina Co. 4 p. Undated. Front and back, color. 28 cm. [4 ref]

• ***Summary:*** Cover: Mostly glossy white paper. A checkerboard with 9 squares. In each of the four corner squares is a photograph related to isolated soy protein. In the center square is a checkerboard with 9 squares; six are red and 4 are white.

Page 2, contents: What is protein? What is isolated soy protein? How nutritious is isolated soy protein? What advantages does isolated soy protein offer?

Page 3, contents: Ralston Purina's versatile Purina proteins. What about cost. Isolated soy protein–Ralston Purina–Purina proteins ("The worldwide leader,

manufacturer, and marketer of isolated soy proteins is Ralston Purina...").

Rear cover: For more information call:
Ralston Purina Company
Protein Division
Checkerboard Square
St. Louis, Missouri 63164
Ph: (800) 325-7108
Telex: 447240

Purina Protein Europe S.A.
Avenue Louise 391
B-1050, Brussels, Belgium
Ph: (02) 641-1211
Telex: 64388

Fujipurina Protein
SKF Building 4th Floor
9-1, 1-Chome
Shiba Daimon
Minato-Ku, Tokyo
105 Japan
Ph: (03) 438-2021
Telex: 2423701.
Address: St. Louis, Missouri.

612. Haake, Dave. 1985. Purina plant sale to Cargill final. *Pantagraph* (*The*) (*Bloomington, Illinois*). Jan. 3. p. 27.
• ***Summary:*** "Sale of Ralston Purina Co.'s soybean operations in Bloomington and five other cities to Cargill Inc., Minneapolis, took place yesterday at Ralston Purina's St. Louis headquarters.

"Terms of the sale were not disclosed."

Arrangements for Cargill's takeover were completed last week.

Ralston Purina sold substantially all of its soybean operations, including soybean solvent crushing plants in:
Lafayette, Indiana
Iowa Falls, Iowa
Louisville, Kentucky
Kansas City, Missouri
Raleigh, North Carolina, and
Bloomington, Illinois (built in 1948).

The acquisition "gives Cargill 20 plants in 10 Midwest and Southern states."

A photo shows Steve Sproull, Cargill's Bloomington manager. Address: Pantagraph business writer.

613. *Wall Street Journal.* 1985. Ralston Purina says it sold 6 soybean-processing sites. Jan. 3. p. 23, col. 3.
• ***Summary:*** The deal leaves Ralston Purina completely dependent on outside sources for soybean products for its pet food and other products. "The food and animal-feed concern said the sale is part of a strategy to move away from commodity-based enterprises to higher-margin consumer goods. Ralston stopped operations at its seventh soybean-processing facility in Memphis, Tennessee, on Dec. 18 and the plant will be permanently closed on Feb. 1... Ralston will buy soymeal from suppliers in the future."

Cargill, a closely held grain processor and merchant based in Minneapolis, Minnesota, now owns 20 soybean-milling plants in the Midwest and Southeast.

614. Cooper, Russell L. 1985. Re: Ralston Purina to work with Soyfoods Association in developing standards. Letter to Dr. Clifford Hesseltine, Northern Regional Research Lab, USDA, 1815 No. University St., Peoria, Illinois, Jan. 17 1 . Typed, with signature on letterhead.
• ***Summary:*** "Dear Dr. Hesseltine:

"Ralston Purina Company is looking forward to working with the Soyfoods Association in developing proper standards for tofu, and second generation commercial food products containing tofu.

"As a new member of the Soyfoods Association, we agree that the development of standards and labeling for soy foods is an important priority. To facilitate the promulgation of informed standards, Ralston Purina has prepared a Report to the Soyfoods Association on Isolated Soy Protein.

"Previous drafts of proposed standards for tofu have considered isolated soy protein. Ralston Purina, as the leading producer of isolated soy protein, has prepared the attached position paper for your information. It is hoped this position paper will contribute to the Association's understanding of isolated soy protein.

"I look forward to meeting you at the upcoming Soyfoods Association meeting. In the meantime, should you have any questions or comments regarding the attached information, please do not hesitate to contact me at (314) 982-3885.

"Thank you for your consideration."

Attached to this letter is an 8-page paper (with 8 references) titled "Report to the Soyfoods Association on Isolated Soy Protein," dated Jan. 1985. Address: Associate Counsel & Director of Regulatory & Trade Affairs, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri.

615. Boyer, Robert A. 1985. Henry Ford, soymilk, soy ice cream, Bob Smith, Rex Diamond, and Rich Products (Interview). *SoyaScan Notes.* Jan. 30. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Soymilk and soy ice cream: "We made soy ice creams in the early 1930s, as a sort of by-product of our work with soymilk. We actually built quite a nice little production unit for making soymilk. It was a natural evolution to make soymilk from ice cream; we didn't learn the idea or the process from anyone. To make the ice cream, we coagulated the soymilk to make a curd, like fresh tofu, which we then dispersed (without drying it) in a colloid

mill. We found we got a better product from the curd than from the soymilk itself. So you could call the final product a sort of tofu ice cream. The ice creams were made in the laboratories at Greenfield Village in Dearborn. We had 2-3 labs there. Henry Ford used to call it the Engineering Laboratory. The ice creams were served to special visitors. Mr. Ford would put on special press luncheons for journalists, food editors, etc. and soy ice cream was always on the menu. It was also served in the VIP lounge. It remained an experimental item that we and Mr. Ford would serve to impress people with the good taste and versatility of soy. We served it in the basic favorite American flavors: Chocolate, strawberry, and vanilla. I don't recall whether or not it was served at the 1934 World's Fair in Chicago [probably not], or whether it was served after the start of World War II.

"Later at Ralston Purina we made soy ice cream prototypes from soy protein isolates in order to show the potential and versatility of isolates. We served the ice creams to potential customers. I started to work with Purina in 1960 and our team (headed by Ralph Hoer and soon joined by Frank Calvert) started building an isolate plant in St. Louis, Missouri, shortly after that, so the first ice creams at Purina were probably made in about 1962-63.

"When I joined Ralston Purina, the company already had a commercial isolate plant in Louisville, Kentucky, that made industrial isolates for paper coatings. It was only after I arrived that Purina became involved in edible food-grade soy protein isolates, and these isolates are now a major, rapidly growing product line–which trace their origin back to Henry Ford.

Rich Products Corp. in Buffalo, New York got interested in soy via Rex Diamond, who worked for Henry Ford as Bob Smith's assistant. "Rex Diamond was the original spark plug for Rich. I'm not sure who had the original idea for whip toppings, coffee creamers, etc. Rex finally became the research director for Rich Products Corp. and that company developed the first good whipped topping and coffee whitener.

"When Bob Smith went out on his own to put out his own soymilk [sic, Delsoy whip topping], Rex went with him [though several years later]. After that, Rex left Bob Smith and eventually went with Rich Products. Later there were some hard feelings between Rich Products and Rex, but I don't know what that was all about. I once visited Rex in Buffalo, New York." Address: 632 Edgewater Dr., Apt. 731, Dunedin, Florida 33528. Phone: 813-734-2415.

616. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Cargill, Inc.
Manufacturer's Address: Bloomington, Illinois.
Date of Introduction: 1985 January.
Ingredients: Soybeans.
New Product–Documentation: *J. of the American Oil Chemists' Soc.* 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing plants from Ralston Purina Co. One of these was at Bloomington, Illinois.

617. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Cargill, Inc.
Manufacturer's Address: Lafayette, Indiana.
Date of Introduction: 1985 January.
Ingredients: Soybeans.
New Product–Documentation: *J. of the American Oil Chemists' Soc.* 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing plants from Ralston Purina Co. One of these was at Lafayette, Indiana.

618. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Cargill, Inc.
Manufacturer's Address: Iowa Falls, Iowa.
Date of Introduction: 1985 January.
Ingredients: Soybeans.
New Product–Documentation: *J. of the American Oil Chemists' Soc.* 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing plants from Ralston Purina Co. One of these was at Iowa Falls, Iowa.

619. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Cargill, Inc.
Manufacturer's Address: Kansas City, Missouri.
Date of Introduction: 1985 January.
Ingredients: Soybeans.
New Product–Documentation: *J. of the American Oil Chemists' Soc.* 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing plants from Ralston Purina Co. One of these was at Kansas City, Missouri.

620. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Cargill, Inc.
Manufacturer's Address: Louisville, Kentucky.
Date of Introduction: 1985 January.
Ingredients: Soybeans.
New Product–Documentation: *J. of the American Oil Chemists' Soc.* 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing plants from Ralston Purina Co. One of these was at Louisville, Kentucky.

621. **Product Name:** Soybean Oil, and Soybean Meal.
Manufacturer's Name: Cargill, Inc.
Manufacturer's Address: Raleigh, North Carolina.
Date of Introduction: 1985 January.
Ingredients: Soybeans.

New Product–Documentation: *J. of the American Oil Chemists' Soc.* 1985. "Soy pioneer bows out, others grow bigger." March. p. 474, 476. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing plants from Ralston Purina Co. One of these was at Raleigh, North Carolina.

622. Young, L. Steven. 1985. Work with soy protein products by ADM and Central Soya, including soy ice creams and soy protein isolates (Three interviews). Conducted by William Shurtleff of Soyfoods Center, Jan. 9 and 16, Feb. 14. 7 p. transcript.

• ***Summary:*** ADM and Ralston Purina have approximately equal shares of the market for isolated soy proteins; there are no other major manufacturers. In 1984 approximate total use of isolates, with Tofutti as a major user, was 200,000 to 400,000 lb as delivered. Since only 2% of the soy ice cream mix is isolates, this translates into 10 to 20 million lb of mix. To convert this to gallons, figure 40-50% overrun, leading to 3 to 3.5 million gallons of nondairy frozen desserts.

Why did Central Soya get out of the soy protein isolate business at the very time when they were the world leader with their line of Promine products? Probably because it was not profitable. When they got out, they literally handed the market over to Ralston Purina. They told their former customers to buy from Purina, and even which products to buy. This move made Purina's isolate business profitable. Prior to that, Purina was within a year of getting out of isolates. Address: ADM, Manger of Product Applications, Food Research Div., 1825 N. Laramie, Chicago, Illinois, 60639.

623. Rich, Robert. 1985. History of Rich Products Corporation's work with soy-based dairy analogs (Interview: Continued–Document part IV). Conducted by William Shurtleff of Soyfoods Center, Feb. 8 and March 20. 12 p. transcript.

• ***Summary:*** (Continued): The process was Freeze Flo, a dramatic processing breakthrough that was first used to make Bettercreme. Freeze Flo makes it possible to use a frozen food without thawing it. By eliminating the need to thaw, Freeze Flo quickly began to change the very concept of frozen foods. The process, invented by Marvin L. Kahn (who worked with a company Rich acquired), replaces free water in a product with water bound to fructose or other natural sugars in the product. Binding water in a product (such as a fresh or dried fruit) it does two things: (1) It eliminates a medium for bacteria to grow, so that spoilage is greatly retarded, and (2) it makes it impossible for ice crystals to form. Rich Products soon had high hopes that Freeze Flo might become the most revolutionary development in this field since Clarence Birdseye froze his first fish in 1929.

In 1978 Bob Rich Jr. became president of Rich Products. His father retired but remained chairman of the board and chief executive officer, and his brother, David, was/ head of the public relations department.

The 1980s. By the early 1980s Freeze Flo had already become very popular in Europe, some exciting medical applications were being investigated. By 1983 Rich Products was using the Freeze Flo process to make many of its "Fresh 'n Ready No Thaw Desserts," including Grand America (a dairy ice cream), Fresh 'n Frosty (a mellorine, resembling ice cream but with the butterfat replaced by soy oil), the fillings for chocolate eclairs, Bavarian cream puffs, creme pies, cakes, and cheesecakes–as well as Bettercreme. It was billing this "gentle freezing process" as "the most significant breakthrough in Frozen Foods in 50 years." Because of Freeze Flo, the ice cream and mellorine, both introduced in 1983, could rise in temperature to 5º above zero without defrosting; typical ice creams defrost at 20º below zero. But Freeze Flo is not used to make some other of Rich's products, such as frozen fish and meat balls (Rich Products 1983; Owen 1983).

In the late 1970s Rich hired Mike Billoni, a local sports reporter, to write a company history. It was to be titled 35 Years Below Zero and published in 1980 to commemorate the company's 35th anniversary. But so many exciting things began happening with Freeze Flo that Rich postponed publication and is now hoping that it will eventually be the first chapter in a longer work. The company also maintains a large scrapbook that goes back to the founding in 1944.

In 1985 Rich Products, still privately owned, was the world's largest maker of non-dairy products, with sales of $545 million a year. Roughly 75% of Rich Products' sales were to foodservice organizations, and 25% to retail consumers. Starting in 1972, I.D. magazine picked Rich Products for 12 out of 13 years as the outstanding frozen foodservice packer in America. The most popular retail products (in descending order of sales) were Coffee Rich, Rich's Frozen Chocolate Eclairs, and Rich's Donuts. A little of Rich's Whip Topping is sold retail in pressurized containers. Richwhip Topping, a beat-it-yourself liquid, sells well only in Milwaukee [Wisconsin] and Minneapolis [Minnesota].

From the 1970s on, the only two of Rich's products contained a significant amount of soy protein: Coffee Rich and Bettercreme. Of the two, Coffee Rich used the larger amount in total annual tonnage. The company bought its isolated soy proteins from Ralston Purina. But as of 1985 Rich Products was seriously considering at least one product that would get the company much more actively involved with soy protein. It is still on the drawing boards, so details are not yet available.

There are two basic types of coffee whiteners or coffee creamers: Powdered and non-powdered. Coffee Rich is the only non-powdered coffee whitener that is distributed nationally. It has an estimated 90% of the branded, non-powdered market.

In 1985 Robert E. Rich Sr. recalled: "In the frozen food

business, my heart has always been in the non-dairy segment of it. I always figured that was my baby. That's what put our company on the map. . . Its always interesting to recall the early days of the soybean business. I foresee a steady growth in that area" (personal communication) (Continued). Address: Chairman of the Board, Rich Products Corp., P.O. Box 245 (1150 Niagara St.), Buffalo, New York. Phone: 716-878-8000.

624. Aldon, Don. 1985. Work with Swift & Co. and non-dairy frozen desserts (Interview). *SoyaScan Notes.* Feb. 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Don started with Swift & Co. in 1961 in the "Vegetable Protein Products Division," a brand new division of the oil mill department. The oil was their main product and the protein-rich meal was a by-product. The president of the oil mill department started this department to turn the meal into food. Research on vegetable proteins started in about 1957-58.

Their first product, launched in early 1961, was brand-named SFP (Swift's Protein Food), a water-extracted, granular soy protein concentrate, containing 70% protein. It was not an isoelectric concentrate, and it was not texturized. It was used mostly in ground beef products, but also in some breads. More was sold to other companies than used in Swift's meat products.

The next product was Texgran, a textured soy flour (somewhat like today's TVP), invented by Dean Wilding in about 1963-64. He invented a texturization process while trying to find a way to extrusion cook soy flour. He visited Wenger and saw a variety of products they made. He recognized their value and bought a machine. Don worked for about 18 months developing the process, doing research, and generating information to be used in the patent. Swift started selling the product before they applied for the patent. "As soon as our competitors saw this product, they recognized its value because they had been extruding dog food. Ralston Purina slammed things together and got a patent application in first. Two weeks later ADM had one in. Then 3-4 weeks later Swift applied." Swift started selling Texgran in 1964-65. The patent was finally issued in about 1971-72. Litigation went on for years and years between the three companies. Finally Ralston got the basic patent since they had applied first. ADM and Swift got a royalty-free license. They did that just to settle the litigation. Note: The final key U.S. patent (No. 3,940,495) was issued to Ronald Flier of Ralston Purina in Feb. 1976, based on an application field on 17 Jan. 1973, but based on an earlier application filed on 10 July 1964.

Texgran was used by Swift as a meat extender and sold to other companies as well. The first retail product in which Texgran was used was artificial bacon bits, the first such product on the market. Don developed this product, which was launched in about 1977-78. It was based on Texgran, with flavors added then smoked in a smokehouse. Right after that, General Mills introduced Bac*O's.

Swift, which had a combined dairy and ice cream department (the main plant was in Holland, Michigan) was also involved in making soy ice creams, using soy protein isolates purchased from Central Soya. For years, Swift also made an artificial nonfat dried milk (NFDM) called Provide, based on soy flour and cheese whey. They introduced it in about 1973-74. It was used by bakeries in place of NFDM. But Swift never really got into using isolates commercially. They were preparing to do so when they sold the business.

Dean's Dairy in Arizona was the first to start selling Swift's artificial milk, which contained vegetable fat, nonfat dry milk, and soy isolates. The product didn't last very long; it was used to sort of test the market. For details, ask Tony Scaletto, who was Mr. Dipper Dan–head of Swift's ice cream operations. "We had those ice cream parlors nationwide at one time. He developed all the ice creams and novelties. He may not remember all that went on with soy; we were compartmentalized." Note: Talk with Tony Scaletto (Feb. 26): He is certain that Swift never had a frozen dessert containing soy protein on the market. He tried using soy protein in a soft-serve product but it was unsuccessful.

Swift got out of the soy protein business because it was driven by the vegetable oil business. They sold the whole oil business (3 crushing plants) to A.E. Staley in about 1979. The one making soy products was in Champaign, Illinois. He is not sure exactly why, but probably because sales and earnings fluctuated too much and could not be controlled. Also, most of the old-timers who really knew the business had retired.

Staley kept Provide and had it custom made outside. Since Staley had its own textured soy protein product, it shut down the Swift protein plant; SFP lingered on, then died.

Concerning Swift's early history: They started as a meat packer. Then in the 1930s or 1940s they started making oil products from lard. In about 1938, to extend their business, they got into the oil extraction business and soybeans. Today their big products are processed meats and poultry. Swift bought Hunt-Wesson in late 1983 or 1984. Swift & Co. is now a division of Beatrice Meats, Inc. in Oak Brook, Illinois. All the old company records on soy have been discarded.

Dean Wilding is now in the Philippines building houses. He left Kraft several years ago. His son is a contractor. Address: Alberto Culver, 2525 Armitage, Melrose Park, Illinois. Phone: 312-450-3000.

625. Johnson, Dale W. 1985. Work with The Glidden Company and Central Soya (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 27. 5 p. transcript.
• ***Summary:*** Dale went to work for Glidden in 1948. The following people worked at Glidden: Walter Bain, Sidney Circle (who now has Parkinson's disease), Andy Engstrom,

Art Levinson (who was with Spencer Kellogg & Sons in the 1920s and 1930s before coming to Glidden), Willard C. Lighter, Ed Meyer, Joseph Rakosky. People who worked at Central Soya before Central shut down their food labs in early 1949: Louis Sair who went to Griffith Laboratories, Ken Gunther who founded Gunther Products, and E.B. Oberg who went to Glidden and then Carnation.

Industrial soy protein isolates really started commercially in about 1934. They were originally used mainly as coatings for paper, but some were used in paints, shoe polish, and other miscellaneous uses. Procter & Gamble started making industrial soy protein isolates in the late 1930s or early 1940s; they made an isolate that went into Spic and Span, a wall cleanser. The isolate served both as a good detergent and to give a coating to a painted wall to make it easier to clean the second time.

Also discusses Promine D, Amisoy, Ralston Purina, Pillsbury's work with soy isolates, Picot Laboratory in Mexico, General Foods, Pillsbury, Morel, Sidney Circle's move to Anderson Clayton in 1967, why Central Soya sold its isolate business to ADM, the story of how Glidden developed soy protein concentrate (first commercialized as Promosoy by Central Soya in the early 1960s), first big sale of Promosoy in the early 1960s to Mead Johnson for use in their Metrecal Wafer (it was not used in liquid Metrecal), Central Soya's concentrate plant at Gibson City, Illinois, Henry Ford's researchers who did the pioneering work in whipped toppings, especially Rex Diamond who eventually went to Rich Products and ended up committing suicide, and Bob Smith who went to Delsoy, Bob Boyer and Francis Calvert went to Ralston Purina, Bill Atkinson went to ADM, Jim Liggett at Central Soya developed Rich Freeze (a soy ice cream). Address: Food Ingredients (Minnesota), Inc., 2121 Toledo Ave. No., Golden Valley, Minnesota 55422. Phone: 612-588-9456.

626. Boyer, Robert A. 1985. Reminiscences: Automotive design–Oral history project. Dearborn, Michigan: Henry Ford Museum and Greenfield Village. 130 p. Accession #1673.

• ***Summary:*** This is the transcript of an interview conducted by Dave Crippen of the Henry Ford Museum on 7 Feb. 1985 at Mr. Boyer's home in Dunedin, Florida. It covers all aspects of Boyer's work with soybeans at the Ford Motor Co., including: Growing up in Royal Oak, Michigan; his father worked in the accounting department of the Ford Motor Co. at Highland Park, Michigan (p. 1). Boyer's first meeting with Frank Campsall (p. 2). Growing up at the Wayside Inn (the oldest hotel in America, in South Sudbury, Massachusetts, p. 1-6). Attending high school in Framingham, Massachusetts (p. 6). First meeting with Henry Ford when the two ice skated together on the mill pond behind the Wayside Inn (p. 7). Moving to Dearborn in Sept. 1927 to attend Ford's Trade School (p. 7-11). Early work at the chemical plant (quarter-size model of Iron Mountain plant) in Greenfield Village (p. 12-13). Ford's trip to Germany [Peace Ship to Europe, in 1915 during World War I?] crystallized a lot of his thinking. The Great Depression and the origins of his chemurgic thinking. In 1934 the first National Chemurgic Conference was held at Dearborn Inn; Boyer was in charge of the program. Mr. Irenee DuPont attended and Mr. Ford spent a lot of time with him. Before that, the DuPonts and the big banks did not trust Ford. (p. 14). Opening of Greenfield Village in late 1929 on the 50th anniversary of Edison's first successful light bulb (p. 15). Chemical experiments on truckloads of farm crops using a retort; Frank Calvert (p. 16-19).

Experiments starting in about 1933 using hexane as a solvent to extract the oil from soybeans; the Ford Extractor (p. 20-23). Boyer's group wanted to get pure protein from soybeans. So "in the lab we developed our own process for extracting the oil... We used hexane solvent, like dry cleaning. We'd flake the beans and run them through a pipe that was full of hexane on an angle with a screw in it." Hexane solvent is "distilled out of petroleum. It has a very narrow boiling point–66º centigrade. The Ford extractor... got quite a lot of attention. We built it across the street from the chemical plant. It was about 150 feet away. Mounted it all by itself because everybody was afraid of fire." A roof was built over it but no walls. It was probably built in about 1933.

In 1933 at the World's Fair [sic, the Ford Exposition of Progress] in New York City, Boyer's group had a glass model (on a table) of this extractor that used hexane solvent.

Note: Ford boycotted Chicago's A Century of Progress Exposition which opened in 1933, in part to call attention to the company's 30th anniversary; he held his own "industrial fair," first in Detroit and then in New York, in late 1933. *Business Week* described it as "the greatest industrial show ever held." Some 2.3 million people attended the two-week show in New York.

A working model of the Ford extractor, using hexane solvent, was at the Chicago World's Fair, starting in mid-1934, in the Ford Industrial Barn. "They would never let you do that today. Too dangerous."

Research on purified soy protein and soy plastics with formaldehyde; Bakelite (p. 24-25). Use of soy oil for foundry core binders for casting the Ford V-8 engine block; thus, the soy experiments are now commercialized. Building a 50 ton/day extractor (p. 26-27). Spinning soy protein fiber like rayon, based on spinning milk protein in Italy. Using the fibers to make wrinkle resistant synthetic wool, a suit of clothes for Henry Ford and others, overcoats, neckties, felt hats. "We also found that these fibers blended in very well with rabbit fur for making men's felt hats. So the Hat Corporation of America took all the fiber we could make. It wasn't very much and they would blend it in with rabbit fur. And they actually had them [the men's felt hats] on the

market." Rabbit fur is very expensive (p. 29-36). Ford's suit of clothes contained 65% wool and 35% soy fiber. Boyer leaves Ford Motor Co. in 1943. Problem with fiber was tensile strength, especially wet strength. Ford's interest in this fiber work, and his fitness at age 75 (p. 37-38). Ford "was not a true vegetarian but he was pretty close" (p. 38). Edsel Ruddiman's work with foods (p. 39-47). Boyer and Ruddiman attend American Soybean Assoc. soybean conference in Washington, DC [in Sept. 1932] where they saw "leather-like products that the Chinese make" [yuba]. Boyer tried unsuccessfully to use the idea to make "synthetic leather." USDA's experimental farm in Holgate, Ohio, where many soybeans sent back by W.J. Morse were tested (p. 40-42). Work with soybean milk (p. 43-46). The executive dining room in the Engineering Laboratory. Henry Ford invited Boyer to lunch there about 6 times (p. 45). Development of soy ice cream; lipoxidase enzyme inactivation (p. 45-46).

Visits to Battle Creek, Michigan and Dr. John Harvey Kellogg (p. 47). Boyer's work was with industrial products; the plastic car and structural plastics with hemp, flax, and phenol formaldehyde (soya protein Bakelite resin) (p. 47-64, 70). Making trunk lids using a hydraulic press (p. 50). Ford's famous axe demonstration on a trunk lid (p. 50-52). Lowell Overly and Joe Stewart (p. 53-56, 61, 78-79). Boyer drives the plastic car home (p. 63). Ford's aim with the plastic car: to provide industrial markets for farmers (p. 65). World War II stops plastic car development (p. 65-66). Contract to build an airplane wing of plastic (p. 66-70). The plastic lid and car contain little or no soy (p. 70). Fiberglass and the Chevrolet Corvette (p. 71). Plexiglas and the B-24 bomber made at Willow Run (p. 72). Edsel Ford's death of stomach cancer in the spring of 1943 and its effect on his father, Henry (p. 73-74). Ending work with soy fiber (p. 74).

Boyer leaves Ford in 1943 and goes to work for Drackett Co. in Cincinnati, Ohio. Wife needs to leave Detroit. After 1943 Boyer's career really takes off. Dr. Gangloff (p. 75-77). Use of soy fiber by Drackett in felt hats. "We sold them a lot of fiber and we decided to build a bigger plant." Building a protein plant and a fiber plant in Cincinnati big enough to supply the hat company's demands and larger "than we needed just to supply our fiber operation." They also had a big operation in Cincinnati for high-impact (not structural) plastic (p. 78-80). Drackett's marketing people knew how to market Windex and Drano "but they had no feeling for the soybean operation. So when Mr. Drackett died, they sold the whole soybean plant to Archer-Daniels-Midland (ADM, p. 81-83). Before Mr. Drackett died, Boyer's division had developed commercial soy products, and Drackett was making money on the plastic (phenol formaldehyde plus hemp) and the fiber (p. 81). Use of soy protein as a paper coating (p. 83). ADM finally closes the old Drackett protein plant and sells it to Central Soya, which used the million bushel elevator capacity for storage (p. 83-84).

Shortly after Mr. Drackett died, Boyer left Drackett to work on his edible soy fiber, where he owned patents. "If we can make a fiber from soy protein that resembles the outside of a sheep, why not make a fiber that will resemble the inside (p. 84-86). Idea of building an edible soy protein plant is in Cincinnati, with Mr. Drackett's approval (p. 87). Boyer tries to find companies to license rights to his landmark patent: Virginia Carolina Chemical (Taftville, Connecticut, p. 88); Swift & Co. (p. 89-92); Unilever, which was interested in peanut protein in Africa and at Port Sunlight near Liverpool (p. 92-94, 112-13); General Foods and Nabisco (Fairmont, New Jersey research lab) (p. 94, 99). Unilever and Swift pay licensing fees of $20,000 a year plus consulting fees. General Mills and Ralston Purina (p. 94-95). Why Swift dropped its interest (p. 95-96). General Mills and Bacos (p. 96). Patent expires in 1971 after 17 years (p. 96). Worthington Foods (p. 97). Ralston Purina was getting into protein. In about 1956-58 they "had bought Procter & Gamble's protein plant in Louisville [Kentucky], which was making industrial protein for paper coating" (p. 98). Worthington Foods was too small to make their own soy protein fibers, so Ralston Purina made it for them (p. 78-80). Ralston Purina's great success with edible soy protein and their small conflict: pet food vs. human food (p. 100-01). From 1961 to 1971 Boyer was receiving licensing fees / patent royalties from Ralston Purina, Worthington, and General Mills (p. 102). General Mills and Bacos (p. 103-04). Ralston Purina's patent lawsuit against Far-Mar-Co. Ralston won $8 million. Boyer testified as an expert witness (p. 104-05).

Boyer remarries and retires in 1971 (p. 102, 105, 107). Subsequent work with Miles and Worthington; the Morningstar Farms line (p. 105-08). Companies now spinning soy protein fiber (two in the Netherlands, one in Japan, one in Australia). Ford Foundation was not interested in his work with soy protein for Third World nations (p. 110). Central Soya bought the ADM plant that was located in Chicago (p. 113-14). Kellogg's Corn Soya breakfast cereal (p. 114-15). Worthington's Soyloin Steaks; all early Kellogg and Worthington vegetarian products based on wheat gluten (p. 119). When Worthington bought Battle Creek they got their lady research director; she worked at Worthington until she was quite elderly. Boyer visited her in her lab at Battle Creek several times (p. 119-20. Note: Josephine F. Williams was in charge of the lab and product development at Battle Creek, where she worked closely with Dr. John H. Kellogg. She kept similar positions at Worthington Foods, according to Ron McDermott). Henry Ford as a soybean pioneer and visionary. The soybean is now America's No. 2 cash crop and also our second largest earner of foreign exchange. "That really started from Ford. When we first started in 1931, hardly anybody ever heard of the soybean, and Henry Ford's penchant for publicity publicized the soybean... He certainly made it popular and made people become aware of it. Today it's darned important." He should be remembered as the

"Father of the Soybean." "I always thought it would be nice if they would rebuild the [Soybean] laboratory [in Greenfield Village] or restore it like it was when we were doing the soybean work and give it the real credit that it deserves..." (p. 120). After Henry Ford died in 1947 his family wanted no part of any of his pet projects. They completely eradicated the old Ford company (p. 121). Henry Ford was deeply interested in the welfare of American farmers. His tractors and Model T were of great use to them (p. 121). Origins of Ford's interest in chemurgy; William Hale and Dow Chemical Co. in Midland, Michigan; the first three chemurgic conferences in Dearborn, Michigan, in May 1935, 1936, and 1937 (p. 122-27). Ford and Ruddiman establish a complete canning line for good-tasting green soybeans on the outskirts of the Ford estate. The equipment was quite expensive. When World War II threatened, Ford gave it to Michigan State University to teach canning to students. (p. 129-30). Boyer's personal impressions of Henry Ford (p. 128-30). Address: 632 Edgewater Dr. #731, Dunedin, Florida 33528.

627. Sair, Louis. 1985. History of Griffith Laboratories (Interview). Conducted by William Shurtleff of Soyfoods Center, March 16. 4 p. transcript.

• ***Summary:*** Griffith Laboratories was founded in 1918 by a salesman of baking supplies named Enoch L. Griffith. The main first product was Aquatex, a gelatinized starch sold to the bakery trade. The company specialized in bakery supplies. The son of the founder, C.L. Griffith, is now age 92, and still active in the business.

Lou Sair was born in Canada in 1910. He graduated from the University of Manitoba [Canada] with BS and MS degrees in cereal chemistry, then earned a PhD degree from McGill University (McDonald College). After working at the National Research Council on a meat problem, then Ogilvie Flour Mills and the Corn Industries Research Foundation in Missouri (on starch and cereals), he went to work for Central Soya Co. in about 1944 and began his first research on soy.

After World War II started, egg albumin (egg white) was selling for $5 a pound. In 1939 the Glidden Co.'s Soya Products Division had started making a whipping compound named Albusoy, then in 1944 Soybean Products Co. in Chicago had started selling a similar product named Soyco that was made elsewhere for them. The Regional Soybean Industrial Products Laboratory in Urbana, Illinois (after 1942 called the USDA Northern Regional Research Laboratory) in Peoria, Illinois, played a leading role in the research on whipping compounds. Sair recalls that Albusoy yielded a fairly coarse foam, so while at Central Soya he was assigned the job of coming up with a good whipping compound. He made isolated soy protein, then used a pepsin digestion to convert the isolate to a fat free compound that whipped nougats and candy very well. Used in cakes, it rose beautifully during baking, then collapsed, since it was not denatured by heat. This product, also called Soy Whip, was of excellent quality and in 1945 it was commercialized. During the 2 years that Sair was at Central Soya, no one thought that soy isolates might have a place in human foods or in the food supply, other than in frills such as whip toppings. No thought was given to using soy protein isolates in sausages, breakfast cereals, etc.

In 1946 Sair left Central Soya and Ken Gunther took over research on whipping compounds. Soy Whip continued to be a commercial product, sold to good candy accounts. Then in 1949 Dale McMillan, founder of Central Soya, decided that there was no future for vegetable proteins at Central Soya so he shut down the whole operation and licensed the rights to the whipping compound to Ken Gunther, who established his own company in 1949 in Galesburg, Illinois, and, with his brother. Robert, made this product (and others like it) for many years until A.E. Staley bought the company. The company didn't expand much and is still fairly small.

In 1950 Sair and Rathman (both from Central Soya) were issued a patent on an improved process for making a soy-based whipping agent. He thinks he got 2-3 patents at Central Soya on Soy Whip. Another author on one may have been Mr. Turner, a salesman.

In 1946 Sair went to work for Griffith Laboratories, where he worked in many areas. He got over 50 patents at Griffith. He thinks he has more patents as a food chemist than anyone in USA. Griffith is involved in almost everything. But his mind kept going back to the work he did at Central. Griffith had a big business in binders for sausage products, so he began to wonder if they couldn't use a soy protein in sausages. Since Griffith was not a soybean crusher, nor a manufacturer of isolates (which have a very low yield and cause major waste disposal problems), he hit on a very simple idea called the 'isoelectric (water) wash process' (different from the alcohol extraction process) to make a soluble soy protein concentrate (as they named it). The yield was 70%. Sair got the first patent. He began working on development of such a product in about 1950. This was long before Sidney Circle began working on this at Glidden (note at Glidden; Circle's was insoluble with an alcohol wash). It has a sandy texture, a completely different product. Extracting the sugars from soy with alcohol denatures the protein, so it has no emulsifying properties. It is a filler with good nutritional properties. But it has little functional value.

The Griffith process started with defatted soy flour, purchased from the A.E. Staley Mfg. Co., which sold them several hundred million pounds over the years. The protein was extracted from the flour, the pH lowered to 4, the sugars washed out with water, the protein neutralized, and then the protein was spray dried. The Nitrogen Solubility Index of the protein was 70%. A pound of the concentrate would do about the same job in terms of binding power as an isolate but it was much less expensive.

They went to the USDA and, after a long process, got the first approval to use soy protein concentrate in sausage–at a fairly low level.

In 1956 Griffith Laboratories introduced America's first commercial food-grade soy protein concentrate. The demand was great for their small production. At that time Griffith was also manufacturing a lot of sodium caseinate. They couldn't supply the market for caseinate for some applications. So Sair went to Glidden and bought some isolate. Sair thinks they were the first company that bought any soy isolate with the intention of putting it into a food. But the taste was so terrible (it was high in sulfur from Glidden's paper coatings), that it almost ruined a few Griffith accounts. Griffith bought large quantities then gave it up because it was absolutely useless as food. Griffith was using the isolate before it was modified (ask Ed Meyer).

Years later Ralston Purina went to Griffith and asked to purchase a license on their concentrate. Griffith refused.

In the 1920s Griffith Labs got involved with manufacture of hydrolysates at their East Coast plant in Newark, New Jersey. Initially everything was made from wheat gluten. In about 1965 they began to hydrolyze soy. George Inglett was in charge, under Sair for 2-3 years doing research on hydrolysates; George is now at NRRC in Peoria, Illinois.

One of Griffith's most interesting stories is in textured soy proteins. One of Sair's patents may even be before ADM's TVP. He made what was called a "structured protein." In 1976 it was name GSVP (Griffith Structured Vegetable Protein). It is made by using soy flour by a controlled extrusion process; they controlled the pressure along the length of the extruder and at the exit from the die to give a good structure. He thinks it is greatly superior to TVP.

Note: Talk with Ralph Sair at Griffith Labs. 1991. Oct. 15. Louis Sair passed away about 3 years ago. The next best man to talk with about the early history of Griffith Labs would be Irving Melcer. Address: 9100 S. Sacramento, Evergreen Park, Illinois 60642. Phone: 312-422-2033.

628. *J. of the American Oil Chemists' Society.* 1985. Soy pioneer bows out, others grow bigger. 62(3):474, 476. March.

• ***Summary:*** The soybean crushing industry is undergoing major restructuring as A.E. Staley Manufacturing Co., a pioneer in soybean processing, leaves the business. On 2 Jan. 1985 Cargill finalized its purchase of six soybean processing facilities from Ralston Purina. At that time it probably passed ADM to become America's largest soybean crusher. The plants acquired by Cargill are in Bloomington, Illinois; Lafayette, Indiana; Iowa Falls, Iowa; Kansas City, Missouri; Louisville, Kentucky; and Raleigh, North Carolina. A 7th plant owned by Ralston Purina at Memphis, Tennessee, was not offered for sale, but was scheduled to be closed in February.

With this acquisition, Cargill now has 20 soybean crushing plants in the Midwest and Southeast. The location of each of Cargill's 14 other soybean crushing plants, with daily processing capacities ranging from 20,000 bushels to 120,000 bushels, are given.

Ten days later the A.E. Staley Manufacturing Co. announced it had sold its soybean crushing business to Illinois-based independent Soy Processors Co., owned by a general partnership of individuals associated with Archer Daniels Midland (ADM) and including ADM as a minority partner. With this, ADM probably recaptured its lead, but only by a slight edge.

In October Staley agreed to buy CFC Continental Inc., the nation's second largest supplier to the food service business. Ralston Purina, meanwhile, in October acquired ITT's Continental Baking Co.

Central Soya Co. has 9 soybean crushing plants, 7 of them in the USA at: Gibson City. Illinois; Decatur and Indianapolis, Indiana; Bellevue, Delphos, and Marion, Ohio; and Chattanooga, Tennessee. These 7 U.S. plants are said to have a total capacity of about 10,000 tons/day of soybeans. The 2 plants outside the U.S. are in Utrecht, The Netherlands, and Victory Soya Mills in Toronto, Ontario, Canada.

Ag Processing, a cooperative based in Omaha, Nebraska, operates 6 soybean crushing plants in the USA at: Van Buren, Arkansas; Eagle Grove, Sergeant Bluff, and Sheldon, Iowa; Dawson, Minnesota; and St. Joseph, Missouri. Total crushing capacity is estimated at 11,000 tons/day of soybeans. Ag processing is now entering the edible oil refining business, constructing its first refinery adjacent to its soybean crushing plant at St. Joseph, Missouri. Expected to be completed in 1985, it is rated to have a refining capacity of 12 tank cars (720,000 pounds) of soybean oil per day.

Two poultry-related firms that are building oil refineries next to their soybean crushing plants are Perdue Inc. of Salisbury, Maryland, and Townsends of Millsboro, Delaware. Each refinery will have a capacity of 12 tank cars (720,000 pounds) of soybean oil per day.

According to the *Soya Bluebook*, the capacities of Perdue's two crushing plants are 700 tons/day at Salisbury, Maryland, and 600 tons/day at Cofield, North Carolina. Townsend's single crushing plant has a 1,200 tons/day capacity.

629. Meyer, Edwin W. 1985. Details on work with The Glidden Company (Interview). Conducted by William Shurtleff of Soyfoods Center, April 8. 4 p. transcript.

• ***Summary:*** Discusses: ADM's solvent extraction plant in Chicago, Norm Witte, Central Soya's Miracle Meal (the world's first dehulled soybean meal made with a desolventizer-toaster; launched in 1952, it revolutionized the poultry industry), Central Soya's first desolventizer-toaster

started operation in Decatur in May 1950, Central Soya's soy protein concentrate plants, Robert Boyer and Frank Calvert, Norman F. Kruse [pronounced Cruze], Endre F. Sipos. Elmer B. Oberg.

Say Calumet Harbor, not Calumet River; Ed thinks they acquired the 2 country elevators on the rivers but may have added on something. Ed Wilhelm might know.

Promine was used mostly by a large sausage manufacturer in Detroit, Michigan, for its functional properties. It was looked at but never used by John Morrell & Co., Armour, Swift, or Kraft–which had an all-meat image and mentality; "they never touched it.

Glidden sold Morrell a lot of soybean grits for dog food, for years during the 1930s; Morrell had a dog food company in Iowa, which made a popular canned product.

Ed had to make a rapid exodus from the Glidden Co. on Laramie after ADM bought it. They wanted to get in quickly; he left some important documents behind.

ADM did sell their lecithin through the American Lecithin Co. in the early days, just like Glidden. Ask Joseph Eichberg about the exact nature of the agreement.

Ed wouldn't say that Glidden soy operations Chicago was struggling, but their profits were not up to Glidden's expectations so they were considered a weak division. World War II helped a lot financially, especially since the industrial protein was requisitioned by the U.S. Navy through NFS. Toward the end of the war Glidden was supplying soy flour for the relief programs to the liberated areas, especially Italy.

Oberg is too gracious to say that Central Soya bought Glidden largely for its research team. The main reason was the price was cheap; the whole works for $14 million, including all the elevators. Central got a great deal. Some years later they sold the Calumet Harbor elevators to Cargill for $8 million. At that time Central Soya had only a small development group under Sipos, who is still with them. He reported to Norm Kruse, starting in 1953. True, they basically had no research team. It was of equal importance to many others.

Steroids: After 1953 they had a major contract with Charles Pfizer Co. to process steroids and to sell them an intermediate for making corticoid steroids / hormones. That was the main business. They also had a little business with Charles Strauss in Montreal, Canada. "After 1953 we toll processed for Pfizer alone (that means for a given sum you process material for a certain party) so we remained in the steroids business."

Ed was an Abbott–Glidden–Upjohn fellow at Northwestern University. Abbott Labs and Upjohn were very interested in Glidden's work; they were involved in an informal joint research operation. General Mills got into making soy sterols at their Kankakee plant. Glidden put them into the business in a way. Upjohn was buying sterols from General Mills for many years. Upjohn is still using soybeans for their corticoid hormones. General Mills sold that plant to Henkel A.G., a German company.

The forerunner of Promosoy (Central Soya's soy protein concentrate) was Protein 70 (also called Pro-70), developed by E.B. Oberg. The pilot plant was built in 1959 and the full commercial plant later at the Gibson City plant. Pro-70 was developed at Glidden by Sidney Circle. He started working on the concentrate after the soy protein isolate, in about 1953-54. Pro-70 was not commercialized until after Central Soya bought Glidden's Chemurgy Div. in 1958. It was commercialized under the name Pro-70. The term Promosoy was introduced in about 1960 [sic, 1962] with the Gibson City plant. Both were exactly the same product–a soy protein concentrate. Response, their textured soy protein concentrate, was developed later under Ed Meyer's supervision.

The first formula for Rich Freeze was developed by Jim Liggett in about 1963-64; Ed was director of research at the time. It was developed partly for the Japanese market. "We [Central Soya] had an affiliate, Dai Nippon pharmaceutical, which was selling our granular phosphatides in Japan. Dai Nippon also had a few food ingredients, principally plant gums. They thought they might sell Rich Freeze, but they bombed out" [failed].

The Cone and Brown patent which was the basis for Alpha Protein. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

630. Shurtleff, William; Aoyagi, Akiko. 1985. History of Central Soya Company–started 1934 (Continued–Document part V). Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 12 p. April 30. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** (Continued): Growth also continued in Central Soya's original feed business. The company acquired Pay Way Feed Mill, Inc. in Kansas City and bought additional feed manufacturing plants to increase market penetration in Iowa, Nebraska, Michigan, Missouri, Kansas, and Kentucky.

Also during the 1970s Central Soya became heavily involved in poultry and egg production and processing. The company was one of the leaders in shaping the modern poultry industry, which moved in the 1960s from America's backyards to large, vertically integrated animal factories. These led to a dramatic drop in the price of poultry and eggs. Soybean meal was used extensively in these poultry operations.

Key advances were made by feed researchers. In 1973 layer feeds based on amino acid levels rather than protein content were introduced. In 1977 the company developed the first-ever swine feed concentrates based on available amino acid content, a concept that soon became standard in the industry. During the 1970s Central Soya shifted its former emphasis on expanding crushing capacity to increasing crushing efficiency and product quality at existing soybean plants. In 1973 the company acquired its first soybean crushing facility outside the US, a plant located at Utrecht,

the Netherlands.

In 1977 Central Soya entered the seed business by acquiring O's Gold Seed Company, a hybrid seed corn company in Parkersburg, Iowa. Soy proteins made several important advances. By 1968 Central Soya was making Textrol, a textured soy flour; it lasted for only about 2 years. In 1974 they introduced PlusMeat, a meat extender based on textured soy flour, and in the mid-1970s stopped making full-fat soy flour. Then in 1975 Central Soya introduced the industry's first textured soy protein concentrate, brand-named Response. It represented a significant technological improvement over conventional textured soy flours, which it began to replace. In 1976 Central Soya acquired rights to produce and market steam texturized vegetable proteins under General Mills' patents. The purchase included steam texturizing technology and equipment, plus exclusive US rights to the Bontrae line of textured soy flour products. In 1979 the US Department of Defense approved the use of soy concentrates in the ground meat products used by the Armed Forces. Earlier that year, the corporation made the difficult decision to drop its soy isolate business. From 1958 until 1979 when he retired Dr. Edwin W. Meyer, had been Director of Research for Central Soya's Chemurgy division. During this period he authored 31 articles and 38 patents related to soy products, mostly soy proteins (*Inform.* 2008. Dec, p. 12).

Throughout the 1970s, Central Soya's Promine was the world's best-selling and most esteemed isolated soy protein. But, for various reasons, the product was only marginally profitable. The plant in Chicago was obsolete and in a bad location, with major expensive waste disposal problems. There was no room to expand the old plant, and to move it would have been too expensive. So in about 1978-79 Central Soya simply announced that it was discontinuing production of Promine soy protein isolates. When they went out, they literally handed the market over to Ralston Purina by suggesting to their customers that they buy from Purina. Prior to this time, isolates had been a minor, slightly unprofitable business for Purina. Now they became big business. In about 1980-81 Archer Daniels Midland, after making a deal with the city of Chicago over waste disposal, finally bought Central Soya's once-famous isolate plant in Chicago. Central Soya took a pretax loss of $5.2 million on the deal (W. Williams 1981).

In 1978 Central Soya consolidated most of its food research operations in a new 24-acre, $9 million Research and Engineering facility north of Fort Wayne. There 60 scientists and technicians support the firm's Chemurgy Division, Refined Oil Division, and three food company subsidiaries. The facility housed state-of-the-art food, product development, microbiological, analytical, chemical, and sensory evaluation laboratories, as well as a complete process engineering plant. It marked a milestone in the company's diversification into the food industry.

The 1980s. During the early 1980s, under Chairman, President, and CEO Douglas G. Fleming, Central Soya took major steps toward long-range corporate redirection, attempting to restructure the company and reposition its of assets for stronger growth and improved profitability. There was movement away from Central Soya's "traditional concentration on basic commodities to more emphasis on value-added businesses." Aggressive expansion was planned into food processing. A new emphasis was placed on increasing the return on stockholder's investment. The company had a firm corporate policy of using future markets to hedge all soybean and grain transactions, thus minimizing the effects of commodity price fluctuations on profit margins and reducing the risk of ownership. But hedging did not guarantee satisfactory profit margins or return on invested capital. The weak US farm economy and strong US dollar (which seriously hurt exports) both hurt Central Soya's profits.

The 1980 annual report showed net sales of $1,744 million for the year (up from $1,194 in 1976) and net earnings of $34.8 million. It described the company as employing 10,500 people, operating 80 facilities in the US plus 20 plants outside the country, and having four business segments, each of which relied heavily on soybeans:

1. Commodity Operations (including soybean processing and grain merchandising): 34% of total sales
2. Feed and Farm Supplies (including Domestic Feed, Farm Supply, O's Gold Seed Company, and International Feed): 33% of sales
3. Food Products (including Butcher Boy Food Products, Fred's Frozen Foods, J.H. Filbert, Refined Oil, and Chemurgy): 19% of sales
4. Poultry Products: 14% of sales

In September 1983 Central Soya sold its seed business and in February 1984 sold the last of its poultry operations, which were generating a relatively low return on investment. At the time of sale, the company was one of America's largest processors of broiler chickens (400 million lb a year), turkeys (50 million lb), and eggs (1,000 million). The 1984 annual report showed the company has having two basic groups, with seven divisions. These were supported by major research facilities in Decatur, Indiana (animal feeding and management), The Netherlands (animal feeding), and Fort Wayne (food related).

1. Agribusiness Group
   Domestic Feed Division
   International Feed Division
   Soybean Processing Division
   Grain Merchandising Division
2. Food Group
   Refined Oil Division
   Food Subsidiaries (Fred's Frozen Foods, J.H. Filbert, Butcher Boy Food Products, Zatarain's, Inc.)
   Chemurgy Division

During the 1980s Central began to reflect on its rich heritage. In mid-1981 the company published 17 "Fact Sheets" giving the most complete and detailed information (including history) about the company and each of its divisions, subsidiaries, and products. Then in 1984, in celebration of its fiftieth anniversary, it published a special lengthy history of the company under the theme "Fifty Years of Growth and a Future to Share." This was sent to stockholders with the annual report

In its 1984 annual report Central Soya described itself as: *"... an international agribusiness and food processing company. Central Soya's people, products and processes help farmers raise livestock more efficiently, develop new uses of soybeans and soybean products, and provide high quality and convenient food for consumption both at home and away. From farm to table, the Company is involved in virtually every part of the food production system."* (Continued). Address: Lafayette, California. Phone: 415-283-2991.

631. Shurtleff, William; Aoyagi, Akiko. 1985. Soyfoods industry and market: Directory and databook 1985. 5th ed. Lafayette, California: Soyfoods Center. 220 p. Index. April. 28 cm. Updated every 1-3 years with a bibliographic supplement. [360 ref]
• ***Summary:*** Contents: 1. Introduction. 2. Directory of soyfoods manufacturers. 3. Directory of soyfoods support industry: Goods & services. 4. The many types of soyfoods. 5. Historical: Historically most important books and serials, earliest references to individual soyfoods. 6. Year in review. 7. Soyfoods industry and market in the U.S. 8. Tofu industry and market in the U.S. and Canada. 9. Soymilk industry and market: Worldwide and in the U.S. 10. Tempeh industry and market in the U.S. 11. Soy sauce industry and market in the U.S. and Japan. 12. Miso industry and market in the U.S. and Japan. 13. Soynut industry and market in the U.S. 14. Natto industry and market in Japan. 15. Statistics on fermented soyfoods in East Asia. 16. Soyfoods in restaurants, delis & cafeterias. 17. Soybean crushing industry in the U.S. 18. Soy oil industry and market in the U.S. 19. Soy flour and cereal-soy blends industry and market worldwide. 20. Modern soy protein products industry and market in the U.S. 21. Soyfoods terminology and standards. 22. Names of soyfoods in major foreign languages (incl. Chinese / pinyin; Hoisin sauce = haixian jiang). 23. Soybean production worldwide and country-by-country. 24. Key institutions working with soyfoods worldwide. 25. Measures, weights, and equivalents. 26. About the Soyfoods Center & soyfoods consulting services. 27. Bibliography.

In February 1977 a Gallup poll in America showed a remarkable shift in the public's awareness of and attitudes toward soyfoods. The sampling of 1,543 adults across the nation found that: 33% believe that soybeans will be the most important source of protein in the future–ahead of fish at 24% and meat at 21%. 55% believe that "soy products have a nutritional value equal or superior to that of meat." 54% reported that they "had eaten foods containing soy protein as a prime ingredient within the past 12 months." Younger age groups living in large cities and those with college or university educations had the most favorable attitudes toward soy protein, indicating that support for soyfoods is likely to grow in the future. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

632. Kingsbaker, C. Louis. 1985. The Louisville sewer explosions. Paper presented at the 91st Annual Convention of the International Oil Mill Superintendents Association. 12 p. Held 17 June 1985 at Denver, Colorado.
• ***Summary:*** Gives a detailed description of the fire and explosion at the Ralston Purina solvent extraction plant in Louisville, Kentucky, and the day by day, hour by hour sequence of events leading up to them. The explosions took place at 5:13 a.m. on Friday, Feb. 13, 1981. This was the worst sewer explosion in the history of the United States. The flash in the pre-dawn sky was so bright that a pilot 120 miles away, at 5,500 feet reported seeing it to the local control towel.

"Fortunately, it occurred at 5:13 a.m., before rush hour traffic started and offices became filled.

"There were two miracles that happened here at this time. The first was that no one was killed, and only four hospitalized, none seriously... The second miracle was the weather." Long stretches of the main sewer trunk were totally blocked. It took 2 months before normal flows were returned to the sewer system, and 9 months to completely repair it. During these 2 months there were no heavy rains in the area. Heavy rains would probably have caused "flooding upstream of raw sewage with great health hazard to the residents of Louisville."

Photographs show the magnitude and power of these explosions. The sewers, located 30 feet below ground, "are about 12 feet wide, 12 feet high, and have concrete walls 10 to 12 inches thick, with rebar installed in the concrete. Yet the force of the explosions was enough to blow up streets above the sewer along a two mile stretch in Louisville and leave 23 craters in the area, some as large as 30 feet long, 30 feet wide and about 25 feet deep. I have personally walked these sewers for 6 hours and this was done about 4 weeks after the explosion. The damage was incredible."

"What was the cause of this disaster? I am going to continue telling of the events for the 12 hour period after the 5:13 AM explosion and then provide a flash back (pun intended) to the events leading up to the explosion. I first heard of the explosion the following day watching television in Atlanta. I then received a call from the law firm representing the Metropolitan Sewer district (MSD) on Wednesday February 18, and went to Louisville the next day. Over the next three years, I have had a professional

involvement with this incident and I probably have as much information as to what happened as anyone, except possibly, employees and ex-employees of Ralston Purina. I want the record to show that I did not volunteer to give this presentation but was invited on February 22, 1985 by Mr. Scott A. Edwards, Chairman of this IOMSA Technical Program. I had made a personal decision not to volunteer to give a talk about Louisville as I am doing now unless invited to do so. This has been a very hot subject and I had thought by now it had cooled, but apparently has not. Soon after the *Oil Mill Gazetteer* published that I was to talk, I began receiving telephone calls, and requests that maybe I should not do this. There has been sufficient time since the explosion to make this presentation, the Federal Trial in Louisville ended over a year ago. What I am saying here is in the public record. I will only mention one Ralston Purina employee's name, since he is no longer with Purina, nor is he involved in this industry. I will be happy to answer any questions you might have after my presentation. It is impossible to tell this story in 30 minutes. If you so desire and would consider inviting me next year, I will continue to tell you more of what happened.

"Now let's get back to the morning of Friday the 13th [of February], 1981:"

There follows a detailed chronology of events, with exact times given if possible. The chronology starts at 6:05 AM on Friday Feb. 13 and continues until Feb. 14, but goes back a few days to Wed. Feb. 11 and Thursday, Feb. 12 "to find out what precipitated this bizarre situation."

Page 4: "8. It should be pointed out that Steve Colthurst was one of 39 Ralston Purina employees and ex-employees who took their 5th Amendment Privilege of the U.S. Constitution and refused to answer or provide any information as to the entire incident. Information given to Ralston Purina executives was done by legal counsel and therefore, did not have to be revealed. So it was very difficult to get information to determine what actually happened. This was an important function that I had in my work for MSD. We were given plant records and some drawings but no plant process flow diagrams, since none existed at the time of the explosion. We had access to the plant and I prepared flow diagrams by making sketches of all equipment, and tracing the pipe lines in the plant. But slowly, we were able to put the puzzle together, piece by piece, line, by line, and it all fell into place. But it was not easy."

Elsie Fischer was driving to work that morning when the street blew apart under her car. The roof of her Chevrolet Monte Carlo hit the bottom of the concrete viaduct, 13 feet above the street. She reported hearing a big boom sound under her car. She then passed out. "When she came to, he car was resting on its side against the concrete wall of the viaduct. Her friend, Shirley Rodes, looked out and said, 'my God, the whole street is gone.'" Elsie suffered only broken ribs and Shirley a broken hip.

"Page 11: "The plant was filthy and in deplorable condition. The previous plant superintendent wrote in his resignation letter a few years before the explosion that the 'plant was a pig pen'.

"There were over 30 violations of NFPA 36 Standard, 'Solvent Extraction Plants', as of February 13, 1981.

"Finally, Ralston Purina had two incidents in their other plants that were similar to what happened in Louisville. In December 1976, about 1,300 gallons of hexane were discharged into the Wabash River in Lafayette, Indiana. A shut off valve was installed at the outlet of the Separation Basin to the sewer after this incident, but only at Lafayette and not at the other 6 Purina extraction plants.

"At the Bloomington, Illinois extraction plant in November 1977, hexane was discharged from the Separation Basin to Sugar Creek. A low temperature alarm was installed at the outlet of the Waste Water Evaporator to prevent this from happening again, and a 'dead man' switch was installed on the Hexane Transfer Pump from storage. But this was done only at the Bloomington Plant. If these three devices had been installed in Louisville, the sewer explosions could have been prevented. The total cost for these three items was only about $1,500."

Page 12: Ralston Purina Co. ended up paying about $38.6 million for "their negligence and gross negligence," including about $18.1 million to the Metropolitan Sewer District and about $12 million to private entity plaintiffs–20,000 people and 2,000 businesses who were without sewage service to their homes and businesses.

"This amount does not include Ralston Purina's huge out of pocket costs." This event was a major reason that Ralston Purina got out of the soybean crushing business; they sold their seven solvent extraction plants to Cargill in 1985.

A graph accompanying this paper, and prepared by the author in 1981, shows 3 temperatures versus hourly time for Feb. 12 and 13, 1981. They are: (1) Discharge temperature from the rising film Evaporator (RFE). (2) Discharge temperature form the oil stripper. (3) Outlet temperature from the waste water evaporator (WWE). Taken together, the three graphs show that there were attempts Ralston Purina personnel to restart the extraction plant at 6:30 a.m., 7:30 a.m., and 7:30 to 12 noon on Feb. 13. Address: C.L. Kingsbaker, Inc., Atlanta, Georgia.

633. Chen, Steve. 1985. Re: Soy ice cream made of isolated soy protein in 1967 at Ralston Purina Co. Letter to William Shurtleff at Soyfoods Center, June 19. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "I used isolated soy protein back in 1967 to make soymilk, soy ice cream and high protein snacks while I was with the Central Research at Ralston Purina Co. in St. Louis, Missouri. I named my soy ice cream as 'Icetein' (means Ice Protein), but Ralston never commercialized the product. I guess "Icetein" can be considered as a very early

version of Tofutti." Address: PhD, Country Director/Taiwan, American Soybean Assoc., P.O. Box 3512 Taipei, Taiwan, R.O.C.

634. Olsman, Willem J.; Dobbelaere, S.; Hitchcock, C.H.S. 1985. The performance of an SDS-PAGE and an ELISA method for the quantitative analysis of soya protein in meat products: An international collaborative study. *J. of the Science of Food and Agriculture* (*London*) 36(6):499-507. June. [8 ref]
• ***Summary:*** "All correspondence should be addressed to EUVEPRO, 19 Rue de L'Orme, 1040 Brussels, Belgium." This is the result of a collaborative study in which 5 meat products containing different known levels of one of five different commercial soya ingredients, together with a blind duplicate and a blank, were analyzed for soya protein by 26 laboratories (whose addresses are given with the name of the primary researcher) in 10 European countries. Two techniques were tested: the sodium dodecylsulphate-polyacrylamide gel electrophoresis (SDS-PAGE) method of Armstrong *et al.* (*J. of Food Technology* 1982, 17:327-33) and the enzyme-linked immunosorbent assay (ELISA) method of Hitchcock *et al.* (*J. of the Science of Food and Agriculture* 1981, 32:157-65). Both methods give good results, "but require further refinements to make them generally acceptable for control purposes." Address: 1. Service Lab. and Consultancy Bureau, P.O. Box 649, 3700 AP Zeist, The Netherlands; 2. Purina Protein Europe, Zwaanhofeg 1, 8900 Ieper, Belgium; 3. Unilever Research Lab., Colworth House, Sharnbrook, Bedford MK44 1LQ, UK.

635. Ralston Purina Co. Protein Div. 1985. 1985 consumer attitudes monitor: Soy protein in foods. Checkerboard Square, St. Louis, MO 63164. 4 p. June.
• ***Summary:*** This nationwide survey of 628 men and women, 18 years and older who are primary grocery shoppers, was conducted during early 1985 by an independent research firm at the request of Ralston Purina Co. 1. Have you heard of soy protein being included in certain food products? Yes 65%, No 35%. 2. What types of food products are currently available which contain soy protein in them? Don't know 42%, Meat 40%, All other foods 18%. 3. Have you ever tried food products with soy protein included in them? Currently using 60%, Not using 29%, Don't know 11%. 4. Have you ever not purchased a product because it contained soy or soy protein? No 89%, Yes 8%, Don't know 3%. 5. If you knew that meat products, such as sausage and lunch meat, available to you at the supermarket contained soy protein, would you be more or less likely to buy them? No difference 44%, Less likely 28%, More likely 13%, Don't know 15%.

6. Why is it that you would be more likely to buy meat products containing soy protein? Healthier 57%, Less fat 7%, More natural 6%, Good taste 6%, Lower cost 6%, Less cholesterol 3%. 7. Why is that you would be less likely to buy meat products containing soy protein? Taste 37%, Filler 20%, Additive 14%, Processed 3%, Higher cost 3%, Appearance 3%. Do you agree or disagree with the following statement about soy protein? Meat with soy protein has less cholesterol, Agree 72%. Meat with soy protein has less fat, Agree 69%. Meat with soy protein has fewer calories, Agree 68%. Soy protein is better for you, Agree 63%. Meats with soy protein are more nutritionally balanced, 60%.

Does the fact that a food manufacturer uses soy protein in its products change your feelings about that company? No difference, 80%, Feel worse 12%, Feel better 8%. Would you say that you read and pay close attention to labels on products such as luncheon meats, hot dogs and sausages? All the time 32%, Sometimes 48%, Not at all 20%. Have you changed your/your family's eating habits and meal menus recently? Those age 18-29 said Yes 23%, No 77%. Those age 30-44 said Yes 28%, No 72%. Those age 45+ said Yes 37%, No 63%. Address: Checkerboard Square, St. Louis, Missouri 63134.

636. Ralston Purina Company. 1985. Report to shareholders for the third quarter and nine months ended June 30, 1985. Checkerboard Square, St. Louis, MO 63164. 8 p. 22 cm.
• ***Summary:*** The company declared a dividend of 25 cents per share to shareholders of record on 1 Aug. 1985. It will be paid on 6 Sept. 1985. Last year the company closed its tuna cannery.

Page 5: "Cash provided from operations is the Company's primary source of liquidity. Disposals of property, principally the restructuring of capital investment in Keystone resort and the sale of the Company's soybean processing operations, were other important sources of funds during the nine months ended June 30, 1985. The acquisition of Continental and treasury stock purchases represented substantial outlays of funds in the period. Capital expenditures for new and improved facilities for the nine months were $161.7 million compared to $96.1 million last year." Address: St. Louis, Missouri.

637. Johnson, Dale. 1985. Statistics on production and prices of soy protein products in the USA (Interview). *SoyaScan Notes.* Aug. 27. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** Dale has just contacted industry experts and compiled the following figures. Estimates of soy protein production and wholesale prices:

Defatted soy flour and grits: 150,000 tonnes (metric tons) = 330 million lb at 18-20 cents/kg = 8.2-9.1 cents/lb.

Soy protein concentrates: 50,000 tonnes (metric tons) = 110 million lb at 77-132 cents/kg = 35-60 cents/lb.

Soy protein isolates: 70,000 tonnes (metric tons) = 154 million lb at 220-243 cents/kg = 100-110 cents/lb.

Textured soy flours + concentrates: 75,000 tonnes

(metric tons) = 165 million lb. Textured soy flours sell for at 55-66 cents/kg = 25-30 cents/lb. Textured soy protein concentrates sell for at 154-176 cents/kg = 70-80 cents/lb.

Spun soy protein fibers (Ralston Purina isolate product) sell for at 330 cents/kg = 150 cents/lb.

Soy protein hydrolysates (Gunther product) sell for at 550-600 cents/kg = 250-273 cents/lb.

Exports (U.S. Dept. of Commerce data, 1984): Vegetable flours and grits, defatted: 7,170 tonnes. Vegetable flours and grits, not defatted: 197 tonnes. Concentrates, hydrolysates, textured and spun fibers: 9,545 tonnes. Isolates: 2,300 tonnes.

Johnson will be in Japan to address the Japanese Vegetable Protein Food Association at the end of September. His trip is sponsored by Miss Kojima and American Soybean Association. Address: Food Ingredients (Minnesota), Inc., 2121 Toledo Ave. North, Golden Valley, Minnesota 55422.

Estimated Capacities of Major Soybean Crushers. Sept. 1985.

Company Name	Estimated Capacity (tons/day)	Ownership
1. Archer Daniels Midland	33,500	Public
2. Cargill, Inc.	26,000	Private
3. Bunge	12,700	
4. Ag Processing Inc.	10,500	Co-op
5. Central Soya	9,800	Private
6. Quincy Soybean	4,600	Public?
7. Continental Grain	4,100	?
8. Ralston Purina	3,000	Public
9. Harvest States (Mankato)	2,500	Co-op

638. Curley, John. 1985. Ralston Purina's taste for its shares is sated, but investors may find debt hard to swallow: heard on the street. *Wall Street Journal*. Sept. 6.

• ***Summary:*** "Ralston's stock-buyback binge, which has been good news for shareholders in recent years, ended earlier this year." The stock (NYSE symbol RAL) has rise from about 31 in Sept. 1984 to a high of about 46 in May 1985.

For the year ended S4ept. 30, 1984, Ralston had sales of $4.98 million and earnings of$242.7 million, or $2.61 a share (fully diluted).

639. Stone, Dave. 1985. Japanese approval to affix JAS seal (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 3.

• ***Summary:*** He reads: "St. Louis, Missouri. 21 Sept. 1984. Japanese officials announced today approval for Ralston Purina Co. to affix the JAS seal of approval to the company's isolated soy protein at its manufacturing plants in the USA. This approval will be the first given to a food manufacturing facility in the USA." Address: Manager, Marketing Communications, Ralston Purina Co., Protein Div., St. Louis, Missouri.

640. Dunn, John R. 1985. Update on U.S. cooperatives and soybeans (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 21. 2 p. typescript. [1 ref]

• ***Summary:*** Estimated capacities (in tons/day) of the major U.S. soybean crushers (Sept. 1985). Mr. Dunn has compiled the following statistics from the trade literature: 1. ADM 33,000. Ownership: Public. 2. Cargill, Inc. 26,000. Private. 3. Bunge 12,700. Private. Ag Processing Inc. 10,500. Co-op. 5. Central Soya 9,800. Private. 6. Quincy Soybean 4,600. Public? 7. Continental Grain. 4,100. Private? 8. Ralston Purina. 3,000. Public. 9. Harvest States Cooperatives (Mankato). 2,500. Co-op.

In August 1983 Land O'Lakes, Farmland Industries, and Boone Valley Processing Assoc. put all their plants into an interregional cooperative named Ag Processing Inc., headquartered in Omaha, Nebraska. It began operation in August 1983. Boone Valley no longer exists; its feed mill was taken over by Farmland. Land O'Lakes and Farmland still exist–they just spun their soybean processing assets into Ag Processing, of which they are owners. In Sept. 1983 [or June 1982] Ag Processing Inc. closed its plant in Fort Dodge, Iowa.

"Sept. 1983. Ag. Processing Inc. closed its Fort Dodge, Iowa plant.

Oct. 1984. Ralston Purina sold 6 of its 7 plants to Cargill. It kept its large plant in Memphis, Tennessee. That was part of a change in Ralston's strategy to exit some of the commodities/ingredients and concentrate more on consumer products.

"Dec. 1984. A.E. Staley sold all its 6 plants to a wholly-owned subsidiary of ADM.

"1984. Riceland Foods sold its Helena Ark plant on the Mississippi to Quincy Soybean, based in Quincy, Illinois.

"1984. Coops. Goldkist had 3 plants. It sold 2 to Bunge. Marks (Mississippi, but not on the Miss. River) and Decatur (Alabama). Kept the one in Valdosta, Georgia.

"March 1984. Cargill closed its small (about 300 tons/day capacity) plant in Washington, Iowa

"The big picture. Last 4 years. Two main things are: 1. Consolidation of crushing activities in the Western Corn Belt to rationalize their capacity, including some vertical integration. Ag Processing Inc. has just began processing a salad oil called Ag Soy (spell?) in their St. Joseph, Missouri plant. Consumer or industrial product? 2. Contraction out of export based soybean crushing activities. Never had plants overseas. Goldkist's two plants and Riceland's one river

plant were all oriented toward export. But Ag Processing Inc. is still doing a lot of exporting. Others now better placed to serve the domestic market. Plants that were sold were the ones that depended on an active export market.

"Ag Processing Inc. is now the biggest cooperative SB crusher."

A ranking of the cooperative soybean processors is as follows: 1. Ag Processing Inc. 2. Harvest States (including Honeymead). 3. Gold Kist. 4. Riceland. 5. Agri-Industries. Address: USDA Agricultural Cooperative Service (ACS), Washington, DC 20250. Phone: 202-475-4929.

641. Ralston Purina Company. 1985. Annual report to shareholders 1985. St. Louis, Missouri. 38 p. 28 cm.
• ***Summary:*** Inside front cover: "Ralston Purina Company, founded in 1894, is the world's largest producer of dry dog and dry and soft-moist cat foods. The Company is the largest wholesale baker of fresh bakery products in the United States. Other consumer products include cereal and canned tuna. The Company is also the world's largest producer of commercial feed for livestock and poultry and is a major producer of isolated soy protein."

Page 1: Operating results. Net sales for 1985 were $5,863.9 million, up from $4,9801.1 million in 1984. Earnings for the year 1985 was $256.4 million, up from $242.7 million in 1984.

Page 5: Color photos show (1) PurinaProtein 710 isolated soy protein. (2) FujiPro 575.

Page 2: Chairman's letter to shareholders (from William P. Stiritz): The "sale of our soybean processing [crushing] operations in January removed the Company from a commodities business and freed cash for other investment... The result of these actions is that approximately 80 percent of the Company's earnings, with the addition of Continental Baking, is now related to Consumer Products."

Page 12: "Protein Technologies completed construction and start-up of a self-contained market development unit in Memphis, Tennessee, to permit rapid scale-up and marketing of new and improved isolated soy protein products."

Page 20: Sales of soy protein products were: $144.3 million in 1983, $154.3 million in 1984, and $126.4 million in 1985. Address: St. Louis, Missouri.

642. Shorey, RoseAnn L.; Day, P.J.; Willis, R.A.; Lo, G.S.; Steinke, F.H. 1985. Effects of soybean polysaccharide on plasma lipids. *J. of the American Dietetic Association* 85(11):1461-65. Nov. [23 ref]
• ***Summary:*** This is the earliest known trial of an isolated soybean polysaccharide preparation in individuals with moderately elevated cholesterol levels. 25 gm of soybean polysaccharide fiber was added to the diet of people with mild to moderately high plasma cholesterol in the form of a cookie or crouton. The 8 week experiment on 31 people used a crossover design. The fiber promoted a significant decrease in cholesterol. Address: Graduate Nutrition Div., Univ. of Texas at Austin; Ralsotn Purina Co., St. Louis, Missouri.

643. *SoyaScan Notes.* 1985. Chronology of soybeans, soyfoods and natural foods in the United States 1985 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 2. The soybean crushing industry begins a year of major restructuring as the big get bigger and two pioneers drop out. Ralston Purina announces that it has sold six of its soybean crushing plants to Cargill, Inc. A seventh at Memphis, Tennessee, was closed. This removed the company from the soybean commodity business. With this transaction Cargill passes ADM to become America's largest soybean crusher.

Jan. 3. "Myth or Miracle: Debunking the Tofutti Fad," by Mark Medoff published in *Whole Life Times.* The first exposé of Tofutti, which contains very little tofu. Jan. 13 Medoff appears on the Gary Null Show, Natural Living, to discuss his findings for 1 hour on prime time radio.

1985 Jan. 12. A.E. Staley Manufacturing Co. announces that it is basically getting out of the soybean crushing business. It has sold five of its six soybean plants (having a combined crushing capacity of some 275,000 bushels daily) to Independent Soy Processors Co., which is closely affiliated with Archer Daniels Midland. Staley was unable to sell its Decatur facility, which ceased operations indefinitely in Jan. 1984. With this transaction ADM has probably regained a slight lead as America's largest soybean crusher.

Jan. 14-26. Soybean Utilization Workshop held at Soyafoods Research Center in Gannoruwa, Peradeniya, Sri Lanka, sponsored by the Sri Lanka Soybean Project and INTSOY. 24 representatives from 12 developing countries participate. The world's first event of its kind (*Soyanews*, Dec. 1985).

Jan. 25-27. Natural Foods Expo at Anaheim. Soy ice creams steal the show. Tofu standards are debated heatedly at Soyfoods Association board of directors meeting on Jan. 28, especially by Ralston Purina attorney. Board decides funds are too limited to try to hire an executive director for SAA. Jan. 31. Paul Obis, founder and editor of *Vegetarian Times*, is seriously considering buying *Soyfoods* magazine from Doug Fiske. He makes a firm offer in late March.

Feb. "Designer Beans," an excellent overview of the U.S. soyfoods movement and its gourmet connections by Sandy MacDonald, published in *New Age* magazine.

Jan. American Soybean Association introduces SIS (Soybean Information Service), a computerized database focusing on soybean production and marketing, and oil and meal. The earliest record is 1958.

Feb. 21. *Tofutti and Other Soy Ice Creams: Non-Dairy Frozen Dessert Industry and Market,* by Shurtleff and Aoyagi published by The Soyfoods Center. Two volumes, 352 pages. This is the first study of the rapidly emerging soy

ice cream market, and of Tofutti.

Feb. 27. "Tofu Products May Be In, but Its Fans Wonder if There's Tofu in the Products" by Trish Hall published in *The Wall Street Journal.* Second major exposé on so-called "tofu ice creams" (such as Tofutti and Gloria Vanderbilt Glace), which contain only a token amount of tofu, as a marketing gimmick.

March 13-14. The theme of the Feb. 27 *Wall Street Journal* article picked up by the NBC evening news and the Today Show. Very positive coverage for tofu. Gary Barat of Legume, David Mintz of Tofu Time, and Gloria Vanderbilt each speak about tofu.

March 22. *The Book of Tempeh*, extensively revised second edition by Shurtleff and Aoyagi, published by Harper & Row. New bibliography (374 entries), history chapter, and list of tempeh producers.

March 26. Soyfoods Association's Tofu Standards (7th draft) presented to eight senior officials at the U.S. Food and Drug Administration's Center for Food Safety and Applied Nutrition, in Washington, DC, by Tom Timmins (Head of SAA Standards Committee), Gary Barat (President of SAA), Steve McNamara and Tom Donegan (SAA Food & Drug attorneys). The FDA group hears an hour long presentation on tofu, the standards, and the Soyfoods Association of America.

March. Soyarella (later renamed Soy Mozzarella), a tofu-based cheese, is introduced. It becomes an instant hit. Distributed by Neshaminy Valley Natural Foods of Huntingdon Valley, Pennsylvania, it is labeled as "non-dairy," yet it melts, and it tastes like cheese. Shrouded in secrecy, its manufacturer is unknown and the ingredients are questionable. It is sold in large blocks and labeled at individual stores.

March. American Soybean Assoc. launches a campaign among its members to write USAID and encourage them to cancel support for U.S. programs (such as INTSOY) aiding soybean production in Third World nations. The campaign is successful.

April 1. INTSOY signs a new cooperative agreement with USAID. Their work will henceforth focus on soybean utilization. The shift toward utilization began in 1983 and all work on soybean production and varietal development stopped in Aug. 1986.

April. *Tempe: An Annotated Bibliography,* compiled by Siagian and Sofia in Indonesia. Containing 273 references, it is the first bibliography to introduce the extensive Indonesian-language research on tempeh, the majority of which has been published since 1980.

April 15-16. International Symposium on Tempeh held in Jakarta, sponsored by the Indonesian Ministry of Health. 113 people attend.

April. Central Soya buys Griffith Laboratories' line of protein products.

May 31. Barricini Foods acquires Farm Foods, which then becomes a trade name for Barricini's natural / health foods line of non-dairy frozen desserts, including the pioneering product, Ice Bean, and Barricini Tofulite.

May. Morinaga, one of Japan's largest dairy companies, establishes Morinaga Nutritional Foods, Inc., a subsidiary with offices in Los Angeles, to focus on promoting their long-life silken tofu in America.

May. At the 6th Annual *Natural Foods Merchandiser* Merchandising Awards, soyfoods do well. Miso Mustard by American Natural Foods and Malteds by Westbrae win gold medals. Ah Soy by Great Eastern Sun wins a silver.

May. Soft Tofu Cheese, a non-dairy cream cheese cultured in miso, launched by Simply Natural, Inc.

June. Tofu Topper launched by Worthington Foods.

June. Ralston Purina publishes its 1985 Consumer Attitudes Monitor. Soy Protein in Foods, based on a nationwide survey of 628 adults. Indicates positive attitudes toward soy protein and soyfoods.

July 19. Shamrock Capital, a private company headed by Roy Disney, buys Central Soya, a publicly owned corporation. Agreement to buy was announced April 2.

July. Soy Supreme, spray-dried tofu powder, launched by Oberg Foods Div. of St. Peter Creamery.

July. Asian Symposium on Non-Salted Soybean Fermentation held at Tsukuba, Japan.

July 31. Tofu Time's sales of Tofutti increased more than sevenfold last year to $17,114,886 as compared with $2,361,391 for the previous year. Net income increased nearly 100-fold to $2,006,451.

July. New Gallup survey on vegetarianism of 1,033 Americans shows that millions are eating less meat and tens of millions agree with the move away from meat. 72% disagree with what used to be the standard notion: "The vegetarian diet is just a fad that will pass." A majority (52%) believe that "no one really needs to eat meat more than once or twice a week."

Aug. The DE-VAU-GE soymilk plant in West Germany starts production. Built by STS, with 4,000 liters/hour of soymilk capacity, they make Granose and GranoVita brands of soymilk.

Aug. Lightlife Meatless Tofu Pups (hot dogs) introduced by Tempehworks / Lightlife Foods of Greenfield, Massachusetts. The product sold nearly $250,000 in the next 10 months.

Sept. Soyfoods Center introduces SOYA, a computerized bibliographic database on soybean utilization, history, nutrition, processing, marketing, and production. Contains 18,500 references from 1100 B.C. to the present.

Sept. 30. Fearn Natural Foods in Illinois is sold by Louis Richard to Modern Products, Inc. in Milwaukee, Wisconsin.

Sept. 30 to Oct. 4. Tropical Soybean Workshop held at the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. Proceedings are published in 1987 as Soybeans for the Tropics. Also this year IITA established a

soybean utilization unit.

Sept. Tofulicious, a tofu-based non-dairy ice cream launched by Eastern Food products of Minneapolis. It was developed in conjunction with the University of Minnesota and funded by the Minnesota Soybean Research and Promotion Council. By 1986 it has become the first soyfood product in recent times to be actively promoted by state soybean associations, who sell it at many state and county fairs... where it is a big hit. Through Tofulicious many soybean growers begin to warm up to soyfoods.

Oct. 8th Draft of the Tofu Standards finished, incorporating extensive suggestions from FDA. Compiled by William Shurtleff.

Oct. Mori-Nu brand aseptically packaged tofu introduced by Morinaga Nutritional Foods.

Oct. Cream of the Bean Soygurt, a cultured soymilk yogurt, launched by Cream of the Bean, Inc.

Nov. Kikkoman introduces a long-life tofu in a foil retort pouch, imported from Japan. Poor quality causes the product to be withdrawn. It was re-introduced later.

Dec. Tofu Time starts exporting Tofutti to Japan. The first order by Daiei (a large retailer) of tubs for their parlors, is $350,000. This may be the first major export of a soyfood product (not including ingredients such as soy protein isolates) to Japan.

* The International Institute of Tropical Agriculture (IITA) in Ibadan, Nigeria, starts a program to promote processing and utilization of soybeans in Nigeria and throughout Africa. Continued.

644. *SoyaScan Notes.* 1985. Chronology of soybeans, soyfoods and natural foods in the United States 1985 (Continued) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. 1985 New Trends:

Dramatic Rise of Tofutti and Other Soy Ice Creams. 1985 will go down in the soyfoods history books as the "Year of Tofutti." Never before in history of the United States has any soyfood product achieved such widespread and sudden popularity or notoriety.

During 1985 at least 50 brands of soy ice cream (many with "Tofu" on the label) were on the market worldwide, most in the USA. And many were made by America's biggest dairy companies. An estimated 2.5% of all frozen desserts except novelties (popsicles, bars, etc.) sold in supermarkets were soy-based nondairy. The result of all this was to introduce tofu and isolated soy proteins to millions of people in a very positive context.

But many of the companies that sold so-called "tofu ice creams," while emphasizing tofu in their product names and marketing programs, actually had surprisingly little (if any) tofu in their products. In fact they contain so little that this marketing gimmick might be misbranding and a deliberate deception of the consuming public.

Rise of Soyfoods in Europe. Thanks to the Belgian Office of the American Soybean Association (ASA), and specifically to the efforts of Michael Martin, Europe's growing soyfoods movement is starting to become organized and active. In March 1984 Martin launched Europe's earliest known soyfoods newsletter, *Soya Foods*, and in September organized the First European Soyfoods Workshop, for which bound proceedings were published. This is the first time in recent decades that ASA has promoted soyfoods (other than soy oil) in the Western World. The strong U.S. dollar has led to a recent dramatic decline in imports of soybeans and soybean meal to Europe for feed and oil use (European rapeseed and sunflowerseed are being substituted), so the ASA is exploring new outlets where soy is unique.

The launching of tofu production and marketing by Switzerland's biggest supermarket chain, Migros, and by Galactina, a large and respected maker of dietetic and pharmaceutical products (including soymilk) is a landmark for tofu in Europe. In early January, *Tages Anzeiger*, one of Switzerland's biggest newspapers, had a special report on tofu, followed on Jan. 9 by a 30-minute TV feature on tofu.

The total number of soyfoods companies in Europe continues to show a steady increase. Many of these are being founded by people interested in macrobiotics. By Jan. 1985 there were 1,113 names in The Soyfoods Center's computerized mailing list of people actively involved with soyfoods in Europe.

At the 1984 ASA soyfoods workshop, Martin reported the following estimates of annual European soyfoods consumption: A table with three columns shows: Soyfood name, consumption, percentage of U.S. consumption.

Soy oil–1.7 million metric tons–38%
Modern soy protein products–40 million kg–28%
Soymilk–9 to 10 million liters–7%*
Tofu–5 to 6 million kg–22%
Tempeh–400,000 to 500,000 kg–50%
Miso–250,000 to 300,000 kg–11%

* U.S. figure includes soy based infant formulas. European figure is not clear on this point.

Note that the population of the USA is about 234 million compared with 489 million for all of Europe (not including the USSR), but 237 million for Northern and Western Europe, where most of these products are consumed.

Rapid Growth of Second Generation Soyfoods. In the 1984 edition of this book, we stated that the three fastest growing soyfoods in the USA (in terms of production increases) were tempeh (33% a year compound annual growth rate), tofu (15%), and soy sauce (14%). But now the picture has changed. In 1984 the fastest growing category was second generation products, ready-to-eat, all-American preparations, especially those based on tofu. The leader in this group is clearly soy ice creams (led by Tofutti), with a production growth rate of roughly 600% a year for the past 1-2 years. Then comes convenience tofu-based entrees such

as Legume's products, tofu burgers and tofu burger mixes, and the like. This is the number one way that soyfoods are now entering the mainstream American diet. And the biggest gains are being made by marketing companies, rather than manufacturers. The second fastest growing category may now be imported soymilks, growing at about 40-60% a year. Major New Capital Influx. The following is a brief summary of new capital influx to the soyfoods industry: A table with four columns shows: Company name, date of offering, $ amount, equity or debt; use.

Legume–Oct. 1982–$100,000 net–Equity. For tofu frozen entrees

Legume–Oct. 1982–$100,000–Debt. For tofu frozen entrees

Legume–Nov. 1983–$400,000 net–*Equity. For tofu frozen entrees

Legume–Nov. 1983–$200,000–Debt. For tofu Frozen entrees

Hinode Tofu–Nov. 1983–$2,500,000–Equity For general expansion

Tofu Time–Dec. 1983 $2,760,000 net–Equity. For soy ice cream

Tempehworks–July 1984–$265,000–Debt. For tempeh expansion

Legume–Feb. 1984–$200,000–Debt. For tofu frozen entrees

Legume–Aug. 1984–$1,248,000 net–Equity. For tofu frozen entrees

Brightsong–Dec. 1984–$500,000–Equity. For tofu products

Legume–April 1985–Expecting lots more. For tofu frozen entrees

White Wave–Expecting.

Note: Equity = Sale of equity ownership in the company via stock in a public offering or in a private placement. Debt = Debt financing by taking out a private loan.

How have these companies fared? Tofu Time has done spectacularly well. The value of the company has increased more than five-fold since Dec. 1983, and profits are excellent. Legume, a marketer of low-calorie, cholesterol-free frozen entrees featuring tofu, has had the hardest sledding. A preliminary prospectus by Huberman Margaretten & Straus dated 5 June 1984 stated that from its inception through 31 March 1984, the company incurred aggregate losses of $709,773, including a loss of $18,465 in 1982, then $225,302 in 1983, increasing again to roughly $486,500 in 1984. Legume's common stock had a negative book value; 1984 sales were "a little less than $1 million." Yet the company has excellent products and in early 1985 landed some big food chains, which could help its bottom line considerably.

Growing International Interest in Tempeh. During 1983-84 Japan became a major tempeh producer. By May 1984 the world's largest tempeh producing company was Marusan-Ai (of Japan), which made 15,150 lb. a week. New marketing and production techniques were pioneered. The full story was described by Shurtleff and Aoyagi in *Tempeh Production* (1984).

Three Major International Symposia Featuring Tempeh were held: 15-16 April 1984 in Jakarta, Indonesia; 15-17 July 1984 in Tsukuba, Japan; and May 1986 in Honolulu, Hawaii. A special 13-day group study tour on Japanese Food Fermentations, led by Dr. Keith H. Steinkraus, has been organized by the Japanese-run, New York-based Technology Transfer Institute. Tempeh continues to be one of the fastest-growing soyfoods in the USA.

Growing Interest in Spray-Dried Tofu. Eleven articles were published this year on a product that promises to revolutionize the tofu industry. The first and largest manufacturers (St. Peters Creamery and Clofine) are both dairy companies. Spray dried tofu should appeal to the food industry, since it is easy to ship, store, and process.

Dairy Magazines Publishing Many Positive Articles About Soy-Based Dairylike Products. Traditionally the dairy industry has seen dairy analogs as a threat and fought to oppose them. The decades-long struggle against margarine is a good example of this. But now, many small dairies, struggling to survive, are looking for new products. A number (such as St. Peter Creamery and Clofine) have gained a new lease on life by starting production of soyfoods.

Major Changes in the U.S. Soybean Crushing Industry. Narrow crushing margins, a depressed export market for U.S. soybean meal, and poor profitability have led two of America's biggest soybean crushers, the A.E. Staley Manufacturing Company and Ralston Purina, to decide to get out of the soybean crushing business in Jan. 1985. Clearly they view poor profitability as a long term problem, and plan to diversify away from unpredictable agricultural commodities toward the "value added," retail end of the nation's food supply. Staley, in effect, sold its plants to ADM and Ralston Purina sold its plants to Cargill. In Nov. 1984 Staley acquired CFS Continental, Inc., the nation's second largest supplier to the foodservice industry. Staley, previously the oldest existing soybean crusher in America (since 1922), now relinquishes that honor to ADM. ADM is now the largest soybean crusher in America, but Cargill (which has many overseas plants) is the biggest in the world. These changes have led to a concentration of control in the U.S. soybean crushing industry. Both Staley and Ralston Purina plan to keep their edible soy protein (isolates, concentrates, etc.) operations.

Biotechnology is Emerging as a Major, Promising Factor in future soybean breeding development. Some agricultural experts are predicting that it could usher in the latest agricultural revolution, following the agrichemical revolution of the 1940s and the Green Revolution of the 1960s and 1970s.

The "Calcium Craze" Starts in America, aiding sales of

tofu (curded with calcium sulfate), which is one of the best non-dairy sources of calcium.

645. Andres, Cal. 1985. Potential nutritional benefits of beverage with isolated soy protein. Isolated soy protein-based beverage may reduce cholesterol levels. *Food Processing* (*Chicago*) 46(13):40-41. Dec.
• ***Summary:*** "Isolated soy protein products have been developed with specific functional characteristics. For example, one company has more than 14 different isolated soy proteins in its product line." Address: Editorial Director.

646. *SoyaScan Notes.* 1985. Development of the book *History of Soybeans and Soyfoods* (Overview). Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1980 Oct. 22. First Table of Contents for Soyfoods History. I started this book because Nahum Stiskin of Autumn Press refused to let us use material from our tofu and miso books in our next book, titled *Soyfoods*, and it's hard to write the history portions of soyfoods. Inspired by Dr. Harry W. Miller and Henry Ford.

Dec. 9. Start to put bibliographic records on 3 x 5 inch file cards.

1981 March 13. Add chapters on Nutrition, National Soybean Processors Assoc., T.A. Van Gundy.

April 26. Add Society for Acclimatization, Li Yu-ying, Horvath, Lager.

May 15. Make Overview into four chapters. Add Soybean Chronology, Sri Lanka, History of Soybean Production, Asian History, Berczeller, USDA.

May 30. Change book title to History of Soyfoods and Soybeans from Soyfoods History.

June 6. Make Chronology Chapter 1. Make History of Soybean Production a separate chapter. Add McCay, Soyfoods Producers in the West (Listing of companies), changed title from Soyfoods History to History of Soyfoods.

August 21. Four Soybean Processors (Staley, ADM, Ralston Purina, Central Soya), Hymowitz, Bureau of Plant Introduction.

Oct. 8. Cargill, Co-op Processors, drop Hymowitz, Soybean Production Pioneers, put Soy oil ahead of soy flour, change the order of many chapters.

Nov. 3. Change title to *History of Soybeans and Soyfoods.* Put soy nuggets [fermented black soybeans] before miso.

Nov. 7. Set up first 3+2 character cataloging codes for Soyfoods Center library and documents, e.g. Hym-81.

1982 Jan. 2. Brief History of Fermentation East and West.

Feb. 2. Macrobiotics and Soyfoods, Kikkoman.

March 21. K.S. Lo and Vitasoy. Relocate East Asian pioneers at end of Pioneers section.

June 18. Separate Fermented Tofu and Fermented Soymilk.

July 22. Separate Soy Oil and Soybean Meal from Hydrogenated Soy Oil Products.

Aug. 21. Put all country histories together.

Oct. 25. Start using % instead of percent in Margarine chapter.

Nov. 13. D.W. Harrison.

Nov. 19. Decide to do separate chapter on Lecithin. Retitle each country from "History of Soyfoods in X" to "History of Soybeans and Soyfoods in X."

1983 Jan. 1. Switch from 3-letter codes to 4-letter. Hymo-73.

April 17. Changed "at" to KW = (keyword) on cards.

May 5. Dr. Fearn.

Nov. Added Cereal-Soy Blends at Flour chapter, Iowa State University, History of Soyfoods and Health Foods in Los Angeles.

1984 March. Meals for Millions, SFM-Rodale.

Sept. 22. Added 12 chapters on individual countries. Divided hydrogenation into 3 chapters: Oil, margarine and shortening. Change book's subtitle to "Past, Present, and Future." Structure it into four volumes.

Oct. 31. Completely restructure Soybean Production chapter into 16 parts. Discuss each by decade.

Dec. 26. Add Ice Cream.

1985 Jan. 19. Change ModProt to ProtMod, ProtIsol, etc.

March 8. Add PPC = Pioneering Protein Companies: Glidden, Rich Products, Gunther, Griffith Labs, I.F. Laucks. March 9. Add the Chemurgic Movement and US Regional Soybean Industrial Products Lab: Industrial Uses of Soybeans. United Nations, History of World Food and Protein, Hunger and Malnutrition.

April 17th. Redo outline, giving each company its own line and bibliography, like Adventists. Print outline vertically. Address: Director, Soyfoods Center, Lafayette, California 94549. Phone: 510-283-2991.

647. **Product Name:** Purina Protein 350, 610, 620, 630, 640T Fortiblend, 500E, 500 ST, 590, 510, 200, 220, HD90, 1500, 1710, 1711. 760. Renamed PP610, PP620, and PP760 by Nov. 1987.
Manufacturer's Name: Ralston Purina Co. Protein Div.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1985.
New Product–Documentation: Soya Bluebook. 1985. p. 86. And talk with Lisa Koppen. 1989, Jan.

648. Altschul, Aaron M.; Wilcke, Harold L. eds. 1985. New protein foods. Vol. 5. Seed storage proteins. New York, NY: Academic Press. xxi + 474 p. Index. 24 cm. [200+ ref]
• ***Summary:*** Contains 13 chapters by various authors. Those related to soy are cited separately. Chapters not cited separately are: 3. Relationships of genetic engineering to

conventional genetic technology and plant breeding. 6. Chemical and enzymatic modification of plant proteins. 10. Rapeseed. 11. Peanuts (groundnuts). 12. Sunflower seed protein. 13. The physical characteristics and functional properties of sesame proteins. Address: 1. Georgetown Univ. School of Medicine, Washington, DC; 2. Ralston Purina Co., St. Louis, Missouri.

649. Kolar, C.W.; Richert, S.H.; Decker, C.D.; Steinke, F.H.; Vander Zanden, R.J. 1985. Isolated soy protein. In: A.M. Altschul and H.L. Wilcke, eds. 1985. New Protein Foods. Vol. 5. Seed Storage Proteins. New York: Academic Press. xxi + 474 p. See p. 260-99. Chap. 8. [88 ref]
• ***Summary:*** Contents: Introduction. History. Manufacture of isolated soy proteins. Manufacture of structured isolated soy proteins. Research in soy protein isolation. Composition of isolated soy proteins. Physical and functional properties. Nutrition factors. Meat, poultry, and seafood applications. Infant formulas. Dairy-type applications. Bakery applications. The future of isolated soy protein. Address: Ralston Purina Co. St. Louis, Missouri.

650. Leeds, Anthony R. ed. 1985. Dietary fibre perspectives: reviews and bibliography 1. London: John Libbey. viii + 358 p. Bibliographical editor Alinson Avenell. Foreword by Denis P. Burkitt. 25 cm. [997 ref]
• ***Summary:*** This is one of the most interesting and comprehensive books published to date on the subject of fiber in human diets. Contents: Foreword, by Denis P. Burkitt. The authors and editors. Introduction by A.R. Leeds. Part I: Reviews. 1. Fiber and the large gut, by G. Roth and C. Leitzman. 2. Dietary fibre and blood lipids in man, by Patricia A. Judd and A. Stuart Truswell. 3. Dietary fibre and gallstones, by Patricia A. Judd. 4. Fibre and diabetes–new perspectives, by David B. Peterson. 5. Dietary fibre in obesity, by Marcin Krotiewski and Ulf Smith. 6. Dietary fibre supplements and weight reduction, by Kjeld R. Ryttig. 7. Fibre and mineral absorption [phytic acid], by Barbara F. Harland and Eugene R. Morris. 8. Fibre and food products, by Peter R. Ellis. Index.

Part II: Bibliography. 9. Dietary fibre in human nutrition: a bibliography to 1977, compiled by Hugh C. Trowell, with Foreword by K.W. Heaton. Subject index. Author index. Addendum. 10. Dietary fibre in human nutrition: a bibliography for 1978-1982, compiled by Alison Avenell, Anthony R. Leeds, and Hugh C. Trowell–1978 = 481 references, 1979 = 528 references, 1980 = 480 references, 1981 = 657 references, 1982 = 610 references.

Part III: Indexes to Part II. Structure of subject indexes 1978-1982. Then there is a subject index and an author index to the bibliographies for each year from 1978 to 1982.

The worldwide bibliography to 1977, compiled by Trowell, was first published in 1979 by John Libbey (London) for Kellogg Company of Great Britain Ltd. (which see for details).

In the Foreword, Denis P. Burkitt (now at The Old House, Bussage, Near Stroud, Gloucestershire, England) begins by noting: "Nothing more dramatically illustrates the phenomenal growth of interest in dietary fibre which has been witnessed during the last 15 years than the explosive increase in scientific publications on the subject. Within a decade the annual rate of publications on the subject rose a remarkable 40-fold."

Fibrim soy fiber is mentioned in chapters on "Fibre and the Large Gut," "Dietary Fibre and Blood Lipids in Man," "Fibre and Diabetes," and "Fibre and Mineral Absorption." Address: Dep. of Food and Nutritional Sciences, Queen Elizabeth College (Univ. of London), Campden Hill Road, London W8 7AH, England.

651. Smouse, Thomas H. 1985. Flavor reversion of soybean oil. In: D.B. Min and T.H. Smouse, eds. 1985. Flavor Chemistry of Fats and Oils. Champaign, IL: American Oil Chemists' Society. viii + 309 p. See p. 85-116. [121 ref]
• ***Summary:*** Contents: Introduction. Reversion. Literature reviews: The first meeting to discuss the flavor stability of soybean oil was in 1946. The first review by Markley (1951, Vol. II, p. 812-31) contained 39 references. Theories of reversion: linolenic acid theory, isolinoleic acid theory ("Isomers of linoleic acid are called isolinoleic acid"), phospholipid theory (discovered by Warren Goss in Germany), nonsaponifiable theory, multivalent metals, singlet oxygen, controlling reversion ("No known method is available to prevent the reversion flavor of soybean oil"). Conclusion. Acknowledgement. Address: Manager of Lipid Science, Protein Technology Div., Ralston Purina Co., St. Louis, Missouri 63164.

652. Lo, G.S.; Evans, R.H.; Phillips, K.S.; Dahlgren, R.R.; Steinke, F.H. 1986. Effect of soy fiber and soy protein on cholesterol metabolism and atherosclerosis in rabbits. *Federation Proceedings* (*FASEB*) 45(3):348 (Abst. #1129). March.
• ***Summary:*** Rabbits were fed dietary fiber from dehulled, defatted soybeans alone and in combination with isolated soy protein (ISP) or casein to study the effect on cholesterol metabolism and atherosclerosis. The fiber, called "soy ploysaccharide" (SPS) contains both cellulosic and non-cellulosic dietary fiber, and contains about 75% total dietary fiber.

Rabbits fed a diet with ISP + SPS had the highest excretion of fecal fat, cholesterol, and bile acids. When fed with SPS, ISP gave lower plasma cholesterol levels and incidence of atherosclerotic lesions than casein. Address: Ralston Purina Company, St. Louis, Missouri 63164.

653. Wilkinson, Ralph. 1986. Soy fiber: types and sources (Interview). *SoyaScan Notes.* May 2. Conducted by William

Shurtleff of Soyfoods Center.
• ***Summary:*** Soy fiber is classified into three basic types: (1) Soy bran or soy bran fiber: It is cleaned, finely pulverized soybean hulls.

(2) Okara or soy pulp: The residue left after making tofu or soymilk. It contains some natural oils and protein, and has a very high protein quality (as measured by PER).

(3) Soy cotyledon fiber (SCF) or defatted soy cotyledon fiber: The residue left after making isolated soy proteins. It contains almost no fat (since isolates are made from defatted soybean flakes), but it still contains quite a lot of high-quality fiber. It binds a great deal of water.

Who sells what?

(1) ADM introduced soy bran in about 1977. Their 1983 catalog (from the IFT show) lists "Nutrisoy Fiber (Soy Bran)."

(2) Ralston Purina now makes SCF which they call "soy polysaccharides." Ross Laboratories and Mead Johnson use this in small amounts for geriatric foods, sort of like an infant formula for the aged.

(3) Grain Processing Corp. plans to introduce a SCF in mid-1986, i.e. later this year.

(4) Dawson Mills made SCF 5-6 years ago as a by-product of their soy protein isolate operations. It was on the market for only 1-2 months before they got out of the isolate business. Note: The product was named Fi-Trate / Fitrate Soy Fiber Concentrate. On 1 March 1980 the merger of Dawson Mills and Land O'Lakes was officially announced. Address: Grain Processing Corp., Muscatine, Iowa.

654. *Food Technology.* 1986. Ralston [Purina] dedicates soy protein market unit [producing a new generation of isolated soy proteins in Memphis, Tennessee]. 40(5):238. May.
• ***Summary:*** A small aerial photo shows the new facility.

655. *Canadian Institute of Food Science and Technology Journal.* 1986. Ralston Purina soy facility [at Memphis, Tennessee]. 19(3):xi-xii, xiv. June. [Eng]
• ***Summary:*** Ralston Purina is the world's leading manufacturer and wholesaler of isolated soy proteins (ISP). The company introduced its first commercial ISP almost 25 years ago. One of the first and most important uses of ISP products was in hypoallergenic infant foods; soy is less allergenic than cow's milk.

In the early 1970s Ralston Purina elevated its protein operations to the new Protein Division. Today Ralston Purina offers some 90 varieties of ISP.

It new facility in Memphis will be for manufacturing the next generation of food-grade ISPs.

656. *Food Processing* (*Chicago*). 1986. R&D profile: Ralston Purina Company. 47(6):21, 23, 25-26, 29, 31, 33. June. Foods of Tomorrow section.
• ***Summary:*** Quality, nutrition, and economics are the keys to Ralston Purina's research program. The Protein Technologies Group has a staff of 92+ ingredient researchers. Total company R&D expenditures of $48.5 million, out of total 1985 sales of approximately $5,900 million. Discusses: Protein Technologies Group (president Paul Hatfield), isolated soy protein, nutrition, soy fiber (from the cell wall and not from the hull/bran of the bean).

Note: This is the earliest document seen (Sept. 2020) that mentions the "Protein Technologies Group," which was renamed Protein Technologies International by May 1987.

657. **Product Name:** Meats Extended with Soy Protein [Chicken Patties, Chicken Nuggets, Pork Sausage, or Ground Beef Patties].
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1986 June.
New Product–Documentation: Spot in New Product News. 1986. June. These are fully cooked, microwave ready. Test marketing in Rochester, New York.

658. McCarthy, Michael J.; Hemp, Paul. 1986. Ralston to sell U.S. feed line to unit of BP [British Petroleum Co.]: sale reflects recent effort to focus St. Louis firm on consumer products. *Wall Street Journal.* July 11.
• ***Summary:*** Ralston Purina has "agreed to sell its animal feed business to BP Nutrition Ltd., a unit of British Petroleum Co."

"Purina Mills, the largest U.S. maker and marketer of commercial feed for livestock and poultry, operates 70 mills and has about 10% of the U.S. animal feed market, said Ralston." Analysts estimate that, in fiscal 1985, Purina Mills had sales of about $1 billion and operating profit of about $60 million.

The sale is expected to be finalized by Oct. 1. Address: Staff Reporters for the WSJ.

659. *Nutrition Overview.* 1986--. Serial/periodical. St. Louis, Missouri: Protein Technologies International. Vol. 1, No. 1. July, 1986. Quarterly. James G. Elliott, editor.
• ***Summary:*** See next page. This 4-page newsletter provides "current information on topics of interest in the field of nutrition, including an overview of a prominent nutrition topic each issue." Of major interest are isolated soy proteins and dietary fiber, both made by Ralston Purina's Protein Division. Address: St. Louis, Missouri.

660. *Food Engineering.* 1986. New facility offers fast supplies of customized ISP. 58(8):51. Aug.
• ***Summary:*** Customized isolated soy proteins, from Ralston Purina's new market development unit in Memphis, Tennessee, can now be supplied quickly for test marketing and regional launches of new products. Examples of the new custom ISPs are Purina Proteins 780, 690, and 660.

NUTRITION —OVERVIEW—

JULY, 1986 VOL.1 NO.1

INTRODUCTION

Nutrition Overview is the first of a series of newsletters brought to you by the Ralston Purina Protein Division. This service will provide current information on topics of interest in the field of nutrition, including an overview of a prominent nutrition topic in each issue.

We hope this newsletter proves helpful to you. We would appreciate hearing from you regarding future topics, or if you have any questions or suggestions.

Georgina Sikorski,
Industry Manager
PROTEIN DIVISION
Ralston Purina Company
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THE WORLD HEALTH ORGANIZATION SETS NEW PROTEIN STANDARDS

Isolated soy protein provides the same high-quality protein as meat, milk and eggs, according to the recently revised World Health Organization (WHO) report, ENERGY AND PROTEIN REQUIREMENTS.(1) The report updates the 1973 WHO protein report, developing new energy, protein and amino acid requirements for humans throughout life.

The report also sets new worldwide nutritional standards for assessing protein quality and protein requirements in the human diet. The revisions include the adoption of higher, safe levels of protein intake for all age groups and the addition of an amino acid requirement pattern for preschool children.

The report was developed jointly by WHO, the Food and Agriculture Organization and the United Nations University. Vernon Young, Ph.D., a participant on the consulting committee that developed the new protein guidelines, noted that protein research conducted over the past decade made the revisions necessary.

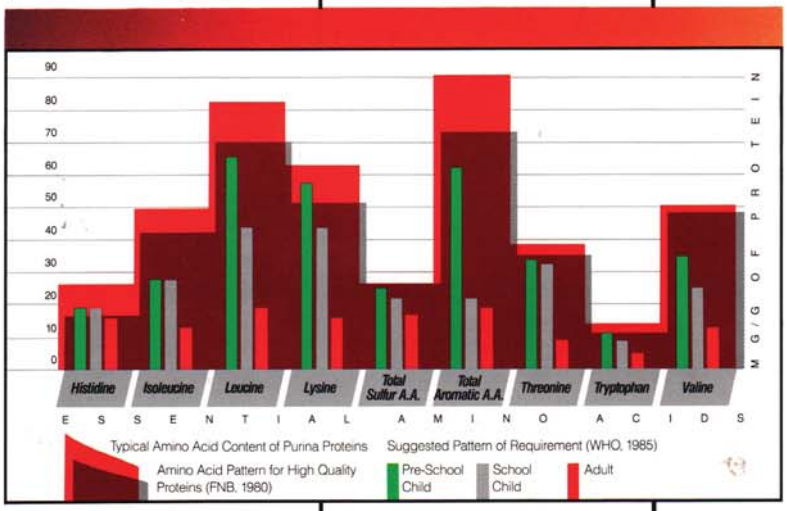
"Since the 1973 report, the number of human studies has increased dramatically," explained Young. "With this new knowledge has come the clearer understanding that the quality of food proteins must be judged finally on the basis of known human requirements."

These WHO amino acid patterns are based on human requirements defined over years of study. These new patterns clearly show that animal proteins are not the only high quality proteins. Ralston Purina's isolated soy protein, for example, can be consumed as the sole dietary protein source. It meets or exceeds the amino acid requirements recommended for the preschool child and is highly digestible — the requirements for a high quality protein.

The WHO pattern of amino acids also provides a new method of assessing the quality of food proteins. It is no longer necessary to compare the quality of a food protein to the amino acid profile of casein or lactalbumin using animal tests.

References

1. WHO Expert Consultation. Energy and Protein Requirements. Report of FAO/WHO/UNU Expert Consultation, WHO Technical Report Series 724, 1985.



Purina Proteins meet or exceed the WHO recommendations for high quality proteins.

661. *Food Engineering.* 1986. Sea and soy proteins spark analogs, blends. 58(8):91. Aug.
• ***Summary:*** "By acquiring the Griffith soy protein concentrate line (April 1985) and the Staley concentrate line (Feb. 1986), Central Soya is now the nation's only supplier of soy protein concentrates." Also discusses Ralston Purina custom isolated soy proteins, Grain Processing Corp.'s Frostline tofu mix, Dreamy Tofu from Giant Foods, Tofu For You (a non-dairy frozen dessert based on powdered tofu) from the Ingredient Systems Div. of ITC, spray dried tofu from St. Peter Creamery and Clofine Dairy Products, creamy tofu dressings and Nasoyanaise from Nasoya Foods.

662. Ralston Purina Co. 1986. Sale of Purina Mills to BP Nutrition finalized (News release). Checkerboard Square, St. Louis, MO 63164. 2 p. Oct.
• ***Summary:*** BP Nutrition is the food and agriculture subsidiary of The British Petroleum Co. The sale price was $545 million. On July 10 Ralston Purina had announced an agreement in principle to sell Purina Mills, Inc., its U.S. animal feed business. "This was a very difficult decision for us because the animal feed business represents the origins of our company. In addition, Purina Mills is the market leader in its industry and has consistently performed extremely well." The sale will enable Ralston to focus its efforts on becoming a consumer packaged goods business. With this sale, more than 90% of Ralston Purina's earnings will come from consumer packaged goods products. Brands include Purina Dog Chow and Cat Chow, Hostess, Wonder, Chex cereals, Chicken of the Sea tuna, Eveready, and Energizer. Address: St. Louis, Missouri.

663. *Food Engineering.* 1986. Higher suggested dietary intakes of protein: A recent FAO/WHO/UNU report recommends a new approach for estimating human protein requirements. 58(11):49, 52-53, 56, 58. Nov.
• ***Summary:*** The first FAO/WHO report, issued in 1973 defined the protein problem away. The new report, issued in late 1985, increased recommended daily protein intake by 25%, from 0.60 to 0.75 gm per kilogram of body weight per day. A single amino acid pattern was used in 1973, but now four are used. The recent tests are all based on humans, rather than rats. And Protein Efficiency Ratio (PER) is no longer recommended as the measure of protein quality for humans.

664. Ralston Purina Company. 1986. Annual report. Checkerboard Square, St. Louis, MO 63164. 32 p.
• ***Summary:*** The company, incorporated on 8 Jan. 1894 in Missouri, is the world's largest producer of dry dog and dry and soft-moist cat foods, and is the largest wholesale baker of bakery products in the U.S. "Ralston's metamorphosis into a very attractive consumer packaged goods company is now essentially complete." The restructuring of the past few years has strengthened the company. The company is now comprised of three business segments: Human and Pet Foods (incl. isolated soy proteins), Other Consumer Products, and Agricultural Products. Return on average equity grew from 23.1% in 1984 to 40.4% in 1986. Sales grew to $5,500 million in 1986 from 3,200 million in 1977. Net earnings grew to $388 million from $142 million. Total assets to 4,200 million from 1,770 million in 1977. Address: St. Louis, Missouri. Phone: 314-982-1000.

665. *SoyaScan Notes.* 1986. Chronology of soybeans, soyfoods and natural foods in the United States 1986 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan.–The first major soy cheese to hit the market is Soya Kaas–a landmark product. It was developed and introduced by Richard McIntyre of Soya Kaas Inc., a subsidiary of Swan Gardens Inc. Marketed exclusively by American Natural Snacks of Florida, it long remain America's most popular cheese alternative.

Jan. Ron Ishida, an attorney with no previous knowledge of tofu, working for Azumaya Inc. (South San Francisco, California), rewrites the Tofu Standards without authorization. They have already gone through 8 drafts. This creates a crisis.

Jan. *Soyfoods: The Journal of the European Soyfoods Association* (*ESFA*) begins publication from Paris. Philippe Vandemoortele of Alpro is president of the association and Guy Coudert is editor of the periodical. The association plans to organize a soyfoods conference every 2 years. But the journal is discontinued after 3 issues.

Jan. Tomsun Foods is reorganized, changing its name (for the fourth time) to Tomsun Foods International. The firm's new chairman is Juan Metzger, founder of Dannon Yogurt. The company produces nearly 3 million lb. of tofu a year.

Jan. First Tofutti Shop opened in Japan by Daiei Co. Inc., Japan's largest retailer. Shop sells non-dairy soy-based ice cream and related snacks.

Feb. 7. Fire destroys Island Spring tofu plant in Vashon, Washington, with an estimated $1 million loss.

Feb. Soya Kaas, an imitation cheese containing soymilk and casein, launched by American Natural Snacks, a marketer. The manufacturer is Swan Gardens of Georgia.

Feb. Jofu, a tofu-based, non-dairy, nonfermented, yogurt-like product, sweetened with fruits, launched by Tomsun Foods International of Greenfield, Massachusetts. The product is a hit, grossing nearly $400,000 in its first 32 weeks on the market.

Feb. Barricini Foods has its first public stock offering. Raises $1.5 million, gross to use in marketing Tofulite and Ice Bean soy ice creams.

Feb. Central Soya purchases Staley's protein line,

including Mira-Tex, Procon [soy protein concentrate], and Textured Procon brands.

Feb. ASA hires Jim Guinn as technical director of soybean quality programs. Soybean quality is an area of growing interest, with two parts: 1. The traditional area of soybean condition, concerning grades, damage, foreign material, etc. 2. The newly emerging area of soybean composition and its relation to grades. New measurement technologies make it likely that soybeans may soon be sold based on their composition of oil and protein. Both effect exports and price.

March 5. Pesticide control now tops the Environmental Protection Agency's list of most pressing problems, announces *The New York Times* (and *Soybean Digest*, June/July). Stricter pesticide laws are enacted.

March 7. Richard E. Lyng of California becomes U.S. Secretary of Agriculture, replacing John R. Block. Policies remain unchanged.

April 18. Wm. Shurtleff, in charge of compiling the original tofu standards, submits a strong criticism of the illegitimate Ishida draft in the form of a detailed chronology of the development of the tofu standards.

April. Tofu cheesecake revolution in New York City profiled by *Whole Life*. Thirteen restaurants now offer them.

May. Tofutti Love Drops (chocolate covered graham cookie drops) launched by Tofutti Brands with much fanfare.

May. Nasoya's new million-dollar automatic tofu-making system, imported from Sato Shoji in Japan, begins operation.

June. Increasing consumer deception by "soy cheese" manufacturers. *Whole Life* publishes "Whole Frauds in the News: Will the Real Soy Mozzarella Please Stand Up (That is, If There is One)," an exposé of mislabeling involving Soyarella, Tofu Mozzarella, and Soya Kaas (though the latter brand is not at fault). Argues that it is deceptive for health food stores to call a product "non-dairy" if it contains casein (milk protein), even though FDA rules allows such a designation. In Oct. *Whole Life* reports that "Independent lab tests prove Soyarella hoax; Large quantities of casein [19.6%] found in so-called soy cheese." Soyarella had previously been marketed as casein free.

July. Ralston Purina Co. starts publication of *Nutrition Overview*, a newsletter focusing on soy protein and fiber.

July. Soyfoods win big in 7th Annual Natural Foods Merchandiser merchandising awards: Gold: San-J tamari and shoyu. Silver: Fantastic Foods' Tofu Scrambler and Tofu Burger, Westbrae Natural miso soups. Honorable mention: Walker & Wilks frozen entrees, White Wave boxed tofu.

July. Vitasoy reintroduces its line of reformulated and repackaged soymilk products, originally launched in 1984. They contain more solids and nutrients, and are sweetened with barley malt instead of maple syrup.

July. A Roper poll in the U.S. finds that tofu is the "most hated" food. 35% of a sample of 2,000 adults checked it on a list of foods said to be disliked, ahead of liver (34%), yogurt (29%), Brussels sprouts (28%), and prunes (24%). Results do not vary significantly by age, but tofu dislike is somewhat less among those with higher incomes. The poll results are very widely publicized, and are even the subject of a question on the TV program Jeopardy (in early 1988)–and its rerun! These findings suggest both a widespread awareness of tofu and a split image: Some like it and others don't.

Aug. Kikkoman's new shoyu plant starts operation in Chitose, Hokkaido, in northern Japan. The first product was shipped on 30 Jan. 1987.

Sept. 9. American Soy Products Inc. plant dedicated in Clinton, Michigan. A $10 million joint venture between Eden Foods and four Japanese companies (Kawasho, Marusan, Muso, Seikensha), construction on the plant began in Oct. 1985. It will make Edensoy soymilk in Tetra Brik cartons. The first products are shipped in November.

Sept. 19. Tofu standards passed by Tofu Standards Committee in San Francisco, after all committee members except Shurtleff agree to start with a blank slate in drafting new standards–thus erasing years of work by hundreds of people. Shurtleff resigns in protest, arguing that this is a violation due process. Shortly thereafter Barricini and Ralston Purina also refuse to give final approval. Tofu standards are stalled indefinitely after many years of hard work.

Sept. 24. First International Tofu Products Expo, Seminar, and Soyfoods Buffet, held in Munich, West Germany. Sponsored by Bernd Lehmann International Consultants. 100 people attend.

Oct. Supersoy brand soymilk introduced to America by Mitoku USA. It is made by Kibun Health Foods Co. in Japan.

Oct. Ralston Purina sells its domestic agricultural products business, Purina Mills. Total sales for 1986 were $5.5 billion.

Nov. Island Spring announces $6.5 million investment from Edward Lynch Co. to finance an expansion plan. Construction of a new 30,000 square foot factory is now underway on Vashon Island.

Dec. 1. White Wave of Boulder, Colorado, acquires Soyfoods Unlimited, a tempeh manufacturer of San Leandro, California. This makes White Wave America's largest tempeh manufacturer.

Dec. 8. Central Soya purchases 7 of 9 Bunge's soybean crushing plants. ADM is now estimated to control 30% of U.S. crushing capacity followed by Cargill (25%), Central Soya (20%), and other (25%).

Dec. Tomsun Foods International nets about $3.45 million in its first public stock offering (IPO). Most of the funds will be used for sales and marketing of Jofu, and to repay $800,000 in debts. Total Tomsun sales in 1986 were about $3.1 million.

Dec. Haagen-Dazs will drop Tofutti and start

distributing Barricini Tofulite, a non-dairy frozen dessert.

Dec. Brightsong Foods is named as one of the top ten food innovators for 1986 by Food & Beverage Marketing magazine. In fact, Brightsong is listed first!

Dec. Tofruzen Inc., a soy ice cream marketer from Englewood, Colorado, raises $1.6 million in a public stock offering. Sales of Tofruzen in fiscal 1986 were $91,000, rising to $158,000 in 1987, and $213,000 in the first quarter of 1988.

Dec. Edible Soy Products in Hudson Iowa is sold to Solnuts of Tilburg, The Netherlands, and renamed Solnuts, Inc. The Hudson and Tilburg plants are the only ones in the world that dry roast soybeans to make soynuts.

Dec. More than 60,000 Italian farmers harvested nearly 25,000 hectares (61,700 acres) of soybeans this year. Italy is now Europe's largest soybean producing country, followed by France. Five years ago, Italy produced virtually no soybeans. The Ferruzzi Group is the leading promoter, helped by hefty subsidies from the EEC.

1986 New Trends:

So Called Tofu Cheeses. Eight new soy cheeses were launched during 1986, many with the term "Tofu" in the product name. Many have been shrouded in mystery, with the names of the manufacturer and ingredients often not disclosed. There has been much consumer deception, mislabeling, and several attempts to conceal the fact that they usually contain casein, the protein in cow's milk.

Soy Yogurts and Yogurt-Style Products. The leader in this exciting new category is Jofu from Tomsun Foods. The two basic types are fermented soymilk products (e.g. Cream of the Bean, Soy-O), and non-fermented tofu-fruit blends (e.g. Jofu).

Move to Manufacturing Soymilk in America. The rising cost of soymilk imports is making them unprofitable. Domestic production, which obviates shipping U.S. soybeans to Japan, then shipping the beans and water back, will have major, beneficial long-term effects on Edensoy, Ah Soy, and Westbrae Malteds. Still imported are Vitasoy (from Hong Kong, whose exchange rate is tied to the dollar) and Sunsoy (from Belgium).

The declining value of the dollar against the yen starting in late 1985 led to a steady rise in soymilk prices. But the combination of domestic production and larger size packages (see below) has led to a drop in soymilk prices during 1986. For example, Edensoy, selling for 6 times the price of dairy milk per unit volume in early 1984, was selling for only 3.5 to 4.1 times as much in late 1986, a drop of about 37%.

Soymilk Switches to Tetra Brik Cartons and Liters or Quarts. Edensoy, Westsoy, and Ah Soy have all switched to Tetra Brik cartons this year. Lower total manufacturing and shipping cost is the main reason. The liter/quart size was pioneered in the U.S. by Alpro/Vamo Foods/Sunsoy, and followed by Edensoy, Ah Soy, and Vitasoy. These counterparts of dairy milk in quarts suit the needs of regular soymilk users by offering a more economical price per unit volume plus greater convenience. Soymilk may be the first liter-size Tetra Brik product to succeed in America.

INTSOY is doing outstanding, pioneering work with soyfoods and soybean utilization in the Third World and America. Research is focusing on extrusion cooking, extruder-expeller processing for small-scale oil expression, and fresh green soybeans. Since April 1987 the INTSOY Newsletter has become one of the best soy-related publications available.

Morinaga Long-life Silken Tofu becomes a major force in the U.S. tofu market. Traditional manufacturers consider the product a major threat to their markets. Azumaya has hired an attorney who spends considerable time causing troubles for Morinaga.

666. Duxbury, Dean D. 1986. Consumer attitude survey indicates acceptance of soy protein foods. *Food Processing* (*Chicago*) 47(13):112-13. Dec.

• ***Summary:*** A quantitative survey of primary grocery shoppers (625 U.S. men and women, age 18 and older) was conducted in 1985 by an independent research firm to measure U.S. consumer attitudes toward the use of soy protein in foods. 60-70% of consumers have strong healthy associations of meat and soy protein in attitude questioning. Address: Associate editor.

667. Lo, Grace S.; Goldberg, A.P.; Lim, A.; Grundhauser, J.J.; Anderson, C.; Schonfield, C. 1986. Soy fiber improves lipid and carbohydrate metabolism in primary hyperlipidemic subjects. *Atherosclerosis* 62(3):239-48. Dec. [26 ref]

• ***Summary:*** The authors studied the effect of soy polysaccharide on glucose tolerance in patients with hyperlipidemia. Adding 25 gm of soy polysaccharide significantly reduced fasting glucose levels by 8.5%. Soy fiber significantly reduced insulin responses to oral glucose challenge by 20% in patients with Type II-A hypercholesterolemia. Address: 1. Protein Technologies, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63164; 2-3. Lipid Research Center, Dep. of Preventive Medicine, Washington Univ., St. Louis 63110.

668. **Product Name:** Fibrim (Soy Fiber from Processing Isolated Soy Proteins) [1000, 1450, or 2000].
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164.
Date of Introduction: 1986.
New Product–Documentation: Hurd. 1987. Baking Industry. Jan. p. 52. This odorless bland product contains 75% dietary fiber. It is composed primarily of cell wall material (both cellulosic and non-cellulosic) of soybean cotyledons derived from processing dehulled, defatted

soybean flakes. It contains neither soybean hull nor soy bran. Oil Mill Gazetteer. 1987. Oct. Fibrim brand soy fiber was introduced in 1986, part of an accelerated new products program.

669. Wilcke, Harold H.; Bodwell, C.E.; Hopkins, D.T.; Altschul, A.M. 1986. New Protein Foods: A study of a treatise. *Advances in Food Research* 30:331-85. [108 ref]
• ***Summary:*** This is an analysis of the multivolume monograph titled *New Protein Foods*. That treatise also reviewed new ways of producing and marketing classical protein foods. Contents: Introduction. The energy-protein interaction. Food supply. Conventional sources of protein foods: Plant, land animals, marine animals. Reflections on foods from animal sources. New protein foods based on plant sources: Introduction, cereal-legume model, nutritious beverage model, animal flesh model. Properties of plant protein products: Nutritional equivalence, chemistry and technology, genetics, government regulations, comment. Intervention to improve energy and protein nutrition: Short term, long term.

"There was a time when any emphasis on protein foods was taken to mean that the world food problem was considered to be primarily a protein problem. In opposition, many others insisted that there was no evidence of a protein problem: It was total food supply, total energy supply, that was the problem. And there were two camps: those who insisted that the major effort to increase food supply should be on total food supply, and the other that the effort must be concentrated on protein supply. Neither is correct. Protein and energy are interrelated and inseparable in individual human and animal nutrition; they are equally inseparable in considering agricultural resources. The food problem, wherever it exists, is a joint protein-energy problem, just as severe malnutrition in children is a protein-calorie problem. Surely other essential nutrients are required, but in relatively small quantities for which there are alternate sources. It is the protein-energy axis that is limiting." Address: 1. Ralston Purina Co., St. Louis, Missouri 63164; 2. Energy and Protein Nutrition Lab., Beltsville Human Nutrition Research Center, ARS/USDA, Beltsville, Maryland 20705; 3. Agricultural Nutritional Consultants, Inc., Cedar Rapids, Iowa 52406; 4. Depts. of Medicine, and Community and Family Medicine, Georgetown Univ. School of Medicine, Washington, DC 20007.

670. **Product Name:** Soy Polymers.
Manufacturer's Name: Ralston Purina Co.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164. Phone: 314-982-1000 or 314-982-3117.
Date of Introduction: 1987 January.
New Product–Documentation: These industrial products act as functional additives for the coated paper and paperboard markets.

671. Mercer, Nina J.H.; Carroll, K.K.; Giovannetti, P.M.; Steinke, F.H.; Wolfe, B.M. 1987. Effects on human plasma lipids of substituting soybean protein isolate for milk protein in the diet. *Nutrition Reports International* 35(2):279-87. Feb. [23 ref]
• ***Summary:*** 33 healthy adult volunteers were studied over a 12 week period during which they continued their usual diet. Each volunteer consumed 500 ml of 2% cow's milk for 6 weeks and 500 ml of an isolated soy protein beverage in a crossover design. Both beverages contained the same level of protein and 2% butterfat This simple dietary change produced a significant shift in the animal:plant protein ratio for 2.44 to 1.08. Although it had no significant effect on total plasma cholesterol (reduced by 5.7%), VLDL cholesterol decreased significantly. The authors concluded that "consumption of beverages based on soy protein isolate could assist in the dietary management of individuals with elevated fasting serum cholesterol levels." Address: Depts. of Biochemistry, Medicine, and Home Economics (Bresica College), Univ. of Western Ontario, London, Ontario, Canada.

672. Lo, G.S.; Evans, R.H.; Phillips, K.S.; Dahlgren, R.R.; Steinke, F.H. 1987. Effect of soy fiber and soy protein on cholesterol metabolism and atherosclerosis in rabbits. *Atherosclerosis* 64(1):47-54. March. [31 ref]
• ***Summary:*** Rabbits fed the combination of ISP and soy fiber had the lowest plasma cholesterol concentration and the lowest incidence of aortic lesions, suggesting a complementary role for these two products in preventing atherosclerosis in rabbits. Address: Ralston Purina Co., Checkerboard Square, St. Louis, Missouri 63164.

673. *Nutrition Overview.* 1987. Dietary fiber. Fibrim soy fiber. 2(1):1-3. March. [21 ref]
• ***Summary:*** A good review of the key literature on dietary fiber, and a definition of dietary fiber versus crude fiber. Crude fiber, used until recently in dietary tables, represents only a small portion of the dietary fiber in a food. Americans are advised to consume 20-35 gm of fiber daily. Discusses effects of Fibrim soy fiber on bowel function (decreased mouth to cecum transit time, increased fecal bulk and moisture), lipid metabolism (lowered serum cholesterol), diabetic control (reduced hypoglycemic rebound in normal individuals, improved glucose tolerance in obese diabetics), and mineral bioavailability (mineral balance and macronutrient utilization were not affected).

674. Richert, Stanley H. 1987. Forms of soy protein for use in meat formulations. *National Provisioner.* May 16. p. 40-44, 76.
• ***Summary:*** Richert argues that the least expensive way to formulate comminuted meat products is with isolated

soy proteins. Although they cost more than concentrates or textured soy flour, a higher replacement level can be used. Examples of replacement levels, costs, and hedonic scores are given for beef patties, chicken patties, frankfurters, and tuna salad.

Note: This is the earliest document seen (Sept. 2020) that mentions the "Protein Technologies International"–a division of Ralston Purina Co. Address: Protein Technologies International, Ralston Purina Co., St. Louis, Missouri.

675. Cho, I.C. 1987. Isolated soy proteins as emulsifiers: Coffee creamer application. *Protein Technology Review* (*PTI / Ralston Purina, St. Louis, Missouri*) No. 1. p. 6-7. Spring. [4 ref]
• ***Summary:*** Americans consume over 33 million gallons of coffee a day. To improve its acidic or bitter flavor and to give it a light, creamy appearance, they add cream, milk, or a formulated non-dairy creamer. A table gives the typical formulation for liquid coffee creamer. The first six ingredients (by weight) are: Water 73.0%. Corn syrup solids 15.0%. Vegetable fat 10.1%. Isolated soy protein 0.8%. Mono- and di-glycerides 0.5%. Sodium stearoyl-2-lactylate 0.2%. Address: PhD, Manager, Dietary Healthy Industry R&D, Protein Technologies International, Div. of Ralston Purina Co., St. Louis, Missouri.

676. Coco, Ed. 1987. Soy polymer insolubilization. *Pulp & Paper* 61(5):51-52. May.
• ***Summary:*** "Three types of soy polymers (and variants thereof) are commercially available today. They are native (unhydrolyzed), thermochemically modified (hydrolyzed), and carboxylated. The native soy protein is an associated amphoteric polymer of high molecular weight made up of four ultracentrifuge sedimentation fractions. The bulk of the commercial product is a combination of 7S, congycinin and 11S, gycinin.

"The subunits are tightly coiled polymers that are made up of 20 different amino acids that are characterized by different functionalities."

"Various commercial insolubilizers can be used to get necessary water resistance, wet pick, and gluability on coated paper and board." Address: Ralston Purina Co.

677. *J. of the American Oil Chemists' Society.* 1987. Ralston Purina seeks protein ruling. 64(5):702. May. [1 ref]
• ***Summary:*** Ralston Purina Company has asked the U.S. Food and Drug Administration (FDA) to establish that Purina Protein 500 and Purina Protein 710, when used as the sole protein source in a food product, provide protein quality equal to casein. The company provided data on the casein protein equivalency of these two isolated soy protein products. Details: *Food Chemical News,* March 9, 1987, p. 33.

678. LaBell, Fran. 1987. Tofu & Tofu Products. *Food Processing* (*Chicago*) 48(5):Ingredient Handbook insert. May.
• ***Summary:*** Discusses tofu standards, Brightsong Foods, Nasoya Foods, Clofine Dairy & Food Products, Soyco Foods (Div. of Galaxy Cheese, P.O. Box 5181, New Castle, Pennsylvania 16105), St. Peter Creamery Inc. (Div. of Oberg Foods, 119 W. Broadway, St. Peter, Minnesota. Makes spray dried tofu powder from soymilk coagulated by adding calcium sulfate. Its protein level is 38% and moisture is 5% maximum. pH is 6.7–7.0% in a 10% solution. Fat is about 18%). ADM, Ralston Purina, Rose International, Soyatech.

Soyco Foods makes Soymage, "a new cheese alternative," which is casein free and non-dairy. It is sold in four flavors: Cheddar, Mozzarella, Monterey Jack, and Jalapeno. "It has a light texture and shreds and slices readily." The ingredients and packaging information are given. The company has been making a cheese substitute named Fromage™, based on casein and soy oil, which comes in about 20 flavors. Soymage was developed for people who want a completely non-dairy cheese substitute.

Photos show: Tomsun Jofu (in the carton and in a dish ready to eat). Nasoya creamy tofu dressing (3 flavors in bottles). Address: Chicago, Illinois.

679. Waggle, Doyle. 1987. All-vegetable, isolated soy protein puts functional and nutritional performance in today's food products. *Protein Technology Review* (*PTI / Ralston Purina, St. Louis, Missouri*) No. 1. p. 1-5. Spring. [14 ref]
• ***Summary:*** Editor's introduction: "Modern isolated soy proteins provide opportunities for food marketers and technologists to develop and position new and reformulated products for their targeted customers.

"Foreword: Protein ingredients with improved functional and organoleptic properties are required to fill consumer demands for healthful, tasty foods. As an all-vegetable, no-cholesterol, high quality protein source with virtually no fat, isolated soy proteins from Protein Technologies International, a division of Ralston Purina Company, provide production-tested functional and clinically-tested nutritional benefits for food manufacturers, over a wide latitude of product categories." Address: PhD, Vice President and Director of R&D, Protein Technologies International, Div. of Ralston Purina Co., St. Louis, Missouri.

680. Elliott, James G. 1987. Lactose intolerance. *Nutrition Overview* 2(2):1-3. June. [23 ref]
• ***Summary:*** A good overview of the subject. "Lactose intolerance is a partial to complete inability of the body's enzymes to digest milk sugar often resulting in diarrhea and possibly accompanied by abdominal bloating, vomiting and cramps. Human milk contains 7.5 gm of lactose per 100 ml whereas cow's milk contains only 4.5 gm. The activity of lactase in the intestine reaches a maximum immediately

after birth and begins to decline thereafter until adulthood. There are three types of lactose intolerance: Congenital, primary acquired, and secondary." Address: Manager, Nutritional Science Dep., R&D Group, Protein Technologies International (Ralston Purina).

681. Protein Technologies International. 1987. Introducing Protein Technologies International: The ingredients for success (Brochure). St. Louis, Missouri. 12 p. 28 cm.
• ***Summary:*** See next page. Contents: All the ingredients for success. The main ingredient (protein, Fibrim soy fiber, polymers, etc.). The human ingredient. The right ingredient. The key ingredient (we are problem solvers). The next ingredient. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: (314) 982-2108.

682. Golbitz, Peter. 1987. Isolated soy proteins play increasing role in new foods development. Demand for healthful foods and highly functional ingredients spurs market forward. *Soya Newsletter* (*Bar Harbor, Maine*). July/Aug. p. 1, 10-11.
• ***Summary:*** The four major isolate producers today are Ralston Purina's new subsidiary Protein Technologies International (St. Louis, Missouri), ADM (Decatur, Illinois), Grain Processing Corp. (Muscatine, Iowa), and Gunther Products (Galesburg, Illinois; Div. of A.E. Staley Mfg. Co.). ADM entered the isolate market when it purchased Central Soya's plant in 1980. GPC has been making isolates since the early 1970s. Golbitz describes in detail the process for manufacturing soy protein isolates but completely/carefully omits reference to the hexane solvent extraction step.

Note: This is the earliest document seen (Sept. 2020) that mentions "Protein Technologies International." Address: Bar Harbor, Maine.

683. *Soya Newsletter* (*Bar Harbor, Maine*). 1987. American Dietetic Association to explore benefits of soy products. July/Aug. p. 5.
• ***Summary:*** A program at the annual ADA meeting in October in Atlanta will be titled "Soybean Products for Nutrition and Health." Fred Steinke of Protein Technologies International (Ralston Purina) will introduce and moderate the session.

684. *Soya Newsletter* (*Bar Harbor, Maine*). 1987. Ralston Purina establishes Protein Technologies International as wholly-owned subsidiary. July/Aug. p. 9.
• ***Summary:*** On 1 July 1987 Ralston Purina Co. of St. Louis, Missouri, established their Protein Technologies group as a wholly-owned subsidiary. Sales of soy protein products are: 1982, $132.4 million; 1983, $144.3 million; 1984, $154.3 million; 1985, $126.4 million, and 1986 $139.8 million. Ralston Purina's total 1986 sales were $5,500 million.

Note: Several long-time observers of the soy protein industry have told Soyfoods Center that this move was probably made by Ralston Purina in order to facilitate sale of their isolated soy protein operations, which have not grown as rapidly as hoped or expected, probably 5-10% a year.

685. Elliott, James G. 1987. Beneficial effects of soy protein on blood cholesterol. *Nutrition Overview* 2(3):1-3. Sept. [34 ref]
• ***Summary:*** An excellent review of the literature, discussing animal studies, human studies, and the possible mechanism for hypocholesterolemic effect, which is still uncertain.

Studies with rats and rabbits demonstrated an increased excretion of neutral and acidic steroids when the low-fat, cholesterol-free diet contained isolated soy protein in place of casein. However studies with humans have failed to confirm an increased fecal excretion of steroids due to feeding soy proteins.

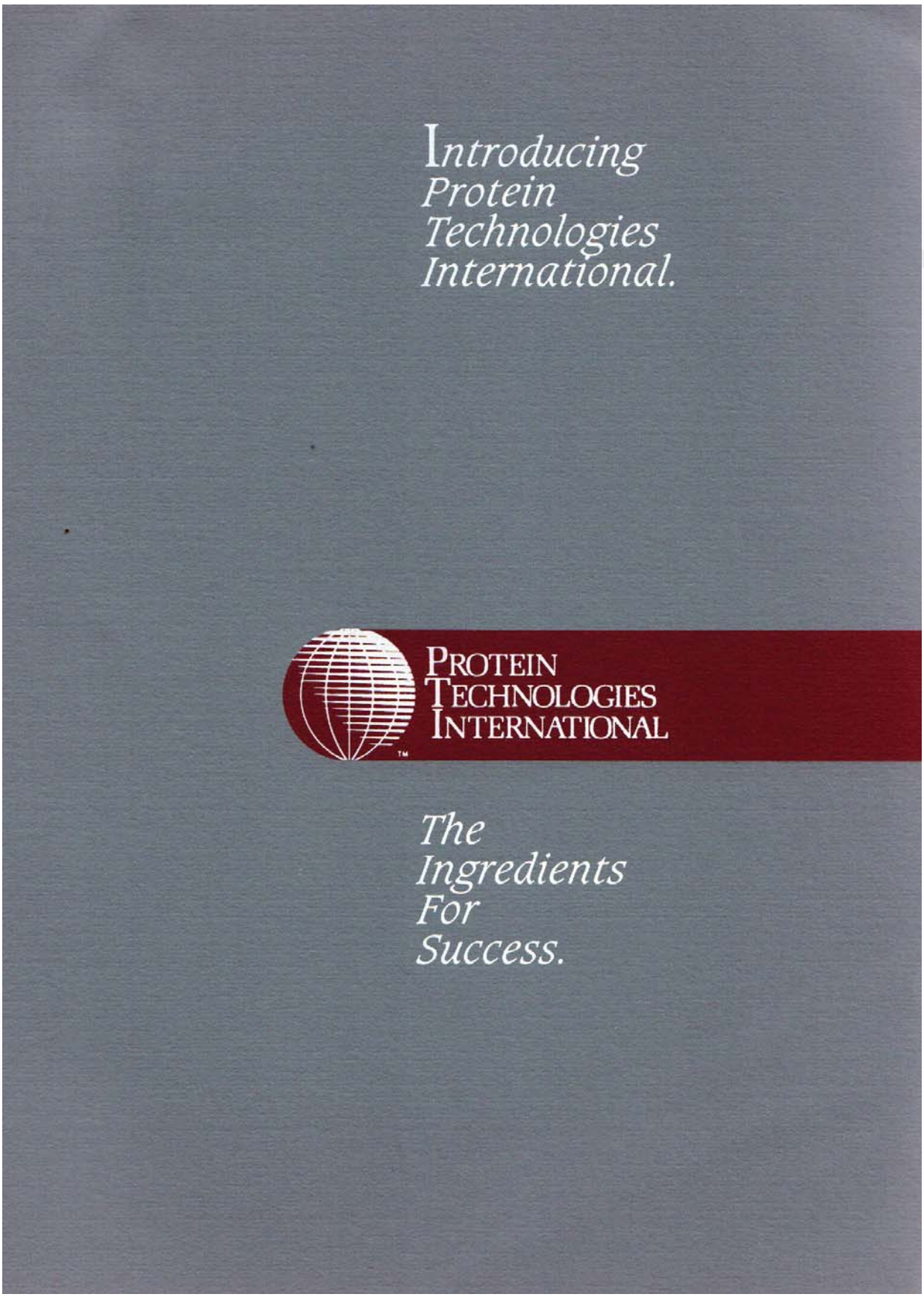
"A considerable body of evidence from animal studies demonstrates that replacement of animal protein in the diet with soy proteins will protect animal models from hypercholesterolemia and atherosclerosis. In humans, replacement (partial or complete) of animal protein in the diet with soy proteins was shown to significantly reduce total cholesterol in hypercholesterolemics but not normal individuals. Some studies showed that addition of soy proteins without replacement was also effective. The mechanism for the hypocholesterolemic effect of soy protein is not fully known, but recent evidence suggests that a difference in response of gut hormones, insulin, and glucagon, to animal and soy proteins may be a key factor." Address: Ralston Purina.

686. *Meat Processing.* 1987. Soy protein makers seek hot dog labeling changes. Sept.
• ***Summary:*** The Soy Protein Council asked FSIS to regulate and allow all non-meat protein ingredients, such as soy, milk, and proteinaceous flavoring agents on an equal basis. They asked that the present qualifying phrase for soy proteins ("Soy Added") in the title be eliminated in hot dogs and cooked sausages. Address: Duluth, Minnesota.

687. Protein Technologies International (a subsidiary of the Ralston Purina Company). 1987. There are only two constants: Change and increasing competition. Now, one source can help you take advantage of both (Ad). *Food Processing* (*Chicago*). Sept.
• ***Summary:*** A 3-page ad on unnumbered pages. The title on page 2 is: "Introducing Protein Technologies International. All the ingredients for success."

"Our ingredients. For over 25 years, you've known us as the Protein Division of Ralston Purina Company.

"Now, we're Protein Technologies International, a name that better reflects our worldwide leadership in dietary protein and fiber technology.



"No one knows how to get more from the protein molecule than we do. Our people are on the leading edge of protein and fiber technology, constantly finding new ways to put it to work for you.

"Consequently, we offer you a wide range of products that grows wider almost every day. From our PP-series isolated soy proteins for profit improvement, product enhancement or new product development to our new Fibrim® soy fiber product, which offers you new potential to tap the growing health and wellness-conscious market.

"But we also offer you the resources of the largest research and development program of its kind in the world. An international organization that stands ready to apply its full capabilities to work capturing your unique opportunities.

"We will work with you to provide the ingredients and technology you need to stay ahead of the market.

"The ingredients you need to succeed.

"Your success. As broad as the product line we offer, we're really involved in just one endeavor.

"Delivering value.

"Everything we do is designed to provide you with an economic advantage while maintaining quality. Or even improving it.

"The result could be a more efficient product, or one that satisfies a growing consumer demand. It could be as simple as a reliable source of ingredients at a stable cost that lets you price with confidence.

"But whether the target is increased manufacturing efficiency, reduced cost, response to a market need or improved functionality, our aim is always the same.

"An improved bottom line that helps you compete, and win.

"To find out what we can do for you, call us today. And let us show you how to take advantage of our ingredients to build your success."

A photo shows the cover of a red brochure.

"To get the full story, call or write for our brochure today: Protein Technologies International, Checkerboard Square, St. Louis, MO 63164. (800) 325-7108 or in Missouri (314) 982-2108 Telex: 447240 RAL STL." Address: Kansas City, Missouri.

688. *Oil Mill Gazetteer.* 1987. Purina Protein Division takes on new identity as international supplier. Oct.
• ***Summary:*** The former protein division of the Ralston Purina Co. has become a wholly owned subsidiary of Ralston Purina named Protein Technologies International. The company remains the world leader in advanced isolated soy protein and soy fiber technology. This change marks substantial growth on the part of the protein division according to Paul Hatfield, president of PTI. Since its start in 1961, the business has evolved from a small, food-grade soy isolate facility in Louisville, Kentucky, to an international supplier of protein, polymer, and fiber products with offices worldwide. A key to the company's future growth will be the accelerated new products program. The 1986 introduction of Fibrim brand soy fiber is one example of this effort.

In a 1986 Food Marketing Institute survey, 93% of consumers said they are concerned about what they eat. Fat and cholesterol are two concerns that have increased since 1984. A 1986 FDA survey found that about 80% of U.S. adults pay attention to ingredients lists on labels. Two thirds use the information to avoid or limit certain items. The FDA is considering introducing cholesterol labeling in 1988. Reduced cholesterol, low cholesterol, or cholesterol free categories are proposed. Address: Houston, Texas.

689. Ralston Purina Co. Protein Div. 1987. A review of animal and clinical studies on the effect of isolated soy proteins on blood lipids. St. Louis, Missouri. 12 p. [21 ref]
• ***Summary:*** Clinical studies with isolated soy proteins fed to humans suggest a significant reduction in plasma cholesterol and triglycerides in hyperlipidemic individuals. Address: St. Louis, Missouri.

690. Weingartner, Karl E. 1987. Processing, nutrition and utilization of soybeans. In: S.R. Singh, K.O. Rachie, and K.E. Dashiell. eds. 1987. Soybeans for the Tropics: Research, Production and Utilization. New York, etc: John Wiley & Sons Ltd. xx + 230 p. See p. 149-78. Chapt. 15.
• ***Summary:*** An excellent, easy-to-understand condensation of the basics. Contents: Introduction. Oil extraction, Processing (and refining) the oil. Soy flours and grits. Soy protein concentrate and isolate. Nutritional components. Antinutritional components. Soybean use in Africa: Zimbabwe, Zambia, Nigeria, IITA's strategy.

Currently more than 10 countries are involved in manufacturing or processing soybean foods in Africa. In 1985-86 the major producers of soybeans in subsaharan Africa were Zimbabwe (80,000 tonnes), Nigeria (65,000 tonnes), and Zambia (36,000 tonnes), and these three countries are at the forefront in processing and utilization. In Zimbabwe, a company named Nutresco makes Mahewu, a bestselling beverage made from soybeans and maize, and a breakfast cereal named Nutri-Plus containing soybeans. In Nigeria, Nestlé makes Nutrend, an infant cereal, and another company makes Nutrimax-10, an instant cereal for the whole family. In Zaire, Cerevap, an instant cereal is sold.

In 1985 IITA in Nigeria began a program to promote processing and utilization of soybeans, in collaboration with INTSOY. One focus has been the use of expellers for small-scale expression of soy oil. Research is also being done on soymilk and extrusion cooking.

Tables: (1) Composition (% dry weight) of soybeans and the seed parts (from Kawamura and Tada, 1967). Includes whole soybeans, cotyledon, hull, and hypocotyl.

(2) Soybean grades, according to U.S. standards (from USDA, 1970). Grades are 1 to 4. (3) Composition

of crude and refined soybean oil (from Pryde, 1980). (4) Specifications for crude, degummed and once-refined soybean oil to be traded. (from Brekke, 1980). (5) Conditions for degumming (from Wiedermann, 1981). (6) Comparison of some activated bleaching clays (from Wiedermann, 1981). (7) Selective hydrogenation of soybean oil (from Hastert, 1981). (8) Composition (% dry weight) of soybean flour, soy protein concentrate and isolate (from Bressani, 1981).

(9) Comparison (% dry weight) of three flours made from soybeans (from Smith and Circle, 1972).

(10) Composition (% dry weight) of soybean concentrates (Meyer, 1967). Made by alcohol leach, acid leach, or moist heat (water).

(11) Estimate (mg/kg body weight) of humans' daily requirements of amino acids (FAO / WHO, 1983).

(12) Essential amino acids contained in whole soybeans (FAO, 1971), soybean flour, soy protein concentrate (Central Soya, 1979) and soy protein isolate (Ralston Purina, 1978). "Worldwide, lysine is the amino acid that is limiting in most low-cost diets." Tryptophan is limiting in some diets, while threonine is often present in less than recommended amounts. The sulphur amino acids are slightly low in relatively few diets. "Since soy protein is a good source of lysine, tryptophan and threonine, its addition to a mixed diet greatly improves quality of the diet's protein."

(13) WHO suggested requirements (gm of amino acid per 100 gm of protein) of four critical amino acids (lysine, tryptophan, threonine, sulphur amino acids {methionine and cystine}) for preschool- and school-aged children, and adults (Anonymous 1986).

(14) Effect of soybean flour as a protein supplement to cereal grains (Bressani, 1981).

(15) Fatty acids (%) in soybean oil–divided into saturated and unsaturated (Nwar, 1985).

(16) Mineral content of whole soybeans (FAO, 1971), defatted flour, concentrate (Central Soya, 1979) and isolate (Ralston Purina, 1978).

(17) Sugar analysis (%) of hydrolyzed carbohydrates from soybean products (Eldridge et al., 1979).

(18) Effect of raffinose plus stachyose in the diet of humans; production of flatus (van Stratum and Rudrum, 1979).

(19) Evaluation of soybean line PI157440, which lacks the Kunitz trypsin inhibitor, compared with regular soybeans, raw or heated, in terms of trypsin inhibitor activity, rat PER, and chick gain per unit of feed. It was found to be better than regular raw soybeans but poorer than heated regular soybeans.

(20) Nutrient content of 1 cup (237 ml) soy milk, cow's milk and human milk (Pennington and Church, 1985). Address: IITA (International Inst. of Tropical Agriculture), Ibadan, Nigeria.

691. Protein Technologies International. 1987. PP-series proteins and beverages: Products designed to meet the needs of a changing market. St. Louis, Missouri. 8 p. + 5 inserts. Manufacturer's catalog.

• ***Summary:*** PP-series isolated soy proteins (PP660, PP670, and PP710) contain over 90% protein. They offer a high quality source of protein for beverage formulations. Major markets include: 1. Sports nutrition market. 2. Calorie-conscious market. Today an estimated 44.4 million Americans are on a diet; 62% are women. 3. Health-conscious market, concerned with saturated fat and cholesterol. 4. The mature market. Today 27 million Americans (16% of the population) are age 65 or older. That figure was 12.3 million in 1950 and is projected to be 35 million by the year 2000. Individuals in this market segment are more likely than the population as a whole to be adhering to a low fat, low cholesterol diet. They are also more likely to be among the 13 million Americans who are lactose intolerant.

Inserts give a formulation and nutritional analysis for Nutritional Weight Loss Beverage, Protein Supplement Beverage, Low Calorie Nutritional Shake, Weight Gain, and Adult Nutritional Beverage. Address: St. Louis, Missouri.

692. Ralston Purina Company. 1987. Marketing manager (Ad). *Wall Street Journal.* Dec. 15. p. 40.

• ***Summary:*** "Here is an opportunity to contribute to the continuing growth and success of the world leader in protein and food technology. Protein Technologies International, a subsidiary of the Ralston Purina Company, is able to offer a career opportunity to a marketing professional capable of identifying, developing, and managing an exciting array of new market opportunities..."

Note: This is the earliest document seen (Sept. 2020) announcing the existence of Protein Technologies International in the *Wall Street Journal*, or any other major U.S. newspaper. Address: Checkerboard Square, St. Louis, Missouri 63164.

693. *SoyaScan Notes.* 1987. Chronology of soybeans, soyfoods and natural foods in the United States 1987 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. Westbrae moves the production of Malteds to California from Japan.

Jan. The Soy Plant, a tofu cooperative in Ann Arbor, Michigan, files for Chapter 7 bankruptcy. It is soon purchased by Bruce Rose of Rosewood Products, Inc.

Jan. Soymage, the first casein-free soy cheese, is introduced by Soyco Foods, a Division of Galaxy Cheese Co.

Feb. *Soya Newsletter,* a 12-page, bimonthly publication costing $96/year, is launched by Soyatech of Bar Harbor, Maine. Publishers are Peter Golbitz and Sharyn Kingma, former owners of Island Tofu Works. The publication

quickly proves itself to be the world's best English-language publication on soyfoods. By October, paid circulation tops 900 in 20 countries.

Feb. American Soybean Association petitions the U.S. Food and Drug Administration to require food manufacturers to be more specific in labeling food products that contain highly saturated imported tropical fats (palm, palm kernel, and coconut oils). The petition includes results of a supermarket survey of 1,555 foods containing vegetable oils. 43% of the labels list multiple choice or generic vegetable oil ingredients which hides from the consumer the fact that the products contain highly saturated tropical fats. Imported tropical fats displace the equivalent of oil derived from 171 million bushels of soybeans. Herewith begin the great "Fat Wars" of 1987-88.

Feb. Lite Lite Tofutti introduced by Tofutti Brands, Inc. This non-dairy frozen dessert contains only 90 calories per 4-ounce serving. It soon becomes a big hit.

Feb. Ah Soy in Tetra Brik cartons launched by Great Eastern Sun.

Feb. Options trading on futures for soybean oil and meal opened on Chicago Board of Trade.

March 4. The USDA's Federal Grain Inspection Service rules that soybean oil may be used to control grain dust in elevators. This voids the Barnham patent and opens up a large potential new market for soy oil, which is in surplus.

March. Great Shake soymilk launched by Noble Soya in India. Sold in Tetra Brik cartons in mango, strawberry, and chocolate favors, it is the country's most heavily promoted soymilk to date, but gets off to a slow start.

March 16-18. First International Congress on Vegetarian Nutrition held in Washington, D.C., sponsored by eight Seventh-day Adventist universities and health care organizations, and three SDA food companies, plus S.E. Rykoff/Sexton.

March. *Vitasoy Vitabrations*, a newsletter, starts being published by Vitasoy USA.

March 31. Hong Kong Soya Bean Products Co. Ltd., makers of Vitasoy, move into a large new plant (370,000 square feet costing $20 million) in the New Territories. Sales of Vitasoy in 1987 is projected to be 126 million packs.

April 1. Tempehworks, Inc., America's first major tempeh producer from Greenfield, Massachusetts, changes its name to Lightlife Foods, Inc. In recent years, Tofu Pups have become the company's bestselling product.

April. Stir Fruity, a non-dairy, nonfermented, soy-based yogurt, is introduced by Azumaya Inc. of San Francisco. Shelf life problems cause the product to be withdrawn, causing Azumaya to set aside plans for an $800,000 radio ad campaign in northern California. The product is soon back on the market, but in limited distribution and with little promotion. Yet during this year, Azumaya probably passed House Foods & Yamauchi to become America's largest tofu producer.

April. *Healthy Times*, a bimonthly newsletter, starts being published by Morinaga Nutritional Foods of Los Angeles, makers of Mori-Nu long-life silken tofu, for members of the Mori-Nu Health for Life Club. By Aug. 1988 circulation is up to 10,000; A subscription costs $3 a year.

May 26. Tofutti Brands Inc. and Coca-Cola launch Cheater's Delite, a major joint promotion featuring a 90-calorie scoop of Lite Lite Tofutti and a 1-calorie glass of Diet Coke, special labeling and couponing on 3 million bottles of Diet Coke, 5 weeks of heavy advertising in New York, New Jersey and Connecticut, and a Caribbean cruise sweepstakes.

June. Dr. Jane Gleason of the University of Illinois goes to Sri Lanka to spend a year studying its soybean and soyfoods industries.

July 1. Ralston Purina Co. of St. Louis, Missouri, establishes Protein Technologies International as a wholly-owned subsidiary to focus on sales of soy protein for food uses. The company's sales of soy protein products were $139.8 million in 1986.

July. Victor Food Products in Toronto, Canada's largest tofu manufacturer, declares bankruptcy. The main cause: Overexpansion, trying to grow too fast.

Aug. The Barat Bar, an upscale chocolate bar containing spray-dried tofu instead of dairy products, is launched by Legume Inc. and extensively promoted. It soon becomes a big hit.

Aug. Brightsong Foods of Petaluma, California, ceases operations. Richard and Sharon Rose resign to found a new company, Rose International, which will be a tofu development, marketing, and consulting company, rather than a manufacturer.

Sept. 24. San-J International of Richmond, Virginia, dedicates the first tamari brewery ever built outside of Japan. The 40,000 square foot facility with a capacity of 1 million gallons a year is located in Varina, Virginia. San-J tamari was first imported to America in 1979.

Sept. 28. Plenty Soya Centre, run by Plenty Canada, opens in Kandy, Sri Lanka. They will sell as many soyfood products as possible at a reasonable cost.

Oct. 6. Anti-cholesterol campaign starts. The U.S. Federal Government and more than 20 health organizations issue the nation's first detailed guidelines for identifying and treating people whose blood cholesterol levels are more than 200 mg per deciliter. The guidelines signal the beginning of a nationwide health promotion campaign designed to reduce blood cholesterol to safer levels. This signals exciting new opportunities to market cholesterol-free soy-based alternatives to meat.

Nov. *Kikkoman Taste*, a stylish full-color "quarterly intercultural forum for the exchange of ideas on food," published by Kikkoman Corp. in Tokyo. Its focus is on shoyu in international cuisine.

* During this year of the great vegetable oil wars, the

ASA launched an all-out no-holds-barred campaign to educate Americans of the health dangers of tropical fats (palm and coconut oil; which succeeded) and to require such products to be clearly labeled (which failed).

* This year the world's population passed 5 billion. It is increasing by a record 80 million people a year, so that every 3 years the equivalent of one United States' full of people is added to the population of planet Earth. Continued.

694. **Product Name:** PP-Series Isolated Soy Proteins (PP670).
Manufacturer's Name: Protein Technologies International.
Manufacturer's Address: Checkerboard Square, St. Louis, Missouri.
Date of Introduction: 1987 December.
How Stored: Shelf stable.
Nutrition: 90% protein.
New Product–Documentation: PTI. 1987, Nov. PP-Series Proteins & Beverages. Talk with Lisa Koppen who talked with Jean Kuster, brand manager, at PTI. PP670 was launched in Dec. 1987. The others products in the PP series (PP610, PP620, PP660, PP710, and PP760) have all been around for 6-15 years, but were formerly named Supro, then Purina Protein. Now they are planning to change back to Supro in about 3 months to unlink the name Purina or PP with PTI.

695. Ralston Purina Company. 1987. Annual report to shareholders. St. Louis, Missouri. 32 p. 28 cm.
• ***Summary:*** Ralston Purina Company, founded in 1894, is the world's largest producer of dry dog and soft-moist cat foods. The company is the largest wholesale baker of fresh bakery products in the U.S. Sales for the year ended Sept. 30, 1987, totaled $5,868,000,000 compared to 1986 sales of $5,514,600,000. Net earnings for the year were $523,100,000 compared to 1986 earnings of $388,700,000. The sale of Purina Mills, Inc. in October 1986 resulting in an after-tax gain of $209.3 million. At Continental Baking Company, both bread and snack cake volume improved in fiscal 1987. Protein Technologies International achieved record volume sales in the U.S. and in most of its foreign markets.

Page 8: Paul H. Hatfield, Corporate Vice President [Ralston Purina] and President, Protein Technologies International (PTI), reports that PTI achieved record sales and earnings in fiscal 1987 on solid volume gains in both U.S. and most foreign markets. Protein Technologies continued its emphasis on the testing and development of new isolated soy protein product applications during the year, focusing primarily on new products for key food industry segments. The new Market Development Unit located in Memphis was fully utilized during the year. Capitalizing on the increased interest in reduced-calorie and high fiber products, Fibrim's use in bakery goods and packaged foods is expanding. One successful example of Fibrim's use is by Ralston's Continental Baking Company in its new Wonder Light reduced-calorie bread.

Divisions of the company include: Grocery Products, Branded Foods, Continental Baking Company, Eveready Battery Company, and Protein Technologies International. PTI is further divided into Dietary Protein Food Ingredients (PP-Series Isolated Soy Proteins, Dari-Pro Milk Replacers), Dietary Fiber Food Ingredients (Fibrim Soy Fiber), Dairy Food Systems Products (Specialty Animal Ingredients), Paper and Paperboard Coating Ingredients (Pro-Cote and Sp-Series Soy Polymers).

In October 1986, the company sold its domestic agricultural products business (Purina Mills). In Jan. 1985, the company sold its low-margin soybean processing operations. In October 1984, the company acquired Continental Baking Company for $475.0 million in cash.

Page 15: Sales of soy protein products 1985 were $126.4 million, in 1986 were $139.8 million, and in 1987 were $157.1 million. Sales of soybean meal and oil in in 1985 were $101.1 million, and in 1986 were only $2.4 million.

Incorporation occurred on January 8, 1894 in Missouri. The current number of shareholders is 33,458, the number of employees in the U.S. is 37,366, and the number outside the U.S. is 20,932. Address: St. Louis, Missouri.

696. Harland, Barbara F.; Oberleas, Donald. 1987. Phytate in foods. *World Review of Nutrition and Dietetics* 52:235-59. [62* ref]
• ***Summary:*** Mature soybean seeds contain up to 2.58% wt/wt of phytic acid, whereas various soy-based compounds contain much smaller amounts. For example various meat analogs contain from 0.12% to 1.63% wt/wt, soy-based infant formula contains 0.062%, soy flour (Ralston Purina) contains 1.52%, soy protein isolate (Ralston Purina) contains 1.34%, and textured soy protein concentrate (Patti Pro, made by General Mills) contains 1.50% wt/wt of phytic acid. Address: 1. Div. of Nutrition, Food, and Drug Administration, Washington, DC; 2. Dep. of Nutrition and Food Science, Univ. of Kentucky, Lexington, KY.

697. Protein Technologies International. 1987? Fibrim soy fiber: A physiological and functional report on a new and unique dietary fiber from a natural source. St. Louis, Missouri: PTI. 27 p. Undated. *
Address: St. Louis, Missouri.

698. Elliott, James G. 1988. Consumer attitudes regarding soy products. In: L. McCann, ed. 1988. Soybean Utilization Alternatives. St. Paul, MN: Univ. of Minnesota Center for Alternative Crops and Products. vi + 429 p. See p. 381-91. [3 ref]
• ***Summary:*** Discusses: Consumer awareness of soy foods. Consumers' awareness of manufacturers' use of soy protein. Consumer willingness to purchase meat products containing

soy protein. People were asked, when you think of foods which are made from soybeans, what products come to mind? Unaided awareness of soyfoods among consumers was low, only 4 in 10 were able to name a specific soyfood on a top-of-the-mind basis. However, aided awareness was significantly higher. Soy sauce and soybean oil had the highest levels of aided awareness among consumers at 94% and 77% respectively. Tofu, soymilk, margarine, and soy nuts registered moderate levels of aided awareness at 45%, 38%, 38%, and 31% respectively. Tofutti came in next at 21% and miso came in last at 10%.

When asked if they had "ever tried" these products, of the eight soyfoods mentioned, soy sauce demonstrated the highest trial level at 75%. All other products "ever tried" were 20% or less. Respondents who had not tried a particular food product made from soybeans were asked if they would be willing to do so. Expressed willingness to try was in the 60% to 70% range. It was the highest for soybean oil, soy nuts, margarine, tofu and Tofutti.

65% of those surveyed responded positively when asked, "have you heard of soy protein being included in certain food products?" 35% were unaware. Among consumers who were aware that manufacturers use soy protein, 60% said that they were definitely using foods that contain soy protein, or believed that they were; 29% said they were not using them; and 11% didn't know. When asked, "Does the fact that a food manufacturer uses soy protein in its products change your feeling about the company?," 80% stated no difference; 8% stated that they felt better; and 12% said that they felt worse. Address: Manager of scientific communications, Protein Technologies International, St. Louis, Missouri.

699. **Product Name:** PP670 Isolated Soy Protein (for Beverage Powders).
Manufacturer's Name: Protein Technologies International.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63164. Phone: 800-325-7108.
Date of Introduction: 1988 February.
Wt/Vol., Packaging, Price: Bulk.
How Stored: Shelf stable.
Nutrition: 90% + soy protein.
New Product–Documentation: Soya Newsletter. 1988. Jan/Feb. p. 8. Designed for beverage powders and other products that require superior flavor/odor and mouthfeel characteristics, PP670 comes in powdered form and has excellent suspension and dispersibility properties. It can be used for partial or complete replacement of caseinate in new or existing product formulations.

700. Sipos, Endre F. 1988. Edible uses of soybean protein. In: L. McCann, ed. 1988. Soybean Utilization Alternatives. St. Paul, MN: Univ. of Minnesota Center for Alternative Crops and Products. vi + 429 p. See p. 57-93. [107 ref]

• ***Summary:*** Discusses: Definitions and methods of preparation. Nutritional and health aspects of soy proteins: Nutritional value of soy protein ingredients, amino acid profile, digestibility, amino acid requirements, nutritional value of soy proteins in food systems, meat, poultry, and fish, dairy products, cereal grains, health and soy protein products. Functionality: General properties, functionality of soy protein ingredients, soy flours/grits (untextured), soy protein concentrates (untextured), soy protein isolates, soy albumens, textured/structured soy protein products, flavor and texture. Uses in food systems: Meat food products, emulsified meats, coarsely-chopped meats, canned meats, whole muscle meats, poultry products, seafood products, analogs, pet foods, dairy-type products, bakery products–cereals–pastas, bread and rolls, specialty breads, cakes and cake mixes, doughnuts, breakfast cereals, pasta products, misc. baking applications, misc. foods. Consumption trends. Future considerations. Summary.

Soy protein concentrates are preferred in milk replacers for baby animals such as calves, lambs, and pigs because of their low soluble carbohydrate content (i.e. less gastrointestinal disturbance problems) and lower immunogenicity. The industry producing edible soy protein products for human consumption has grown enormously since the late 1950's. Yearly world production is estimated to be approximately 1,500,000 tonnes (metric tons or 3,300 million lb; Note: Text figure of 1,500 tonnes is an error) of soy flour, 90,000 tonnes (200 million lb) of soy protein concentrate, and 70,000 tonnes (170 million lb) of soy protein isolate, which amounts to about 3,700 million pounds/year of edible protein for human consumption. Since soy flour is used in many developing countries where statistical records are incomplete, the figure for this ingredient could be higher than given here. The demand for soy protein concentrates appears to be growing at the fastest rate.

Note: Dr. Dale Johnson, in a personal communication to Dr. Walter Wolf at the USDA Northern Regional Research Center in Peoria, Illinois, estimated the 1985 production of isolated soy proteins in the USA to be 70,000 tonnes. Sipos here gives that same figure as the world total. Yet isolate production has increased worldwide since 1985 and it is produced outside the USA in Japan, in Belgium (by Ralston Purina), and in China. Address: Sipos & Associates, Inc. Fort Wayne, Indiana.

701. Nordquist, Ted. 1988. New developments with tofu and soymilk in Sweden (Interview). *SoyaScan Notes.* March 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ted is working with three of Sweden's largest food companies: (1) Semper AB, the country's largest milk company, used to be an independent milk research company. Semper now makes an infant formula, and two flavors of soy drink for adults, both from soy protein isolates. The

later is poor tasting. Semper is now wholly owned by Arla, the Swedish milk company. (2) Karlshamn Oliefabrik, Sweden's largest oils and fats company, that is also the largest manufacturer of ice cream and margarine. They used to be a soybean crusher, but now they import their oil. Karlshamn has the Swedish franchise for Ralston Purina. They have a newsletter The Soybean Magazine that they use to market Ralston's products. They import isolates, which Semper buys for use in their infant formula (Soja Semp) and adult soymilks. (3) Trensums Musteri, a juice company owned by Mark Jungstrum, who owns the only 3 Combibloc machines in Sweden. He packages Knorr soups in them. The resources are unlimited. The present focus is on developing a natural soy base free of beany flavor and evaluation the economics of the product. From this base they will make a line of products, including dairylike products and non-beany tofu. Ted has a contract with Trensums to receive a 2% commission on all soy products made in the new plant, since he basically developed the plant, which is inside the Trensums Musteri juice factory located in the south of Sweden, near Karlshamn. He also has a contract with Semper. Semper supplies Karlshamn with all their milk products. Roughly 12 million crowns ($2-3 million) has already been invested in soy equipment and R&D at this plant in Tingsryd, which produces about 4,000 liters/hour of soymilk.

This project began in 1983, when Luke Lukoskie came to Ted with a proposal to cooperate with Alfa-Laval, since Ted was the only tofu maker in Sweden, where Alfa-Laval is located (in Lund). Luke had a contract with Alfa-Laval to develop tofu and other soy products. He wanted a continuous tofu making process. Alfa-Laval had a plant installed in his former factory, which burned down. At one point Lukoskie was considering a lawsuit against Alfa-Laval. In 1984 Alfa-Laval began moving the soy development operations from Lund to Singapore. At the time they had sold one plant to China, with plans to sell 2 more if the first proved successful.

Ted met with the people from Talmo Gordon, who were planning to build a soymilk plant in Ludvika, funded with government money, but dropped the idea after Semper and Ted showed them that their concept was not feasible. The owner of the plant in Tingsryd is an expert at product development, including foods such as mushroom soups in German Combibloc that cannot be done in Tetra Pak. So Ted left his cooperation with Alfa-Laval and started developing with him in Tingsryd. They signed a contract. Ted goes there for 3 days a week. The sales of Aros grew 70% last year, in part because of new labels. All products are doing well. He makes an average of 2,000 kg (4,400 lb) of tofu per week. By vacuum packing his tofu then pasteurizing it at 95ºC for 45 minutes, then quick cooling it in water at 4-6ºC, he gets a shelf life of 85 days at 4ºC under ideal conditions vs. 30 days shelf life if it is not vacuum packed. None of Sweden's three big supermarket distributors carry his tofu, so he distributes to supers himself. The three distributors that serve the country's 65 health food stores do not have refrigeration. There are no tofu companies yet in Norway, Denmark, or Finland. Of all of Aros sales, 55% is regular tofu, followed by marinated tofu (*Tofu Marinerad*) 15%, then three other products. Nutana makes a canned tofu (made entirely from isolates) in cubes in a sauce. Lima Foods sells a bottled tofu. There are 8 million people in Sweden.

Tomsun is trying to register the trademark Jofu (their nonfermented soy yogurt) in Sweden. This may upstage Ted's attempt to trademark Sofu for soymilk and wipe out his trademark on the term "Tofu."

Semper is interested in having the new soy base be low in oligosaccharides so that their infant formula does not cause flatulence. The following oligosaccharide levels have been found in European soymilks: Alfa-Laval's plant in Colmar, France, that uses ultrafiltration 0.02 gm/liter; Alpro in Belgium 0.28 gm/liter; Alfa-Laval's pilot plant in Sweden 0.43 gm/liter; the STS plant built for DE-VAU-GE in Germany 0.58 gm/liter. By using ultrafiltration to make tofu you can both remove the oligosaccharides and reduce the water content. Address: President, Aros Sojaprodukter, Bergsvagen 1, S-190 63 Orsundsbro, Sweden. Phone: 0171-604 56.

702. Duxbury, Dean D. 1988. Isolated soy proteins add "lite" image to meat products: replaces up to 25% of ground meat. *Food Processing* (*Chicago*) 49(4):64, 66. April.
• ***Summary:*** A 1987 survey shows that Americans are concerned about fat, cholesterol, and calories. One company–Protein Technologies International–offers 20 different isolated soy proteins. Address: Associate editor.

703. Phillippy, B.Q.; Johnston, M.R.; Tsao, S.-H.; Fox, M.R.S. 1988. Inositol phosphates in processed foods. *J. of Food Science* 53(2):496-99. March/April. [35 ref]
• ***Summary:*** Myo-inositol bis-, tris-, tetrakis-, pentakis- and hexakisphosphates (IP2-6) were quantified in 9 thermally processed or fermented food products (including bran, canned [mung] bean sprouts, canned kidney beans, fried soy burger, infant formula concentrate and powder, soy isolate, tofu and white bread). Total inositol phosphate content (millimoles/kg dry weight) ranged from 1.35 in white bread to 23.26 in tofu and 26.05 in soy isolate. In all foods analyzed, inositol hexakisphosphate (phytic acid) accounted for greater than 40% of the total inositol phosphates on a molar basis.

Note: Supro 610K soy isolate was obtained from Ralston Purina Co. (St. Louis, Missouri). Address: 1-2. Div. of Food Chemistry and Technology; 3-4. Div. of Nutrition. All: Food and Drug Administration (FDA), Washington, DC 20204. Phillippy's present address: Southern Regional Research Center, USDA, New Orleans, Louisiana 70124.

704. Elliott, J.G.; Wagner, T.J.; Geurin, H.B. 1988. Performance of calf milk replacers based on milk protein, isolated soy protein/milk proteins or soy protein concentrate/ milk proteins. *J. of Dairy Science* 71(Supplement 1):125 (Abst. #P20). June. American Dairy Science Association 83rd Annual Meeting.
• ***Summary:*** "The findings to be presented verify that isolated soy protein is able to economically replace 50% of the milk proteins in calf milk replacers without sacrifice of performance." Address: Protein Technologies International, Dairy Food Systems Div., St. Louis, Missouri 63164.

705. Kingma, Sharyn. 1988. New study released on consumer attitudes about soy proteins. *Soya Newsletter* (*Bar Harbor, Maine*). May/June. p. 3, 14-15.
• ***Summary:*** Protein Technologies International, a subsidiary of Ralston Purina, St. Louis, Missouri, has recently released the results of a new study which evaluates current consumer attitudes related to soy protein, nutrition, dietary habits, and knowledge of dietary fiber. The 1988 Consumer Attitudes Monitor was undertaken to determine if there had been any significant changes in consumer attitudes since their first study was done in 1985.

One of the major differences between the earlier study (see Ralston Purina 1985 and Elliott 1988) and the current one is that the 1985 study contained specific questions related to soyfoods. But the 1988 survey also probed some interesting areas. For details, see the study itself.

Copies of the 1988 Consumer Attitudes Monitor are available through Jean Kuster, Protein Technologies International, Checkerboard Square, St. Louis, Missouri, 63164 or call 800-325-7108.

706. *Nutrition Overview.* 1988. Consumer research study offers insight into fitness market. 3(2):5-6. June.
• ***Summary:*** Protein Technologies International commissioned a study of exercise and dietary habits, interests, and practices of physically active consumers. Results of the survey indicated that physically active consumers believe a high correlation exists between diet and exercise performance. When asked why they participated in a regular exercise program, both the moderately active and very active segment responded that improved health was their primary motivation to exercise. Weight control, enjoyment, improved appearance, muscle building, and stress management (in that order) were other popular responses.

707. Protein Technologies International. 1988. 1988 Consumer Attitudes Monitor: Nutrition, soy protein and soy fiber. St. Louis, Missouri. 10 p. 28 cm.
• ***Summary:*** This study, an update of a study conducted in 1985, is based on a telephone poll of 1,005 Americans nationwide, 18 years or older, half men and half women. The results are as follows: "1. Have you heard of soy protein being included in certain food products?": Yes 61%. No 39%. Of those which answered yes, "2. What types of food products are currently available which contain soy protein?" Meat 42%, all other foods 23%, don't know 35%. Of those who answered yes to #1, "Have you ever tried food products with soy protein included in them?" Yes 40%. No 50%. Don't know 10%. "4. If you knew products available at the supermarket contained soy protein, would you be more or less likely to buy them?" More likely to purchase 20%. No difference 37%. Less likely to purchase 32%. Don't know 11%. Of the 20% who answered "more likely" to #4: "5. Why is it you would be more likely to buy products containing soy protein?" Healthier 34%. Nutritious 18%. Lower cost 8%. Good taste 6%. Less cholesterol 6%. Less fat 4%. Less calories 3%. Of the 32% who answered "less likely" to #4: "6. Why is it you would be less likely to buy products containing soy protein?" Don't know 20%. Taste 20% (they perceived that soy protein negatively affected the taste). Additive/chemical 12%. Process 9%. Filler 7%. Cost 2%.

#7 showed that only 6% had refused to purchase a product because it contained soy protein. "8. Does the fact that a food manufacturer uses soy protein in its products change your feeling about the company?" No difference 47%. Feel better 26%. Feel worse 17%. Don't know 10%. "9. How would you rate your knowledge about 'Dietary Fiber?'" Very knowledgeable 9%. Knowledgeable 24%. Neutral (some knowledge) 19%. Only slightly knowledgeable 29%. Not at all knowledgeable 19%. "10. What do you think are the benefits of food high in fiber?" Aids digestion 33%. Reduces some forms of cancer 26%. Promotes regularity 23%. Reduces cholesterol 9%. Aids glucose tolerance 2%. "11. Have you changed your (your family's) eating habits and meal menus within the last 12 months?" Changed 58%. Not changed 42%. Of the 58% who have changed: "12. What were the major reasons for those changes?" Concerned about calories/weight 17%. Concerned about cholesterol 12%. Physician recommendations/orders 11%. Concern about fat content 9%. Economic 3%. Note that all but 3% reported the major reasons for this were health-related. Again, of the 58% who have changed: "13. How have you changed?" Eat more fruit/vegetables 28%. Reduced amount of red meat eaten 26%. Reduced cholesterol 23%. Reduced salt/sodium consumption 15%. Added fiber to diet 13%. Reduced dairy products 11%. Address: St. Louis, Missouri.

708. Wagner, T.J.; Elliott, J.G.; Geurin, H.B. 1988. Effect of isolated soy protein and whey on partial or complete replacement of dried skim milk in a milk replacer for veal calves. *J. of Dairy Science* 71(Supplement 1):126 (Abst. #P21). June. American Dairy Science Association 83rd Annual Meeting.
• ***Summary:*** 55 male Holstein calves were used and

"slaughtered as veals at 15 weeks of age."

"These findings demonstrate that ISP (isolated soy protein) can be used with whey to replace skim milk and offer an economic alternative while maintaining nutritional performance for 3-15 weeks." Address: Protein Technologies International, Dairy Food Systems Div., St. Louis, Missouri 63164.

709. Steffens, Ken. 1988. Farmland, Far-Mar-Co., and PMS Foods, Inc. (Interview). *SoyaScan Notes.* Aug. 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Far-Mar-Co merged with Farmland in the late 1970s. Farmland then started losing money in a big way, so they wanted to divest some of their assets and get out of the business of making TVP. So three of the personnel bought Far-Mar-Co in 1983 in a leveraged buyout. The new company was called PMS Foods Inc., standing for Parke, Major and Shoup. They are still in Hutchinson, Kansas, making TVP. Farmland is a mere shadow of its former self, a manufacturer in Kansas City.

PMS paid ADM a licensing fee to make TVP. It goes for another 3 years. Four companies made TVP: ADM, PMS, Cargill, and Central Soya (in that order of size). The latter three all license the process from ADM. Ken, who worked for Ralston, says that Ralston is also named on the original patent and they get lots of licensing money. They litigated against all the producers of TVP. There were three different rights: process, chemical, and one other. ADM, Ralston, and Staley were co-holders of the patent–not just ADM. Ralston is no longer in the business.

Update. 1998. April. PMS Foods, Inc. is listed in the 1998 Soya Bluebook Plus on p. 192. Location: 2701 E. 11th, P.O. Box 1099, Hutchinson, Kansas 67504-1099. Phone: 316-663-5711. Fax: 316-663-7195. e-mail: sales@pmsfoods.com. Internet: www.pmsfoods.com. Contact: Derek Park, President. Plant manager: Floyd Shoup. Facility: Extrusion, served by rail & truck. Edible products: Meat analogs, textured soy flour. Address: PMS Foods, Inc., 2701 East 11th St., Hutchinson, Kansas 67501. Phone: 316-663-5711 (Oct. 1995).

710. Schwarz, F.H. ed. 1988. Soy protein and national food policy. Boulder (Colorado) and London: Westview Press. Published in cooperation with Protein Technologies International, a subsidiary of the Ralston Purina Company. x + 349 p. No index. 24 cm. Published in cooperation with Protein Technologies International, a subsidiary of the Ralston Purina Company. Foreword by P.H. Hatfield, President of PTI. [212 ref]

• ***Summary:*** Contents: Foreword, by P.H. Hatfield. Part 1: Introduction. 1. Policy implications, by D. Gale Johnson. 2. Meat supply and demand in developing countries: Past trends and projections to 2000, by J.S. Sarma.

Part 2: Case studies. 3. The introduction of isolated soy protein food ingredients in Sweden: Prospective impacts on trade, food policy, and agricultural resource use, by Matthew G. Smith. 4. Grain and meat in China: Trends in Consumption, Production, and imports with special reference to isolated soy protein meat ingredients, by Terry Sicular with Vanessa Weiss. 5. The potential role of isolated soy protein food ingredients in Mexico, by G. Edward Schuh, Matthew G. Smith, and Maria Ignez Schuh.

Part 3: Microeconomic considerations. Part 4. Technical and consumer considerations.

Discusses the many benefits of using isolated soy proteins as an ingredient in processed meat products. Economic benefits include substantial cost savings. Nutritional benefits include reduction of cholesterol, saturated fats, and total fat content, plus increase in protein content. Address: Senior vice president, Agribusiness Corp. of America, Washington, DC.

711. Aarons, Theodore. 1988. Unilab Research, Protein Research Associates, Dr. Abraham Schapiro, lecithinated instant soy proteins, and Boericke & Runyon Co. (Interview). *SoyaScan Notes.* Sept. 23. Conducted by William Shurtleff of Soyfoods Center. [2 ref]

• ***Summary:*** Ted founded Protein Research Associates in Berkeley in 1969. In 1981 the company became Protein Research Associates. Working with various chemists and biochemists, he extracted high-grade, inexpensive protein from agricultural by-products and wastes. In 1970 Dr. Abraham "Schap" Schapiro, a chemist, developed the first soluble soy protein, via a process of lecithination, in conjunction with his work at Boericke & Runyon Co., Inc. in El Cerrito. The concept of lecithinating a powder to make it soluble was first applied to soy proteins. Schapiro was granted various patents on the process, starting in 1969. These were assigned to Mr. Aarons. Unfortunately, in the mid-1970s Ralston Purina, followed by Staley, Central Soya, and other large protein companies modified the engineering and bypassed the patents. No legal action was taken. The lecithinated proteins contained less than 1% lecithin (0.3 to 0.8%). Prior to this discovery, many protein powders had been mixed with large amounts of sugar to make them soluble. The key to the patent was that the lecithin and protein were mixed in incremental steps. First an aqueous solution of liquid lecithin was mixed into soy protein powder, then in 2 steps more protein was stirred into that mixture.

The first commercial application of the process was with Shaklee's Instant Protein Powder. The process was licensed to Mr. Worthington, head of Boericke & Runyon Co., a custom formulator in El Cerrito that prepared the product for Shaklee. It was sold in 1-lb cans in vanilla, chocolate, and strawberry flavors. Total pounds of Instant Protein shipped by B&R were as followed: 1970 (from March) was 654,615 lb; 1971 was 1,321,774 lb; 1972 was 1,391,904 lb, and 1973

through March was 346,356 lb (1,385,424 lb annualized).

Another popular early instant protein powder was sold by Naturade in Paramount, California. Most of the products in the amino acid field have gone through their labs.

Ted now does product development with protein powders, hydrolyzed proteins, amino acids, and amino acid supplementation to get optimal PER. He is very interested in alfalfa protein; a 70% protein powder costs $0.20/lb with a PER of 2.6 if tailored by adding methionine and tryptophane. Address: Protein Research Associates, 901 Grayson St., Berkeley, California 94710. Phone: 415-845-7614.

712. *SoyaScan Notes.* 1988. Microbiological specifications for tofu, powdered soymilk, and soy protein isolates (Overview). Oct. 10. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** According to the 8th draft of the tofu standards (Oct. 1985): None of the following should be present in fresh tofu: *Staphylococcus aureus, Salmonella, enteropathogenic Escherichia coli, Vibrio parahemolyticus, Yersinia enterocolitica.* At the plant on the day of production: Coliforms < 5/gm, Standard Plate Count (SPC) < 100, pH < 7.0. At the time the tofu is sold: Coliforms < 500, SPC < 1 million, pH 6.0 to 7.0

For St. Peter Creamery spray dried soymilk: Coliforms < 10, E. coli negative, Salmonella negative, Standard Plate Count 30,000 units/gram (Most Probable Number). For Ralston Purina isolated soy protein, ditto except that Standard Plate Count is < 10,000 units/gram.

713. Freedman, Alix M.; Gibson, Richard. 1988. Brand news–Philip Morris's bid for Kraft could limit product innovation: Consumers and rivals fear dominance of shelf space and advertising media. Don't expect a drop in prices. *Wall Street Journal.* Oct. 20. p. A1, A6.

• ***Summary:*** Three years ago General Foods was acquired by Philip Morris. Now the cigarette giant is bidding $11 billion for Kraft Inc., which owns some of America's best known brands

A pie chart shows 1987 sales for the new company which has two parts and six segments: (1) Kraft Foods $9.9 billion, including: Consumer foods $4.5 billion (Kraft, Miracle Whip topping, Parkay margarine, Velveeta cheese, Breyer's ice cream, Breakstone dairy products, Frusen Gladje, Budget Gourmet frozen dinners, Tombstone pizza), Food service and ingredients $3.0 billion, International Foods $2.3 billion. (2) Philip Morris $27.7 billion, including: Brewing $3.1 billion (Miller, Lite, Matilda Bay wine coolers), General Foods $10.0 billion (Maxwell House coffee, Birds Eye frozen foods, Jell-O, Entenmann's, Oscar Meyer meats, Post cereals, Ronzoni), Cigarettes $14.6 billion (Malboro, Benson & Hedges, Virginia Slims).

A table shows the most profitable consumer food companies, with annual sales (in millions of dollars) and operating profit margin for each, in descending order of operating profit margin (earnings before taxes, interest and depreciation as a percentage of sales), as follows: Kellogg ($3,793, 21.2%), Ralston Purina ($5,868, 16.3%), Heinz ($5,244, 15.7%), Hershey Foods ($2,434, 15.0%), RJR Nabisco (food operations only; $9.420, 13.7%), Campbell Soup ($4,869, 12.7%), Quaker Oats ($5,330, 12.0%), General Mills ($5,179, 12.0%), Borden ($6,514, 11.7%), Pillsbury ($6,191, 11.1%), Kraft ($9,876, 9.5%), General Foods (Philip Morris; $9,946, 8.1%), Sara Lee ($10,424, 7.7%).

In 1984 Kraft acquired Celestial Seasonings, the herbal-tea company, then aggressively extended the line to include many new flavors, and put the brand on mixed seasonings, salad dressings, and even cosmetics. This proved to be a blunder, so last year Kraft sold Celestial (barely profitable despite $38 million in sales) to a management group. Address: Staff reporter.

714. Krizmanic, Judy. 1988. Fit to be tofu: When technology brought changes to this traditional product, the question arose, "Is tofu still the real thing." *Vegetarian Times.* Oct. p. 21-23.

• ***Summary:*** Discusses some of the issues and controversies involved with the development of tofu standards by the Soyfoods Association of America. The tofu liberals wanted a broad definition of the product, allowing it to contain soy protein isolates, if that was clearly stated. The tofu traditionalists felt that a product containing isolates should not be allowed to be called tofu.

715. Lo, Grace Shen. 1988. Physiological benefits of Fibrim soy fiber in humans. *Nutrition Overview* 3(3):1, 6-7. Oct. [13 ref]

• ***Summary:*** Fibrim is a natural choice. It lowers cholesterol in hypercholesterolemic subjects, improves glucose tolerance and insulin response in humans, improves gastrointestinal response in humans, and does not affect nutrient absorption in humans. Address: Director, Fiber Research, Protein Technologies International.

716. *Nutrition Overview.* 1988. Consumer interest in dietary fiber and Fibrim soy fiber. 3(3):8-9. Oct.

• ***Summary:*** In 1985 Ralston Purina began an ongoing consumer research program to measure opinions about dietary fiber. The initial study was conducted during May 1985 by the Nova Research Group in San Francisco, based on interviews with 375 consumers (75% female). People 60 years and older rated high-fiber foods the highest. Fiber rated higher than bran as an ingredient. Fibrim is not a type of bran.

A follow-up study was done in late 1987 by Bothwell Associates and Contemporary Studies, Inc. in Chicago, Illinois; Phoenix, Arizona; and Daytona Beach, Florida.

300 women were interviewed. Results revealed a major trend away from the main 1985 perceived benefits "helps regularity" and "aids digestion" to a much broader awareness of the benefits of fiber, including "keeps body healthy, helps prevent cancer, good for colon, lowers cholesterol." More than 50% of those age 60+ were very concerned about fiber in their diets.

717. Caton, Greg. 1988. Early work with textured soy products: ADM, Ralston, Purina, and Swift & Co. (Interview). *SoyaScan Notes.* Nov. 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** ADM and Ralston Purina filed for independent patents related to texturization of soy flour at about the same time. There was a suit and counter-suit, then Swift & Co. and Staley jumped in on the counter-suit. After a lengthy and very expensive trial, there was an out of court settlement. Then Ralston Purina was granted the process patent and ADM got the product patent.

Jim Beyers has the whole, fascinating story and a wealth of related information. He testified at many depositions. He is with Westward Industries Inc., 1819 S. Meridian Ave., Wichita, Kansas 67213 (Phone: 316-942-8387). Another knowledgeable person is Chuck Harwood, a consultant in the Chicago area.

Also contact Dr. Tom Futch of Manna International in New Orleans, Louisiana, for info on TVP. He is a born again Christian of the best type. Phone: 504-254-3333. A PhD in food science, he worked with Staley in extrusion of soy protein concentrates. Address: President, Lumen Food Corp., 409 Scott St., Lake Charles, Louisiana 70602-0350. Phone: 318-436-6748.

718. **Product Name:** Supro 670 (Isolated Soy Protein).
Manufacturer's Name: Protein Technologies International.
Manufacturer's Address: Checkerboard Square, St. Louis, MO 63188.
Date of Introduction: 1988 November.
New Product–Documentation: Spot in Food Processing. 1988. Nov. "Isolated soy protein for beverage powder... Suggested application in beverages include dry protein supplements, dry weight-loss mixes, meal replacements, and hot cocoa mixes." Spot in Food Processing. 1989. Jan.

719. Protein Technologies International. 1988. It's what inside that counts [Supro brand isolated soy protein] (Ad). *Muscle & Fitness.* Nov. p. 36.
• ***Summary:*** See next page. The top half of this full-page color ad shows a man's bulging biceps. "Supro: A superior protein. Supro, as part of a modified diet, can aid in lowering blood cholesterol in individuals with high plasma cholesterol." Two scientific studies are cited. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 800-727-8776.

720. Golbitz, Peter. 1988. Soyfoods Association: New developments (Interview). *SoyaScan Notes.* Dec. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Natural Foods Expo in Anaheim, 14-17 April 1989, will have a panel on marketing soyfoods aimed at retailers; 75 minutes for 4 speakers.

Concerning the tofu standards, the standards committee approved them unanimously, but when the board of directors voted on them, Barricini and Ralston Purina refused to approve.

The Association is planning to petition the USDA to allow tofu to be used as a meat alternative in school lunches and have it qualify for reimbursement.

Gordon Bennett will be president of SAA until April 1989. The Board has paid all past debts to Steve McNamara and has budgeted $5,000 for a part time administrator to work in the Soyatech office. The person will do 5-10 hours/week of SAA work such as news releases, soliciting dues, etc.

SAA voted to drop the Clip Service on 31 Dec. 1988. Golbitz gets about 50 magazines, which he clips and there was not enough in the clip service for him to make it worth $400 a year. Plus there was a big filing problem.

Golbitz is very happy that he bought the *Soya Bluebook.* In Jan. 1989 Soyatech will hire its second employee. So with Peter and Sharyn that makes 4 workers. During the Bluebook crunch in summer they will hire an extra person. Address: Bar Harbor, Maine. Phone: 207-288-4969.

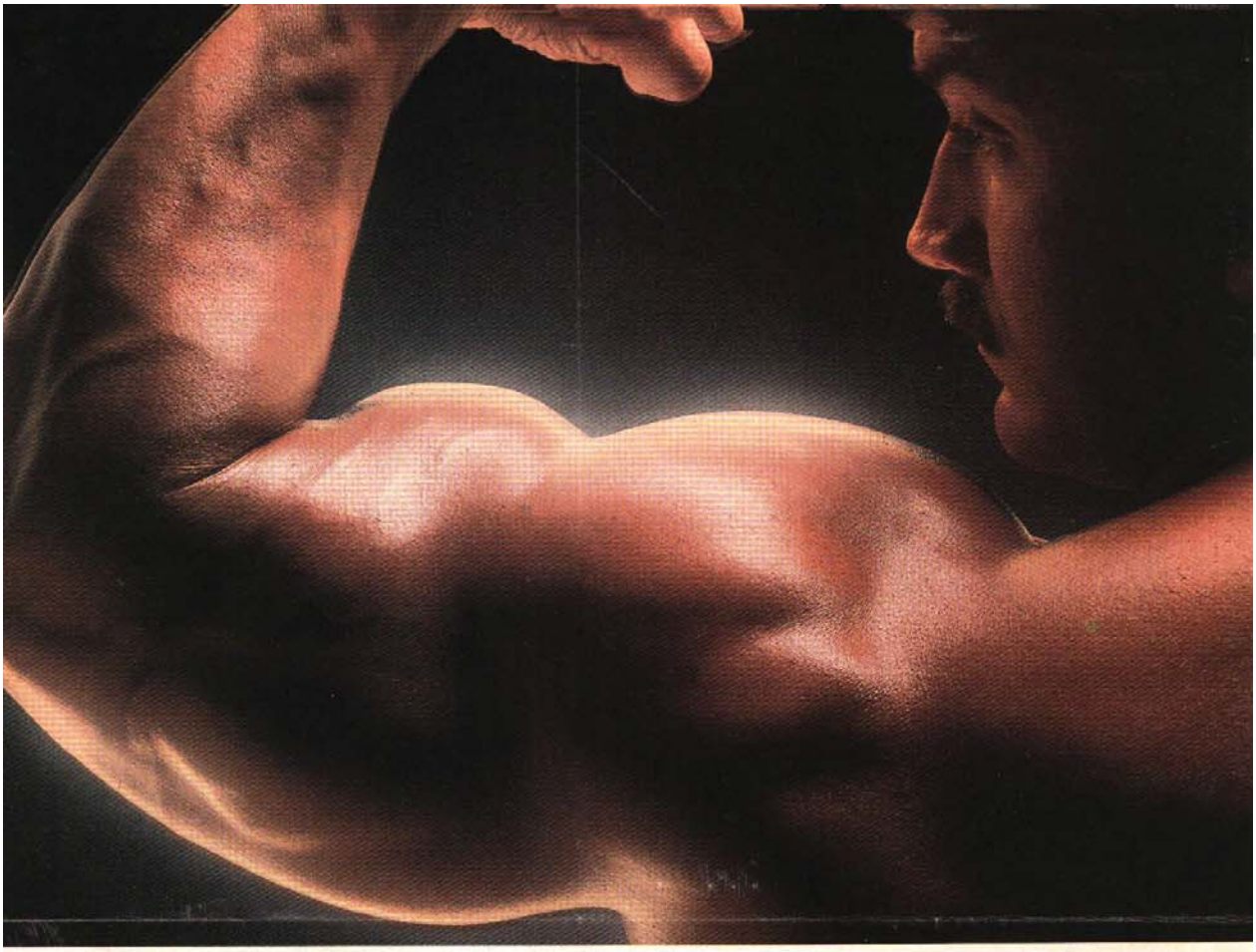
721. *Food Technology.* 1988. Protein Technologies expanding three plants. 42(12):68. Dec.
• ***Summary:*** "The expansion program will increase the production capacities at each of its food ingredient manufacturing facilities located in Memphis, Tennessee; Pryor, Oklahoma; and Ieper [Ypres], Belgium. Capital investment in the program, begun in early 1988 and to be completed by April 1989, will exceed $10 million.

"Protein Technologies International is the only marketer of isolated soy protein and fiber food ingredients with multiple manufacturing facilities and has the only isolated soy protein plant on the continent of Europe."

A small aerial photo shows the Protein Technologies plant at Pryor, Oklahoma.

722. Ralston Purina Company. 1988. Annual report to shareholders. St. Louis, Missouri. 32 p.
• ***Summary:*** Net sales for the year ended Sept. 30, 1988, totaled $5,875,900,000 compared to 1987 sales of $5,577,900,000. Net earnings for the year were $387,800,000 compared to 1987 earnings of $523,100,000.

"Driven in part by the accelerating growth in consumer demand for healthier, higher quality food products, Protein Technologies International had a superb year in fiscal 1988.



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1. Wolfe, et al, Nutr. Rep. Int., 24:1187. 2. Goldberg, et al, Atherosclerosis, 43:355.

Volume gains were achieved in every domestic and overseas food ingredient market in which PTI competes."

Nurish brand proteins, a line of soy protein products used in high performance weaning rations for farm animals, were introduced on a worldwide basis in the third quarter of the fiscal year. The group's soy polymer business, which includes a line of functional soy polymers for high-quality paper and paperboard coating, had a strong volume year. To keep pace with demand, in 1988 the Group began an expansion program to increase production capacity at its three isolated soy protein manufacturing plants. This multi-phased expansion program is expected to be completed in April 1989. A table showing "Sales by Product Lines and Segments" for Soy Protein Products indicates sales in 1988 at $182.0 million; 1987 at $157.1 million; and 1986 at $139.8 million. Address: St. Louis, Missouri.

723. Farris, Paul L.; Crowder, R.T.; Dahl, R.P.; Thompson, Sarahelen. 1988. Economics of grain and soybean processing in the United States. In: Chester O. McCorkle, Jr., ed. 1988. Economics of Food Processing in the United States. San Diego, California: Academic Press. xiii + 449 p. See p. 315, 341-48. Chap. 9. Illust. Index. 24 cm. [42 ref]
• ***Summary:*** The contents of Chapter 9 includes: The manufactured feed industry: Feed demand and ingredients, industry structure, industry performance (larger feed manufacturing companies include Ralston-Purina and Cargill-Nutrena), the future of feed manufacturing.

The barley malting industry ("Malt produced from barley is a major ingredient in the production of beer and other alcoholic beverages." The U.S. barley malting industry uses about 40% of U.S. barley production. Barley is allowed to sprout ("malt") slightly before it is processed).

The soybean processing industry: Soybean products (one bushel of soybeans is converted into about 48 pounds of meal and 11 pounds of oil), industry growth and organization, industry operating characteristics and operating environment in the 1980s, future challenges. Address: 1. Dep. of Agricultural Economics, Purdue Univ., West Lafayette, Indiana 47907; 2. Pillsbury Co., Minneapolis, Minnesota 55402.

724. *Food Processing* (*Chicago*). 1989. Isolated soy protein for beverage powder. Jan. p. 34.
• ***Summary:*** "A powdered form of isolated soy protein has recently been introduced to provide economic, performance, and dietary benefits in beverage mixes. Product is a source of vegetable protein (90%) which is highly digestible. Usage in beverage powders delivers functionality in suspension properties, dispersibility, and mouthfeel characteristics. Beverage applications suggested include dry protein supplements, dry weight-loss mixes, meal replacements, and hot cocoa mixes.

For additional information on Supro 670 Isolated Soy Protein contact Protein Technologies International, St. Louis, Missouri.

"Circle 704."

725. Ralston Purina Company. 1989. First quarter report to shareholders. Annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 12 panels.
• ***Summary:*** For the three months ended Dec. 31, 1988. There is growing consolidation in the food industry. "Turning to Protein Technologies, Mr. Stiritz underscored the success of this business by saying it 'had its best year in its history. Volume increased in practically all of the 30 countries where we compete. In particular, there was strong worldwide volume growth in isolated soy protein food ingredients with all customer segments–meat, dietary and nutritional–contributing to the growth.'" Address: St. Louis, Missouri.

726. Worthington Foods, Inc. 1989. The tradition of healthy choices. 900 Proprietors Rd., Worthington, OH 43085. 29 p. 29 cm. Undated.
• ***Summary:*** See next page. This document was published to celebrate Worthington Foods' 50th anniversary. It contains the best history of the company seen to date.

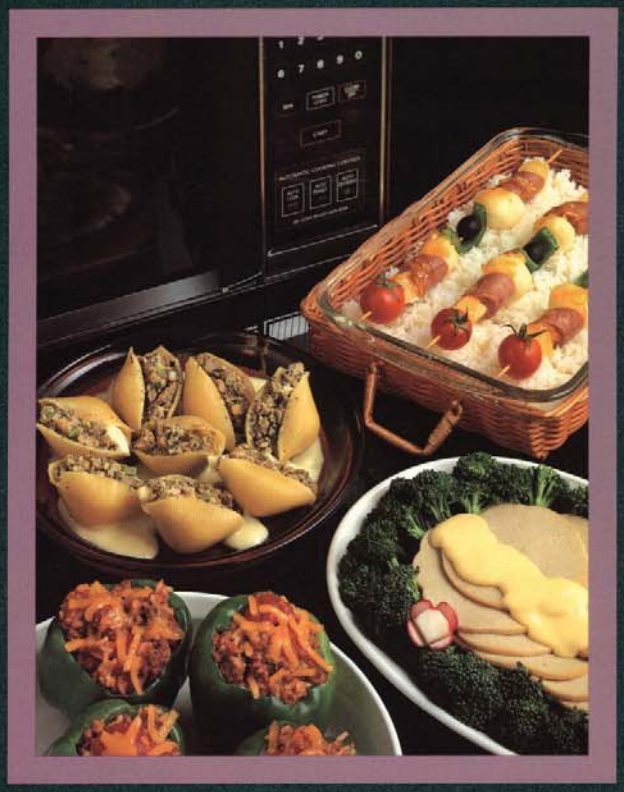
Contents: Mission statement. A tradition of excellence. Mainstream America eats healthier. Southern fried flavor... zero cholesterol: The story of Morningstar Farms Country Crisps from soybeans to shoppers. The "heart-wise" choice. Good taste plus good nutrition (A graph shows that the number of vegetarians in the USA has increased from 1 million in 1978 to 6.2 million in 1986 a six-fold increase). The good taste of natural living (the Natural Touch line, launched in 1984). Directors and officers. A history of Worthington Foods (p. 13-27).

Black-and-white photos show the following early Worthington canned products: Proast, Choplets, Choplet Burger, Worthington Veja-Links (Vegetarian, Smoke Flavor, Skinless), Miller's MC Vegetarian Main Course, Worthington Soyamel.

"The breakthrough" Spun soy fiber (p. 21): Perhaps the single most innovative development in the history of the company started the day Robert Boyer paid an unannounced visit to Worthington Foods. He walked into Buller's office, introduced himself and opened an attache case full of samples wrapped in tinfoil. Buller almost jumped out of his chair. Remembering that day, he says, 'I imagine my eyes got pretty big, because he had several products there that looked very much like meat, and I realized they weren't meat.' One looked like ham, one like beef and one like lamb. When he tore one apart, it looked like the fibers of meat. Then he put it in his mouth and chewed it. Although it had the texture of meat, it tasted 'horrible.' But Buller got excited about the possibilities of what he was seeing and called Hagle in to have a look. After chewing a piece, Hagle asked Boyer, 'Can

The Tradition of Healthy Choices

Worthington Foods



you make it taste like anything?' Boyer assured them that he could and that it was the alcohol used to extract the protein that had given it the horrible taste. A different extraction method could produce a different product."

"Boyer was invited to work in the Worthington laboratory with Kelly Hartman, and Worthington eventually licensed his patents and hired Boyer as a consultant. Out of this relationship, a whole new line of products developed. Worthington was too small to go into the business of crushing soybeans and disposing of the oil, or of purchasing the protein extrusion or spinning equipment. So Boyer negotiated with Ralston-Purina to set up a pilot plant to make the protein for Worthington. As it turned out, Ralston-Purina made the protein, did the spinning, and Worthington bought the output and put it into new products.

"When the new Ralston-Purina plant was operational, it had the capacity of 10,000 pounds a day. Worthington was not ready for this kind of volume, but working out these difficulties involved Jim Hagle in further negotiations with executives of a large corporation. Finally, Worthington agreed to take all the production, and sales took off. The products–White Chik, Beeflike, Prosage, Stripples, and Holiday Roast (with a plastic wishbone)–were all hits.

"Hartman remembers those days as his most exciting and challenging with the company. It was a delicate problem getting other companies, like Ralston-Purina, to do a part of the research and production cycle without stealing Worthington's thunder. Many corporations got involved and took a license because they wanted to be on the cutting edge of technology. Hartman says, 'We had vice presidents sticking out our ears, coming here trying either to buy us or get in on the know-how.'

"Almost every major university in the country was interested in what was going on. Hartman says the experimental products were called a lot of good things and a lot of bad things, too. The products were called 'phony-bologna,' 'fake steaks' and 'sham ham.' Government agencies also became interested, including the Agency for International Development and the United Children's Fund."

"The first to offer frozen meat analogs." One of Worthington's new products that contained spun soy fiber was named Wham. The company that manufactured a meat product named Spam sued Worthington for infringing on their product name. A skillful presentation by Jim Hagle before the company's officers and attorneys at their headquarters in Chicago, Illinois, led to the withdrawal of the lawsuit. "Another problem with the new line of products was that they did not can well. The products deteriorated in flavor and texture under high temperatures. Freezing was the obvious answer, but this required big changes. The company had to purchase trucks for frozen delivery. In addition, at that time many stores were not equipped for frozen foods, so Worthington supplied these stores with food freezers. It was a costly but profitable venture because it increased sales volume tremendously. Thus Worthington Foods became the first company to offer frozen meat analogs. And in October, 1963, a series of television, radio and newspaper advertisements featuring the new frozen foods was introduced. All these developments caught the attention of a number of major food companies." Address: 900 Proprietors Road, Worthington, Ohio 43085. Phone: (614) 885-9511.

727. Steinke, Frederick H. 1989. Der Naehrwert isolierter Sojaproteine in der menschlichen Ernaehrung [The nutritional value of isolated soy proteins in the human diet]. *Ernaehrungs-Umschau* 36(5):184-86. May. [Ger]
• ***Summary:*** More and more food products are now coming onto the market which contain soy protein and specially isolated soy protein. The isolated soy proteins are used both as a complete protein substitute and in conjunction with other vegetable and animal proteins. The nutritional value of these isolated soy proteins has been extensively studied in children and adults to determine their importance as a source of protein and amino acids. This paper examines these studies in relation to human needs. Isolated soy proteins offer opportunities for extensive modification of foods that make them more valuable to human health.

Tables show: (1) The composition of various soy ingredients (*Sojabohnen-Nahrungsmittelprodukten*).

Isolated soy protein: 92% protein (N x 6.25), 2.5% total carbohydrates, 0.5% soy oil.

Soya concentrate: 70% protein, 24.0% total carbohydrates, 1.0% soy oil.

Defatted soybean meal: 54% protein, 38.0% total carbohydrates, 1.0% soy oil.

Whole soybean meal: 42% protein, 35.0% total carbohydrates, 20.0% soy oil.

(2) Amino acid content of soy protein isolate and recommended standard requirements for amino acids (for children aged 2-5, or aged 10-12, and for adults).

(3) The growth of normal infants with soy protein foods of 3 gm protein per 100 kcal (male and female, growth in mm/day and gm/day).

(4) Results of feeding children in preschool with soy protein isolate (the 3 types are Supro 620, Supro 710, and Purina 220).

(5) Nitrogen balance data for mixed beef protein and isolated soy protein at 0.6/gm/kg body weight per day. Address: Dep. of Nutritional Science, Protein Technologies International, St. Louis, Missouri.

728. Chang, K.C.; Skauge, L.H.; Satterlee, L.D. 1989. Analysis of amino acids in soy isolates and navy beans using precolumn derivization with phenylisothiocyanate and reversed-phase high performance liquid chromatography. *J. of Food Science* 54(3):756-57. May/June. [12 ref]
• ***Summary:*** Soy protein isolates Supro 620 and 710 (made by Ralston Purina Co., St. Louis, Missouri) were used.

Amino acid profiles obtained by PITC derivatization and RP-HPLC compared fairly well with literature data for soy isolates. Address: 1-2. Dep. of Food and Nutrition, College of Home Economics, Agric. Exp. Station, North Dakota State Univ., Fargo, ND 58105; 3. Dep. of Food Science, Pennsylvania State Univ., University Park, PA 16802.

729. Golbitz, Peter. 1989. Mexican soyfoods producers form association. *Soya Newsletter* (*Bar Harbor, Maine*). May/June. p. 7.
• ***Summary:*** "Representatives of Industrial de Alimentos, Nutricasa, Productos Alimentarios Delicias, Nutrimex, Alimentos Proteinicos S.A., Arancia Purina Proteinas, Archer Daniels Midland, Laboratorios Abbot, Mead Johnson and Nestlé have been meeting with Dr. Susana Dehesa de Manjarrez and Adela Perez of the American Soybean Association's Technical Assistance Center to plan joint activities targeted at expanding the market of edible soy protein products. The first project is to launch a generic soy advertising campaign directed at 3 market segments: food industry, medical and nutrition community, and food service and consumers."

"A net result of the program has been the establishment of a new mind set–the reality that with soy, you can feed the same amount of people with less money." Address: Soyatech, Bar Harbor, Maine.

730. *Food Processing* (*Chicago*). 1989. Soy fiber ingredients contributes 75% total dietary fiber. Food Processing awards–ingredients–honors. July. p. 81.
• ***Summary:*** "Extensive clinical research has proven that consumption of Fibrim Brand Soy Fiber in a modified diet can reduce elevated serum cholesterol and add bulk fiber as well. These physiological benefits plus a high concentration of dietary fiber (75%) allows effective formulation of both low-calorie and high-fiber foods. Fibrim also enhances functionality in applications such as beverages, extruded snacks, crackers, puddings, pastas, white bread, and flaked cereals. A bland taste and light color allows addition of considerable fiber to food products without affecting taste or texture." Fibrim is made and sold by Protein Technologies International.

731. Timmins, Thomas P. 1989. Timmins Group. 105 Beacon St., Greenfield, MA 01301. 10 p.
• ***Summary:*** Timmins, founder and president of Tomsun Foods International, has started a new company, a consulting firm named Timmins Group. He has 17 years management experience in the food industry and 12 years with Tomsun. This packet of information consists of a cover letter, a description of five areas in which the Timmins Group will offer consultation, and a resume of Timmins past experience.

He graduated in 1967 from the University of Notre Dame in Indiana with a BA degree, magna cum laude. 1972-73 he worked for Wadco Foods, Inc. in Estherville, Iowa, as supervisor of shipping and receiving. 1973-75 he was manager of Yellow Sun Natural Foods Cooperative in Amherst, Massachusetts. This food co-op had 500 member families and was a pioneer in the organic farming movement in New England. 1975-77 he was sales manager at Llama, Toucan, and Crow, a natural foods distributor in Brattleboro, Vermont. In 1977 he was a co-founder of Tomsun Foods International, Inc., an early tofu manufacturer in Greenfield, Massachusetts. In 1982 Tomsun was named to the INC., Magazine 500, a group of the fastest growing small companies in the country. In Dec. 1986 the company conducted an initial public stock offering to support the launch of Jofu, a refrigerated tofu and fruit snack.

Note: Timmins is no longer involved with Tomsun Foods or Jofu. By Oct. 1991 he had developed a vegetarian ham (using soy protein isolates made by Protein Technologies International) and shipped 60,000 lb to Taiwan. Address: Greenfield, Massachusetts. Phone: 413-772-0035.

732. National Oilseed Processors Association. 1989. Yearbook and trading rules 1989-1990. Washington, DC. [iv] + 123 + 11 p. 23 cm.
• ***Summary:*** On the cover (but not the title page) is written: Effective August 1, 1989. Contents: Constitution and by-laws. Officers and directors. Executive office. Members. Associate members. Standing committees. Trading rules on soybean meal. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}), sampling of soybean meal {at origin} (automatic mechanic sampler, pneumatic probe sampler, probe sampler), sampling of soybean meal (at barge loading transfer facilities), official weighmaster application, semi-annual scale report, certification of installation of automatic sampler & mechanical divider (at origin), semi-annual certification of automatic sampler & mechanical divider (at origin), certification of installation of automatic sampler & mechanical divider (at barge loading transfer facility), semi-annual certification of automatic sampler & mechanical divider (at barge loading transfer facility), official referee laboratories (meal), official NSPA soybean meal sample bag. Soybean meal export trading rules: Minimum blending procedures for export meal blended at ports, sampling of soybean meal (at vessel loading facilities), weighing of soybean meal (at vessel loading facilities), certification of installation of automatic sampler & mechanical divider (at vessel loading facility), semi-annual certification of automatic sampler & mechanical divider (at vessel loading facility), semi-annual certification of scales at vessel loading facilities. Trading rules on soybean oil. Sales contract. Definitions of grade and quality of export oils. Soybean lecithin specifications. Appendix to trading rules on soybean oil: Inspection, grading soybean oil for color (NSPA tentative method), methods of analysis (A.O.C.S. official

methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses; soap stock, acidulated soap stock and tank bottoms (only method numbers listed), official weighmaster application, semi-annual scale report, official referee chemists (oil). Soybean oil export trading rules. Uniform soybean oil export contract. Foreign trade definitions (for information purposes only) Appendix 1.

The section on officers, executive committee, and board of directors (p. 7-8) gives the name, company affiliation, and phone number of each person. Officers (executive committee)–Chairman: James W. Lindsay, Ag Processing Inc a cooperative [AGP], Vice Chairman: C. Lockwood Marine, Central Soya Co., Inc. Secretary: John March, Cargill, Inc. Treasurer: John Burritt, National Sun Industries, Inc. Immediate past chairman: John G. Reed, Jr., Archer Daniels Midland Co.

Executive staff: President: Sheldon J. Hauck. Executive vice president: Brose A. McVey.

Board of directors (alphabetically by company; each member company may have up to two representatives on the board; only the first of these may vote): James W. Lindsay & William C. Lester, Ag Processing Inc a cooperative. John G. Reed, Jr. & Michael D. Andreas, Archer Daniels Midland Co. John March & Thomas O. Palmby, Cargill, Inc. C. Lockwood Marine & David H. Swanson, Central Soya Co., Inc. David B. Mulhollem & Bernard Steinweg, Continental Grain Co. Ian White & Donald G. Foster, Elders Oilseeds Inc. Merritt E. Petersen & Stan Eichten, Honeymead Products Co. John Burritt & Jeff Berkow, National Sun Industries, Inc. John M. Wright & Henry E. O'Bryan, Owensboro Grain Co., Inc. Sewell L. Spedden & William Bohan, Perdue Incorporated. Paul D. Otto & J. Richard Galloway, Quincy Soybean Co. James K. Smith & Richard E. Bell, Riceland Foods, Inc. Thomas L. Harper, Southern Soya Corp. D. Daryl Houghton & P. Coleman Townsend, Townsends, Inc.

Executive office, Washington, DC: President, Sheldon J. Hauck. Executive vice president: Brose A. McVey. Administrative asst.: Steven C. Kemp. Legislative asst.: Elizabeth A. Loudy. General counsel: Elroy H. Wolff, Sidley & Austin. Special counsel: Richard O. Cunningham, Steptoe & Johnson.

Members (listed alphabetically by company; within each company, first the name of the official Association representative {who is on the Board and votes}, followed by the other personal members listed alphabetically by surname. For example, Archer Daniels Midland Co., the company with the most personal members, has 34. After the name of each personal member is given with his address and phone number. In the listing below, the number of personal members is shown in parentheses after the name of each company, followed by city and state of the various locations): Ag Processing Inc a cooperative (21); Van Buren, Arkansas; Eagle Grove, Iowa; Manning, Iowa; Mason City, Iowa; Sergeant Bluff, Iowa; Sheldon, Iowa; Dawson, Minnesota; St. Joseph, Missouri. Omaha, Nebraska. Archer Daniels Midland Co. (23); Archer Daniels Midland Co. (24); Little Rock, Arkansas; Augusta, Georgia; Valdosta, Georgia; Decatur, Illinois; Galesburg, Illinois; Granite City, Illinois; Taylorville, Illinois; Frankfort, Indiana; Des Moines, Iowa; Fredonia, Kansas; Destrehan, Louisiana; Mankato, Minnesota; Red Wing, Minnesota; Kansas City, Missouri; Mexico, Missouri; Clarksdale, Mississippi; Fremont, Nebraska; Lincoln, Nebraska; Fostoria, Ohio; Kershaw, South Carolina; Memphis, Tennessee. Cargill, Inc. (20); Osceola, Arkansas; Gainesville, Georgia; Lafayette, Indiana; Cedar Rapids, Iowa; Des Moines, Iowa; Iowa Falls, Iowa; Sioux City, Iowa; Washington, Iowa; Bloomington, Illinois; Chicago, Illinois; Wichita, Kansas; Burnsville, Minnesota; Minneapolis, Minnesota; South Savage, Minnesota; Wayzata, Minnesota; Kansas City, Missouri; Fayetteville, North Carolina; Raleigh, North Carolina; Sidney, Ohio; Memphis, Tennessee; Chesapeake, Virginia. Central Soya Co., Inc. (13); Gibson City, Illinois; Decatur, Indiana; Fort Wayne, Indiana; Indianapolis, Indiana; Belmond, Iowa; Bellevue, Ohio; Marion, Ohio; Delphos, Ohio; Chattanooga, Tennessee. Continental Grain Co. (8); Guntersville, Alabama; Chicago, Illinois; New York City, New York. Elders Oilseeds Inc. (3); Culbertson, Montana; Blaine, Washington. Honeymead Products Co. (3); Mankato, Minnesota. National Sun Industries, Inc. (3); Minneapolis, Minnesota. Owensboro Grain Co., Inc. (4); Owensboro, Kentucky. Perdue Incorporated (4); Salisbury, Maryland; Cofield, North Carolina. Quincy Soybean Co. (6); Helena, Arkansas, Quincy, Illinois. Riceland Foods, Inc. (7); Stuttgart, Arkansas. Southern Soya Corp. (2); Estill, South Carolina. Townsend's Inc. (2); Millsboro, Delaware.

Associate Members: ADM Agri-Industries Ltd., Windsor, Ontario, Canada. Beatrice / Hunt-Wesson, Fullerton, California. Best Foods, a Unit of CPC International Inc., Englewood Cliffs, New Jersey. Bestel Inc., Minneapolis, Minnesota. C&T Refinery, Inc., Richmond, Virginia. Con Agra Poultry Co., El Dorado, Arkansas. Conti-Quincy Export Co., New York City, New York. Louis Dreyfus, Wilton, Connecticut. Empire Kosher Poultry, Inc., Mifflintown, Pennsylvania. Garnac Grain Co., Overland Park, Kansas. Goldman Sachs–J. Aron Div., New York City, New York. K&L Feeds, Inc., Selinsgrove, Pennsylvania. Kraft Food Ingredients Corp., Glenview, Illinois; Memphis, Tennessee. Krohn Trading Limited Partnership, New Orleans, Louisiana. Lever Bros Company, Inc., New York City, New York. Overseas Commodities Corp., Minneapolis, Minnesota. Pilgrim's Pride Corp., Pittsburg, Texas. Pillsbury Co. (The), Overland, Kansas; Minneapolis, Minnesota. Procter & Gamble Co., Cincinnati, Ohio. Purina Mills, Inc., St. Louis, Missouri. Ralston Purina Co., St. Louis, Missouri. Schouten International, Inc., Minneapolis, Minnesota. A.E.

Staley Manufacturing, Decatur, Illinois. Alfred C. Toepfer International, Inc., New York City, New York (Knud Winkelman). Tradecom, Inc., Boca Raton, Florida. Van Den Bergh Foods Co., Chicago, Illinois.

Standing committees: For each committee, the function of the committee, the names of all members (with the chairman designated), with the company and company address of each are given–Crusher committees: Canola, flaxseed, safflower seed, sunflower seed. International trade policy. Soybean meal trading rules. Soybean oil trading rules. Safety, health, and loss prevention. Technical. Address: 1255 Twenty-Third St., N.W., Washington, DC 20037. Phone: 202/452-8040. Telex: 248959. Fax: 202/833-3636.

733. United States District Court–Central District of Illinois. 1989. Ralston Purina Company, a corporation, Plaintiff, v. A.E. Staley Manufacturing Company, a corporation, Defendant. Supplemental findings of fact and conclusions of law pursuant to Rule 52. Case No. 84-1378. 5 p. Decided Sept. 6, 1989. Unpublished manuscript.

• ***Summary:*** Ralston has sued A.E. Staley for infringement of patent number 3,940,495, which was issued from the application of Ronald Flier (the "Flier application). The Flier application was filed initially in 1964; a continuation-in-part application was filed in 1966 and a continuation was filed in 1973. The patent was issued in 1976. Staley asserted the defense of inequitable conduct.

The ADM Dutch Patent Application No. 6506477 was a printed publication, with a publication date of 22 Nov. 1965. "A reasonable examiner would have considered it highly material in determining whether to allow the 1966 Flier application or the 1973 Flier application issue as a patent."

The record establishes by clear and convincing evidence that Robert Brukardt, the manager of Ralston's patent department, knew of the publication date of the ADM Dutch application and knew that the ADM Dutch application constituted a statutory bar to subject matter in the 1966 and 1973 Flier applications that was not supported in the 1964 Flier application. It is clear that Brukardt knew the materiality of the ADM Dutch application and intended to conceal that information from the Examiner. "Further, the record demonstrates by clear and convincing evidence that Mr. Brukardt intended to deceive, and did deceive the Examiner as to the ADM Dutch application in 1973."

The court finds no evidence whatsoever that the Examiner considered the Dutch application. The Examiner expressly informed Ralston on three occasions that he would not consider the prior art until only the most pertinent prior art was presented as was required by the PTO rules. Ralston's submission of prior art never conformed to the required format. In addition, the ADM Dutch application is not listed among the cited art on the face of the patent. The court rules that patent no. 3,940,495 (the Flier patent) "is held to be unenforceable by virtue of inequitable conduct."

734. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of soy protein isolates, concentrates, and textured soy protein products: 2,528 references from 1883 to 1989, partially annotated. Lafayette, California: Soyfoods Center. 328 p. Subject/geographical index. Author/company index. Printed Sept. 8. 28 cm. [2528 ref]

• ***Summary:*** Although the Chinese had produced a type of isolated soy protein product (tofu) since the tenth century A.D., western research on the isolation of soy proteins began in Germany 1883, when Meissl and Boecker introduced the terms soy casein and soy albumin. Similar work was published in 1898 by Osborne and Campbell at the Connecticut Agricultural Experiment Station in the USA. In 1903 Oscar Nagel of New York described in detail how he produced "soy casein" and discussed it potential applications as a commercial product. Since that time, the United States has been the world leader in soy protein research and production.

The world's earliest known commercial food product made from isolated or concentrated soy protein was Albusoy, introduced in 1939 by the Soya Products Division of the Glidden Co. in Chicago. This was an enzyme-modified isolated soy protein product used as a whipping agent. Many of the earliest soy protein products were used like Albusoy in whipping applications. Soyco, launched in 1944 by Soybean Products Co. in Chicago, was a hydrolyzed soy protein whipping agent used as an egg white substitute. Rich's Whip Topping, introduced in March 1945 by Rich Products Corporation in Buffalo, New York, was used as an alternate for whipped cream. In 1947 Archer Daniels Midland Co. introduced Nutriwhip, the Borden Company debuted Soyco, and Central Soya Co. launched Soy Albumen, all whipping agents.

In 1951 the first patent for spun soy protein fibers was issued to Robert Boyer, formerly a soy researcher at the Ford Motor Co. In 1952 the first commercial soymilk based on soy protein isolate, Soyamel, was introduced by Worthington Foods. Isolates soon replaced soy flour in non-dairy infant formulas worldwide. In 1959 the first food-grade soy-protein concentrates were introduced by Griffith Laboratories.

The 1960s put modern soy protein products on the map. In 1960 the Boyer patent and its 1954 revision started the high-tech meat analog industry when Worthington Foods launched Fri-Chik, a meatless drumstick. In 1961 and 1966 conferences on soy protein foods were at the USDA Northern Regional Research Center in Peoria, Illinois. Many of the 276 attendees at the second conference were pioneers in the field. A major theme at both was that protein malnutrition was the world's most widespread deficiency disease. In 1966 General Mills introduced Bac*O's, meatless fried bacon bits made from spun soy protein fiber. At a May 1968 Conference on Protein Rich Food Products from Oilseeds held by the USDA in New Orleans, Louisiana, oilseed proteins were

increasingly seen as the answer to the "protein crisis." Also that year International Action to Avert the Impending Protein Crisis, a United Nations publication, recommends soybeans as the single most promising protein source to close the "protein gap." In Nov. 1969 General Mills launched its second bacon analog, Bac-o-Bits, this time made from textured soy flour. Frozen Bontrae meat analogs were sold to the foodservice trade. This pioneering work nationwide by one of America's largest food companies indicated to the U.S. food industry that the time for soy protein foods of the future had arrived.

In 1971 Dr. K.K. Carroll at the University of Ontario, Canada, published the first modern study showing that even in fat-free diets, animal proteins raise serum cholesterol and soy proteins lower it. Many subsequent studies worldwide confirmed these important results.

During the 1970s soy protein products entered the mainstream. In Jan. 1970 W.T. Atkinson, assignor to the Archer Daniels Midland Co., was issued a key patent for a "Meat-like protein food product," which was soon widely sold under the registered trademark TVP. In Feb. 1971 textured soy protein products were authorized for use as meat extenders in the U.S. National School Lunch program, opening up a huge potential new market for TVP type products. The amount of products used jumped from 8.5 million lb dry weight in 1971-72 to 87.5 million lb in 1976-77. Also in 1971 the Food Protein Council (renamed the Soy Protein Council in Dec. 1981) was established as a trade association for major soy protein manufacturers.

In March 1973, as meat prices skyrocketed, beef-soy blends containing 25% hydrated textured soy flour began to be introduced to U.S. supermarket chains, marketed for their lower price and higher nutritional value. Predictions of huge future markets (which failed to materialize) were published. In Nov. 1973 the first World Soy Protein Conference was held in Munich, Germany, attended by over 1,000 people from 45 countries. In late 1974 Miles Laboratories/Worthington Foods launched the Morningstar Farms line of meat analogs based on spun soy protein fiber nationwide at U.S. supermarkets. In Aug. 1975 Japan Vegetable Protein Food Association was founded to promote modern soy protein products, primarily soy protein isolates. In Oct. 1976 seminars on the use of soy protein for foods and meal for feeds were held in Moscow, sponsored jointly by three U.S. groups. More than 200 Soviet officials attended. In May 1978 The Keystone Conference on Soy Protein and Human Nutrition was held at Keystone Colorado. Sponsored by Ralston Purina Co., it presented a new view of soy protein quality. In Jan. 1978 the International Soya Protein Food Conference was held in Singapore; 400 people from 24 countries participated. And in Oct/Nov. 1978 the World Conference on Vegetable Food Proteins was held in Amsterdam, The Netherlands; More than 1,000 people attended.

In 1980 soy protein products were approved for use as a beef extender by the U.S. Armed Forces. That same year the World Conference on Soya Processing and Utilization was held in Acapulco, Mexico. In Aug. 1980 Archer Daniels Midland Co. entered the soy protein isolate market with its purchase of Central Soya's isolate plant. Then in April 1985 Central Soya bought Griffith Laboratories' line of protein products. And in Feb. 1986 Central Soya purchased the Staley protein line, including Mira-Tex, Procon, and Textured Procon brands. In July 1987 Ralston Purina Co. of St. Louis, Missouri, established Protein Technologies International as a wholly-owned subsidiary to focus on sales of soy protein for food uses. The company's sales of soy protein products were $139.8 million in 1986.

But during the 1980s the total market for soy protein products grew very slowly, if at all. In 1984 Dr. Walter Wolf of the USDA Northern Regional Research Center estimated U.S. production as follows: Soy protein concentrates 36,000 tonnes (metric tons), soy isolates 41,000 tonnes, textured soy flour 43,000 tonnes, and textured soy concentrates 4,000 tonnes. The segment showing greatest growth appeared to be that of soy protein isolates, of which Ralston Purina/Protein Technologies International in the largest manufacturer.

Still there is widespread hope that, with the growing concern over dietary cholesterol, the low cost of soy protein relative to meat protein, the inevitable widening of this cost gap in the years to come, and the increasingly positive consumer attitudes toward soy protein products shown in polls, the market for these products will soon begin to realize its long-forecast potential.

This is the most comprehensive bibliography ever published on modern soy protein products. It is also the single most current and useful source of information on this subject available today, since 53% of all references (and most of the current ones) contain a summary/abstract averaging 68 words in length.

One of more than 40 bibliographies on soybeans and soyfoods being published by the Soyfoods Center, it is based on historical principles, listing all known documents and commercial products in chronological order. Containing 37 different document types (both published and unpublished, including many original interviews and partial translations of Japanese and European works), it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 15 years, each reference in this bibliography features (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 publications together with an English translation, month and issue of publication, and the first author's first name (if given).

It also includes details on 651 commercial soy

products, including 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 references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, and a bibliometric analysis of the composition of the book (by language, document type, year, leading countries, states, and related subjects) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

735. McElfresh, Dinah. 1989. Recent developments at the Soy Protein Council (Interview). *SoyaScan Notes*. Dec. 27. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Soy Protein Council now has only 3 members: ADM, Cargill, and Central Soya. The last to leave was Grain Processing Corp. in 1987. Ralston Purina left because they wanted to focus on isolates and dues dollars were being spent more on generic promotion. They had previously been very active. SPC is on good terms with Ralston and still works with them occasionally on regulatory issues. Before the recent spate of mergers and acquisitions, the board had directed SPC to do some promotional activities. Now with the limited membership the board has advised that they want to focus on monitoring and tracking regulatory issues, mainly in the USA and mainly on labeling of consumer products. They are working with USDA and FDA on review. The institutional market continues to be strong and acceptability is high.

SPC is now totally independent of NSPA/NOPA and has been for many years. It used to be a committee of NSPA and she thinks it became independent in 1971 at the time the committee became the Food Protein Council. The last news release by SPC was when FNS (USDA's Food & Nutrition Service) opened the School Lunch Program to all vegetable proteins.

There used to be Associate Members like Lipton and Quaker Oats and others that used the products. They were not voting members put they participated in meetings. This was discontinued in the 1970s. Address: 1255 Twenty-Third St., N.W., Washington, DC 20037. Phone: 202-467-6610.

736. Ralston Purina Company. 1989. Annual report to shareholders. St. Louis, Missouri. 32 p.
• ***Summary:*** Net sales for the year ended Sept. 30, 1989, totaled $6,658,300,000, up 13.3% over 1988 sales of $5,875,900,000. Net earnings for the year were $422,500,000, up 8.9% over 1988 earnings of $387,800,000. In 1987 earnings were $523,100,000.

In the section titled Business Segments, under Other Consumer Products are listed battery products, isolated soy protein and industrial polymer products, and all-seasons resort. A table showing "Sales by Product Lines and Segments" for Soy Protein Products indicates sales in 1989 at $221.6 million (up 21.8% over 1988); 1988 at $182.0 million; 1987 at $157.1 million; and 1986 at $139.8 million.

Protein Technologies International produces the following product lines: 1. Dietary protein food ingredients (Supro and ProPlus isolated soy proteins). 2. Dietary fiber food ingredients (Fibrim soy fiber). 3. Dairy food systems products (Nurish animal ingredients; these are protein products formulated for animal weaning rations). 4. Paper and paperboard coating ingredients (Pro Cote and Sp Series soy polymers). Address: St. Louis, Missouri.

737. *Yearbook and Trading Rules.* 1989-2000. Serial/periodical. National Oilseed Processors Association. Annual.
• ***Summary:*** Preceded by: Year Book and Trading Rules. Issued annually to all members of the association. The 1981-82 Year Book, for example, was spiral bound and 23 cm high. The last published yearbook was 2000-2001. Thereafter, most of the information appeared on the association's website nopa.org.

Letter (e-mail) from Kathy Pennington, office administrator of NOPA. 2005. Aug. 15. NOPA no longer publishes the Yearbook & Trading Rules. In 2003, when she joined NOPA, it was available online only with purchase. Beginning in 2004 NOPA made the trading rules available to all on its website. Names and contact information for the officers and board members, are listed under "About us–Board and staff. The member companies names, headquarter addresses, headquarter phone numbers, and weblinks are under Membership." The detailed membership roster (contact information, committee membership, etc.) is available to Members Only. HOPA has no extra printed copies at all; they have only one copy of each Yearbook for their records. Address: 1800 M. St., N.W., Washington, DC 20036.

738. Matthews, Ruth H. ed. 1989. Legumes: Chemistry, technology, and human nutrition. New York, NY: Marcel Dekker. x + 389 p. Illust. Index. 24 cm. Series: Food science and technology, No. 32. [150+ ref]
• ***Summary:*** Contains 10 chapters by various authors. Chapters 4 and 6 are cited separately. 1. Culture and genetics of grain legumes, by Edgar E. Hartwig (for soybeans, see p. 1-5). 2. Harvesting and storage of legumes, by S.S. Kadam, D.H. Salunkhe, and C.Y. Kuo. 3. Refined oils, by Clyde E. Stauffer. 4. Isolated soy proteins, by D.H. Waggle, Fred H. Steinke, and Jerome L. Shen. 5. Legume protein flour and concentrates, by Joseph G. Endres (for soybean protein flour, see p. 140-45; for soybean protein concentrate, see p. 151-53). 6. Fermented products, by Clifford W. Hesseltine. 7. Nutrient composition of raw, cooked, canned, and sprouted

legumes (incl. sprouted soybeans, p. 187-217), by Jörg Augustin and Barbara P. Klein (for soybeans, see p. 198-203, 208-11). 8. Nutrient content of other legume products, by David B. Haytowitz and Ruth H. Matthews (for soybeans, see p. 219-25, 229-38). 9. Animal feed uses of legumes, by Park W. Waldroup and Keith J. Smith (for soybean meal and whole soybeans, see p. 247-64). 10. Antinutritional factors, by Irvin E. Liener. Dr. Liener notes that plants did not evolve to serve humans or animals. Their main concern is their own survival. Thus, nature has given them the genetic capacity to synthesize toxic substances to help ensure their own survival against predators of all kinds such as insects, fungi, or animals including humans. His Table 1 titled "Distribution of protease inhibitors present in legumes" (p. 341) shows that they are present in most legumes.

Other legumes discussed include peanuts, dry beans, dry peas, lentils, chickpeas, and winged beans. Address: Human Nutrition Information Service, USDA, Hyattsville, Maryland.

739. Waggle, Doyle H.; Steinke, Fred H.; Shen, Jerome L. 1989. Isolated soy proteins. In: Ruth H. Matthews, ed. 1989. Legumes: Chemistry, Technology, and Human Nutrition. New York, NY: Marcel Dekker. x + 389 p. See p. 99-138. [70 ref]
• ***Summary:*** Contents: Introduction. Uses of isolated soy proteins. Nutritional value of isolated soy proteins. Physicochemical and functional properties. Formulation guidelines. Conclusion and a look at the future. Contains 3 figures and 9 tables. Address: Protein Technologies International, St. Louis, Missouri.

740. Denham, Janice. 1990. Soy supplements [are] one way to boost protein levels. *Post-Dispatch* (*St. Louis, Missouri*). Jan. 17.
• ***Summary:*** Ralston Purina's Supro, isolated soy protein, is now used by many famous professional sports teams. For example, "Supro is used in ground beef products to replace traditional high-fat, high-cholesterol hamburgers and casseroles with traditional food that cuts the fat in half."

741. Stroud, Jerri. 1990. Ralston hires panel to back up claims for soybean fiber. *Post-Dispatch* (*St. Louis, Missouri*). Jan. 29.
• ***Summary:*** "Ralston Purina Co., has hired a panel of doctors, nutrition experts and scientists to help the company validate claims about the benefits of protein and fiber made from soybeans... Last summer, the company began promoting its Fibrim soy fiber for use in beverages, baked goods, meats and other products. The company has promoted the products with the slogan, 'What could be better than oat bran?'"

742. Ralston Purina Company. 1990. First quarter report to shareholders. Annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 12 panels.
• ***Summary:*** For the three months ended Dec. 31, 1989. Paul Hatfield, CEO of Protein Technologies International, reported: "To reach our nearly 2,000 customers in over 35 countries our marketing representatives are located throughout the world," he said. "The markets in which we compete can be characterized by three key factors.

"First is changing economics. World protein economics have changed over the last four years due primarily to reduced intervention by the U.S. and European Economic Community.

"Secondly, consumer lifestyle trends are favorable. Today's consumer in most developed economies around the world is making many food choices based on perceived need to improve health through nutrition.

"The third factor is technology. The worldwide food, feed, and paper industries are taking advantage of advanced technological solutions to meet their own customers' demands for optimal value." Address: St. Louis, Missouri.

743. Lo, Grace S.; Cole, Thomas G. 1990. Soy cotyledon fiber products reduce plasma lipids. *Atherosclerosis* 82:59-67. May. [24 ref]
• ***Summary:*** "Twenty subjects were randomly assigned to two groups... Total blood cholesterol levels and LDL cholesterol levels were significantly lowered when the soy fiber was a part of the diet." Address: 1. Protein Technologies International, Checkerboard Square, St. Louis, Missouri 63164; 2. Lipid Research Center, Dep. of Internal Medicine, Washington Univ., St. Louis, MO 63110.

744. *Soya International* (*Bar Harbor, Maine*). 1990. Protein Technologies International plans $50 million expansion. April/June. p. 3.
• ***Summary:*** The expansion to the Memphis, Tennessee, plant will add up to 50 new jobs to the company's present 200 employee operation. The company is a leading producer of isolated soy proteins and soy fiber products.

745. Rabheru, Neil. 1990. The soymilk industry and market in the United Kingdom (Interview). *SoyaScan Notes.* July 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** There are only two significant manufacturers of soymilk from soyabeans in the U.K.; Unisoy and Soya Health Foods Ltd. Plamil Foods Ltd. buys soy protein isolates from Protein Technologies International, then subcontracts with a dairy to have these mixed with water and other ingredients, according to Plamil's formula, to make a soymilk. As far as he knows, Plamil has never purchased soybeans to make soymilk and has never had their own plant. Haldane used to import its soymilk from France. This soymilk was made, not from soybeans but from some kind of a spray-dried formulation. Then Unisoy started supplying

Haldane, but that contract came to an end when Haldane was acquired by another company. Neil thinks they are now importing again, probably from France, not from Australia. Haldane's imports are very small. Neil has never heard of Itona Products Ltd. in Wigan, Lancashire [although they are still in business in 1990].

Of the soymilk made in the Unisoy produces well over 50%. Approximately 18-20 million liters of soymilk are sold and consumed in the UK each year. It is the biggest soymilk market in Europe, and it is growing at the rate of roughly 15-26% a year. "The growth has been phenomenal, and the bulk of the growth in the European soymilk market seems to have been in the UK." But he doubts very much that it is growing faster than 26% a year. The estimated market shares by company are: Alpro/Vandemoortele 51%, Granose 15-17%, Unisoy 15-17%, and others (Plamil, Soya Health Foods, Haldane, etc.) 15-19%.

In terms of outlets, Granose is sold only in health food outlets. Unisoy's best-selling and most profitable line is its four soyamilk products. White Waves sugar free has long been the best selling single product, but it is rapidly being overtaken by Unisoy Gold (fortified with vitamins and minerals), which has been a phenomenal success. The bulk of Unisoy's soyamilk sales is in national multiples/grocery chains. Of all Unisoy's products, about 65% of sales is in multiples and 35% in health food stores. Plamil has its own clientele; its products are very popular among vegans. Soya Health Foods Ltd. has been able to survive largely because of their soy ice cream, which was one of the first ones on the market in the UK [after Sojal and SoyBoy Soymilk Ices from the Regular Tofu Co.] and the most widely available brand for a long time. Soyamilk is a very small product for Soya Health Foods Ltd. now.

Alpro/Vandemoortele did the pioneering work in getting soymilk into British multiples (supermarkets). In about 1982 Safeway (which has its origins in America), became the first multiple (supermarket chain) to sell soymilk in the UK. They sold the Alpro/Vandemoortele line but they sold only a small quantity. Safeway has always purchased its soyamilk from Vandemoortele. Michael Cole of Soya Health Foods Ltd. also deserves a good deal of credit for the growth of soymilk in the UK. He did the early work in getting British-based supermarkets, large chain stores, and normal grocery stores interested in carrying soyamilk. By late 1985 Cole was selling large amounts of his aseptically packed Sunrise Soya Milk to multiples, including Tesco. "Cole did the solid job of marketing and bringing soyamilk into the perspective it is in now. Then he left Soya Health Foods in mid- to late-1987." He started his own consulting company. Today every multiple in the country, including the large chemist chains (drug stores) are now offering soyamilk to the consumer.

Unisoy exports their soymilk to the Netherlands, Italy (to Parma Soia), and Ireland. It is also sold in Portugal. It used to be sold in Belgium. Address: Unit 1, Cromwell Trading Estate, Cromwell Rd., Bredbury, Stockport, Cheshire SK6 2RF, England. Phone: 061-430 6329.

746. United States Court of Appeals for the Federal Circuit. 1990. Ralston Purina Company, Plaintiff-Appellant, v. A.E. Staley Manufacturing Company, Defendant/Cross-Appellant. Court Decicion 90-1019, -1045. 3 p. Decided July 5, 1990. Unpublished manuscript.

• ***Summary:*** "Decision: Ralston Purina Company (Ralston) appeals from a judgment of the United States District Court for the Central District of Illinois, No. 84-1378 (July 27, 1989), holding the United Stated Patent No. 3,940,495 ('495) unenforceable for inequitable conduct. A.E. Staley Manufacturing Company (Staley) cross-appeals denial of its motion to amend the judgment to include an award of attorney fees. We affirm."

"Opinion: Evidence that Ralston intended to deceive the Patent and Trademark Office (PTO) includes: (1) Brukardt and Price knew of the Archer-Daniels-Midland (ADM) Dutch application no later than 1968; (2) Ralston made no disclosure of the ADM Dutch application until 1973; (3) Ralston's disclosure of the ADM Dutch application appeared in an 18 page statement discussing 118 references; and (4) when the PTO examiner said that he had not fully considered the cited references and objected to the statement, citing Manual of Patent Examining Procedure 707.05(b), Ralston refused to limit the statement to the five most pertinent references... Ralston did not and could not contest the finding that the ADM Dutch Patent application was material. The findings are not clearly erroneous and support the inferences drawn.

"Ralston's reliance on *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 227 USPQ 177 (Fed. Cir. 1985) is misplaced. Inequitable conduct was neither at issue nor considered in that case.

"In denying Staley's motion for attorney fees, the district court considered all relevant factors (Ralston's inequitable conduct, that 'the issues in the case were very hotly contested and the case was vigorously litigated,' and our holdings on validity and infringement in *Far-Mar-Co*). We cannot say the district court abused its discretion in denying Staley's motion."

Before Markey and Michel, Circuit Judges, and Brewster, District Judge.

"Note: This opinion has not been prepared for publication in a printed volume because it does not add significantly to the body of law and is not of widespread legal interest."

747. Shurtleff, William; Aoyagi, Akiko. 1990. Soymilk in Europe: The industry and market, commercial products, publications, and history. Lafayette, California: Soyfoods Center. 261 p. July 17. Indexes. 28 cm. [763 ref]

• ***Summary:*** Since the mid-1980s, the soymilk industry

and market in Western Europe has been booming, and the future looks very bright. Many large companies with plenty of capital and marketing expertise are entering the market, product quality and diversity is steadily improving, and consumers are showing and increased interest in nutritional protein beverages that are free of cholesterol and lactose, and low in saturated fats.

Soymilk production and growth rate: Production of soymilk in western Europe as a whole is estimated to have grown to 30–42.5 million liters/year (7.9–11.2 million gallons/year) in 1990, up from only 6-10 million liters/year (1.59–2.64 million gallons/year) in 1984, a roughly fivefold increase in 6 years. This represents an average compound growth rate of about 30% a year.

Estimates of total market size (not including infant formulas): Philippe Vandemoortele, managing director of Alpro, Europe's largest soymilk manufacturer, estimates the adult soymilk market in Europe to be 30 million liters/year. Asger Somer Hansen, managing director of DTD/STS, one of Europe's two largest suppliers of soymilk plants, estimates 35-40 million liters/year. Anders Lindner, managing director of DTD/STS until late 1989, estimates 42.5 million liters/year, plus an additional 7.5 million liters/year that are made into dairylike products such as soy puddings, yogurts, ice creams, and cheeses.

Leading countries: The largest soymilk market in Europe is clearly in the UK, because of its large population of vegetarians and vegans (vegans do not consume milk or any other animal products), its large total population, its large number of soymilk manufacturers and marketers, the fact that soymilk is now sold in many UK multiples/supermarkets, its relatively long history of soymilk production, and the fact that many soymilk products bear the generic name "Soya Milk" on the front panel. The first commercial soymilk in England was Solac, launched in 1912 with great fanfare and publicity by the Solac Company/Synthetic Milk Syndicate. Roughly 40% of all soymilk consumed in Europe is consumed in the UK, and per capita consumption is also highest there. The second largest market is probably France, with West Germany a very close third.

Leading manufacturers: Two companies (Alpro in Belgium and DE-VAU-GE in West Germany) dominate the market with an estimated 70% market share, and that percentage is not likely to decrease. Competition is fierce and increasing. Alpro, which began making soymilk in 1979 and now produces about 21 million liters/year, is building a new plant at Wevelgem, Belgium, which is scheduled to begin operation in June 1990. Costing about US$15 million, it will have a capacity of 45 million liters/year. DE-VAU-GE's plant, which was built by DTD/STS and began operation in August 1985, now produces about 12 million liters/year but has a capacity of 3,000 to 4,000 liters/hour of finished soymilk. Other manufactures with the year they started making soymilk and their current estimated annual production in liters/year: Unisoy (UK, 1986) 3 million; Cacoja (France, 1987) 3 million; Soyana (Switzerland, 1985) 2.5 million; Société Soy (France, 1975) 1.2 million; Soya Health Foods (UK, 1985) 1 million; Galactina (Switzerland, 1969) 1 million; Triballat (France, 1989) 0.5 million; Innoval (France, 1987) 0.5 million; Crivellaro (Italy, 1989) 0.5 million. Other smaller producers include Plamil (UK, 1965), Haldane (UK, 1984), Itona (UK, 1964), and Ralston Purina España (Spain 1984).

Price: The retail price of soymilk is 2-3 times as high as that of cow's milk.

Packaging: Virtually all European soymilk and soymilk-based products are now sold in Tetra Brik Aseptic cartons. But with the growing concern about and legislation concerning disposal of solid wastes, one very big potential danger lies on the horizon for soymilk–that aseptic packaging will be increasingly banned, as it already has been in the state of Maine in the USA after Sept. 1990. If the manufacturers of aseptic packaging do not find a truly recyclable package or establish a workable system to recycle their current packages, soymilk could be in for hard times.

Soymilk trends in Europe: Though soymilk production has increased fivefold since 1984, it is still minuscule compared to cow's milk. The flavor of soymilk continues to be a major problem for most Europeans. Features/benefits attracting Europeans to soymilk are its freedom from cholesterol and lactose, and the fact that its production places less of a burden on the environment and on factory-farmed dairy cows. Most of the soymilk in Europe is sold to the natural/health food trades via health food stores and (in German speaking countries) Reform House chains. Only in France and the UK (plus a little in Belgium) is it also marketed as a mainstream product through supermarkets. A small amount is consumed by Asian-Europeans and Seventh-day Adventists. Organically grown soybeans are used in a large and increasing percentage of European soymilk. In the UK, innovative natural sweeteners (such as apple juice) have also started to be used. Private labeling: Many large European natural/health food manufacturers and/or distributors now sell soymilk under their own brand. Alpro produces many private-label brands. This practice is much more common in Europe than in the USA. Medical Soy and Parma Soia in Italy are two recent additions to this growing list. Soymilk is widely exported across national boundaries within Europe. This will probably not change much after 1992. Many large companies have entered the market since 1985 with large automated plants, but many of these are running at a small percentage of their capacity–and thus are losing money. Because of the surpluses of cow's milk in Europe, there are many regulations (including value added taxes and labeling restrictions) against "imitation dairy products." These differ from country to country and will probably become less severe after 1992. These practices are much more restrictive in Europe than in the

USA, although also in the USA soymilk is not allowed to be labeled "soymilk." European dairy magazines (unlike their counterparts in America) continue to view soymilk with fear and criticism, even ridicule, at the same time that many large European dairy companies are jumping into this new market that shows future promise–which the European cow's milk market seems not to. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

748. Gibson, Richard. 1990. Ralston Purina's favored few come close, but no chow: Stock's decline ends string of gains, halts impetus to set off option plan. *Wall Street Journal.* Oct. 12. p. A10.
• ***Summary:*** Ralston's present chairman and CEO, William P. Stiritz, took over in 1981. He has done more than anyone to increase the value of the company's shares. Since 1981 he has "implemented one of the most aggressive stock-repurchase plans of any U.S. corporation." Ralston has spent close to $2.84 billion–nearly as much as it earned–buying back its shares.

Paul H. Hatfield is a Ralston vice president and president of the Protein Technologies International. Address: Staff reporter.

749. Boismenue, Clyde. 1990. The market for soy protein isolates, concentrates, textured soy protein products, and soy flour in America today (Interview). *SoyaScan Notes.* Nov. 13. With follow-up on 22 Jan. 1992. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Soy protein isolates have been the big unfulfilled promise in the U.S. food industry during the last 2 decades. Since 1975 Clyde has been a wholesale distributor for ADM. Today only 2 companies in America make regular isolates: ADM and Protein Technologies International. ADM was weakest in isolates until they purchased the Central Soya line. ADM also bought Grain Processing Corporation's Pro-Fam line and closed it down to get rid of excess industry capacity. Then ADM hired Roger Kilburn away from Ralston Purina to improve the flavor of ADM's isolates. This upset Ralston greatly. Ralston Purina spun off Protein Technologies International primarily to make it available for sale; everyone in the industry knows this.

In recent years there has been a little resurgence in isolates for several reasons largely related to the rise in casein prices: (1) With the rise of free enterprise and economic flux in Eastern European countries, they are being used increasingly to extend meats; the problem for western suppliers is getting paid. (2) The Chernobyl nuclear disaster, which took place on 26 April 1986 in the Ukranian SSR, wiped out the Polish dairy industry. Casein prices rose and isolates filled part of the void. (3) Worldwide, the price of nonfat dry milk (NFDM) and casein has been very high since about 1986 due to short supplies. Casein has traditionally been more expensive than isolated soy protein, in part because it is more functional (it melts and binds water well) and most people like the taste better. Within a period of several years, the price of casein rose from $0.90/lb to $2.50/lb. Egg protein costs $4 to $5 per pound. All of these things helped the U.S. isolate industry. In the U.S. the main problem is the obnoxious meat labelling requirements. For example, if isolates are injected into ham, it must be sold as "Smoked pork ham with soy protein isolate product." The labeling problems are caused in part by the fact that USDA is staffed largely by veterinarians.

The main applications for soy protein isolates in America are in infant formulas (roughly 50% of the total), muscle powders (35%), diet beverages that are supposed to suppress appetite, and other (health food candy bars, etc., 15%). The use of isolates in meat products is very small.

Most isolates are not very bland and not very functional. PTI's are more bland than ADM's. The bulk of Clyde's isolate sales are for muscle powders, which are used to make shakes. The only isolate thick enough to work in a shake is the one with the most sodium proteinates, which has the poorest flavor.

Even textured soy flour (TSF/TVP) has not been very successful in food uses; Clyde sells several million pounds a year of it, but the industry is very sleepy. It is used mostly in spicy Mexican foods (mainly burritos, to add chunky texture), and pizza toppings (since labeling is not a problem). It is used in school lunch programs and by the military in meatloaf and braised beef. Seventh-day Adventist food companies buy quite a bit and repackage it. By far the biggest use of TSF is in pet foods. In California, what is commonly called the "Brigg's Amendment" (Food, Drug and Cosmetic Law, California code, Article 7, Section 26595-26599, "Hamburger and imitation hamburger," became effective in July 1974), effectively prevents the use of TSP in hamburger, even in restaurants. Ground beef or hamburger containing any extenders (such as TSP), binders, or added water must be called "imitation hamburger." If imitation hamburger is sold or served in a restaurant, a list of its ingredients must appear on the menu. Mr. Briggs, a state legislator from Orange County, had a friend with some hamburger stands. This law is enforced, in practice, only with respect to hamburger patties, and especially when the price of hamburger rises; 80-85% of all ground beef is sold in the form of patties. It is not enforced when the ground beef is "cooked in a recipe" as in spaghetti sauce, taco filling, meat loaf, and sloppy joe mix. In these cases regulators do not enforce the law that requires the product to be called "imitation hamburger" if bread crumbs, rolled oats, or a soy protein product are added.

Concerning ADM's Veggie Burger, there are 4 kinds that come in dry form: Herbs & Spices Style, Curry, Meat-Style, and Gyros-Style. They were introduced about 4 years ago. ADM also makes pre-cooked, frozen patties.

Soy flour has two main applications: (1) As a replacer

for non-fat dry milk (NFDM), usually sold mixed with whey and used in baked goods. Kraft makes one popular brand. (2) In calf milk replacers (CMR). Calva in Modesto makes lots of CMR using soy flour; not much soy protein concentrate is used in CMR. The key consideration is the "per pound protein basis." Meat protein costs $6/lb and soy flour protein costs $0.35/lb. Labeling regulations are the main barrier to more widespread use. Not much NFDM is used in breads today in America. Soy flour is more expensive than wheat flour, but it holds more water, and slows staling–two major sales points. Address: Basic Foods Co., 1211 E. Olympic Blvd. #204, Los Angeles, California 90021. Phone: 213-623-6686.

750. Ralston Purina Company. 1990. Annual report to shareholders. St. Louis, Missouri. 36 p.
• ***Summary:*** Net sales for the year ended Sept. 30, 1990, were $7,101,400,000, up from 1989 sales of $6,858,300,000. Net earnings for the year were $396,300,000, up from 1989 earnings of $351,200,000. Address: Checkerboard Square, St. Louis, Missouri.

751. **Product Name:** [Milksoy].
Foreign Name: Milksoy.
Manufacturer's Name: Indulac and Protein Technologies International.
Manufacturer's Address: Venezuela.
Date of Introduction: 1990.
Ingredients: Milk powder, Supro isolated soy protein.
New Product–Documentation: Ralston Purina Company. 1991. First Quarter Report to Shareholders: Three months ended Dec. 31, 1990. Feb. p. 9. The company has recently developed "a significant new food product in Venezuela–Milksoy. Milksoy combines high quality milk powder with our *Supro* brand isolated soy protein. The launch of Milksoy has successfully established a new alternative food product for the Venezuelan consumer, a product which delivers the taste and nutrition of milk, but at a more affordable price. Consumer satisfaction with Milksoy is reflected in the brand capturing a 20% market share of all milk consumed."

SoyaFoods. 1991. 2(2):7. "New milk for Venezuela." Milksoy has recently been launched by Indulac (Venezuela) with technical support from PTI. It is composed of 90% cow's milk. Though it has a taste and texture similar to that of cow's milk, it contains only two-thirds as much fat and costs 20% less than conventional powdered milk.

752. Anderson, James W.; Siesel, Amy E. 1990. Hypocholesterolemic effects of oat products. In: Ivan Furda and Charles J. Brine, eds. 1990. New Developments in Dietary Fiber: Physiological, Physicochemical, and Analytical Aspects. New York and London: Plenum Press. xii + 325 p. See p. 17-36. [18 ref]
• ***Summary:*** "The cholesterol-lowering effects of oat products were recognized over a quarter of a century ago. With the possible exception of beans, oat bran lowers serum cholesterol in humans more than any other food." Oat products are rich in a gum, beta-glucan, that appears to be the major cholesterol-lowering component in the oat groat. Note: This publication helped to popularize the use of oat bran to lower blood cholesterol levels. Address: Metabolic Research Group, Veterans Administration Medical Center, Univ. of Kentucky College of Medicine, Lexington, Kentucky.

753. Leeds, Anthony R. ed. 1990. Dietary fibre perspectives: reviews and bibliography 2. London: John Libbey. viii + 299 p. 25 cm. Bibliographical editor Victoria J. Burley. Foreword by Denis P. Burkitt. [300+* ref]
• ***Summary:*** Contents: Foreword by D.P. Burkitt (Obituary of The Rev. Dr. Hugh Trowell, O.B.E., M.D., F.R.C.P., 1904-1989). The authors and editors. Introduction, by Anthony R. Leeds.

Reviews: 1. Dietary fibre and starch: definition, classification, and measurement. 2. Fibre intake in prehistoric times. 3. Fibre and peptic ulcer. 4. Fibre and small intestinal function. 5. Dietary fibre and female reproductive physiology. 6. Dietary fibre in the management of overweight–an update. 7. Guar gum and hyperlipidaemia.

Bibliography: Dietary fibre in human nutrition: a bibliography for 1983-1986.

Indices. General index. Address: King's College, London.

754. Lo, Grace S. 1990. Physiological effects and physicochemical properties of soy cotyledon fiber. In: Ivan Furda and Charles J. Brine, eds. 1990. New Developments in Dietary Fiber: Physiological, Physicochemical, and Analytical Aspects. New York and London: Plenum Press. xii + 325 p. See p. 49-66. [21 ref]
• ***Summary:*** Soy cotyledon fiber (such as Fibrim) is derived from dehulled, defatted soybean cotyledons. It is a by-product of the manufacture of isolated soy proteins. "This fiber tends to react physically as an insoluble fiber, and yet it has many physiological soluble fiber properties." It is a common misconception that soluble and insoluble dietary fiber values can be calculated by analytical assays. Fermentation occurring in the large intestine makes the picture much more complex. Address: Protein Technologies International, Checkerboard Square, St. Louis, Missouri 63164.

755. Protein Technologies International. 1990. Discover how a unique protein ingredient can build new value into your food products. Supro brand–A superior protein. St. Louis, Missouri. 13 p. 28 cm. Catalog.
• ***Summary:*** PTI makes the following types of Supro brand proteins: Supro 610, 620, 660, 670, 710, 760, and Supro Plus 651. The company's world headquarters are in St.

Louis, Missouri; it has manufacturing facilities at Memphis, Tennessee, and Ieper, Belgium. It also has offices in 18 countries outside the USA. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

756. Duxbury, Dean. 1991. Isolated soy protein in meat products aids school lunches: Meat protein replacement in beef patties provides 15% fat reduction, 15% less cholesterol, reduced sodium. Ingredients. *Food Processing* (*Chicago*). March. p. 88, 90, 92.
• ***Summary:*** "Since the use of isolated soy protein in foods for the National School Lunch Program was approved by USDA in 1983, combination meat/soy protein products have offered food processors, government supervisory agencies, and school foodservice operators, food choices having beneficial nutritional and eating qualities. A program to further assist schools and their meat product suppliers to provide healthy foods with enhanced taste, flavor, and appearance is also available from a major supplier of high-quality, 90% pure vegetable protein."

For more information on ProPlus® Isolated Soy Protein contact Protein Technologies International, Checkerboard Square, St. Louis, Missouri 63164.

"Circle 460."

A sidebar is titled: "New protein ranking method evaluates quality in human foods." The present method under U.S. food standards is called the Protein Efficiency Ratio (PER) and is based on weight gain in rats, which have different requirements for certain amino acids than humans. The new method–protein digestibility-corrected amino acid scoring (PDCAAS) gives much more accurate values when measuring the protein quality of a food for humans.

Photos show: (1) Many beef patties made with meat and isolated soy proteins. (2) "'Burgers' are always a popular item on school lunch menus." Address: Senior Associate Editor.

757. Laurin, Danielle; Jacques, H.; Moorjani, S.; Steinke, F.H.; Gagné, C.; Brun, D.; Lupien, P-J. 1991. Effects of a soy-protein beverage on plasma lipoproteins in children with familial hypercholesterolemia. *American J. of Clinical Nutrition* 54(1):98-103. July. [43 ref]
• ***Summary:*** "Abstract: The effects of soy protein (35% of protein energy) given as a beverage and those of cow-milk proteins were investigated on plasma lipoprotein concentrations in children with familial hypercholesterolemia (FH)."

"These results indicate that the administration of soy protein may induce clinically beneficial effects in children with FH." Address: 1. Département de nutrition humaine et de consommation, Pavillon Paul-Comtois, Université Laval, Québec, Canada.

758. Ralston Purina Company. 1991. Annual report to shareholders. St. Louis, Missouri. 39 p.
• ***Summary:*** Net sales for the year ended Sept. 30, 1991, were $7,375,800,000, up 3.9% over 1990 sales of $7,101,400,000. Net earnings for the year were $391,900,000, down 1.2% from 1990 earnings of $396,300,000.

Page 7 gives details on Protein Technologies International, "the world's leading producer of dietary soy protein, fiber food ingredients and polymer products... Sales and operating profits were below the prior year principally because of lower export sales volume [particularly to the Soviet market]."

"In a recent significant development, the United States Department of Agriculture, in response to our petition, has dropped the so-called 'qualifier' label requirement for meat packaging. The qualifier required the statement 'contains soy protein' on the front label of processed meat products when our products were used... Also, the U.S. Food and Drug Administration in November, 1991, in response to our petition, recommended the modification of methodology for measuring protein quality as part of overall labeling regulation changes."

Photos show the following PTI products: Pro-Cote 400 Soy Polymer, Fibrim 1250 Soy Fiber, Supro 500E Isolated Soy Protein, ProPlus 500F Vegetable Protein Product, and Nurish 3000 Protein.

Page 17 gives business segment financial information. Sales of consumer soy protein products grew from $221.6 million in 1989, to a record $261.8 million in 1990, dropping slightly to $255.0 million in 1991. Address: Checkerboard Square, St. Louis, Missouri.

759. Rice, Judy. 1991. Meat binder / extender label rule change: food regulations. *Food Processing* (*Chicago*). Dec. p. 10, 12.
• ***Summary:*** "The market for low-fat emulsified meat products could be on the brink of a boom, thanks to a labeling rule change promulgated by the U.S. Dept. of Agriculture. Under the revised regulation, binders and extenders no longer need to be 'prominently' displayed on the label. Instead, they may be listed along with other ingredients in their order of predominance."

"Elimination of 'prominent disclosure' should encourage new low-cal, low-fat processed meat product development/marketing."

"Following a comment period, USDA's FSIS published a final rule in the August 21, 1991 *Federal Register.* The rule became effective September 20, 1991. For further information about this label rule change, contact Charles R. Edwards, Director, Food Ingredient Assessment Div., Regulatory Programs, FSIS, USDA, 202/205-0080.

"Literature describing Supro® vegetable proteins for the economical addition of nutritional value to processed meats, baked goods, infant formulas, and various other

food products may be obtained from Protein Technologies International, Inc., a subsidiary of Ralston Purina Co., Checkerboard Square, St. Louis, MO 63164.

"Circle 452." Address: Senior Associate Editor.

760. Boyer, Nancy. 1991. Re: Biographical sketch. Letter to Ford Bryan at Henry Ford Museum & Greenfield Village, undated. 1 p. Handwritten on Nancy Boyer letterhead.
• ***Summary:*** In 1931 Robert Boyer married Elizabeth Szabo of Detroit; she had been born in Hungary. They had three children: Nancy, Robert Jr., and Thomas. In Feb. 1963 Elizabeth died, and in April 1965 Robert Boyer married Nancy Ann Miller, a recent widow living in St. Louis.

Nancy was born in Ypsilanti, Michigan. In 1937 she married Harold Ory and moved with him from Ypsilanti to St. Louis, Missouri, where Harold worked for Ralston Purina Co. Harold died in 1963.

761. **Product Name:** Mori-Nu Silken Tofu (Chinese Label) [Firm, or Soft].
Manufacturer's Name: Morinaga Nutritional Foods, Inc. (Importer). Made in Japan by Morinaga Milk Co. Ltd.
Manufacturer's Address: 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. Phone: 310-787-0200.
Date of Introduction: 1992 January.
Wt/Vol., Packaging, Price: 10.5 oz (297 gm) Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Almost all of the writing on these products is in Chinese; they are sold to Chinese Americans. Letter (fax) from Art Mio. 1996. May 14. "We first began to sell Chinese Label Mori-Nu Tofu in January 1992... This past fiscal year, which ended in March, saw a surge in sales which approached a 50% increase."

Poster (color, 8 by 11 inches, undated) sent by Art Mio. 1996. May. Shows one carton each of Chinese Label Mori-Nu Tofu firm and soft on a cutting board behind a knife and six small cubes of tofu. In the upper left is written in Chinese characters (with English text below them): "Smooth silken texture. Long shelf life. No preservatives."

762. Whiteman-Jones, Michael. 1992. Soyfoods poised for growth: New mass-market interest, product development and consumer interest are driving sales higher than ever. *Natural Foods Merchandiser.* Feb. p. 18-19.
• ***Summary:*** Last year soyfoods were introduced to mass-market consumers by two of America's corporate giants. (1) Archer Daniels Midland Co. (ADM of Decatur, Illinois) introduced the vegeburger to show that a delicious food product could be made from soy. ADM marketing specialist Lee Lensch says the soy burger is doing very well in test markets in Indiana, Illinois, and Minnesota. Versions of the product are being advertised nationally in corporate TV spots and on local TV in test markets. Buyers who gave the products shelf space at chains such as Kroger, SuperValue and Cub Foods now report brisk sales. (2) Protein Technologies International in St. Louis, Missouri, a subsidiary of Ralston Purina, is test marketing a soy-based beverage named First Alternative in Phoenix, Arizona.

Peter Golbitz, president of Soyatech Inc., a consulting company in Bar Harbor, Maine, notes that since the 1980s, Japanese companies (such as Nichii Co.) have invested at least $50 million in soyfoods manufacturing plants in the U.S.

"Retail sales of soyfoods are growing in America by about 5 to 7 percent a year, increasing to about $657 million in 1990, Golbitz says. The most rapid expansion is for soy milk, which is growing at a rate of about 20% a year, and second-generation soyfoods which are growing at a rate of about 15%... Soy milk consumption in Australia, where it is sold in grocery stores like milk, is about 10 times what it is in this country."

Worldwide, consumption of soyfoods now averages about 1.7 kg/person/year, and is expected to rise to 2 kg or more by the year 2000. Taiwan is the world leader with 15.5 kg/capita/year of soy, followed by Japan at 11.1 kg. A world map and table (largely compiled from FAO Food Balance Sheets) shows "Soyfood consumption: Yearly average per capita (Amount of change from 1979 to 1988)." The following countries are listed in descending order of consumption in kg/capita: Korea 17.1 kg (2.4%). Taiwan 13.0 (37.0%). Japan 10.8 (6.7%). Indonesia 6.3 (57.4%). Hong Kong 3.8 (-22.0%). Saudi Arabia 3.6 (342.9%). China 3.4 (-5.6%). Paraguay 2.8 (50.0%). Malaysia 2.3 (102.2%). Thailand 1.6 (162.5%). Zimbabwe 1.6 (22.2%). United States 1.4 (33.3%).

763. Johnson, Lawrence A.; Meyers, D.J.; Burden, D.J. 1992. Soy protein's history, prospects in food, feed. *INFORM* (*AOCS*) 3(4):429-30, 432, 434, 437, 438, 440, 442-44. April. [54 ref]
• ***Summary:*** "This is the second part of a review that chronicles the individuals and the historical and economic factors noteworthy in the development of soy protein as food and feed ingredients." Contents: Introduction. Early Western food uses (whole and defatted soy flour, enzyme-modified isolated soy proteins as whipping agents, whipped toppings, cereal-soy blends). Soy flour and grits. Protein concentrates and isolates (Griffith Laboratories, Central Soya Co., Mead Johnson and Co., Central Soya). Dairy analogs (Dr. Harry W. Miller, Loma Linda Foods, Mull-Soy and Borden, Vitasoy, Edensoy, Worthington Foods and Soyamel, Prosobee and Mead Johnson, Rich Products and Chill-Zert, Tofutti). Spun fibers (Robert Boyer and the Ford Motor Co., Temptein, Worthington Foods, Bontrae, Bac*O's, Bac-O-Bits, Miles Laboratories, Morningstar Farms). Textured soy protein and meat analogs (W. Atkinson, ADM and TVP, General Mills and frozen Bontrae, the U.S. School Lunch

Program). Nutritional advances in soy products. Today's world soybean and soy protein production (consolidation among manufacturers of modern soy protein ingredients: ADM, Cargill, Central Soya Co., Protein Technologies International, A.E. Staley Mfg. Co.). Future of soy protein products.

Tables show: (1) Soy meal consumption in the USA by type of animal: Poultry 41.1% of total 18.9 million metric tons, swine 27.4%, beef cattle 9.0%, dairy cattle 9.0%, other livestock 9.5%, human food 3.2%, industrial 0.5%. Thus, industrial (nonfood, nonfeed) uses for soybeans presently comprise no more than 0.5% of the protein produced from soybeans grown in the United States. (3) U.S. companies supplying protein in 1948-50 versus 1990 (industrial and edible flours, concentrates, and isolates). 23 companies then vs. 5 in 1990.

Note: Talk with Ed Milligan of EMI by phone. 1992. May 5. This article contains some misleading information. It refers to an article by Ken Becker written in 1971. In 1958-59 USDA developed a laboratory prototype of flash desolventizing. In 1959 they contacted EMI corporation in Des Plaines to commercialize the flash desolventizing system for production of light-colored, edible soybean flakes, for soy flour and grits, with a maximum PDI (protein dispersibility index). At that time Ed Milligan was just a newly hired member EMI, which undertook the project. Ed designed and installed the world's first commercial flash desolventizing system for Honeymead Products Corp. in Mankato, Minnesota, in 1960. Note that this system was used to make food, rather than feed. All but 2 systems have been used exclusively to make foods. All such systems produce a flake with a very light color and controlled PDI, whereas a DT (desolventizer-toaster) produces a golden colored flake. He is leaving for India in a few weeks to commission EMI's 22nd such unit. He has designed, installed, and started every one of the 22. Address: Center for Crops Utilization Research, Iowa State Univ., Ames, Iowa 50111.

764. Duxbury, Dean. 1992. Powdered soy protein fortifies pasta: consumers demanding more nutrition in pasta dishes. Ingredients & product development. *Food Processing* (*Chicago*). May. p. 90, 92.
• ***Summary:*** 15% powdered isolated soy protein can be used to increase the protein content of pasta.

For more information on Supro® Isolated Soy Protein contact Protein Technologies International, Checkerboard Square, St. Louis, Missouri 63164. Circle 462.

"Information on Enriched High Protein Pasta and other custom pasta products is available from A. Zerega's Sons, Inc., 20-01 Broadway, P.O. Box 241, Fair Lawn, NJ 07410.

"Circle 463." Address: Senior Associate Editor.

765. Frost & Sullivan Inc. 1992. The European market for protein ingredients. New York, NY: F&S. 383 p. #E1712/P. 98 tables. 6 figures.
• ***Summary:*** "Sales of protein ingredients to the food industry in Western Europe in 1991 amounted to $1.3 billion. This is expected to increase to $1.5 billion by 1996." Contents: Executive summary. 1. Introduction, scope and methodology. 2. Protein ingredients–Technology, economics and trends: Introduction, vegetable proteins (soy flour and grits, soy protein concentrates, soy protein isolates, textured soy proteins, wheat gluten), animal proteins (milk-based, egg-based, other, single cell proteins incl. yeast and mycoproteins). 3. End-user markets for protein ingredients–Industry requirements, historical and future developments: Introduction, nutrition claims, the food industry (meat and meat products, dairy products and desserts, bakery and cereal products, specialty infant and health food, pet foods, miscellaneous foods). 4. The markets for protein ingredients in Western Europe: Germany (For each country is given: The food industry, protein ingredients off-take by the food industry, sales of protein ingredients to the food industry, volume off-take of protein ingredients by the food industry, sales of protein ingredients by type), United Kingdom, France, Italy, The Benelux countries, Spain and Portugal, other EC countries, other Western European countries. 5. Profiles of major suppliers of protein ingredients in Western Europe: Includes Aarhus Oliefabrik, Archer Daniels Midland Co., British Arkady Co., BSN, Cargill, Central Soya, Dalgety, Danmark Protein, Eridania/Beghin-Sey [sic, Say], Loders Croklaan, Lucas Meyer, Nattermann Phospholipid, Nestle, Protein Technologies, International, RHM Ingredients Ltd., Solnuts BV, Unilever Group. Appendices. A. Names and addresses of suppliers of protein ingredients in Western Europe. B. Company index. Address: 106 Fulton St., New York, NY 10038. Phone: 212-233-1080.

766. *Food Processing* (*Chicago*). 1992. New food plants: Ralston Purina. 53(6):70. June.
• ***Summary:*** The company's new $50 million soy protein plant in Memphis, Tennessee, is expected to be completed in Sept. 1992. A/E: The PSI Group.

767. McGlasson, Linda. 1992. Soyfoods in the next century: Feeding the world one bean at a time. *Health Foods Business* 38(6):30-34, 36. June. [1 ref]
• ***Summary:*** A table gives estimated retail sales of soyfoods in the USA in 1990, in descending order of sales (million dollars): soy sauce $395.5, tofu $94.1, second generation products (such as dips, dressings, entrees, non-dairy desserts, cheeses, yogurts, and imitation meat products) $81.6, soymilk (not including infant formulas made with isolated soy proteins) $60.0, miso $44.5, soynuts $9.7, tempeh $7.5. Total $657 million. Source: Soyatech in Bar Harbor, Maine. The two fastest growing segments are soymilk (increasing at 20% a year) and second generation products (15-20% a year). "Soyfood sales are expected to grow steadily through

the next decade as health and environmental concerns become increasingly important factors in food purchasing decisions... an estimated 33 to 50% of all adults are reducing their intake of meat, yet they still have the craving.

Protein Technologies International of St. Louis, Missouri, is developing a line of structured proteins, which are look-alike meat components. There are versions that look and feel like ground beef, crab meat, and chicken.

Angelo Morini, founder of Galaxy Foods, began trying substitutes for the real cheese he was using in his pizza business. He left the pizza business in 1968 and began making soy cheese full-time. The company began slowly by selling to food service customers, then they started marketing the cheese nationally in 1984. In 1985 Galaxy started in the health food industry with a new line, Soyco. Following a fire, the company has relocated in a new 55,000 square foot state-of-the-art manufacturing facility in Orlando, Florida. They are now producing soy cheese products and are scheduled to launch 30 new items this year.

One sidebar, titled "Quickie Dictionary of Soyfoods," defines tofu, miso, tempeh, soymilk, and shoyu. Another says "Soyfoods Take Spotlight in New Infomercial." The infomercial is based on Dr. Michael Klaper's education seminars for doctors and other health professionals titled "Let Food Be Your Medicine." Klaper (a noted physician, author, environmentalist and nutritionist [and vegan]) is co-founder and director of the Institute for the Advancement of Nutrition Education and Research. The tentative title for the new infomercial is "The Nutrition for the 90s, a Transition to Health." It will begin airing in July on cable TV. Radio's Top 40's Countdown host Casey Kasem will emcee the show with Dr. Klaper. The show will feature top scientists and doctors, plus testimonial interviews with many celebrities and famous athletes. Address: Managing editor.

768. Starr, Sara M. 1992. Don't have a cow! Milking other alternatives. *Health Foods Business* 38(6):37-38, 69. June.
• ***Summary:*** "Soy milk is the biggest seller in the non-dairy beverage category within the health food industry. About 95% of all soy milk is sold through natural food stores. Several supermarkets are beginning to carry this beverage." In 1983 when Eden Foods introduced its Edensoy, about 283,000 gallons of aseptically packaged soy milk were sold in the natural foods industry [in the USA]. According to Peter Golbitz of Soyatech Inc. in Bar Harbor, Maine, by 1991 that figure had jumped to 6.5 million gallons. Golbitz estimates the market for aseptic soymilk in the USA to be $52 million in retail sales (in natural food stores only) and growing at 15-20% annually. The top 3 soymilk manufacturers in America are American Soy Products [Edensoy], Westbrae, and Vitasoy; together they produce over 95% of the aseptically-packaged soymilk in the U.S. according to Golbitz.

New soymilk products: WestSoy Plus is fortified with vitamins A and D, and calcium to make it nutritionally equivalent to dairy milk. Westbrae also has a new non-dairy creamer. Westbrae uses only rice syrup to sweeten its soymilks and is looking closely at producing a fresh (non-aseptically packaged) soymilk. Vitasoy has teamed up with The Yogi Tea Company to produce a cappuccino alternative. This delicious blend of soymilk and herb tea can be made in an espresso machine. Protein Technologies International in St. Louis, Missouri, has developed a new technology–stabilized calcium phosphate and soy protein isolates. When added to soymilk it gives a product comparable in protein and calcium content to dairy milk.

Also discusses amazake and White Almond Beverage. A photo shows Sara Starr. Address: President of Starr Track, a business consulting firm for the natural foods and products industries.

769. Protein Technologies International. 1992. Product specification sheets (Portfolio). St. Louis, Missouri. 29 inserts. 30 cm.
• ***Summary:*** The 29 documents enclosed in this portfolio include a cover letter and business card from Catherine M. Nichols (account representative) and 28 product specification sheets (each 8½ by 11 inches, most printed on one side only). Each specification sheet gives a detailed technical description, including product description and suggested applications, nutritional information, quality guarantee (chemical analysis, microbiological analysis, and physical analysis), typical amino acid composition, packaging, and ingredient statement (for labeling). The following products are described (listed below alphabetically): FP 900 (a modified soy protein to replace egg albumen), FP 940, HVF 50 or HVF 60 (hydrolyzed vegetable protein), ProPlus 200F (frozen, hydrated, granular), ProPlus 500F (for use in school lunch programs), Supro 90, Supro 200FC, Supro 200G, or Supro 200GC (frozen, hydrated, granular, caramel color), Supro 200, Supro 200M, Supro 250, or Supro 251 (structured protein fiber with a filament-like fibrous texture), Supro 425, Supro 500E, Supro 515, Supro 590, Supro 610, Supro 620, Supro 661, Supro 670, Supro 710, Supro 760, Supro HD90, Supro Plus 651, Supro Plus 670, or Supro Plus 675 (with stabilized calcium phosphate), Supro Plus 3000 (with sweet dairy whey and calcium phosphate).

On each sheet is a code or clear statement showing the date that the sheet was last revised. The most recent dates are Oct. 1992, mostly for the Supro and SuproPlus products. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

770. Golbitz, Peter. 1992. The meat alternative industry in the United States. Bar Harbor, Maine: Soyatech, Inc. 30 p. Nov.
• ***Summary:*** This report was written under contract with Protein Technologies International, which owns the rights.

Contents:
Introduction.
History and Development of the Industry.
Estimated Manufacturer Sales of Meat Substitutes.
Estimated Percent of Market Share of Manufacturer Sales.
Estimated Manufacturer Sales in the Major Distribution Channels.
Estimated Total Sales in Each Distribution Channel.
Estimated Amount of Soy-Based Proteins Used in Meat Substitutes.
Projected Sales of Meat Substitutes.
Number of Meat Alternative Products Introduced, 1980-92.
Frequency of Protein Foods Used in Meat-Like Products, 1980-92.
Trends in the Meat Analog Industry.
Supportive Trends in the Food Industry.
Supportive Lifestyle Trends.
Growth Opportunities Within Established Distribution Channels.
Growth Opportunities Outside Established Distribution Channels.
Company Profiles.
Other notable companies and products. Address: P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207-288-4969.

771. Protein Technologies International. 1992. Creating better results... together. St. Louis, Missouri. 16 p. 28 cm.
• ***Summary:*** Contents: Our goal–Your success. We can help you with improved margins, innovative new products, quality management. What our technology does. What our products do: Economically, functionally, nutritionally. What we do benefits you: Customer focus, worldwide strategic locations, experienced professionals, account managers, networking. Creating better result: For the meat, dairy, nutritional, food, and paper industries.

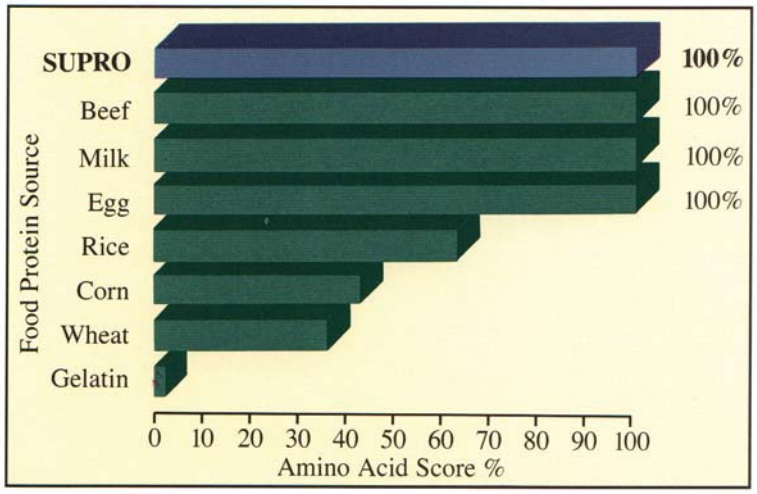
A color bar chart (p. 13) shows that Supro soy protein isolates "meet or exceed recommended amino acid requirements for adults and children, as determined by the World Health Organization and the USFDA." Beef, milk, and egg have the same 100% score as Supro. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

772. *SoyaFoods* (*ASA, Europe*). 1992. New soya protein ingredients. 3(3):2. Autumn.
• ***Summary:*** "Protein Technologies International is marketing several new product lines. Developed in Belgium, the PT and FP ranges are designed to replace milk powders and egg protein products while adding nutritional value to consumer foods. The Suproplus range of isolated soya proteins is marketed by PTI in the US."

773. Schopp, Keith. 1992. Ralston Purina Company's 100th anniversary (Interview). *SoyaScan Notes.* Dec. 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Keith is in charge of condensing 100 years of Ralston Purina history into a 36-page booklet for employees. It places Ralston Purina's history firmly in the context of what was happening throughout the world and the United States. He is working under a budget and time schedule. The booklet should be out in January 1994. It is hard to examine early company records since they are boxed and stored in a salt mine in another state. He joined the company in 1986. He feels that the company "did not do a real good job of keeping track of its history." He does not know when or where Ralston Purina began crushing soybeans [1935]. He will try to find out from a former CEO name Ray Rolland, who joined the company in the late 1920s and is now retired.

The company was incorporated on 8 Jan. 1894 in St. Louis, Missouri, by William H. Danforth and two of his church associates, George Robinson and William Andrews. The latter two men may have operated some sort of feed mill or store front business prior to 1894. The new corporation, named the Robinson-Danforth Commission Company, would produce horse and mule feed.

Amino Acid Scores: Percentage of Human Requirements for Amino Acids Supplied By a Variety of Feed Protein Sources



Our proteins meet or exceed recommended amino acid requirements for adults and children, as determined by the World Health Organization and the USFDA.

In 1896 the mill was destroyed by a Tornado. Some of the early history is legend and some can be documented. Address: Corporate Public Relations, Ralston Purina Co., Checkerboard Square, St. Louis, Missouri. Phone: 314-982-2577.

774. Ralston Purina Company. 1992. Annual report to shareholders. St. Louis, Missouri. 32 p.
• ***Summary:*** Net sales for the year ended Sept. 30, 1992, were $7,752,400 up 5.1% over 1991 sales of $7,375,800. Net earnings for the year were $313,200,000, down 20.1% from 1991 earnings of $391,900,000.

Page 5 gives details on Protein Technologies International. PTI "constructed and began operations at a new cellulose fiber facility in Urbana, Ohio. The integration of the *Solka-Floc* cellulose fiber business into Protein Technologies International is now complete."

Photos shown the following PTI products: Pro-Cote 5000 Soy Polymer, Fibrim Soy Fiber, Supro 500E Isolated Soy Protein, and Nurish 1550 Protein.

Page 13 gives financial information for each business segment. Sales of consumer soy protein products grew from $221.6 million in 1989, to $261.8 million in 1990, dropping slightly to $255.0 million in 1991, then rising to a record $288.1 million in 1992. Address: Checkerboard Square, St. Louis, Missouri.

775. **Product Name:** First Alternative (Soy-Based Beverage).
Manufacturer's Name: Protein Technologies International.
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1992.
New Product–Documentation: Michael Whiteman-Jones. 1992. Natural Foods Merchandiser. Feb. p. 19. This product is now being test marketed in Phoenix, Arizona.

776. **Product Name:** [La Colina {Soymilk}].
Foreign Name: La Colina.
Manufacturer's Name: Protein Technologies International.
Manufacturer's Address: Venezuela.
Date of Introduction: 1992.
New Product–Documentation: Saundra Bottger. 1992. Republican (Wakefield, Nebraska). Sept. 3. "Soy Bits."
A new soy milk has been introduced in Venezuela (the country's first) by "Protein Technologies International (PTI) and one of Venezuela's leading edible oil processors." "The goal was to supply a low-cost product for school lunch programs. Each 100 pounds of soy milk produced contains 25 pounds of vegetable fat from soyoil and 25 pounds of soy protein isolate."

777. Jacques, Hélène; Laurin, D.; Moorjani, S.; et al. 1992. Influence of diets containing cow's milk or soy protein beverage on plasma lipids in children with familial hypercholesterolemia. *J. of the American College of Nutrition* 11(S):69S-73S. [23 ref]
• ***Summary:*** Soy protein seems to have anti-atherogenic properties. There is also the possibility that reliance on soy-based beverages may be beneficial in preventing coronary heart disease in children with familial hypercholesterolemia. Address: Dep. of Human Nutrition and Consumer Studies, Laval Univ., Lipid Research Unit, Quebec, Canada, and Protein Technologies International, St. Louis, Missouri.

778. Mohr, Betty; Littman, Margaret. 1993. What's happening at Ralston Purina: despite strong brand names, Ralston Purina's profits have plummeted, leading analysts to ask. *Prepared Foods* 162(2):24-26. Feb.
• ***Summary:*** Editor's introduction: "Like an aging dancer who is always one beat behind, Ralston Purina seems to be one step behind the changing times. Holding onto the status quo, Ralston is foundering like a big ship without a rudder and without forward vision to steer it."

Ralston Purina continues to have some of the worst earnings in the food industry. Since the company is carrying a huge debt, its focus has been to buy back its own shares and to accumulate cash. Perhaps the main problem is that Ralston has no long-term strategy or focus.

Ralston Purina paid big money to buy ITT and Wonder Bread, failing to realize that the health-conscious, whole-grain generation was here to stay, and that Wonder Bread was of little or no interest to members of that generation.

Surprisingly, neither isolated soy proteins nor Protein Technologies International (PTI) are mentioned. PTI was established on 1 July 1987 a wholly-owned subsidiary of Ralston Purina. PTI was sold to DuPont on 3 Dec. 1997 for $1.554 billion.

779. Ralston Purina Company. 1993. First quarter report to shareholders. Annual meeting highlights. Checkerboard Square, St. Louis, MO 63164. 15 panels.
• ***Summary:*** Paul Hatfield, CEO of Protein Technologies International, stated: "Fiscal 1992 sales and operating profit improved over the prior year on increased sales volumes worldwide... We expect the new FDA regulations under the Nutritional Labeling Education Act will create a positive environment for our products as the U.S. food industry adopts these new labeling standards." Last year the company successfully introduced 10 new products.

William P. Stiritz, Chairman and CEO of Ralston Purina said: "'Change has been important to Ralston and Ralston has changed markedly. Our operating philosophy has been that the company never *is*, rather, it is always in a state of *becoming.* Consider what Ralston was in 1981–a $5 billion company comprised of a consumer pet food and cereal business but more so of a number of low margin, low share, commodity-oriented businesses. Consumer goods represented only 38% of sales.

"'Over the past decade,'" the Chairman said, "'Ralston has become a substantially different company. Lower margin businesses were divested and we made two principal acquisitions–Continental Baking Company and Eveready Battery Company, both of which would be ranked in the top Fortune 250 companies on a stand-alone basis.

"'We have managed for the long term, and over the period from 1981 to 1992, our performance has been above average. The average share price of Ralston stock in 1981 was $6.00; today it's about $48.00. Ralston's market capitalization was $1.2 billion in 1981; it is now over $5 billion, and this doesn't count the $3.3 billion paid to shareholders for share buy backs.'" Address: St. Louis, Missouri.

780. *SoyaFoods* (*ASA, Europe*). 1993. Exhibition report [SIAL in Paris]. 4(1):7. Winter.
• ***Summary:*** "SIAL in Paris is always one of the biggest and best attended food product exhibitions and 1992 was no exception. Soya foods were well represented and some new products were launched including Celia's new *Biostar Blinis* pancake mix; a new soya and rice dessert from Laiterie Ladhuie, frozen soya based meat analogues from Phytikos, Germasoja from Abbaye de Sept-Fons (see p. 5 for details of these products).

"Other companies presenting soya foods included: Sojinal, France–a range of soya products including soya paste, milks, desserts, meals; Zonnatura, Netherlands–soya milks, desserts and vegetarian meal replacements; Tonputs, Netherlands–frozen Soyaschnitzel, Soyaburger and Soyasausage; Bakker Lekkerkerk, Netherlands–the *Vivera* range of chilled and frozen meat alternatives; l'Abbé Bisson, France–biscuits with soya, raisins or chocolate; Vitagermine, France–Soya bars and biscuits; Yeo Hiap Seng Ltd. Singapore–Soysauce, soya drinks and salted soya beans; Minerve SA, France–*Soja Plaisir* range of soya based sauces, bean sprouts and bean sprout salads; Céréal, Wander, France–Soya based drinks, desserts, pastas, sauces, Pains Grillé, biscuits; FPS, France–vegetable protein ingredients; Distriborg–soya drinks, desserts, sauces, meals, biscuits and pastes; and Tivall Vegetarian Food Products, Israel–vegetarian meat alternatives.

"Dusseldorf, Germany was the venue for FIE 92. Of the 451 international companies present several major soya protein companies exhibited including: Solnuts, Netherlands–showing their new range of custom-made food ingredients; Worlée GmbH, a German company, specialising in dried ingredients and soya products; Edelsoja, Germany–soya protein ingredients; Dutch Proteins and Services, Netherlands–soya protein products; Protein Technologies International, Germany–isolated soya proteins; A.E. Staley Manufacturing Co., US–Gunther range of soya ingredients; Mandarin Soy Sauce, Inc., US–liquid and dried soysauces; ADM Ingredients Ltd., UK–flours, flakes, grits, concentrates, isolates and textured products; Solbar Hatzor, Germany–*Contex* textured soya concentrates; Celia Technologies, France–dehydrated soya milk; GMB Proteins, UK–Bontrae textured soya proteins; Central Soya Aarhus, Denmark–soya protein concentrates; Cargill, Netherlands–defatted soya flours, grits and textured soya proteins; Alternative Food Ingredients (AFI), France–soya proteins and fibres; Sogip, France–soya flours, concentrates and textured soya products; Stern, Germany–full fat soya flours, grits, concentrates, isolates, textured proteins, soya bran, full fat soybean snacks (expanded with hulls) and *Sternpur* lecithin."

781. Meyer, Edwin W. 1993. How Ralston Purina got into the soy protein isolate business (Interview). *SoyaScan Notes.* April 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ralston Purina began with industrial isolates which were used for coating paper and sold under the brand name ProCote. They probably heard about Glidden's activities with food-grade isolates so they probably just went ahead and began making edible isolates. Any specialist in this field would have known how to go from industrial to edible isolates. Ed thinks (but is not sure) that Bob Boyer arrived at Ralston Purina from Ford after Ralston Purina started making edible isolates; he was instrumental in showing Ralston how to use their edible isolates to make edible spun soy protein fiber. In the late 1950s Boyer went around trying to sell interest in and licenses to his patent for making spun soy protein fibers. A number of companies took a nonexclusive license including General Mills, Worthington Foods, etc. He may have approached either Glidden or Central Soya. Finally he went to Ralston and sold them the residual exclusive. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

782. Meyer, Edwin W. 1993. The soy protein isolate industry and market (Interview). *SoyaScan Notes.* April 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Meyer, who has been a leading soy protein researcher for The Glidden Co. and Central Soya for about 50 years, would estimate that Protein Technologies International (PTI) manufactures about 60% of the soy protein isolates in the USA and ADM makes the remaining 40%. There are no other significant manufacturers of soy isolates in the USA.

Bob Boyer and Frank Calvert played a major role in convincing Ralston Purina to get heavily involved with soy protein isolates. Before Boyer and Calvert arrived in 1962, Central Soya was America's only manufacturer of edible isolates with their Promine–which was launched in late 1959.

In mid-1980 ADM entered the soy protein isolate business when they bought the Central Soya chemurgy plant at Chicago. They operated it for a few years, then found out that it wasn't profitable to operate in Chicago. So they moved the equipment down to Decatur, Illinois. He has heard that

half the equipment was in mothballs. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

783. Bryan, Ford R. 1993. Robert Allen Boyer (Document part). In: Ford R. Bryan. 1993. Henry's Lieutenants. Detroit, Michigan: Wayne State University Press. 321 p. See p. 44-51. Great Lakes Series. April. [10 ref]

• ***Summary:*** This biographical sketch of Boyer (1909-1989), Henry Ford's top soybean man, is well researched and full of original material. Robert Boyer was born on Sept. 30, 1909 in Toledo, Ohio. In 1916 he moved with his parents to Royal Oak, Michigan, where he attended grade school while his father worked in the accounting department of the Ford Motor Co. in nearby Highland Park. When Henry Ford bought the Wayside Inn in Massachusetts in 1923, Frank Campsall suggested to Ford that Earl Boyer would be an appropriate business manager for the Inn. So the Boyers, including young Robert and his three sisters, moved into a Ford-owned house near the Inn. Robert then attended high school at Framingham, Massachusetts, where he graduated in 1927. Robert met Henry Ford while skating at the Inn. Ford suggested that he come to Dearborn for some work experience before going to college at Dartmouth as planned. So in Sept. 1927 Robert arrived in Dearborn where he was enrolled in the Henry Ford Trade School at the Rouge plant.

"Henry Ford had taken recent trips to Europe and had been impressed with the agricultural prosperity in some of those countries. Returning to Dearborn, Ford wanted to set up an experimental agricultural chemical factory to determine what products could be obtained from plants. The experimental chemical factory became a one-quarter size model of Ford's mammoth wood distillation plant at Iron Mountain, Michigan. The model was constructed at Iron Mountain and moved to Greenfield Village in late 1928. About then Ford asked, 'Bob, how would you like to supervise this model plant–to stay another year or two and live at the Sarah Jordan Boarding House in Greenfield Village.'

"Boyer had had little formal training in chemistry, but he was provided with tutors from the University of Michigan, and from 1929 to 1933 attended the Edison Institute of Technology, a school founded by Henry Ford and Thomas Edison as a school for inventors... Ford's purpose was to find industrial uses for farm crops. A farm depression was imminent. During the depression year of 1931, Robert Boyer married Elizabeth Szabo of Detroit. During the next few years they had three children...

"In 1931, soybeans became one of the plants investigated at the Chemical Laboratory... Usually the beans were pressed to obtain the oil, and the remaining 'cake' was fed to animals. The Boyer group, however, developed a solvent extraction procedure whereby soy protein as well as oil could be produced...

"By this time Henry Ford was growing rather old, approaching seventy. Design of the V-8 Ford in 1931 seems to have been his final great interest in automobile mechanics. His Edison Institute Schools, Greenfield Village, and soybean research now largely occupied his time. In 1932 he began to plant hundreds of acres of soybeans on his Dearborn farm lands and began procuring thousands more acres in Southeastern Michigan. Several additional processing plants were located in outlying towns where he promised to buy even more soybeans from local farmers to use in automotive paints and plastics. Boyer was largely responsible for Ford's advancement in soybean technology.

"Henry's vegetarian eating habits led him to hire his old gradeschool friend, Dr. Edsel Ruddiman, an organic chemist, to devise tasty dishes containing soybean ingredients for the dining room. And Ford's executives, including Boyer, were coaxed by Ford to try them–soybean milk, soups, bread, croquets, simulated meats, butter and ice cream. Most were not very palatable, however, because of the tendency of the soy oil to be slightly rancid."

Boyer was in charge of the "Industrialized American Barn" demonstration at the 1934 Chicago World's Fair. And in May 1935 when the first chemurgy conference was held at the Dearborn Inn, Boyer was in charge of arrangements. During the second chemurgy conference in Dearborn, Boyer led the groups of participants through his Soybean Laboratory at Greenfield Village. At about this time Boyer developed soy protein fibers which were blended with wool (35% soy and 65% wool) and woven into cloth. The resulting cloth was given to Ford's own tailor, and suits of soy fiber were worn by Ford on occasion–and highly publicized. "Boyer admits that the tensile strength of soy fiber was only 85% of wool, however, behooving the wearer to avoid strenuous movements, bending down for example very cautiously.

"Boyer's fiber was ideal for felt hats, however. All of the fiber Boyer could produce was wanted by the Hat Corporation of America. The soy fiber blended well with rabbit fur, was less expensive and much cleaner to work with. To produce fiber in larger amounts and to develop fiber of higher tensile strength, a modern air-conditioned laboratory was built on Village Road in Dearborn. In this plant not only fiber producing equipment was installed but complete weaving equipment as well."

Between 1939 and 1941 Boyer worked on Ford's "plastic car" made from soybean plastic. It also drew widespread media publicity. "Boyer drove the car a few weeks before it was abandoned. (People are still wondering what became of that plastic car.) A major defect never corrected, according to Boyer, was the strong odor reminiscent of a mortuary...

"The soy protein fiber facility was operating nicely when in 1943 the U.S. Air Force demanded the air-conditioned building for precision measurement of aircraft engine parts. When his building was thus usurped, Boyer was out of a job

involving soybeans. He then transferred to Ford's Willow Run Bomber Plant at Ypsilanti, Michigan, where, because of his knowledge of plastics, he was given responsibility for protecting the plastic windshields on the B-24s during assembly of the planes."

In 1943 Drackett Products Co. in Cincinnati, Ohio, purchased the Ford fiber processing equipment and Boyer went to work for Drackett in Cincinnati–he was never again in direct contact with Henry Ford. Boyer wanted to develop edible soy protein fibers. When H.R. Drackett died in 1949, Boyer left The Drackett Co. so he could pursue his goal of receiving a pioneer patent for texturizing vegetable (soy) protein. He was granted this patent in 1949. As many as 30 corollary patents were subsequently obtained.

"Boyer had developed methods for producing soy fiber that was thoroughly washed and tasteless. In 1951 he became a consultant to several food processors who were licensed to use his patents in their operations. These firms included Worthington Foods, Swift & Company, Ralston Purina, Unilever Company of England, National Biscuit Company [Nabisco], General Foods, and General Mills. Dozens of high-volume foods were, and still are, produced using Boyer's procedures... Robert Boyer worked full time for Ralston Purina in St. Louis, Missouri, from 1962 until 1971.

"In February 1963, Elizabeth Szabo Boyer died, and in April 1965, Boyer married Nancy Ann Miller, a recent widow living in St. Louis. Boyer retired from general consulting work in 1971 after his patents had expired in 1966, but continued consulting with Worthington Foods until 1977. In 1973, Nancy and Robert retired to downtown Dunedin, Florida.

"The Boyers did considerable traveling. But in the early 1980s Robert's eyes began to fail, and then his chief hobby became baking, an occupation he had always enjoyed. In 1985 he dictated his oral reminiscences [8 hours on tape with David R. Crippen] as requested by the Henry Ford Archives. Boyer died in Dunedin on November 11, 1989. The body was cremated and the ashes scattered over the Gulf of Mexico."

Photos show: A portrait of Boyer in his later years (Ford Archives photo ID No. P.0.19429). The Chemical Laboratory building at Greenfield Village at Dearborn (No. 0.6213) in 1930. Henry Ford discussing soybean work with Boyer in the Chemical Laboratory on Ford's birthday, July 30, 1937 (No. 188.21320. Ford is seated on a stool by a lab. bench reading and Boyer has one elbow on the bench behind him.) Boyer and Ford with the "plastic car" at Dearborn in 1941 (No. 189.16352).

Talk with Ford Bryan. 1992. Nov. 12. He is now working to get Robert Boyer's soybean research laboratory, the Chemical Plant of the Edison Institute, restored at Greenfield Village and interpreted as to its history and significance. The building is in fairly good shape; the exterior is in good shape but all the equipment has been removed from the interior. Address: 21800 Morley, Apt. 1203, Dearborn, Michigan 48124.

784. Meyer, Edwin W. 1993. Historical notes on textured soy flour (Interview). *SoyaScan Notes.* May 10. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Glidden Co. sold a textured soybean meal mainly to John Morrell & Co. for use in pet (especially dog) foods–but also to some other dog food companies. Morrell was a big meat processing firm with headquarters in Chicago and a big plant in Ottumwa, Iowa. At that time all dog food was canned (no dry or semi-moist) and this textured soy flour kept a certain amount of its integrity during retorting–so the dog-food people liked it.

The solvent defatted soybean meal was run through an expeller (also called a screw press) to give it texture, then the resulting cake was broken up into bits or grits. No die was used. Glidden's early texturizing process, dating from the late 1930s, was covered by a 1939 patent issued to Arthur Levinson and James Dickinson. These two inventors never got much credit for their invention (in part because they unfortunately did not use the term "texturize") and it played no role in the subsequent technology based on extrusion. If Levinson and Dickinson had used the key term "texturize," their patent would have been "prior art" making it more difficult for people to subsequently be issued patents on extruded materials or texturizing. An expeller, which was designed to press the oil from oilseeds, is less well suited to texturization than an extruder–which has no openings along the barrel and which gives more sheer working and alignment of the protein to create that meatlike texture.

Many people think (incorrectly) that William Atkinson was the original inventor of textured soy flour, but the Atkinson patent (issued Jan. 1970; No. 3,488,770) does not dominate the industry–even though Atkinson's patent was a very early, creative, and important one, and ADM did a very good job getting TVP on the market early. Ed is quite sure that Atkinson developed his patent independently and with no knowledge of Flier's work. However the dominant U.S. patent now is the one issued to Flier (pronounced FLEER) of Ralston Purina Co. on 24 Feb. 1976 (No. 3,940,495). There was a long time between application date and issuance date for the Flier patent. The Flier patent expires in 1993.

Part of the following is based on Ed's first-hand knowledge and part on second-hand knowledge (hearsay). After the Flier patent was issued, Ralston Purina filed a lawsuit against ADM in a federal court in southern Illinois. Swift (who was also extruding soy flour) may have been included in the suit. Sometime after the filing of the suit, Ralston Purina and ADM settled out of court. Ed thinks that as part of the settlement, they cross-licensed each other (so that each could use the best parts of the other's patent). After the ADM settlement, Ralston Purina went after all others in the industry who were extruding to take licenses.

If they didn't take a license, Ralston could charge them with infringement, and the cost of the infringement can be very high. So Cargill and A.E. Staley each took a license. Then Ralston Purina sued Far-Mar-Co. Wenger supported Far-Mar-Co because Wenger felt that patent would curtail the sale of their machinery. Ed was subpoenaed by Far-Mar-Co to give testimony under oath. Far-Mar-Co people learned, via Wenger, that there was a man in Decatur, Indiana, who was using a Sprout-Waldron extruder in the early 1960s to produce mixed, extruded feeds. Ed and his coworkers (Steve Frank and Bud Campbell) examined that extruded material in their lab at Central Soya. After some time that case was decided in court and Far-Mar-Co lost it [in mid-1984].

Then Ralston Purina went after Central Soya–which had its own patent issued to Gabor Pusski in 1976. Ed Armstrong, an internal attorney, suggested that Ed Meyer and Art Konwinski (Central Soya's extrusion man), take a very close look at the process by gathering detailed data. Based on that the attorneys concluded that Central Soya was infringing on Ralston Purina's patent. So Joe Gillespe, a vice president at Central Soya, made a deal with Ralston, that Central would sell Ralston several feed operations they had in Brazil at a very attractive price, plus several patents on industrial proteins. In exchange, Central Soya got a non-exclusive royalty-free license in perpetuity.

Ed has long wondered why the patent examiner didn't cite an "interference," which applies when two inventors make claims that overlap or are on the same subject. Then the patent office must conduct an investigation to see who has priority. This story does not appear in the history books and Ed is not sure that it should be.

"Over the years I have learned to be very skeptical of what I read because so much is said in an advertising mode rather than in a definitive or factual mode." People say that their products are used in various applications when they are not–which is wishful thinking in the hope that new customers will try the product. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

785. Shurtleff, William; Aoyagi, Akiko. comps. 1993. Henry Ford and his researchers' work with soybeans, soyfoods, and chemurgy–Bibliography and sourcebook, 1921 to 1993: Detailed information on 439 published documents (extensively annotated bibliography), 79 unpublished archival documents, 71 original interviews (many full text) and overviews, 13 commercial soy products. Lafayette, California: Soyfoods Center. 249 p. Subject/geographical index. Author/company index. Language index. Printed May 19. 28 cm. [567 ref]

• ***Summary:*** This is the most comprehensive book ever published about the work of Henry Ford and his researchers with soybeans and soyfoods. It has been compiled, one record at a time over a period of 18 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, since 96% of all records contain a summary/abstract averaging 286 words in length.

This is one of more than 40 books on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 30 different document types, both published and unpublished; every known publication on the subject in every language; 66 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding this subject from its earliest beginnings to the present.

The bibliographic records in this book include 439 published documents and 79 unpublished archival documents. Each 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 publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 13 commercial soy products, including 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 references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

786. Vorih, Susan W. 1993. Re: History of Ralston Purina's and Protein Technologies International's work with industrial soy proteins. Letter to William Shurtleff at Soyfoods Center, June 17 and July 9–in reply to inquiry. 3 p. + 1 p. Typed, with signature on letterhead.

• ***Summary:*** "Ralston Purina became involved with isolated soy proteins through the acquisition of four soybean processing plants from Procter & Gamble (Buckeye Division) in 1958. One P&G plant, located in Louisville, Kentucky, had an industrial soy protein isolate operation built [in about 1946-47] to produce product for their 'Spic and Span' house cleaner. This was not economical for P&G and conversion was made [starting in about 1953] to produce industrial isolated soy proteins for the paper coating industry. This conversion was taking place at the time of the Ralston

Purina acquisition, which was finalized on December 10, 1958. At this time, Ralston Purina only had an interest in expanding its soybean solvent extraction processing capacity, but the idle isolate manufacturing facility just acquired became of interest.

"There was no link in this acquisition with Mr. E.F. 'Soybean' Johnson of Soy Products Corp. in Louisville. Johnson, a former Ralston Purina employee, joined Soy Products Corp. in mid-1947.

"Ralston Purina decided to modify the Louisville isolate process for paper coating products; the plant began production on June 13, 1959. A series of hydrolyzed and non-hydrolyzed products under the ProCote brand name (first used commercially in June 1959) was produced and sold successfully to the paper coating industry. Under Protein Technologies International management the facilities have been modified and expanded to become the world's leading producer of Industrial Polymer Isolated Soy Protein products today.

Ralston Purina began research on food-grade isolates starting in late 1959 under the direction of Mr. Bill Brew in St. Louis. Many consultants were paid for information. Pilot plant work was also performed in St. Louis prior to first contacts with Mr. Bob Boyer. Mr. Boyer was a spun protein specialist for products made from the Ralston-Purina developed liquid curd process. Other spray-dried products were developed from curd by the company.

Ralston Purina began more active involvement with food-grade isolated soy proteins in 1960 when the company started food-grade isolated soy protein research and pilot plant work at its headquarters in St. Louis, Missouri. A semi-works plant to produce edible soy proteins was erected in 1961 at Louisville, and both spray-dried and spun fiber proteins began to be produced and sold in October 1962. The spray-dried edible isolates, brand-named Edi-Pro A and Edi-Pro N, were sold to food processors. Mr. Bob Boyer [who began working as a full-time consultant on soy protein for Ralston Purina in early 1960 and joined the company as technical director of protein products sales, working under Donald B. Walker, vice president in charge of Ralston Purina's soybean division] was instrumental in directing soy protein spun fibers and sales.

Mr. Frank Calvert was hired in September 1963 to head up Ralston Purina's R&D work on food-grade isolated soy protein in St. Louis. Calvert received a BS degree in chemistry from the Edison Institute of Technology while working at the Ford Motor Co. in Dearborn, Michigan. In 1965 Calvert was named director of soybean research, and in 1967 director of research of the Protein Division. In 1969 Calvert was promoted to director of research, New Venture Management, and finally in 1971 vice president and research director, New Venture Management. During these years, Calvert developed new soy protein isolation processes, 70 percent soy protein concentrate products, and modified soy protein coating compositions for industrial use. Calvert is considered a visionary in soy protein research and the accomplishments of his career were honored when the Protein Technologies International plant at Memphis was dedicated to him in 1973 in recognition of his years of service and dedication to protein technology."

Ralston Purina first made and sold Supro 610 in Oct. 1966. Spun soy protein fiber production was discontinued in 1967. The special equipment was dismantled and parts were sold off for scrap metal. Production of other food-grade soy proteins, such as extruded protein, was started commercially at St. Louis and Memphis in 1973. Wet textured edible soy proteins were produced commercially in Memphis and Osaka, Japan (through a joint venture) in 1975.

"In 1970 the 'Protein Project' became part of the New Ventures Group of Ralston Purina with the Protein Project headed by Paul H. Hatfield. Included in this early business development team were Dr. D.H. Waggle, R&D; Mr. Henry T. James, Director of Engineering, now retired; and B.P. Schwartz, Manufacturing. This team, working as a multi-functional and multi-disciplined team, emphasized process reliability, superior quality and performance products, combined with a worldwide perspective of market development.

Ralston Purina "expanded food grade isolate capacity with new facilities at Memphis, Tennessee, beginning production on April 10, 1973; Pryor, Oklahoma, beginning production on December 1, 1976; and Ieper, Belgium, beginning production on August 21, 1979. This expansion easily vaulted the company into the position of world leader in food-grade isolated soy proteins by 1976."

Note 1. Much of the above information was provided to Susan and her assistant, Jane Phelps, by Henry James, a former employee of Ralston Purina working in the area of soy proteins.

Note 2. On 1 July 1987 Ralston Purina Co. established Protein Technologies International as a wholly-owned subsidiary, with 92 researchers. The first official use of the term "Protein Technologies International" began in March 1987.

Note 3. Concerning the Buckeye Cotton Oil Co. In Nov. 1943 it had soybean processing mills in Louisville, Kentucky (large), and Memphis, Tennessee (medium-sized). By 1948 the company's plant in Louisville was making soy flour and soy lecithin. By 1949 (and probably by 1946) the company had become a subsidiary of Procter & Gamble and its headquarters were in Ivorydale, Ohio; O.H. Alderks was involved with soybean processing in Buckeye's technical division. Address: Communications Manager, Protein Technologies International, Checkerboard Square, St. Louis, Missouri 63164. Phone: (314) 982-1983.

787. Meyer, Edwin W. 1993. Buckeye Cotton Oil Co., Procter & Gamble, and soy protein isolates (Interview).

SoyaScan Notes. June 24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Buckeye Cotton Oil Co. had a soybean crushing plant in Louisville, Kentucky. Ed thinks that Buckeye made an industrial soy protein isolate at this plant, but he does not know how they used this isolate. Procter & Gamble purchased this plant by the mid- to late 1940s, then during the 1940s they introduced a product named Spic & Span, which contain isolated soy protein. "After you washed the wall with Spic & Span, the protein in the product left a film on the wall, which made it easier to wash again on the second washing." The process was somewhat like sizing or coating a paper with protein to make the surface smoother and less porous. Ed doubts that the protein had any detergent effect.

Ralston Purina bought Procter & Gamble's isolate plant in Louisville. Ed thinks that Ralston Purina began work on edible soy proteins at the time that Bob Boyer started consulting with them–and not before. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

788. Leiss, Richard S. 1993. History of the use of spun soy protein fibers at Worthington Foods (Interview). *SoyaScan Notes.* June 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Richard (whose last name is pronounced like "lease," as in "to lease a house") has worked for Worthington Foods in R&D for 28 years, from Aug. 1962 to 1968, then from 1971 to the present. He thinks that small amounts of the first commercial Worthington product to contain spun soy protein fibers were probably sold by late 1962 and definitely by 1963. These meatlike products were probably frozen at first, and then canned later. The first such product may have been the Minute Entree Fried Chicken Style in frozen form. Fri-Chik, which was canned and widely sold to Seventh-day Adventist food outlets, came a little later. The next 3 products that contained spun fibers (White-Chik, Beef Like, and Prosage) were all frozen and were introduced at about the same time (by Oct. 1963), but many Adventist food outlets did not have a frozen food case in those days so Worthington had to supply them with one. Following these, some additional products were made under the Worthington label, including Smoked Beef Style, Wham.

"When I first came to Worthington in 1962 there was a small R&D lab attached to the main food processing building; we didn't have a research facility like we have now. I recall that a new R&D building was completed in October 1964. Prior to Oct. 1964, I recall seeing a Fried Chicken Style product, containing spun fibers, being canned. After Oct. 1964 time, we began to spin our own soy protein for the first time using a pilot plant line in this building. Full-scale spinning of Worthington's Fibrotein soy fibers probably began in about 1965. Prior to that time my recollection is that Worthington purchased most of its spun protein from Ralston Purina Co.; it was manufactured in their Louisville [Kentucky] plant. But Worthington also purchased some spun soy fiber from General Mills; it was made at their James Ford Bell Research Center and was very experimental. I don't recall the name of that product.

"In the early 1960s, about 95% of Worthington's sales were through either the church or through stores in communities where there were heavy concentrations of Adventists. So it really wasn't a very big thing. One very big thing for the company was the first IFT meeting it attended in Kansas City [Missouri] in about 1963 or 1964. It was the first time that Worthington had demonstrated products at a national convention, and there was a lot of interest in these products.

In 1974 the first 3 Morningstar Farms products were introduced: Breakfast Patties, Breakfast Links, and Breakfast Slices. He is quite sure that initially they all contained spun soy protein fibers. However several years after they were launched, the decision was made to remove the spun soy fibers for two main reasons: (1) Making the fibers was an expensive, high-tech process which added too much to the price of each product; (2) Worthington was concerned that if, as anticipated, the Morningstar Farms line became very popular in mainstream national markets, their one spinning line would not be able to produce enough fibers to meet the demand. The "wet spun fiber" was replaced by textured soy concentrates and vital wheat gluten to give similar textures. In 1979 four more Morningstar Farms products were launched: Grillers (meatless burgers), Breakfast Strips (meatless bacon), Luncheon Slices (a new version of the 1974 Breakfast Slices), and Leanies (meatless hot dogs). None of these 4 products contained spun soy protein fibers. Thus, for most of their commercial lives, the Morningstar Farms products have not contained spun soy protein fibers.

Worthington has always had only one line for spinning soy protein fibers–located at their plant in Worthington, Ohio. This line was set it so that a second spinning table could be added to increase its capacity, but that has never been done. Even during the years when the company had a second plant at Schaumburg, Illinois (after Miles Laboratories took over Worthington in 1970), that plant never had its own spinning line.

At one point Worthington sold its Fibrotein spun soy protein fiber to an Adventist company outside the USA. Worthington never sold it to Loma Linda Foods. Initially Loma Linda may have purchased it from Ralston Purina or General Mills; then they got their own spinning line later, in the 1970s; they bought the equipment from Dawson Mills.

Concerning the total amount of spun soy protein fiber used in Worthington food products, it increased rapidly from 1965 to about 1975, then it fell somewhat after the first three Morningstar Farms products were reformulated in the mid-1970s–but it did not fall dramatically because the 3 products were still at the introductory stage. After the amount then

stabilized, and remained fairly constant until recent years when the demand for vegetarian products has increased, and with it production of spun soy protein fibers. Today, about 15-20% of Worthington's meat alternatives contain spun soy protein fibers.

In Richard's opinion, the legacy that Henry Ford and his researchers left in terms of food uses of soybeans is mainly in the areas of soy protein isolates (especially functional isolates; the work done by Frank Calvert and Bob Boyer at Ralston Purina) and textured soy flour (the work done by William Atkinson at ADM). While spinning was certainly the most novel of the technologies, spun soy protein fibers are not nearly as important commercially as food-grade isolates and textured soy flour.

Richard remembers fondly the pioneering days when Bob Boyer had a lab next to his office at Worthington Foods. Boyer told Richard many anecdotes about the times he worked for Henry Ford and Richard wrote them down in his journal. "Bob Boyer was truly a gentleman. I really enjoyed him a lot."

Richard does not recall any commercial product containing spun soy protein fibers that Ralston Purina launched during that time. They sold all their spun fibers as such to Worthington Foods.

"I'm kind of the keeper of the archives and unfortunately a lot of material has gotten out because during the years that Worthington was owned by Miles Laboratories past history was not considered to be very important." Perhaps a record might have appeared in the *Chopletter* (an internal newsletter published by Worthington Foods). Address: Director, R&D, Worthington Foods, 900 Proprietors Rd., Worthington, Ohio 43085-3194. Phone: 614-885-9511.

789. Leiss, Richard S. 1993. Recollections of work at Worthington Foods (Interview). *SoyaScan Notes.* June 30. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Art Schultz worked as a technician with Bob Boyer at Ralston Purina. He is mentioned in some of the patent literature. Art worked for Worthington Foods from about 1970-71 until about 1980.

When Worthington Foods bought Battle Creek Food Co. in 1960, only about 4 people were transferred from that company down to Worthington. One of them was Josephine Williams. She was a nutritionist who worked in the laboratory at Battle Creek, Michigan with Dr. John Harvey Kellogg. She was a very interesting resource, with many stories about working with Dr. Kellogg. She retired in about the early 1970s and may still be living in the Battle Creek area. Address: Director, R&D, Worthington Foods, 900 Proprietors Rd., Worthington, Ohio 43085-3194. Phone: 614-885-9511.

790. McDermott, Ron. 1993. History of the use of spun soy protein fibers by Loma Linda Foods (Interview). *SoyaScan Notes.* July 6. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Note: In about 1968 Loma Linda Foods started making meatlike products containing spun soy protein fibers. The first products were canned meatless slices (chicken-like, beef-like, turkey-like, or luncheon-like slices).

Ron started to work for Loma Linda Foods in 1973 as Director of Quality Assurance at the company's plant in Mt. Vernon, Ohio. In 1975 he left Mt. Vernon and went to Loma Linda's plant at Riverside, California. He thinks that Loma Linda got its first spun soy protein fibers from General Mills. Robert Boyer had licensed General Mills the rights to spin soy protein fibers, and they used these primarily to make their original line of Bontrae Products. At one point after 1973 Ron thinks that Loma Linda was purchasing spun fibers from three sources: Ralston Purina, General Mills, and Miles Laboratories–but the bulk of it came from General Mills. In about 1975-77 General Mills shut down their soy fiber spinning line and sold it to Dawson Mills. During this transition period, Loma Linda purchased a large inventory of frozen, neutralized (neutral pH) fiber from General Mills. The spun soy fiber sold by Miles Laboratories (Worthington) was called "acid tow"; it was refrigerated rather than frozen and the acidic pH prevented spoilage. Loma Linda would then adjust the pH to neutral shortly before use.

In early 1984 (according to documents Ron has in front of him), Loma Linda Foods bought a soy protein fiber spinning line from Dawson Mills. In mid-1984 the equipment was transferred to Loma Linda. Loma Linda probably started spinning their own fibers in California in late 1984 or early 1985. Loma Linda continued to spin their own fibers until the company was sold to Worthington Foods in Jan. 1990. Worthington still owns that line of spinning equipment, which is now dismantled and unused in storage. It could be re-activated if Worthington had a place to put it and a need to make more spun soy protein fibers.

Note: A brief chronology of spinning by General Mills, Dawson Mills, and Ralston Purina Co. 1959–General Mills starts research on textured soy proteins. 1962 Oct.–Ralston Purina Co. begins to make Textured Edi-Pro, a spun soy protein fiber, at its plant in Louisville, Kentucky. 1963 Nov.–The first of many patents for spinning soy protein are issued to General Mills. 1965 Dec.–General Mills introduces the Bontrae line of spun soy protein fiber products, starting with Bac-O*s (bacon-like bits). 1967–Ralston Purina stops spinning soy protein. 1969 June–General Mills breaks ground for major fiber spinning plant at Cedar Rapids, Iowa; It begins operation by late 1970. 1975–General Mills stops spinning, and sells its spinning technology and equipment to Dawson Mills. 1976–Central Soya now owns the Bontrae trademark, formerly owned by General Mills. 1979–Dawson Food Ingredients, a subsidiary of Dawson Mills, starts spinning soy protein fibers; Anaprime is on the market by March 1980. Address: Vice President Research

& Technology, Worthington Foods, 900 Proprietors Rd., Worthington, Ohio 43085-3194. Phone: 614-885-9511.

791. Messina, Mark. ed. 1993. First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease (Leaflet). Libertytown, Maryland. 4 panels each side. Each panel: 22 x 9 cm.
• ***Summary:*** This symposium, scheduled to be held on 20-23 Feb. 1994 in Mesa, Arizona, is being organized by Mark Messina, PhD, and sponsored by the United Soybean Board as well as soybean growers from Nebraska and Indiana. Each session contains a number of speakers and, in some cases, a panel discussion. Agenda: I. Soyfoods and heart disease: Opening remarks and overview. 1. Overview of soybean processing and products. Moderator–Rasik Daftara, Archer Daniels Midland Co. 2. Soy intake and cholesterol reduction. Moderator–John Erdman, Univ. of Illinois. 3. Soy and cholesterol reduction: Hypothesized mechanisms. Moderator–Doyle Waggle, Protein Technologies International. 4. Soy and heart disease prevention: Potential mechanisms unrelated to cholesterol reduction. Moderator–Penny Kris-Etherton, Pennsylvania State Univ. 5. Potential public health impact of soy protein. Moderator–Lynn Scott, Methodist Hospital, Baylor College of Medicine [Texas].

II. Soyfoods and Cancer. 6. Overview of diet and cancer. Moderator–John Potter, Univ. of Minnesota. 7. Soy intake and cancer risk: Animal and epidemiologic studies. Moderator–Daniel W. Nixon, American Cancer Society. 8. Non-isoflavone soybean anticarcinogens. Moderator–Bernard Szuhaj, Central Soya Co. 9. Soybean isoflavones and cancer risk. Moderator–Kenneth Setchell, Children's Hospital and Medical Center. 10. Anticancer effects of genistein. Moderator–Stephen Barnes, Univ. of Alabama.

The registration fees are: Regular: $195.00. Student $75.00.

Note: This in the earliest document seen (March 2019) with the word "soy" in the title referring to the general concept of soy; previously "soy" had referred to soy sauce. Address: Soyfoods & Chronic Disease Symposium, P.O. Box 178, Libertytown, Maryland 21762-0178.

792. Kirk, Bruce. 1993. Re: Feeding of birds with products containing isolated soy protein. Letter to Patricia Carr, Roudybush NZ Limited, P.O. Box 12 238, Christchurch, New Zealand, Oct. 13. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Protein Technologies International isolated soy proteins are regarded as very high quality protein ingredients of equivalent nutritional quality to traditional high quality proteins from egg, milk, fish, and meat etc.

"Our isolates are also widely used in infant feeding programmes where lactose free products are desired. Major multinational food groups such as Wyeth, Mead-Johnson and Nutricia specify only Protein Technologies International isolates for use in their critical infant nutrition products.

"We would strongly dispute any claims that our isolated soy proteins are in any way inferior in quality to other soy protein products on the market.

"We doubt very much that the presence of isolated soy protein in your bird feed products has in any way contributed to the problems experienced by your customer." Address: Columbit [New Zealand] Ltd., Unit 3, 31 Princes St. Onehunga, P.O. Box 29-093 Greenwoods Corner, Auckland, New Zealand.

793. Redmond, Tim. 1993. New developments at the Soyfoods Association of America (SAA) (Interview). *SoyaScan Notes.* Oct. 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Tim has been very active in shepherding SAA during the past year. He is the vice president, on the executive committee, and a director. The original $30,000 grant to SAA from the American Soybean Association increased to about $40,000. SAA will soon be sending 3,000 packets to the media and 5,000 packets to health professionals. Each packet contains fact sheets, a soyfoods brochure, and a brochure announcing the "First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease," which is scheduled to be held on 20-23 Feb. 1994 in Mesa, Arizona. In addition, Tim is now drafting a letter to new and prospective members, including San-J (which has never joined), Worthington Foods, Kikkoman, Ralston Purina, etc. SAA needs more money to promote soyfoods on a broad basis.

Michelle Edwards, Dan Burke's long-time secretary, is now the Executive Director of SAA.

Tetra Pak Inc. has donated $50,000 to SAA over a period of 3 years, primarily to aid in the development of soymilk standards. Note: This is the largest single grant ever received by the Soyfoods Association. As of Jan. 1995, according to Dan Burke (Treasurer of SAA) the funds are being used mainly to pay for legal advice (from Hyman, Phelps & McNamara in Washington, DC) on the standards and to promote soyfoods. Peter Golbitz, who has spent a great deal of time in compiling the standards, has not received any payment for his time. Address: Vice President of Marketing and Sales, American Soy Products, Inc., 1474 N. Woodland Dr., Saline, Michigan 48176. Phone: 313-429-2310.

794. **Product Name:** Mori-Nu Lite Silken Tofu [Extra Firm, or Firm].
Manufacturer's Name: Morinaga Nutritional Foods, Inc. (Importer). Made in Japan by Morinaga Milk Co. Ltd.
Manufacturer's Address: 2050 W. 190th St., Suite 110, Torrance, CA 90504. Phone: 310-787-0200.
Date of Introduction: 1993 November.
Ingredients: Extra firm: Water, soybeans, isolated soy protein, gluconolactone, calcium chloride.

Wt/Vol., Packaging, Price: 10.5 oz (297 gm) Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
Nutrition: Per 3 oz.: Calories 35, calories from fat 10, total fat 1 gm (2 daily value; saturated fat 0 gm), cholesterol 0 mg, sodium 80 mg (3%), total carbohydrate 1 gm (< 1%), protein 6 gm, calcium 2%, iron 4%. Percent daily values are based on a 2,000 calorie diet.
New Product–Documentation: Ad (full-page color) in Health Food Business. 1993. Oct. p. 37. "Mori-Nu. The lowest fat tofu in the world. The others are just plain tubby."

Talk with Tom McReynolds of Morinaga. 1993. Oct. 14. This product will be launched on 1 Nov. 1993. Distribution will start on Oct. 25. The product does not contain any Nichii Soy Flakes (as is implied in a spot in Health Foods Business, Oct. 1993, p. 64). As far as Tom knows, only White Wave and Tree of Life are presently using Nichii flakes to make tofu. The product contains both soybeans (grown in Iowa) and isolated soy protein (from Protein Technologies International). Morinaga has purchased the video of Tom Brokaw interviewing Hillary Rodham Clinton, they have transcribed the parts about tofu and trying to work healthier eating into the White House. Brokaw ends the interview by saying: Perhaps we'll see tofu at a White House state dinner. Morinaga is doing a news release on the subject. Dr. Dean Ornish has already been invited to the White House to advise President Clinton on his diet. Ornish went in and spoke.

Letter (fax) from Morinaga. 1993. Nov. 2. Mori-Nu Lite–Extra Firm contains exactly 0.7 gm of fat and 36.6 calories per 84 gm serving, so that 17% of its calories come from fat.

Product (Extra Firm) with Label sent by Morinaga. 1994. Feb. 5. 4 by 2.5 by 1.75 inches. Tetra Brik Aseptic carton. Purple, yellow, red, and green on white. On front panel: "Only 1% fat." On one side is a recipe for Vegetable Stir Fry. Soyfoods Center Taste Test. The product has a very firm consistency the like white of a hard-boiled egg, and a very bland flavor.

Leaflet sent by Morinaga. 1994. Nov. 25. "See the Lite!" "Mori-Nu Lite is the lowest fat tofu in the world. We combined extremely low-fat isolated soy protein with rich whole-bean soymilk, and then added only enough water to maintain Mori-Nu's creamy smooth texture... Mori-Nu Lite has no cholesterol, and with only 1 gram of fat per serving, you get the highest protein to fat ration (6:1) and less calories (35) than any other tofu."

Prices at Safeway supermarket in Lafayette, California. 1995. Nov. 28. Mori-Nu (3 types): 11.9 cents/oz. Azumaya Chinese style (firm): 7.5 cents/oz. Thus Mori-Nu Tofu costs 59% more than Azumaya tofu.

795. Leiss, Richard S. 1993. Re: History of the use of spun soy protein fibers at Worthington Foods. Letter to William Shurtleff at Soyfoods Center, Dec. 16. 2 p. Typed, with signature on letterhead.
• ***Summary:*** Richard has just located a copy of the July 1962 issue of the *Worthington Chopletter.* The enclosed article is the earliest written reference he has been able to find on wet spun soy protein fibers and commercial retail products containing them. "The article does not specifically state which product was sold first, but certainly the Soyameat Fried Chicken Style, Minute Entrees Fried Chicken Style, and Minute Entrees Sliced Whitemeat Style were the first three.

He began to work for Worthington Foods in August 1962. At that time Worthington was not doing any commercial spinning of soy protein fibers. It is likely that at that time these wet fibers were being purchased primarily from the Ralston Purina Co. "Following the completion of the Worthington Foods research center in October 1964, a spinning line was set up in the pilot plant. This line was expanded so that commercial quantities of fiber were produced, probably beginning in 1965. This operation was continued until the construction of a larger manufacturing plant in 1970, at which time the spinning was relocated to the new building.

"During the same time period (1962-1968) some limited quantities of spun fiber were obtained from General Mills as well. It was my understanding that the GM fiber spinning line was located in the James Ford Bell Research Center, and I remember Worthington receiving fiber from General Mills for use in retail products. The fiber from each source [Ralston Purina and GM] was slightly different and had to be handled somewhat differently in production.

Richard is not aware that Worthington Foods ever sold wet spun fiber to Loma Linda Foods. "Certainly during the early years it as not a consideration by Worthington management because it did indeed give Worthington Foods a strong advantage over Loma Linda."

"I have considered it an honor to have been a part of the evolution and development of the vegetarian food business in the United States. Knowing and being able to work with pioneers such as "Kelly" Hartman, Bob Boyer, "Cal" Calvert, and Bill Atkinson have made my career something special..." Address: Director, R&D, Worthington Foods, 900 Proprietors Rd., Worthington, Ohio 43085-3194. Phone: 614-885-9511.

796. Protein Technologies International. 1993. Facts–1993 (Leaflet). St. Louis, Missouri. 4 panels each side. Each panel: 22 x 9 cm.
• ***Summary:*** PTI makes the following products: Supro brand isolated soy proteins (a complete range), Fibrim brand soy fiber, Supro Plus isolated soy protein products (combine Supro with carbohydrates, vitamins, and minerals), ProPlus brand isolated soy proteins (fortified to meet the requirements of the School Lunch Program), ProCote soy polymers (functional additives for the coated paper and

paperboard markets), Solka-Floc and Keycel brand powdered cellulose.

The company's world headquarters are in St. Louis, Missouri; it has food protein plants at Memphis, Tennessee; Pryor, Oklahoma; Ieper, Belgium; and Hannan, Japan. It has an industrial polymer plant at Louisville, Kentucky, and a dairy food systems facility at Hager City, Wisconsin. PTI also has offices in 24 countries outside the USA. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

797. Ralston Purina Company. 1993. Annual report to shareholders. St. Louis, Missouri. 105 p.
• ***Summary:*** The Ralston Purina Company prepares to celebrate its 100th anniversary on January 8, 1994. For Ralston Purina Co. and subsidiaries: Net sales for the year ended Sept. 30, 1993, were $7,902,200 up 1.9% over 1992 sales of $7,753,400. Net earnings for the year were $122,600,000, down 60.9% from 1992 earnings of $313,200,000.

"As a result of the adoption by Company shareholders on July 30 of a targeted stock plan, the Company now reports financial results for two classes of Ralston Common Stock tied to the Ralston Purina Group (RPG Group) and the Continental Baking Group (CBG Group).

"The RPG Group includes Ralston's pet foods, batteries, cereal foods, snack crackers, protein products, skiing and resort operations, and international livestock and poultry feed business. The CBG Group consists of Ralston's fresh bakery products business."

On September 23, the company's Board of Directors approved a plan to spin-off the Company's private label and branded cereal business, baby food, crackers, ski resort, and coupon redemption business. "The spin-off is subject to receipt of a favorable tax ruling from the Internal Revenue Service, satisfaction of all legal requirements and final review by the Board. The stock of the new company would be distributed to holders of RPG Stock. The Company believes the spin-off will be completed during fiscal 1994."

Page 5 gives details on Protein Technologies International. Sales and operating profits improved slightly over the prior year. A record number of new products were added to each of the company's core product lines in 1993. Photos shown the following PTI products: Supro, Pro-Cote Soy Polymer, SuproPlus, and Fibrim Soy Fiber.

Page 23 gives financial information for each business segment. Sales of consumer soy protein products grew from $221.6 million in 1989, to $261.8 million in 1990, dropping slightly to $255.0 million in 1991, then rising to $288.1 million in 1992, and again to a record of $291.5 million in 1993.

Surprisingly, there is no information about the company's history in its 100th anniversary report. Address: Checkerboard Square, St. Louis, Missouri.

798. Shurtleff, William; Aoyagi, Akiko. comps. 1994. Ralston Purina Co. and Protein Technologies International's work with soybeans and soybean products–Bibliography and sourcebook, 1934 to 1993: Detailed information on 293 published documents (extensively annotated bibliography), 44 commercial soy products, 42 original interviews (many full text) and overviews, 16 unpublished archival documents. Lafayette, California: Soyfoods Center. 147 p. Subject/geographical index. Author/company index. Language index. Printed 4 Dec. 1993. 28 cm. [381 ref]
• ***Summary:*** The Ralston Purina Co.–originally named the Robinson-Danforth Commission Co.–was incorporated on 8 Jan. 1894 in St. Louis, Missouri. The founders, William H. Danforth (lived 1870-1955), George Robinson, and William Andrews belonged to the same church. The original capitalization was $12,000. The company began by making horse and mule feed; their product was mixed with shovels on the floor of a back room. In March 1896 Danforth became the president of the company and on May 26 of that year he became the majority stockholder. The next day the mill was completely destroyed by the worst tornado in St. Louis' history. Danforth rebuilt the company and made it one of America's largest producers of animal feeds.

Ralston Purina's research on soybeans probably dates from the period before World War I, when the meal had to be imported from Manchuria. In 1926 the company established a 712-acre research farm at Gray Summit, Missouri, for testing all ingredients in laboratory-developed formulas. It is not clear when the company first used soybean meal in its feed products.

The company began processing soybeans in the depths of the Great Depression, probably in about 1930. By Aug. 1935 it had plants for processing soybean meal at Lafayette, Indiana, Circleville, Ohio, and St. Louis, Missouri. The company processed over 2,000,000 bushels of 1935 crop soybeans. By 1936 this soybean meal was being used in 14 products, mostly "Purina Chows," animal feeds made by Purina Mills of St. Louis. It was sold under the famous corporate trademark, the red and white checkerboard.

By the early 1940s was the largest single consumer of soybean meal in America. By 1947 Ralston was operating at least four soybean crushing plants, located in Lafayette, Indiana; Iowa Falls, Iowa; Kansas City, Missouri, and St. Louis, Missouri. The four plants contained 23 expeller presses, had a capacity of 560 tons of soybeans per day, and a storage capacity of 3.91 million bushels of soybeans. The main product of each plant was Purina Chows.

Ralston Purina became involved with isolated soy proteins in 1958 through the acquisition of four soybean processing plants from Procter & Gamble (Buckeye Division). One P&G plant, located in Louisville, Kentucky had an industrial soy protein isolate operation built in about 1946-47 to produce industrial isolate for their Spic & Span

house cleaner. During the 1950s P&G converted this plant to making industrial soy protein isolates for the paper coating industry. Production was started by Ralston Purina on 13 June 1959.

The roots of Ralston Purina's work with edible soy protein isolates reach back to Henry Ford. In early 1960 Robert Boyer, who had become one of the world's leading authorities on soy protein isolates while working for Henry Ford, began work as a full-time consultant for Ralston Purina. Starting that year, largely because of Boyer's arrival, Ralston Purina began its first research on edible soy protein isolates at a new research and pilot plant at company headquarters in St. Louis. In 1961 a semi-works plant to create these products was erected at Louisville. In about September 1962 Boyer was named technical director of protein product sales in the soybean division of the Ralston Purina Co.; he worked for Ralston until his retirement in 1971. In 1962 Ralston Purina began to sell both spray-dried edible soy protein isolates (named Edi-Pro A and Edi-Pro N) and the world's first commercial spun soy protein fibers (named Textured Edi-Pro or Fibrotein, and manufactured under patents owned by Robert Boyer). By July 1962 these fibers were being used by Worthington Foods to make a new generation of meatless meatlike products. Ralston Purina's food-grade soy protein products were sold only to the food industry, not directly to consumers.

Frank Calvert, Boyer's co-worker from the Ford Motor Co., was hired in November 1962 to head up Ralston Purina's R&D work on edible isolated soy protein in St. Louis. In 1965 Calvert was named director of soybean research, and in 1967 director of research of the protein division. Calvert is considered a visionary in soy protein research and the accomplishments of his career were honored in 1973 when the Ralston plant at Memphis, Tennessee, was dedicated to him.

By 1969 Ralston Purina had become the world's largest producer of formulated livestock and poultry feeds, with plants in over 40 states and 30 foreign countries.

By 1975 Ralston Purina employed more than 50,000 people worldwide and had sales of $3,000 million a year.

In Dec. 1976 Dun's Review proclaimed Ralston Purina to be one of America's best-managed companies. "Besides being the world's largest producer of animal feed and pet food, Ralston Purina is also a leader in protein production and nutrition research, which have vast implications for the company's future."

A survey of U.S. and Canadian soybean processing facilities conducted in Nov. 1977 by Shearson Hayden Stone Inc. found that Ralston Purina was the fourth largest soybean crusher / processor in North America (after ADM, Central Soya, and A.E. Staley), with a capacity of 92 million bushels per year, representing 7.5% of total industry capacity.

During the late 1970s and early 1980s Ralston Purina, under R. Hal Dean (chairman) and William P. Stiritz (president and CEO), was restructured to focus on being a manufacturer of higher-margin consumer packaged goods and to move away from its inherently volatile commodity-based enterprises. During the restructuring, Ralston Purina sold a number of its core divisions that dealt with commodities and used the revenues to purchase many new companies–including Continental Baking Co., Eveready Battery Co., Jack-in-the-Box restaurant chain, Van Camp Seafood Co., Keystone all-seasons resort, etc.

On 2 Jan. 1985 Ralston Purina finalized its sale of six soybean processing facilities to Cargill. Ralston stopped operations at its seventh soybean processing plant in Memphis, Tennessee. The deal left Ralston completely dependent on outside sources for soybean products for its pet foods and other products.

In mid-1986 Ralston Purina sold Purina Mills, its U.S. animal feed business, which represented the origins of the company. The buyer, BP Nutrition, paid $545 million for the prosperous mills. With these two sales, Ralston Purina exited from the bulk animal feed and soybean crushing business. It still sold pet foods to consumers.

The company's 1986 annual report stated that Ralston Purina was the world's largest producer of dry dog and dry and soft moist cat foods, and was the largest wholesale baker of bakery products in the U.S. "Ralston's metamorphosis into a very attractive consumer packaged goods company is now essentially complete." During the past year the company had earned $388 million on $5,500 million sales.

In 1972 Ralston Purina expanded its isolated soy protein operations into Europe by forming Purina Protein Europe (PPE). This started as a marketing organization but soon expanded into a technical service organization with an Application Laboratory in the UK, first at West Haddon and then at St. Albans, Herts., not far from London's Heathrow Airport. By 1976 PPE had an office in Brussels, Belgium, and in late September, 1978, PPE opened Europe's first plant manufacturing isolated soy proteins, at Ieper (Ypres), Belgium.

Also in 1978, in America, Ralston Purina expressed its growing interest in soy protein foods by sponsoring the Keystone Conference on soy protein and human nutrition, a milestone event that brought together top researchers in the two fields and resulted in the publication of the proceedings (Wilcke et al. 1979).

Starting at about this time, Ralston Purina became the world's leading manufacturer of food-grade isolated soy proteins. On 1 July 1987 Ralston Purina Co. established Protein Technologies International (PTI) as a wholly-owned subsidiary, with 92 researchers. Today PTI continues to be the world's foremost maker of isolated soy proteins, with offices worldwide, and manufacturing plants in the USA and Belgium. PTI also makes several industrial isolates and Fibrim soy fiber.

Issued in commemoration of Ralston Purina's 100th

anniversary, this is the most comprehensive bibliography ever published about Ralston Purina Co. and Protein Technologies International's work with soybeans and soybean products. It has been compiled, one record at a time, over a period of 18 years, in an attempt to document the history of these two pioneering companies. Its scope includes all known information about this subject, worldwide, from 1934 to the present.

This book is also the single most current and useful source of information on this subject, since 85% of all records contain a summary/abstract averaging 170 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 30 different document types, both published and unpublished, every known publication on the subject in every language, and 42 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of these two companies from their earliest beginnings to the present.

The bibliographic records in this book include 293 published documents and 16 unpublished archival documents. Each 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 publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 44 commercial soy products, including 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 references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. The introduction contains a history of both companies. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

799. Shurtleff, William; Aoyagi, Akiko. comps. 1994. Soyfoods industry and market–Bibliography and sourcebook, 1985 to 1993. Lafayette, California: Soyfoods Center. 361 p. Subject/geographical index. Author/company index. Language index. Printed 11 Jan. 1994. Published Jan. 1995. 28 cm. [985 ref]

• ***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 soymilk 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.

800. Pierce, Ray. 1994. A brief history of Genice Foods Ltd. and their work with soy ice creams, yogurts, creams, and margarine. Part I (Interview). *SoyaScan Notes.* Feb. 4, 8, 10, and 16. Conducted by William Shurtleff of Soyfoods Center. Followed by a an 8-page fax on 7 Feb. 1994.

• ***Summary:*** From 1979 to 1982 Ray, a native of Wales, was general manager of Pendeltons Ice Cream. In March 1982, at age 41, he started a company named Classic Ices, which was primarily a dairy ice cream company. Located in Rhydymwyn (pronounced REED-uh-MOO-un), Clwyd (pronounced KLU-ud) County, Wales, the company began trading (making and selling products) in July 1982. In early 1984 Ray sold all but 10% of his shares in Classic Ices to the Hillsdown Holdings Group but continued to work at the company. Then in May 1984 Irene Barclay joined Classic Ices as technical manager. In April 1985 Ray saw an article in *The Grocer* (April 6, p. 23) stating that Michael Cole of Soya Health Foods Ltd. had started making soya milk and was planning to make related non-dairy products–such as soya ice cream. Ray called Michael Cole and asked if Classic Ices could develop and make a soy ice cream for him. Michael was interested, he came to visit Ray at Classic Ices, and that is how Ray's interest in soya ice creams began. Irene Barclay of Classic Ices worked closely with Michael Cole to developed the product. In about July 1985 Classic Ices started making Sunrise Ice Dream and selling it to Cole, who marketed it very successfully. Before this, Classic Ices had never made any non-dairy products. But Classic Ices was not particularly interested in non-dairy products, so Ray and Irene Barclay decided to leave Classic Ices in 1985 and start their own small company in Clwyd, Wales, about 10 miles from Classic Ices, at the same location they now occupy. The two business partners believed they saw a new market with great potential. Moreover, Irene was lactose intolerant so she could not consume dairy products. So Ray sold his remaining shares (10%) in Classic Ices to Hillsdown Holdings, then he and Irene established their company to develop and manufacture non-dairy dessert specialties–starting with soya ice cream.

They named the company Genice Foods Ltd. (short for "Genuine Ice Cream" and pronounced JEN-ais), but today many people pronounce the name jen-EES, which has come to be preferred by the company. In late 1985 Genice Foods moved into a brand new, small custom-designed, purpose-built factory unit in the Llay Industrial Estate. The unit was 5,000 square feet in size, but initially Genice used only half of that space–for manufacturing, cold storage/warehousing, and offices. In early April 1986 Genice was officially established and registered as a company and that same month, about two weeks later, they began trading. Today Ray's title is Director General Manager and Irene is the Technical Director. Genice's first product, launched in April 1986, was Genice Ice Delight, a non-dairy frozen dessert in 5 flavors (vanilla, strawberry, raspberry ripple, hazelnut, and pistachio & almond). Initially the main soy ingredient was powdered soymilk obtained from Michael Cole of Soya Health Foods, which probably imported it. But soon Genice switched to using soy protein isolates because they were less expensive and seemed to give a better product. At that time Genice bought the isolates from Macauley-Edwards (in Peterborough, eastern England), which later somehow became Purina Protein; today Genice buys most of its isolates from ADM (SP6, imported from the USA), but a little from Protein Technologies International for "old time's sake." Genice developed this product largely because they needed an actual product to show potential customers, but they never put much effort into marketing the product because they had already decided that Genice wanted to be a product development and manufacturing company and leave sales and marketing to other companies. Later in 1986 the manufacture of Sunrise Ice Dream was transferred to Genice from Classic Ices. It was now sold in four flavors–vanilla, wildberry, hazelnut, and carob. Genice worked out an agreement with Cole that they would not compete by entering markets where Cole's product was established.

In 1986 Dayville Ltd. asked Genice if they could make a non-dairy frozen dessert intended to appeal more to the general grocery sector of the market than health food stores where Ice Delight and Ice Dream were sold. The product N'ice Day, was launched for Dayville in July 1986, sold in 3/4 litre packs in four flavors–vanilla, hazelnut, strawberry, and pistachio & almond. The soy ingredient was soy protein isolates. Continued. Address: Founder, Genice Foods Ltd., Pinfold Lane, Llay Industrial Estate, Llay near Wrexham, Clwyd, LL12 OPX, Wales/Cymru, UK. Phone: 0978-853-787.

801. Gray, Rockwell. 1994. A century of enterprise: St. Louis, 1894-1994. St. Louis, Missouri: Missouri Historical Society Press. xiv + 136 p. Illust. Company index. 26 x 33 cm. [28* ref]

• ***Summary:*** Contents: Foreword, by Dr. Robert R. Archibald, president, Missouri Historical Society. Preface, by William P. Stiritz, chairman and CEO of Ralston Purina (who is an historian at heart). Introduction, by Rockwell Gray. The growth of commerce in turn-of-the-century St. Louis. The modernization of a great industrial city. Revitalization and renewal in the twentieth century. Selected bibliography.

This is a history of business in St. Louis. Ralston Purina is one of the St. Louis companies whose history is discussed prominently in the book, with numerous large black-and-white photos (see p. ix, 22-24, 87, 101, 107).

Dr. Archibald, president of the Missouri Historical Society, notes at the end of his Foreword: "Finally, I wish to thank the Ralston Purina Company, now celebrating its hundredth year of business in St. Louis, for its generous

support for this project, further evidence of its continuing commitment to the prosperity and spirit of our city."

Page 22: "A bookkeeper and salesman for a small St. Louis feed store in 1893, William H. Danforth quickly became a partner when the Robinson-Danforth Commission Company was formed in 1894. By 1896, he had become president and controlling stockholder of the company, which produced mainly horse and mule feed from ground oats and corn. Danforth added to his product line a whole-wheat cereal called 'Purina Wheat' to suggest the purity and healthful qualities of the product. The name caught on, and the firm was renamed the Ralston Purina Company in 1902, also incorporating the name of a certain Dr. Ralston, an early advocate of whole-grain health foods. Simultaneously, Danforth adopted the now-famous checkerboard logo. He is shown here in a sales meeting with company employees." *Photograph, 1900. Courtesy of Ralston Purina.*

Page 23: "Shown in front of the company mill at Eighth and Gratiot streets, Ralston Purina wagons transported feed from the mill to railroad yards and local dealers." *Photograph, ca. 1910. Courtesy of Ralston Purina.*

Page 24: The simple but eye-catching checkerboard logo caught on quickly. In this early-twentieth-century photograph, a St. Louis feed store sold Checkerboard Chows, as advertised on the awning, storefront, and truck. *Photograph, n.d.* [*undated*] *Courtesy of Ralston Purina.*

Page 101: "On January 11, 1962, a huge blaze destroyed the last St. Louis mill of the Ralston Purina Company, ending the company's production within the city." "In 1956 Ralston introduced Purina Dog Chow, which became the market leader in just over a year. Purina Cat Chow followed in 1962 and was also successful." Address: St. Louis, Missouri.

802. Messina, Mark. ed. 1994. First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease: Abstracts. Chesterfield, Missouri: United Soybean Board. 27 p.

• ***Summary:*** This symposium was held on 20-23 Feb.

1994 at the Mesa Pavilion Hotel in Mesa, Arizona. It was organized by Mark Messina, PhD, and "Sponsored by soybean growers from Nebraska, Indiana, Iowa, and the United Soybean Board." The full proceedings (every paper about nutrition) of the conference will be published in the *Journal of Nutrition* [March 1995, Supplement]. For details see the announcement for the conference.

Pages 6-14 contain abstracts/summaries of 29 papers presented by various speakers; for each, the title, and speaker's name and address are given above the abstract. Pages 15-21 contain the abstracts of 29 posters or poster sessions, using the same format. Pages 22-27 contain a directory of the names and addresses of about 200-225 attendees.

Note: This international symposium was not mentioned in *Soybean Digest.* Address: Chesterfield, Missouri.

803. **Product Name:** Altima HP-20 Nutritious Beverage Powder [Plain, Chocolate, or Strawberry], and Altima FA-8 Nutritious Beverage Powder [Plain, Chocolate, Almond]. The Altima brand was changed to Take Care in about Nov. 1994.
Manufacturer's Name: Nutritious Foods, Inc. Wholly owned subsidiary of Protein Technologies International, Inc.
Manufacturer's Address: 4600 Chippewa, #281, St. Louis, Missouri 63116. Phone: 1-800-445-3350.
Date of Introduction: 1994 February.
Ingredients: Incl. Isolated soy protein, genistein.
How Stored: Shelf stable.
New Product–Documentation: Note: These are the world's first two commercial food products to contain genistein added as an ingredient.

Mail order catalog in the form of two leaflets distributed at the First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease held at Mesa, Arizona. 1994. Feb. "Altima HP-20 provides 20 gm of protein and 20 mg of genistein* per 8-ounce serving, with as few as 100 calories. (Footnote: * Genistein is a naturally occurring isoflavone, or plant tissue compound, found in soy. It is believed to have antioxidant and other anti-cancer properties). Altima HP-20 Nutritious Beverage Powder contains Supro brand Isolated Soy Protein..." made by Protein Technologies International, Inc. of St. Louis, Missouri. "For everyday use, simply stir one serving of Altima HP-20 into 8 ounces (1 cup) of water. Or mix with your favorite juices such as orange and grape; add to your favorite hot chocolate drink or hot coffee. Or use a blender to Altima HP-20 with bananas, strawberries, raspberries, blueberries, sliced peaches or pineapple."

"Altima FA-8 offers all of the essential nutrients of milk but with some significant things missing–cholesterol, lactose, and almost all of the fat. A source of high-quality protein, Altima FA-8 provides 8 grams of protein per 8-ounce serving... and only 90 calories. FA-8 also provides 8 mg of genistein* per 8-ounce serving."

Talk with Nutritious Foods Inc. 1994. March 4. This product was introduced at the conference in Mesa, Arizona, in Feb. 1994. Samples of HP-20 plain were offered to participants. It was never sold before that time. It is currently sold only by mail order. Nutritious Foods Inc. is a wholly owned subsidiary of PTI, established in Feb. 1994 to market its products (such as Supro) to consumers. PTI has not previously sold retail products to consumers. FA-8, which is basically a milk substitute, has less protein and genistein per serving than HP-20.

804. **Product Name:** AB-20 Soyfood Ingredient (Protein Powder), and SF-5 Dietary Fiber.
Manufacturer's Name: Nutritious Foods, Inc. Wholly owned subsidiary of Protein Technologies International, Inc.
Manufacturer's Address: 4600 Chippewa, #281, St. Louis, Missouri 63116. Phone: 1-800-445-3350.
Date of Introduction: 1994 February.
Ingredients: Incl. Isolated soy protein, genistein.
How Stored: Shelf stable.
New Product–Documentation: Talk with Nutritious Foods Inc. 1994. March 4. AB-20 is the same product as HP-20 minus the flavoring and Aspartame. It is very bland, and can be used as a food ingredient to add protein to any home recipe–such as a baking mix, a soup, sauce, gravy, or casserole. Body builders would be more likely to add HP-20 to their shakes because of its flavor. SF-5 is just Fibrim; it can be used to add dietary fiber to any recipe. Fibrim contains both soluble and insoluble fiber. They have a brochure for the Altima line, which talks about each product and the health benefits associated with them.

805. Nutritious Foods, Inc. 1994. Altima (Mail order catalog). St. Louis, Missouri. 2 p.
• ***Summary:*** This mail order catalog, in the form of two leaflets, was distributed at the First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease held at Mesa, Arizona. Products listed: Altima HP-20 and Altima FA-8, each a nutritious beverage powder, available in plain, strawberry, or chocolate flavors. Address: 4600 Chippewa, #281, St. Louis, Missouri 63116. Phone: 1-800-445-3350.

806. Ralston Purina Co. 1994. The Ralston chronicle: 1894-1994. A century of managing change. St. Louis, Missouri. 32 p. Illust. 26 x 33 cm.
• ***Summary:*** This excellent company history, which contains more photographs than text, begins with company "Milestones" (1894-1994) in the inside front cover, followed by an Introduction by Bill Stiritz, Chairman and CEO. For each "era" in the company history is given the years encompassed by that era, a one-line description of the era, a description of the key events of that era–both within the

company and for the United States, and photographs taken during and capturing key parts of that era.

Milestones (inside front cover): "1894–Robinson-Danforth Commission Company is founded in St. Louis. 1896–Tornado destroys original feed mill. 1898–William H. Danforth assumes a leadership position and enters the cereal business with the endorsement of 'Dr. Ralston.' 1902–The name of the company is changed to Ralston Purina Company to reflect more accurately the business–where 'Purity is Paramount." 1902–Ralston adopts the famous Checkerboard logo. 1904–Ralston gains exposure at the 1904 World's Fair in St. Louis. 1926–Ralston opens its experimental farm at Gray Summit, Missouri. 1926–Ralston purchases the Rye-Krisp plant in Minnesota. 1932–Donald Danforth Sr. is named President of Ralston [near the start of the Great Depression]. 1937–Wheat Chex is introduced. 1950–Rice Chex is introduced. 1955–Founder and Chairman of the Board William H. Danforth passes away on Christmas Eve..."

1894-1910: Agricultural volatility and reform, and manufacturing might. Color photos show: (1) Company letterhead in about 1896. Across the top: "Familiar faces at your grocers–Ralston Health Club Breakfast Food, Purina Health Gluten–Whole Wheat Flour, Century Health PanKake Flour, Ralston Health Club Barley Flour, Ralston Infant Food. "Fine foods build fine minds." (2) Poster (red and black on beige) titled "Ralston Purina Foods" with caption "'Dr. Ralston' inspires a line of whole-wheat breakfast foods–'Where Purity is Paramount.' We see the front panel of: Ralston Breakfast Food. Ralston Cereal Coffee. Whole wheat flour for Brain bread (sack). Purina PanKake Flour. Ralston Hominy Grits. Ralston Kornkins–Old fashioned corn meal. Ralston Health Oats. Ralston Barley Food. Black and white photos show: (1) Women working in a factory making Ralston cereals, with rope drives and pulleys. (2) A child by the fire dreaming of the morning and Kellogg's toasted Corn Flakes.

1894-1910: At the World's Fair in St. Louis ("The Louisiana Purchase Exposition"). "Danforth's fascination with fitness and health inspires the endorsement of 'Dr. Ralston, a health guru with 800,000 followers. 'In a million homes,' a 1902 advertisement boasts, 'Ralston Purina

"Dr. Ralston" inspires a line of whole-wheat breakfast foods — "Where Purity is Paramount."

Cereals find a welcome home at the breakfast table.'" "When the Louisiana Purchase Exposition comes to St. Louis in 1904, Ralston celebrates its unlikely first decade in a colorful way. Checkerboard boxes with handles are distributed to fairgoers, and the Purina booth serves Ralston Breakfast Food and pancakes made with Purina PanKake Flour." A color poster titled "Ralston Purina Foods" shows a miller tossing a happy little girl into the air. A package of Ralston Health Breakfast Food is shown. A dark brown on beige poster is titled "You will never forget the World's Fair and your Ralston Box. Begin to Live–now!

Note: A little additional history: 1894–The three founders were George Robinson, Will Andrews, and William Danforth. They started with $12,000 in borrowed capital in a storefront near the St. Louis riverfront. Their horse and mule feed–a combination of corn, oats, and molasses–was mixed by shovels then poured into 175-pound sacks, which were then sewn shut by hand."

Danforth was a man of strong personal convictions. Believing that the 'ingredients' of life were body, mind, personality, and character, he strove to balance all four in his own life and to help his employees do the same. A who felt passionate about healthy living, he boasted that he had never missed a day of work due to illness. It was, in part, Danforth's interest in health that helped him succeed in diversifying from animal feed into consumer goods.

In the late 1800s, most whole-wheat flour had the germ removed, to extend its shelf-life. "In 1898, while traveling in Kansas, Danforth met a miller who had developed a way to prevent rancidity in whole wheat. Packaging the miller's wheat, Danforth named it 'Purina Whole Wheat Cereal,' and began selling it to St. Louis grocers. The name Purina was derived from Robinson-Danforth's company slogan: 'Where purity is paramount.' To promote his new cereal, Danforth approached one of the most famous health spokespersons of the day, a Dr. Ralston. Ralston, whose precepts were followed by thousands, agreed to endorse the cereal only if it were named after him. Danforth quickly renamed the product 'Ralston Wheat Cereal,' and the campaign began. By 1902, there was a whole line of Ralston cereals boasting various health benefits."

Page 20: In 1961 Ralston Purina registers and uses its first food protein trademark: *Edi-Pro*. Protein's *SUPRO* line is introduced in 1967. In 1969 Ralston invests in the Keystone ski operation. Address: St. Louis, Missouri.

807. Ralston Purina Company. 1994. 100th anniversary video (Color videotape). St. Louis, Missouri. 30 min. *
• ***Summary:*** This videotape, describing the company's history, was first shown publicly on 3 Feb. 1994 at the shareholders meeting in St. Louis. According to Joe Hanrahan of Checkmark Communications (Ralston Purina's in-house advertising firm), the video's writer and producer, the film is composed entirely of existing photographs and film or video footage, accompanied by a sound track. It places Ralston Purina's history firmly in the context of what was happening throughout the world and the United States, as well as St. Louis. William P. Stiritz, the Chairman of the Board, CEO, and President of Ralston Purina, is an historian at heart. Address: Checkerboard Square, St. Louis, Missouri.

808. Nutritious Foods, Inc. 1994. Protein Technologies International has started a new subsidiary to sell PTI products by mail order to consumers (Interview). *SoyaScan Notes.* March 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Nutritious Foods, Inc., a wholly owned subsidiary of Protein Technologies International (PTI), Inc., was established in Feb. 1994 to market PTI products (such as Supro isolated soy protein and Fibrim soy fiber) to consumers. Formerly, PTI has not sold retail products to consumers. The new company now sells 4 products, each introduced in Feb. 1994: (1) Altima HP-20 Nutritious Beverage Powder (Plain, Chocolate, or and Strawberry flavors, with 20 gm of protein and 20 mg of genistein per 8-ounce serving); (2) Altima FA-8 Nutritious Beverage Powder (Plain, Chocolate, and Almond flavors, with 8 gm of protein and 8 mg of genistein per 8-ounce). Note: These are the world's first two commercial food products to

contain genistein added as an ingredient, (3) AB-20 Soyfood Ingredient (Protein Powder, to add protein to home recipes), and SF-5 Dietary Fiber (to add fiber to home recipes). Address: 4600 Chippewa, #281, St. Louis, Missouri 63116. Phone: 1-800-445-3350.

809. Johnston, Patricia K. ed. 1994. Second International Congress on Vegetarian Nutrition: Proceedings of a symposium held in Arlington, Virginia, June 28–July 1, 1992. *American J. of Clinical Nutrition* 59(5S):1099S-1262S. Supplement. May.
• ***Summary:*** Patricia Johnston is the guest scientific editor, with assistance from Bert C. Connell, Kenneth I. Burke, Gary Hopkins, and Joan Flynn. Sponsors: Worthington Foods, Inc. Wenger Manufacturing Co. Sanitarium Health Food Co. Rykoff/Sexton, Inc. Kettering Memorial Hospital Foundation. Loma Linda University. Loma Linda University Medical Center. Seventh-day Adventist Dietetic Association. Health Department–Seventh-day Adventist Church. Pacific Health Education Center. Protein Technologies International. Quaker Oats.

Most of the 24 papers by various authors are cited separately. Address: Dep. of Nutrition, Loma Linda Univ., Loma Linda, California.

810. Rutgers University–Office of Ongoing Professional Education. 1994. Designer foods III. Phytochemicals in garlic, soy, and licorice. Research update and implications (Brochure). New Brunswick, New Jersey. 6 p.
• ***Summary:*** The first two designer foods symposia were held in 1990 and 1993. This symposium will be held on 23-25 May 1994 at Georgetown University Conference Center, Washington, DC. It is sponsored by Rutgers University. Dr. Clare Hasler is the director of the Functional Foods for Health (FFH) program/group at the University of Illinois at Urbana. Other co-directors are Phyllis Bowen, John Erdman, etc. They are doing research on fortifying foods with phytochemicals.

Session five: Phytopharmacology of soy food forms–Dr. Mark Messina. Papers (3:15 to 5:20): Phytochemistry of soy horticultural and processing procedures, by Dr. Doyle Waggle. Phytochemicals in soy, by Dr. James Clark. Pharmacology / toxicology of soy phytochemicals, by Dr. Mark Messina. Role of soy food forms in human prevention, Dr. Takemichi Kanazawa. Address: New Brunswick, New Jersey.

811. Duggan, David. 1994. Problems with the Flier patent assigned to Ralston Purina (Interview). *SoyaScan Notes.* June 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** David is an anti-trust attorney, not a patent attorney. On 5 July 1990 the federal circuit court of appeals, which hears appeals concerning patent cases in the United States, ruled that Ralston Purina Company had procured the famous Flier patent (No. 3,940,495. Feb. 24, 1976. Application filed 17 Jan. 1973) by fraud on the patent office. The case is number 909 F.2D 1494 (Staley vs. Ralston Purina).

Price Heneveld (a law firm of patent lawyers in Grand Rapids, Michigan) apparently represented Ralston Purina on both the original application and in subsequent litigation.

There was apparently earlier litigation involving Far-Mar-Co, Staley, Cargill, etc. The first case was apparently Ralston Purina vs. Far-Mar-Co of Kansas. He believes that Ralston Purina filed the lawsuit in Oct. 1976. The judgment was in or about 1981–showing the slow pace of federal litigation. The case was tried in the 10th federal judicial circuit (district of Kansas), which is statistically the worst, in the sense that more cases are later overturned from that circuit by the U.S. Supreme Court. He finds it interesting that Ralston chose to file its first case in that circuit. There is law to the effect that if you engage in fraud on the patent office and then use that fraud in an attempt to control or monopolize the relevant market, that is illegal, and may be the basis for a anti-trust lawsuit.

In 1976, after Ralston Purina won the case against Far-Mar-Co in Kansas, Ralston started sending demand letters to many other companies that were supposedly infringing this patent–including Staley, Cargill, Central Soya, Griffith Laboratories, Miles Laboratories, Nabisco, Anderson Clayton, General Mills, Nestle, Riceland Foods, Dawson Mills, General Foods, Grain Processing Corp., etc. Ralston was protecting its rights.

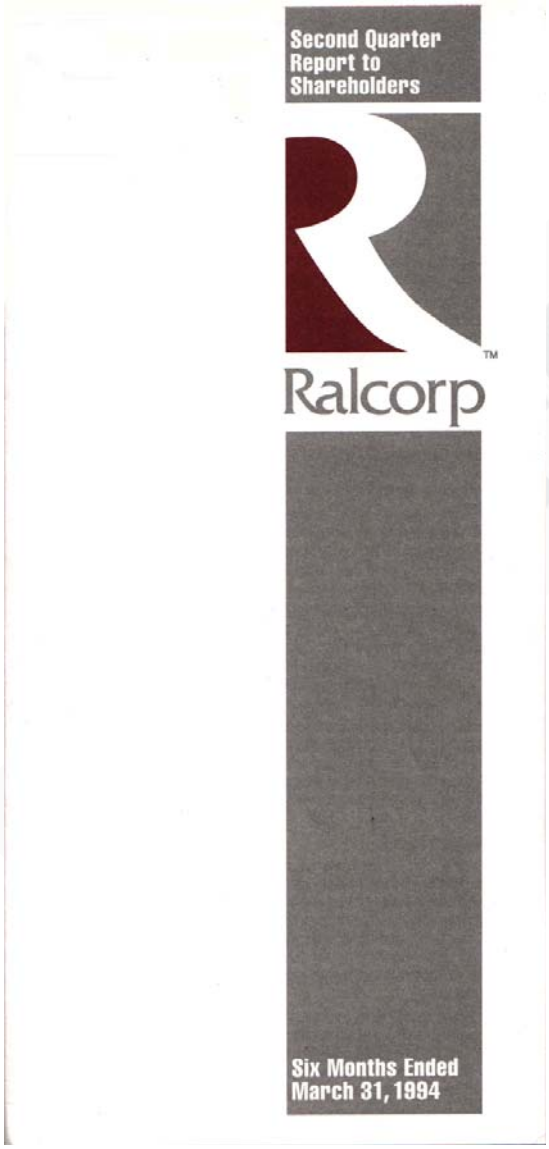
In 1985 the Far-Mar-Co case was upheld, saying that Ralston Purina indeed had the rights to the Flier patent (Case no. 772 F.2D 1570). However Far-Mar-Co did not raise the issue of fraud. So it took another 5 years for the court to reach that question–which it decided in 1990.

David's main questions are: (1) Is textured vegetable protein [actually textured soy flour] a distinct segment of some relevant market? (2) Did Ralston Purina try to exclude other competitors from that market. (3) Were there substitutes for the product on which Ralston Purina had a patent? David's firm is in the process of representing a former player in the industry, a major trading company; they may represent a consortium of companies that were effected by the Ralston Purina's "ill gotten gains."

Update: Talk with David Duggan. 1996. April 26. His firm was representing the Lauhoff Residuary Trust in a case against Ralston Purina Co. Lauhoff is a grain company in Danville, Illinois. They were sued by Ralston, which claimed that they had infringed the patent without paying royalties. Lauhoff initially disregard the demand letter threatening a suit. Then they sold the company, but did not properly disclose to the buyers that a lawsuit was pending or had been threatened. Lauhoff then lost the case against Ralston in about 1986 or 1987. So the new owners sued the formers owners for failure to disclose. David argued

that the amount paid by Lauhoff to settle the lawsuit was fraudulently paid. The case, which was very complex and convoluted, was thrown out of court by the judge because the statute of limitations had expired–they brought the case too late. Moreover, the patent was nearing its expiration date, or had expired. David believes that there was some pretty serious frauds on the courts in litigation to enforce the patent. David tried to present a RICO (Racketeering Influenced and Corrupt Organizations) Act argument. It provides for triple damages. David tried to approach some of the smaller players like Far-Mar-Co but he did not approach ADM. The patent law was recently changed to 20 years from the point of application; formerly it was 17 years from the point of grant. Address: 321 S. Plymouth Court, Suite 800, Chicago, Illinois 60604. Phone: 312-663-0670.

812. Ralcorp Holdings Inc. 1994. Second quarter report to shareholders. St. Louis, Missouri. 12 panels. 24 x 12 cm.



• ***Summary:*** On 31 March 1994 Ralston Purina Company completed the spin-off of Ralcorp Holdings, Inc., which is comprised of Ralston Foods cereal ("Chex" brand), baby food ("Beech-Nut" and "Stages"), "Rye-Krisp" crackers and cookies, Bremner (largest maker of private label crackers and cookies), plus Keystone and Breckenridge ski resorts in Colorado. Cumulatively, these operations represent sales of approximately $1 billion.

Note: On 6 Feb. 1997 General Mills acquired Ralcorp's cereal and snack operations for cash. Address: P.O. Box 618, St. Louis, Missouri 63188-0618. Phone: (314) 982-5900.

813. Dwyer, Johanna; Goldin, B.R.; Saul, N.; Gaultieri, L.; Barakat, S.; Adlercreutz, H. 1994. Tofu and soy drinks contain phytoestrogens. *J. of the American Dietetic Association* 94(7):739-43. July. [45 ref]

• ***Summary:*** Phytoestrogens, compounds with weak estrogenic activity such as isoflavones, coumestans, and resorcyclic acid lactones (lignans), are found in several dozen plants eaten by humans, including some soy products. As the intake of soyfoods rises in the American diet, the activity of phytoestrogens may reach biologically effective levels. Phytoestrogens appear to have both estrogenic and antiestrogenic activity. They may also help prevent cancer. "Anticancer activity has been demonstrated by inhibition of tumor cell growth. Also, they appear to act in other ways that may inhibit tumor formation and growth, including inhibition of tyrosine kinase; inhibition of cell growth stimulated by epidermal growth factor; inhibition of steroid aromatase kinase and of DNA topo-isomerase; elevation of sex-hormone-binding globulin; and possibly lowering of endogenous estrogen levels."

Of the various products tested, tofu contained the highest level of isoflavones. Different brands of tofu contain from 73.0 to 97.5 micrograms per gram (wet weight) of the phytoestrogen daidzein and 187.4 to 215.9 micrograms of genistein per gram. By comparison, the soy drink First Alternative (made by Protein Technologies International of St. Louis, Missouri) contains only 7.0 micrograms of daidzein per gram of weight and 21.0 micrograms of genistein. The two soy-based specialty formulas tested were nearly devoid of these two isoflavones.

The tofu products tested were: Kikkoman firm, Nasoya soft, Azumaya soft, and Vitasoy silken. The soy-based specialty formulas were Jevity Isotonic, Enrich, and Glucerna–each made by Ross laboratories, Columbus, Ohio.

Note: What is the isoflavone content of a typical 130 gm serving of tofu? 9.5 to 12.7 mg of daidzein and 24.3 to 28.1 mg of genistein.

A sidebar (p. 741) features an interview with Johanna Dwyer and Nora Saul (both women); their hospital happens to be located in Boston's Chinese community. "Journal: What are phytoestrogens? How do they function? Dwyer: Phytoestrogens such as isoflavonoids and lignans, are

compounds found in certain plants that are inherently active or are converted by human intestinal microflora into biologically active, hormone-like substances. Phytoestrogens exert weak estrogenic activity, most likely attributable to their ability to activate estrogen receptors in cells such as those in the vagina, uterus, and mammary glands. Depending on the biological environment and their chemical structures, phytoestrogens can function as either estrogens or antiestrogens.

"For example, in premenopausal women, who have high levels of circulating estrogens, phytoestrogens may function as antiestrogens. This is because phytoestrogens that bind weakly at estrogen receptor sites may compete for a place on the estrogen receptors with endogenous estrogens, which have much stronger affinity for the receptor sites. On the other hand, in postmenopausal women, who have low levels of endogenous estrogens, phytoestrogens may function as estrogens. Although phytoestrogens only bind weakly at estrogen receptor sites, there is little other estrogen in circulation, so phytoestrogens do bind to estrogen receptors At present, however, this explanation is based on hypotheses and must be tested."

"Journal: Why are these substances important biologically? Dwyer: A growing body of research suggests that phytoestrogens may reduce risks of certain cancers, especially hormone dependent diseases such as breast and prostate cancers." Address: 1. Prof. of Nutrition at the Tufts Univ. Schools of Medicine and Nutrition and director of the Frances Stern Nutrition Center, New England Medical Center, Boston, Massachusetts.

814. Ralston Purina Co. 1994. Third quarter report to shareholders. St. Louis, Missouri. 23 p. 21 x 15 cm.
• ***Summary:*** See next page. This year Ralston Purina is celebrating its 100th anniversary. William P. Stiritz is Chairman and CEO.

Business segments (p. 10): "Sales for the soy protein products business increased on strong volume in food protein products. Operating profit of the soy protein products business increased as higher volume was partially offset by higher raw material costs and unfavorable foreign currency exchange rates." Address: Checkerboard Square, St. Louis, Missouri 63188-0618. Phone: (314) 982-3002.

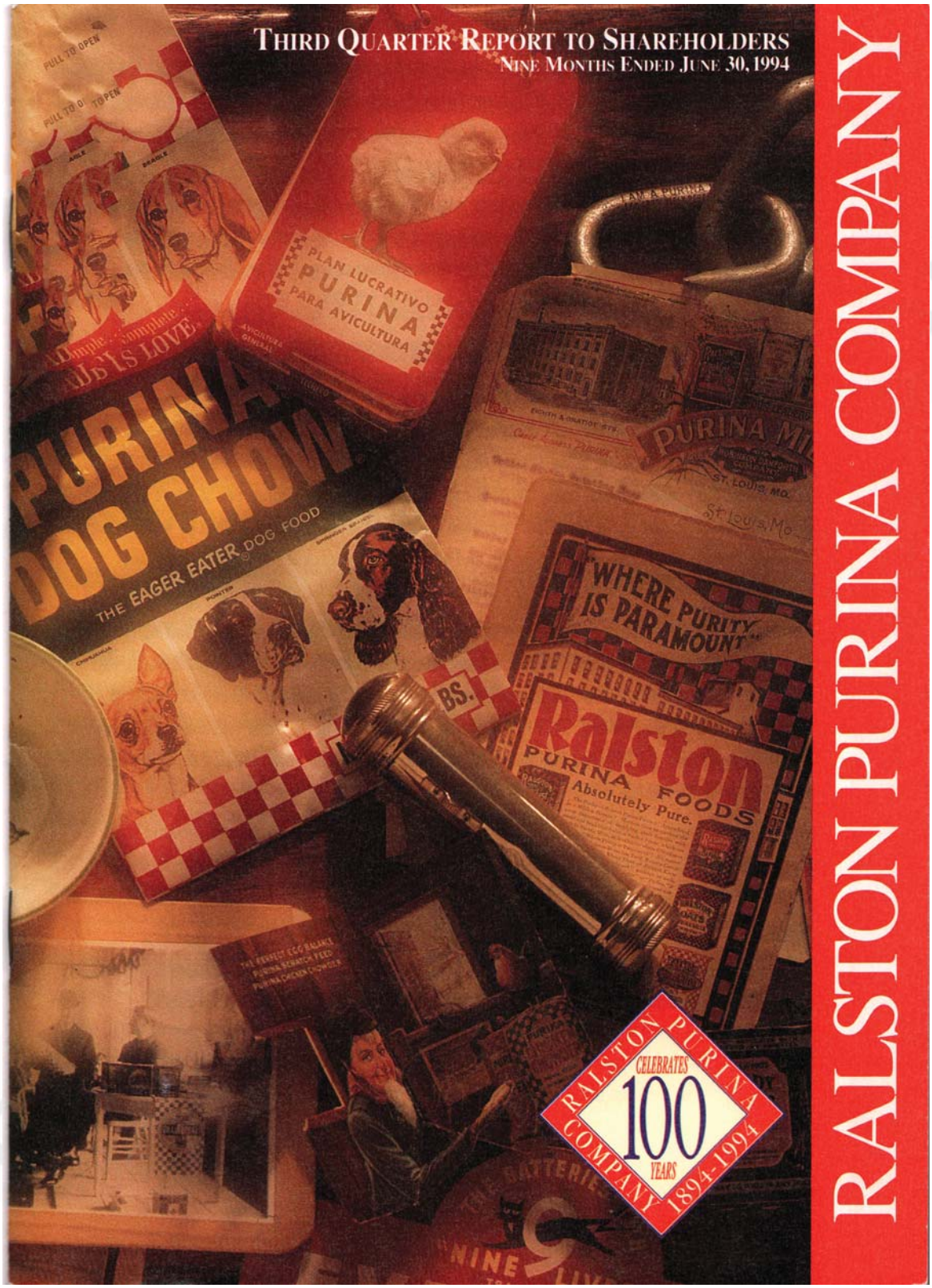
815. Bennink, Maurice. 1994. Research on the effects of genistein in preventing cancer (Interview). *SoyaScan Notes.* Oct. 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Prof. Bennink is conducing a double-blind clinical trial on 60-80 people (4 groups of 15-20 people each of whom have polyps) for 2 years. The first year has almost passed. They are feeding a soy protein isolate made by Protein Technologies International. This isolate contains added genistein to make the genistein content approximately equal to that contained in soy protein before it is isolated. They are looking to see if it reduces some biomarkers that are indicators for the risk for colon cancer. That is, they want to see if it reduces the risk for colon cancer.

The four groups are (1) a negative control which has no dietary intervention, (2) a positive control group which gets calcium caseinate; calcium is also supposed to reduce the risk, (3) a group consuming PTI's isolate which also has calcium added; and (4) the same isolate without any calcium. He did not use tofu (minimally processed soy protein) in one of the groups because (1) it is harder to get people to accept tofu; and (2) the study is double blind, so neither the patients nor the researchers know which group is getting which diet. Nothing has been published yet.

He does not know of anyone breeding soybeans to increase the genistein content. The interest level is not high enough yet. He has found a fair amount of variation in the isoflavone content among soybean varieties. In raw soybeans, about two-thirds of the genistein has the malonyl glucose attached to it and the other third has the glucose attached to it. He suspects that the glucoso- and the melane-glucoso genistein doesn't get hydrolyzed in the small intestine so it passes to the colon and then becomes biologically active in the colon because bacteria liberate it there. He will be testing this theory in several years. Address: Dep. of Food Science and Human Nutrition, Michigan State Univ., East Lansing, MI 48824. Phone: 517-353-9512.

816. Jennings, Richard. 1994. New developments at Protein Technologies International (Interview). *SoyaScan Notes.* Nov. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Richard has just heard from a reliable source that Paul Hatfield, president of PTI, left last week. A new president will soon take his place. Address: Santa Fe, New Mexico.

817. Nutritious Foods, Inc. 1994. Protein Technologies International's Altima line is now being renamed Take Care (Interview). *SoyaScan Notes.* Nov. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Nutritious Foods, Inc., a wholly owned subsidiary of Protein Technologies International (PTI), Inc., was established in Feb. 1994 to market PTI products. Nutritious Foods sells a line of four consumer soy products made by PTI, all under the Take Care brand (which used to be Altima) (1) Take Care First Alternative is a soy-based beverage and alternative to milk sold in both powdered and liquid form. The liquid is sold only in Arizona. The powder is sold in a 16-ounce can (13-20 servings per can) in 3 flavors–plain, almond, and chocolate. Shelf life of one year unrefrigerated. (2) Take Care High Protein Nutritious Beverage Powder (soy based, in plain, strawberry, and chocolate flavors; formerly HP-20). (3) Take Care Nutritious Food Ingredient Product (similar to the Beverage Powder,



but used more for cooking). (4) Take Care Dietary Fiber Product (Fibrim). Their toll-free phone number is 1-800-445-3350. Address: 4600 Chippewa, #281, St. Louis, Missouri 63116. Phone: 1-800-445-3350.

818. *Soyafoods* (*ASA, Europe*). 1994. In depth: Food Ingredients Europe. 5(3):6-7. Autumn.
• ***Summary:*** Food Ingredients Europe, the international exhibition of food ingredients, was held this year on Oct. 4-6 in London, England, at Earl's Court. This was the biggest FIE in its 9-year history, with more than 500 exhibitors. The American Soybean Association (ASA) had a very successful booth at the U.S. Pavilion. One of the most interesting new products was Befine, from a company named VPS Europe. This unique, patented soya-based granule, sold fresh or frozen, mimics the texture of ground meat but it is not TVP or textured soy protein concentrate. Made from organic whole soybeans, it contains 18% protein. ADM Protein Specialties Division introduced their new WMR4, a dry soymilk based on soy protein isolate. Protein Technologies International exhibited Supro brand Isolated Soy Protein and Fibrim brand soy fiber. A line of texturized Danprotex (H-29, B-39, and F) and functional Danpro (DS) soy protein concentrates were launched by Central Soya Aarhus A/S, a member of the Eridania/Beghin-Say agro-industrial group. Kikkoman Trading Europe exhibited their naturally fermented soy sauces in liquid and dehydrated dorms. Other soy sauce exhibitors included Henry Lamotte GmbH and Mandarin Soy Sauce Inc. Loders Croklaan exhibited a new soya concentrate line. Alsace-based Sojinal, which supplies soy products to the food industry, exhibited along with their new sister company, Sevenday. SFI Netherlands BV (SFI = Special Food Ingredients, formerly Solnuts Inc.) exhibited their line of dry roasted soynuts. Also present were Stern Lecithin and Soja GmbH & Co. KG, Sapa and Dafa Associès (makers of Dafasoy for the food, dietetic, and pharmaceutical industries), Soya Mainz & Co. KG and Solbar Hatzor (soy protein concentrates), Dalgety Food Ingredients International (with the former Spillers Premier Products), Lucas Meyer GmbH (with a phosphatidyl choline lecithin powder and a de-oiled lecithin for frozen doughs), Edelsoja GmbH, Celia SA, Freeze-Dry Foods GmbH, and GMB Proteins (a division of Bush Boake Allen Ltd.). The address and fax number of each company is given.

819. Roberts, Rosemary. 1994. Maker welcomes call for research [into safety of soy-based infant food]. *Northern Advocate* (*Whangarei, New Zealand*). Dec. 8. p. 1.
• ***Summary:*** Douglas Pharmaceuticals produces Karicare brand soy-based infant formula; according Dr. John Birbeck, the company's private consultant, Douglas is the only New Zealand company making such a product. He believes other similar foods are being imported. Birbeck says the company welcomes more research on the oestrogen content of its soy-based product, and says it is likely the industry will fund the study.

Columbit New Zealand, the company which imports soy isolates to New Zealand, also backs the call for more research, and is confident research will clear its product. Columbit is a partner of the large international corporation Protein Technologies [International]; principals of that U.S.-based company said that they would respond to any requests for information about their products.

Sanitarium Foods [of New Zealand and Australia] does not produce soy-based infant formulae, but does use soy protein isolates in some of its products. The company's technology superintendent, Graham Jackson, said his company was keeping an eye on the situation.

A large photo shows Valerie and Richard James at their New Zealand aviary, with several large white birds, soy bird food, and reports on soy. A similar article appeared in the *Marlborough Express* on this same day.

820. Limpert, Bill. 1994. The Soy Protein Council and Cargill, Inc. (Interview). *SoyaScan Notes.* Dec. 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** For the last 8-10 years the Soy Protein Council (which was founded in 1971) has had only 3 full members: ADM, Cargill, and Central Soya. As the number of members has decreased, the dues that each member company pays has increased. Protein Technologies International does not belong and pays no dues. He does not know why PTI does not belong, yet they participate in some meetings when there is specific legislation that affects them, and they also participate in lobbying on behalf of soy proteins.

The only soy protein products that Cargill makes are defatted soy flour, textured soy flour, and flavored textured soy flour (as for Schilling or McCormack). These products, which are all produced at one plant in Cedar Rapids, Iowa, often end up as ingredients in consumer food products, but Cargill (like ADM) does not sell any consumer products. Very little Cargill products end up in pet foods any more.

A company that makes full-fat soy flour is HiPro Food Products, Inc., 775 Colorado Ave. South, Minneapolis, Minnesota 55416 (Phone: 612-545-0151; Bob Cross, president). They have a plant in New Germany, Minnesota.

Update: 1997 Oct. 16. The Soy Protein Council still only has the same three full members. PTI still has not joined. Address: Research Chemist, Technical Services Manager, Cargill, Inc., Research Dep., P.O. Box 5699, Minneapolis, Minnesota 55440.

821. *INFORM* (*AOCS*). 1994. Soy protein ventures planned in China. 5(12):1341. Dec.
• ***Summary:*** "Japanese firms have announced participation in two joint ventures producing soy protein foods in China.

"Chirin Fuji Protein Co., to be 51% owned by Fuji Oil Co. of Japan, will manufacture soy protein in Song Yuan City

in Chirin. Other partners will include Chu Itoh Co., Protein Technologists Inc. [sic, Protein Technologies International, owned by Ralston Purina], and Song Yuan City. Initial capital has been announced as ¥792 million (approximately $7.9 million).

"Products will be aimed primarily at the Chinese market, but some may be exported to Japan."

822. Ralcorp Holdings Inc. 1994. Annual report. The freedom to focus, the size to prosper. St. Louis, Missouri. 37 p. 28 cm.
• ***Summary:*** See next page. "This is the first Annual Report to Shareholders of Ralcorp Holdings, Inc., a company that began doing business as a publicly held corporation on April 1, 1994, following the spin-off from Ralston Purina Company of Ralston Foods breakfast cereals and snacks, Beech-Nut baby food," Bremner Inc. (the largest producer of private label crackers and also a producer of specialty cookies for the grocery industry), Keystone/Arapahoe Basin and Breckenridge ski resorts in the Colorado Rockies (the second and third most popular ski resorts in North America in 1994), and American Redemption Systems Inc. (ARS), a full-service promotional fulfillment and coupon management company. "The spin-off, however, did more than merely separate assets from one company and place them with another; it created a new company with a powerful century-old heritage."

The company posted pro forma year-end sales for 1994 of $987 million compared to $932.5 million the previous year. Earnings increased 13% in fiscal 1994 to $43.0 million from 38.2 million. Richard A. Pearce is CEO and President, Joe R. Micheletto is CEO and Chief Financial Officer. Directors include William H. Danforth (age 68, Chancellor of Washington University), and William P. Stiritz. Address: P.O. Box 618, St. Louis, Missouri 63188-0618. Phone: (314) 982-5900.

823. Ralston Purina Company. 1994. Annual report to shareholders. St. Louis, Missouri. 117 p.
• ***Summary:*** The cover states: Refocusing for worldwide growth. This report contains four sections. Financial overview, Ralston Purina Group (RPG), Continental Baking Group (CBG), and Ralston Purina Company. During 1994 the company made an important structural change with the spin-off of Ralcorp Holdings Inc., which began independent operation on 1 April 1994. The on 15 November 1994 Ralston signed a letter of intent to sell its international agribusiness operations to PM Holdings Corporation, the parent company of Purina Mills, Inc.

Due to the complexity generated by fiscal 1994 transactions, it is most useful to discuss Ralston Purina Group financial results for the year on a pro forma basis– excluding results of spun-off businesses, restructuring charges, and other unusual items. RPG pro forma sales for 1994 were $5,236 million, up 4.2% from $5,024 million in 1993. Net earnings in 1994 were $266.4 million, down 4.0% from 277.3 million in 1993.

Officer changes: Paul Hatfield, CEO and President of Protein Technologies International, announced his plans to retire during the 1995 fiscal year. Paul joined the company in 1959. He will be succeeded by Jay W. Brown, Chairman and CEO of Continental Baking Co. Page 21 gives financial information for each RPG business segment. Sales of soy protein products grew from $221.6 million in 1989, to $261.8 million in 1990, dropping slightly to $255.0 million in 1991, then rising to $289.9 million in 1992, to $293.6 million in 1993, and to $322.1 million in 1994 (up 9.7% over 1993).

Operating profit on soy protein products grew from $60.6 in 1992, to $61.7 million in 1993, to $66.9 million in 1994 (up 8.4% over 1993). Address: Checkerboard Square, St. Louis, Missouri.

824. Jorgensen, Janice. 1994. Encyclopedia of consumer brands: Consumable products. Vol. 1. Detroit, Michigan: St. James Press. 681 p. See p. 114-15. Illust. 29 cm. *
• ***Summary:*** "Cleary [1981] reports that Dr. Ralston developed a following of 800,000 people." His real name was Albert Webster Edgerly. Address: Gale Group.

825. Gibson, Richard. 1995. Ralston's Stiritz continues transforming his company: Interstate Bakeries deal would cap a long succession of sales and acquisitions. *Wall Street Journal.* Feb. 10.
• ***Summary:*** A sidebar at the center of the article titled "Reshaping Ralston" gives a chronology of key Stiritz years and events at Ralston Purina:

"1981: William P. Stiritz named CEO

"1982: Company discontinues mushroom operations

"1983: Sells tuna fleet, European pet foods, dinner-house restaurants

"1984: Buys Continental Baking [Twinkies and Wonder Bread] from ITT for $475 million

"1985: Sells Jack-in-the-Box restaurants for $450 million

"1986: Acquires Eveready Battery from Union Carbide for $1.4 billion

"1986: Acquires Drake Bakeries from Borden for $115 million

"1986: Sells Purina Mills to British Petroleum for $545 million

"1987: Sells Drake Bakeries for $176 million

"1988: Sells Van Camp seafood business for $260 million

"1989: Acquires Beech-Nut baby food from Nestle for $55 million

"1989: Acquires Cofinea battery business in France for $160 million

RALCORP HOLDINGS, INC.

the freedom to focus...the size to prosper...

1994 ANNUAL REPORT

Ralcorp™

"1993: Acquires Gates Energy Products rechargeable battery business

"1993: Creates separate stocks for baking, pet foods units

"1994: Spins off cereals, baby food, ski resorts as Ralcorp Holdings

"1995: Agrees to swap Continental for Interstate Bakeries stake.

If that deal is finalized, Ralston Purina would, in essence, be in two big businesses–pet foods and batteries. Ralston owns 42% of the dry dog food market and 45% of the dry cat food market in the USA.

An portrait illustration (dot-style) shows William P. Stiritz, who has fundamentally reshaped Ralston Purina. Address: Staff Reporter of the WSJ.

826. Kirk, Bruce. 1995. Re: Soy proteins–Article and editorial comment on "toxicity." Letter to Martin J. Edwards, New Zealand Ministry of Health, March 29. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Please find attached an article which appeared in last week's 'Rural News' and editorial comment related to 'toxicity' of soy beans and further processed products.

"This article is potentially damaging to the entire soy industry and makes inference to harmful effects of consumption of refined soy proteins eg [sic, e.g.,] isolated soy proteins in areas of human health without any credible scientific support."

"In summary we find the article extremely biased, defamatory of all soy products and very critical of the Ministry of Health. We have also already received concerned response from several of our key users of Supro isolated soy proteins." Address: Columbit [New Zealand] Ltd., 33A Rennie Dr., Mangere, P.O. Box 29093 Greenwoods Corner, Auckland 3, New Zealand.

827. Messina, Mark; Erdman, John W., Jr. eds. 1995. First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease: Proceedings from a symposium held in Mesa, Arizona, on February 20-23, 1994. *J. of Nutrition* 125(3S):567S-808S. March. Supplement.
• ***Summary:*** This symposium was organized by Mark Messina, PhD, and sponsored by Protein Technologies International, the soybean growers from Nebraska, Indiana, and Iowa, and the United Soybean Board.

34 papers by various authors (each cited separately), were presented at this conference. They were arranged under the following categories. Introduction. Overview of soybean processing and products. Soy intake and cholesterol reduction. Soy and cholesterol reduction: Hypothesized mechanisms. Soy and heart disease prevention: Potential mechanisms unrelated to cholesterol reduction. Potential public health impact of soy protein. Overview of diet and cancer. Soy intake and cancer risk: Animal and epidemiologic studies. Nonisoflavone soybean anticarcinogens. Soybean isoflavones and cancer risk. Anticancer effects of genistein. Summary. Abstracts. Address: 1. 1543 Lincoln St., Port Townsend, Washington 98368; 2. Div. of Nutritional Sciences, Univ. of Illinois, Urbana, IL 61801-3852. Phone: 360-379-9544 (Messina).

828. Petrakis, N.; Wiencke, J.; Coward, L.; Kirk, M.; Barnes, S. 1995. A clinical trial of the chemopreventive effect of a soy beverage in women at high risk for breast cancer (Abstract). *J. of Nutrition* 125(3S):800S. March. Supplement. First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease.
• ***Summary:*** It has been proposed that the isoflavone genistein is responsible for the low rate of breast cancer observed in women from Southeast Asia. To evaluate this hypothesis, a pilot study for a clinical trial of the chemopreventive properties of soy protein is being conducted in American women at high risk for breast cancer. Fifty such premenopausal women, previously studied at UCSF, have been recruited and are incorporating into their diet two servings a day of a soy-based nutritional beverage powder prepared using Supro isolated soy protein (made by Protein Technologies International, St Louis, Missouri) for 12 months. The 38 gm of soy protein consumed each day contains about 70 mg of genistein (mostly as glycosidic conjugates). At 3-month intervals on the diet, tests for cytological and biochemical surrogate endpoint biomarkers (SEBs) will be conducted to see if breast cancer risk is reduced. Supported by a grant from the United Soybean Board. Address: 1-2. Dep. of Epidemiology, Univ. of California at San Francisco (UCSF); 3-5. Dep. of Pharmacology, Univ. of Alabama at Birmingham, Birmingham, AL 35294.

829. Protein Technologies International. 1995. Supro and isoflavones: Science & nutrition brief (Leaflet). St. Louis, Missouri. 2 p. Front and back. March. 28 cm.
• ***Summary:*** "Genistein and daidzein are found almost exclusively in soybeans." A chart (p. 1) shows that daidzin and genistin, two glucoside forms of soy isoflavones, each have a glucose (sugar) side chain. These two forms are found in abundance in soy flour, soy protein concentrate (water washed), and soy protein isolate (water washed). Genistein and daidzein, the aglucoside (pronounced AY-glu-ko-side) forms, which have the glucose side chain removed, are found at relatively low levels in the above 3 soy products. "The glucoside forms of the isoflavones are converted to the aglucoside forms during digestion and absorption. Supro protein is processed with water which results in retention of the isoflavones."

Table 1 shows the range (mg/gm of protein) of isoflavone content of Supro brand isolated soy protein products* (Footnote: *"Aglucone units adjusted for

molecular weights"). Daidzein 0.15 to 0.72. Genistein 0.48 to 1.51. Glycitein 0.05 to 0.26. Total isoflavones 0.68 to 2.49. Source: Protein Technologies International. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

830. *SoyaCow Newsletter* (*Ottawa, Canada*). 1995. Protein isolates from soymilk: Canadian scientists developing technology. 4(1):2. Jan/March.
• ***Summary:*** "Protein isolates were successfully prepared using [whole bean] soymilk from SoyaCow SC20 and SC100 in a laboratory as well as at a pilot scale. These isolates were found to be comparable to a commercial product, Supro 610, made from defatted soybean flakes by Protein Technologies International of St. Louis, Missouri."

The project was the result of collaborative research between ProSoya Inc. and an Agriculture Canada team led by Dr. C.Y. Ma. "Isoelectric precipitation and ultrafiltration were used to remove the carbohydrates and solvent extraction was used to remove the fat. Alternate means of removing the fat are currently being explored."

A large table compares the functional properties of isolates made from ProSoya soymilk vs. those of Supro 610.

831. Manning, Anita. 1995. Using soy for protein helps reduce cholesterol. *USA Today.* Aug. 3. [1 ref]
• ***Summary:*** A study by Dr. James Anderson in today's *New England Journal of Medicine* reported that "soy in the diet can significantly lower high cholesterol." The research, which analyzed 38 studies involving 730 people, was funded in part by Protein Technologies International, a manufacturer of soy protein. Cholesterol levels dropped 20% in people who started above 300 mg/dl, and about 4% in those under 200.

A small sidebar titled "Soy sources available," states that soy milk contains 4-10 gm of protein per 8 oz glass, tofu contains 8-13 gm per 4-ounce cube, and soy flour contains 10-13 gm of protein per ounce. It is also used in a range of products from burgers to baked goods, according to John Erdman Jr. of the University of Illinois.

832. Benedetti, Jef. 1995. Soy report generates calls to Worthington Foods, but little stock movement. *Daily Reporter* (*Columbus, Ohio*). Aug. 7. [1 ref]
• ***Summary:*** A study by James W. Anderson published last week in a medical journal touting the advantages of soy protein in reducing blood cholesterol has generated many phone calls to Worthington Foods, and a lot of interest from the consumer and investment communities. Ron McDermott, the company's vice president of research and technology, says that 80% of worthington's food products contain soy protein. The company markets meatless products under four names: Morningstar Farms, Worthington, Loma Linda, and Natural Touch. In 1994 the Morningstar Farms line was the best seller, with almost $56 million in sales, according to the company's 10-K filing.

In April William Blair & Co. in Chicago published a "buy" recommendation on the company's stock, noting that roughly one-half of Worthington's sales are to individuals seeking to reduce their intake of fat and cholesterol.

An Associated Press story about Anderson's study stated that he received $5,000 from Protein Technologies International, which makes soy protein, to help pay for the work. "Anderson told the AP that he believes 20 grams of soy protein a day, substituted for animal protein, could be enough to help lower blood cholesterol."

Patty House of Ohio State University wrote a report titled "From Farm Lands to Shoppers Hands" stating that the average American consumes six gallons of soybean oil per year in such forms as cooking and salad oil, margarine, shortening, and prepared salad dressings.

833. Demos, Steve. 1995. New developments at White Wave (Interview). *SoyaScan Notes.* Aug. 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** White Wave is working to take advantage of the huge amount of publicity about soy protein lowering blood cholesterol. He would like to develop soy-based nutraceuticals (a term Steve first heard from Jeffrey Bland several years ago; the new food medicine) or dietary supplements as a sort of bridge to motivate people to move toward healthy foods. The only two motivators are fear and greed; he will use fear since soy is not glamorous enough to use greed. He has talked with FDA attorneys who have made it clear that under NLEA only dietary supplements can make nutritional claims. Yet the line between foods and dietary supplements is very unclear. It largely depends on how the product is positioned and marketed. Garlic is by far the best-selling supplement in the USA. Slim Fast is a dietary supplement. A soy yogurt or a fortified soymilk could also be positioned as a dietary supplement. Shurtleff's comments: Danger of excess protein intake, which is hard on kidneys and can leach calcium from bones (hypercalciuria). Most of the cholesterol-lowering effect of soy protein may be due to the phytoestrogens bonded to it, so we may want to focus on genistein rather than soy protein. Consider a small product like the lactobacillus drink sold in Japan. Sandoz's concept of selling nutrition not food.

Topic #2. Position on the World Wide Web. Steve's mission is to build brand equity. Paul Chasnoff has registered and "locked in" three positions on the World Wide Web: Tofu.com, Soy.com, and WhiteWave.com. These give him control of the on-ramp to the web. It is very cheap and there are no protections at this time. He has just traded beads for Manhattan, for ownership of the key subject headings in the card catalog. If things change, there will probably be a grandfather clause to protect him.

His soymilk should be on the market in a gable-top

caton in November. He has not yet proved marketability. He thinks he has found a manufacturer. Pacific Foods refused to sell him base. Protein Technologies International (PTI) is selling a consumer soymilk somewhere.

One big upcoming project is to launch a line entrees in five flavors. The center of the meal will be a starch (such as rice or noodles) with flavored protein over the top. Address: President, White Wave Inc., 1990 North 57th Court, Boulder, Colorado 80301. Phone: 303-443-3470.

834. Kilman, Scott; Ingersoll, B.; Abramson, J. 1995. Risk averse. How Dwayne Andreas rules Archer-Daniels by hedging his bets: CEO works with rivals, gives to both parties and invests in the media. Soy meatballs on the menu. *Wall Street Journal.* Oct. 27. p. 1, A8.

• ***Summary:*** A very well researched and written profile of Dwayne Andreas and how he applies the concept of hedging to every aspect of ADM's business life. Andreas was born on 4 March 1918 in Worthington, Minnesota, the son of a Mennonite farmer. From 1936 to 1938 he attended Wheaton College in Illinois. From 1938 to 1945 he was executive officer of Honeymead Products, a family-owned company. From 1945 to 1952 he was vice president of Cargill.

In [Nov.] 1947, when ADM Chairman Shreve Archer died after choking on a chicken bone, Dwayne Andreas was age 29 and vice president of a rival firm. For the next 18 years, Mr. Andreas built a name for himself in the grain industry and became a millionaire in the process. He left Cargill and returned to Honeymead, where from 1953 to 1960 he was an executive and the chief shareholder. From 1960 to 1966 he was executive vice president of Farmers Union Grain Terminal Association, a cooperative. By 1965 ADM was foundering (it had never quite recovered from the loss of its leader) and the founding families were ready to sell a sizeable share to Mr. Andreas, to make him a director, and to groom him for the top job. So in 1966 Andreas accepted the offer, joining ADM as a director and member of the executive committee. He spent the rest of his career leaving as little as possible to chance. Now age 77 and a diminutive 5 feet four inches tall, he "runs the giant publicly-trade grain-processing company like a private family concern. Secrecy is so tight that ADM doesn't even release quarterly revenues. Mr. Andreas once proudly told analysts, "Getting information from me is like frisking a seal." In 1970 Andreas was named ADM chief executive officer, and in 1972 he was elected chairman of the board.

ADM is now America's largest commodity processor, with annual revenues of $12.7 billion. Including stock dividends, ADM's stock value has climbed at an average annual rate of 17% over the past decade–outpacing the stock market's annual return of roughly 15%, as measured by the Wilshire 5000 Equity Index. ADM earnings soared 64% during the last fiscal year to a record $795.9 million.

Notwithstanding criticism that ADM's board is dominated by Mr. Andreas plus his family and friends, Wall Street sees no possibility of a serious battle for corporate control, and little chance that any other company could pay at least $8.7 billion (ADM's market capitalization) to buy the company.

ADM is a major beneficiary of federal price supports for sugar (they make ADM's high-fructose corn sugar an economical product) and of the 54-cent-a-gallon excise tax break on ethanol (since ADM is the dominant producer of the corn-based fuel additive). Mr. Andreas helps preserve these twin towers of legislative largesse by hedging. ADM leads corporate America in contributing to both political parties. "Since 1981, the company has given more than $800,000 to the Democratic Party and more than 1.5 million to the GOP" (Republican Party).

Pie charts show that ADM is the market leader in four major U.S. markets, controlling an estimated 35% of all corn refining (followed by Staley, Cargill, and CPC International), 31% of high-fructose corn syrup (again followed by Staley, Cargill, and CPC), 28% of oilseed processing (followed by Cargill 25%, Bunge 16%, Ag Processors 14%, Central Soya 10%, and others 7%), and 26% of wheat milling (followed by ConAgra 25%, Cargill 12%, Cereal Processors 6%, and others 31%).

Doing business with competitors has long been one of Mr. Andreas's hallmarks. As he likes to say, "Keep your friends close and your enemies closer." In 1992 ADM built a 3.5-mile pipeline to neighboring A.E. Staley Mfg. Co., one of its biggest rivals in the high-fructose corn syrup business. (Together the two companies control half of the $3 billion market.) The pipeline allows either company to call on its neighbor in an emergency for raw material, thus reducing risk.

Four ADM board members are Andreases, and an additional six of the 17 directors are ADM executives, retired executives, or relatives of senior managers. At ADM major decisions are made at the very top, mainly by three men: Dwayne Andreas, his son Michael Andreas (who is in charge of many day-to-day operations), and James R. Randall, who has been president of ADM for 20 years. Top managers operate without budgets or much paperwork. "Decisions are often made in the executive dining room over a lunch of Archer-Daniels soybean cuisine."

"Once Mr. Whitacre helped arrange a luncheon between Mr. Andreas and visiting executives of a company participating in the lysine meetings in hopes of taping them discussing price fixing. But Mr. Andreas spent the entire lunch talking to his bewildered guests about his favorite product, soy-based meat substitute, then sent them off with a big bag of the stuff.

In August 1994 he told this story concerning his views on competition: "The gazelle must run faster than the fastest lion or be eaten. And the lion must outrun the slowest gazelle or starve. It doesn't matter whether you are a lion or a

gazelle; when the sun comes up, you'd better be running."

"He delights in being the most powerful man in American agriculture, regaling his guests over soy meatballs and catfish with stories of his back-channel diplomacy for American presidents... But Mr. Andreas's enjoyment of *Realpolitik* shouldn't be confused with a lack of conviction friends and associates say. He is passionate about the virtue of spreading soy-based food around the world.–albeit generally at a tidy profit–and about the perils of soil erosion. His uncle was an evangelist and young Dwayne spent hours in revivalist tents listening to the preachers. Mr. Andreas preserves some of that fervor in his own speeches about government and business policy."

In recent years ADM has been sued by Ralston Purina Co. for alleged technology theft. Ralston claimed patent infringement and misappropriation of trade secrets involving a soy protein product. This case is now entering the pretrial discovery phase.

Mr. Whitacre has alleged that ADM pays some top executives through illegal channels. ADM in turn has accused Mr. Whitacre of stealing more than $9 million from the company.

Meanwhile ADM has continued its upbeat institutional ads that have blanketed the television networks and many publications for years. In a sort of ratings hedge, the company also spent millions advertising on ABC's "This Week with David Brinkley," NBC's "Meet the Press," and CBS's "Face the Nation." From Jan. 1994 to April 1995 ADM spent $4.7 million advertising on "Meet the Press" and $4.3 million on "Face the Nation." ADM is also the leading corporate underwriter for the PBS MacNeil/Lehrer Newshour, providing $6.8 million or 27% of the program's annual budget.

A point-style portrait illustration shows Dwayne O. Andreas. Address: 1. Decatur, Illinois; 2-3. Washington, DC.

835. Blaze, Marci. 1995. Current prices of soy protein products (Interview). *SoyaScan Notes.* Nov. 13. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** Soy flour and grits 18-37 cents/lb. Textured soy flours 36-48 cents/lb. Soy protein concentrates 65-77 cents/lb. Textured soy protein concentrates 72-84 cents/lb. Soy protein isolates 132-169 cents/lb.

Note: ADM formerly made a soy isolate fiber product similar to PTI's Fibrim but discontinued production in about 1993. Address: Archer Daniels Midland Co., Decatur, Illinois. Phone: (217) 424-7408.

836. Lorenzen, Jerry. 1995. Breeding soybeans for food uses. Interest in tofu (Interview). *SoyaScan Notes.* Nov. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jerry is a soybean geneticist. He develops soybean lines used for making tofu and natto, and also develops commercial soybeans. Over half of his work is breeding soybeans for food uses. A lot of his work is trying to incorporate the right protein and oil contents, along with agronomic characteristics. Jerry graduated from Iowa State University. While in high school, he worked at Pioneer Hi-Bred's production facility at Reinbeck, Iowa. In college he worked as an intern for the Asgrow experimental station in Ames, Iowa. There he learned a lot of his breeding techniques and philosophies on soybean breeding. His interest in the benefits of soybeans for human nutrition grew out of his interest in their benefits for animal nutrition. He grew to believe that soy would someday come to be widely used in human diets. He has two kids and he wanted to find ways to include tofu in their diets. He wanted to find ways that they would like tofu.

In the early 1980s, he started his own soybean breeding company in Fremont, Iowa. He has his own crossing and selection programs. He believes that there is a very bright future for soybeans and tofu. One of his goals is to incorporate more soy into the typical American's diet. Bee-Lor Inc. believes that many nutritional benefits come from including soy as part of the diet–even if you don't change your tastes or the way you eat. He and his partner and good friend Tim Beeler met while working for the Ralston Purina Co. in the area of hog and cattle feeds. Tim left Ralston in about 1986 to start a specialty meat shop with his brothers in Des Moines, Iowa. Jerry left in 1989 to focus on his soybean breeding business. Tim made a very popular, high-quality bratwurst using lean pork and the best ingredients an old family recipe. Jerry approached Tim with the idea of creating a hot dog-type bratwurst product that contained tofu, as a way of introducing tofu into mainstream America. Jerry said: "The first time I want people to taste tofu is in something that they are used to eating." Then their first impression of tofu will be a good one and they will say, "Hey, tofu tastes good." But tofu is a tough sell in the Midwest. Jerry loves tofu, and likes to eat it just like it is. He even gets a craving for tofu at times. Address: Vice-President, Bee-Lor Inc., 103 North Third St., Oskaloosa, Iowa 52577. Phone: 515-673-1930.

837. *INFORM* (*AOCS*). 1995. PSI to handle expansion for Protein Technologies. 6(11):1241. Nov.
• ***Summary:*** Protein Technologies International (PTI) is a subsidiary of Ralston Purina Co. based in St. Louis, Missouri.

The plant to be expanded is PTI's facility in Memphis, Tennessee, which makes soy protein and fiber food ingredients, including isolated soy proteins and soy fibers for the food and meat industries. The project is expected to cost more than $50 million. Construction was to begin in the last quarter of 1995, with completion scheduled in 1998.

"The plant originally opened in Memphis in 1983 and employs 225 persons. It is one of six U.S. facilities operated by PTI."

838. Ralston Purina Company. 1995. Annual report to shareholders. St. Louis, Missouri. 52 p.
• ***Summary:*** See next page. Inside front cover: "Ralston Purina Company was founded in 1894. Today, it is the world's largest producer of dry dog and dry and soft-moist cat foods, which are marketed under the Purina brand name; the world's largest manufacturer of dry cell battery products, including Eveready and Energizer brand products; and a major producer of dietary soy protein, fiber food ingredients, polymer products and, outside the United States, of feeds for livestock and poultry."

Page 52: Corporate Information: The company was incorporated on 8 Jan. 1894 in Missouri. Number of shareholders: 24,324. Number of employees: 10,589 in the United States. 21,248 outside the United States. Fiscal year end: September 30. NYSE trading symbol: RalstonPurGp. Stock price, 52 weeks high: 67, low 43½.

Pages 8-9 give a good overview of Protein Technologies International. In fiscal 1995 PTI contributed $357.4 million in sales and $82.8 million in operating profit before amortization to Ralston Purina Co. PTI serves its global customer base from seven major manufacturing facilities, including five in the USA, and employs approximately 1,200 people. In 1995 PTI began multi-million dollar expansions of its plants in Memphis, Tennessee, and Ieper, Belgium. "Our core technologies are proprietary and fundamentally sound. The global potential for expanded applications is enormous."

Page 20 gives a financial review of each RPC business segment. Sales for the soy protein products business increased 11.4% in 1995 and 10.4% in 1994. Operating profit increased 23.5% in 1995 on higher volume, increased productivity, lower raw material prices and favorable foreign currency exchange rates, partially offset by increased selling, general and administrative costs. In 1994 operating profit increased 8.4%.

Page 22 notes that sales of soy products grew from $291.5 million in 1993, to $320.7 million in 1994, and to $357.4 million in 1995 (up 11.4% over 1994).

Operating profit on soy products before amortization grew from $61.9 million in 1993, to $67.1 million in 1994, and to $82.8 million in 1995 (up 23.4% over 1994). Address: Checkerboard Square, St. Louis, Missouri.

839. Mix, Paul E. 1995. Tom Mix: A heavily illustrated biography of the western star, with a filmography. Jefferson, North Carolina: McFarland & Co. vii + 328 p. See p. 119-21. Illust. 24 cm. [1 ref]
• ***Summary:*** Silent movies made Tom Mix popular and a wholesome hero of America's children. He was known as the "King of the Cowboys" and his horse, Tony, was also a star. By 1921, at age 41, he was at the peak of his career. One of the top-ten box office stars during the roaring 1920s, he became the highest paid movie star in the country, earning $17,500 a week for 52 weeks. Yet it was the Ralston Purina Radio Program, *Tom Mix and His Straight Shooters*, that made Tom immortal. (p. 1-2).

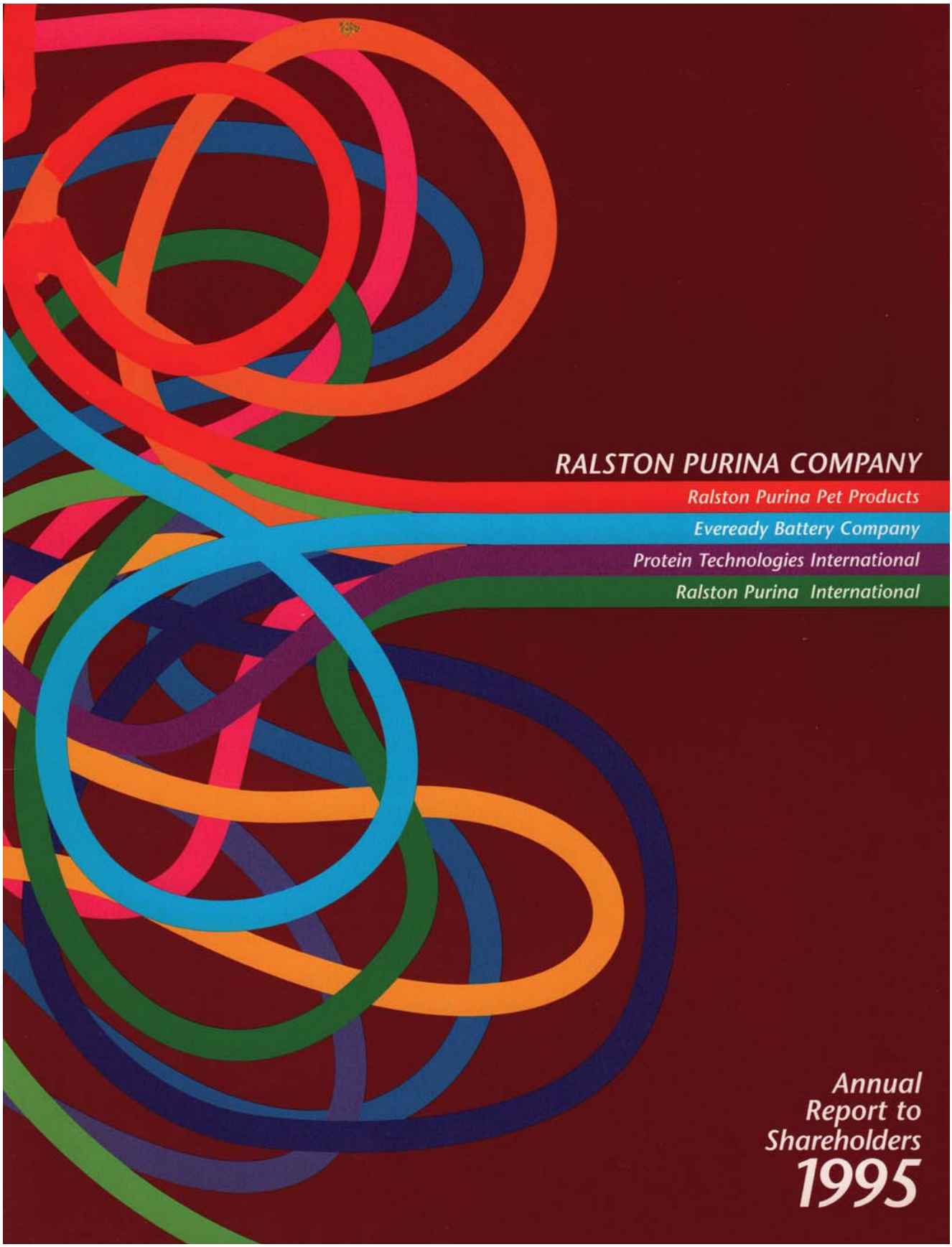
The founder of what would become the Ralston Purina Co. had a humble start indeed. A miller named Will Danforth, from Missouri, believed that good food was the secret to good health. He advocated the idea that "you are what you eat" even before the term "health food" had been coined. Danforth was looking for a way to keep the wheat germ in cereal from turning rancid. A chance meeting with a miller from Kansas gave him the answer he was looking for. Soon Danforth developed a product named "cracked wheat." He was soon packaging and selling Purina Whole Wheat Cereal in and around St. Louis, Missouri.

Meanwhile, a nutritionist with the surname of Ralston, had written a book titled *Life Building*, which was making him popular. The book became so popular that good-health clubs began popping up everywhere. "By the turn of the century, Dr. Ralston had over 800,000 good-health believers." Danforth contacted Dr. Ralston to seek his endorsement for the Purina whole wheat cereal. Dr. Ralston agreed on the condition that his name be added to the product name. So in 1902 Danforth changed his company's name to Ralston Purina Co.

In 1933, when sales for Hot Ralston cereal began slumping, Will Danforth and his Gardner Advertising Agency turned to Tom Mix, "America's No. 1 cowboy hero," for an endorsement. Mix apparently signed a contract with Ralston Purina in 1933; it may have been hand scribbled on the back of a large envelope. On 11 April 1938 Tom Mix signed a second contract in which he "granted Ralston the right to broadcast a series of programs known as *Tom Mix–Ralston Straight Shooters* and to use continuity advertisements" titled "Tom Mix and the Ralston Straight Shooters."

840. Protein Technologies International. 1996. Consumer awareness of soy protein health benefits grows with major media coverage of *The New England Journal of Medicine* article (News release). Checkerboard Square, St. Louis, MO 63164. 1 p. Feb. 28 cm.
• ***Summary:*** "The August 3, 1995 announcement on the results of the Meta-Analysis [by Dr. James W. Anderson] in the *New England Journal of Medicine* received tremendous media coverage and continues to spawn feature articles in national publications. A recap of the media coverage follows. As interest in the health benefits of isolated soy protein grows, we expect media coverage to grow. And as media coverage grows, so do the number of consumers exposed to these important health messages.

Total media exposures:
Number of stories: 874.
Number of print stories 767.
Number of broadcast stories 107.
Total circulation/viewership 190.1 million.



Print circulation 168.8 million.

Broadcast reach 26.3 million.

Print highlights: *Reader's Digest, New York Times, Chicago Tribune Syndicate, Associated Press* (*AP*), *Good Housekeeping, Family Circle, Prevention, USA Today* (Gannett), Reuters, Glamour, McCall's.

Broadcast highlights: ABC–World news this morning. CNN–Early edition, CNN morning news, CNN world news, Headline news. CNBC–Today's business, The monkey wheel, Market wrap. NBC–Today show, NBC news at sunrise. CBS–Up to the minute, CBS morning news.

Key messages communicated in media coverage: (1) Soy protein consumption can help reduce cholesterol–691 articles (90% of total). (2) Amount of soy protein that should be consumed to achieve health benefits–527 articles (70% of total). (3) Protein Technologies International supported research–430 articles (60% of total). (4) Other potential health benefits derived from soy protein consumption–89 articles (10% of total).

This information was collected during the period from August 1995 through February 1996. Address: St. Louis, Missouri. Phone: 1-800-325-7108.

841. Holt, Stephen. 1996. New developments with commercialization of soy isoflavones (Interview). *SoyaScan Notes.* March 2. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dr. Holt's first soy product, Genista (pronounced juh-NIS-tuh), is now on the market. It is basically a soy protein isolate that contains about 2 mg/gm of isoflavones; no isoflavones are added to the product. Genista was just presented yesterday to a large meeting of Midwest cardiologists, and there was enormous interest in the product. The soy protein is much better than Mevacor, a drug used to lower cholesterol, that has many undesirable side effects. Combining James Anderson's meta-analysis studies and his own research, Dr. Holt decided that 30 gm of Genista would lower blood cholesterol by 20-30% over a period of 3-6 months as an adjunct to a low-cholesterol diet. His company is trying to be very responsible in the way they market the product, together with lifestyle changes. They market a health plan, so as not to give consumers a false sense of security.

Take Care, sold by Protein Technologies International, contains anywhere from 0.68 to 2.39 mg/gm of isoflavones; no isoflavones are added. But PTI has not come out with a recommended dose in a format that will lower blood cholesterol. Bodybuilders consume up to 6 gm of protein per kg of body mass. Apparently if they take this protein as soy protein it seems to be efficiently handled, which is quite interesting. Protein Technologies International is conducting a study with Romanian athletes; they are measuring urinary mucoproteins, which are some indicator of efficiency of renal handling.

Genista is based on his own research and that of Dr. James Anderson, which says that if you consume 30 gm of a soy protein isolate containing a standardized amount of isoflavone, you will lower your cholesterol. He has quite good early success. He has a joint venture with Charles Day, PhD, of Kentucky who has a developed an agricultural process for making almost pure isoflavones from soybeans. They have just received investment money from Japan to turn this into a large-scale commercial process. The cost of the key piece of equipment is about $6-8 million. They use a proprietary technique and a patented heat-tank solvent extraction process to process partially defatted lightly heat treated soybean meal (usually used for chicken feed) to extract the isoflavones, which are lipophilic. From 4 tons of the meal he can extract 1 kg of isoflavones of 85% purity; they are composed mainly of genistein. As far as he knows, his is the only company in the extracting isoflavones commercially, and enriching products with isoflavones. He has about $6 million of orders on paper for isoflavones from a variety of nutriceutical manufacturers. Why isn't a big company like ADM doing this? "They are looking at it, but they haven't got the science right or the process; we have."

His second product will be Genista-Plus, which will contain 20 mg/gm of isoflavones and will be enriched with isoflavones. Another product, Phyto-Est, will contain 25 mg/gm of isoflavones; it has come out of the joint-venture agreement with Charles Day and the Japanese. It will on the market as soon as they can get a label on it. These products will be sold in double-oh capsules. The capsules of Phyto-Est are already made.

The Italian National Health Service has been giving out soy protein isolate as a free item in their health care preventive approach, mostly to people with kidney (renal) failure who tend to have high cholesterol levels. It has been shown repeatedly in that experience to be quite effective. In addition, soy proteins lower blood pressure, improve renal efficiency and renal handling, and promote calcium retention–which in turns lowers blood pressure.

Dr. Holt says Twin Laboratories is now selling a product named "Twinlab Genistein." In Jan. 1996 Dr. Holt began publication of a new periodical titled *Nutriceutical News International: An information source on natural remedies.* He is Editor in Chief and president of Natus, Inc., New York. His portrait appears on the front page. Stephen Yaskin, M.S., is editorial editor. To subscribe, send $19.95 for 6 issues, payable to Natus, Inc., 200 Clearbrook Rd., Elmsford, NY 10523.

Note: This is the earliest document seen (Sept. 2001) that contains statistics about the soy estrogen industry and market. Address: M.D., Natus Inc., 2388 28th Street, Long Island City, New York 11105. Phone: 718-721-1496.

842. Boatwright, Linda. 1996. Work with the Kentucky Soybean Association (Interview). *SoyaScan Notes.* April 1.

Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Linda was born in about 1946. She has had to deal with cancer on a personal level since she was 13 years old. That year her father was stricken with cancer and he died 3 years later. In 1969, at age 23, she discovered she had cervical cancer. In 1978 her husband died of colon cancer; Linda finished his term in the Kentucky General Assembly. From 1986 to 1995 she worked for the American Cancer Society, even though she has no scientific background. She was in charge of a 12-county area, doing everything from fund-raising to education concerning cancer prevention and early detection in schools, industry, and civic groups. In one county they had more than 10,000 educators. Gradually she heard about genistein, but she had no idea that it came from soybeans.

Then in July 1995 she got a job working as a consultant to the Kentucky Soybean Association. Shortly thereafter she discovered that genistein came from soybeans. The first week she went to work she attended the Soy Expo in St. Louis, Missouri, where she met Dr. Connie LaBarr; they quickly became very close friends. Together they visited Creighton University in Omaha, where Dr. Gallagher is in charge of a large osteoporosis study which is testing the efficacy of Take Care (a product rich in soy isoflavones made by Protein Technologies International) in reducing osteoporosis in women of various ages. Dr. Gallagher's research coordinator in the bone metabolic unit is Michele Wilson (Phone: 402-280-4167). Mark Messina made a presentation to her Association's board about soyfoods, health, and nutrition. They also utilized him for media, such as TV and radio shows, and a newspaper interview. This was the first time that Kentucky had ever done anything with health and nutrition related to soy.

She attended a phytochemicals conference in Washington, DC, last October. There were 500 scientists there from 25 countries, and 23 of them made presentations. Three of those presentations were about soy–which she found astonishing. That was the first time she realized that there were so many medicinally and therapeutically valuable substances in soybeans. She has a very dear friend who works for the National Cancer Institute as one of the head statisticians; she worked with Mark Messina when he was there. Both Dr. Messina and Dr. Charles Day also attended this conference, and helped her to understand and interpret what was being said.

On Jan. 5-6 1996 the Kentucky Soybean Association organized and sponsored the Thirteenth Annual Soy Research Symposium, in Lexington, Kentucky. For the first time this year papers were presented on soybeans, health, and nutrition. Speakers included Dr. James W. Anderson of the University of Kentucky and Dr. Charles E. Day of Audax (see separate entries).

The Nebraska Soybean Association (NSA) recently received $258,000 to administer the national School Foodservice Pilot Project. Dr. Connie LaBarr would have been in charge but she left NSA in late Nov. 1995 for reasons that Linda would rather not discuss. She was replaced by Stephanie Lynch, a registered dietitian who used to work for ADM; Connie is now in Iowa working for the Iowa Department of Education, in their Foodservice Division; she is still working with soyfoods. Connie told Linda that she has worked to promote soyfoods for 50 years! It looks as if Jim Weyer, who was director of NSA, will also be leaving.

Kentucky has been chosen as one of six states for implementation of the United Soybean Board's (USB's) School Foodservice Pilot Project. USDA has mandated an 8% cut in the fat content of school lunches. So Linda is working to use soy proteins to replace part of the meat and cut the fat in these lunches. She works with both kids and school foodservice people in K-12 schools. She goes in and makes it fun for the kids with balloons and a kid who is called "Soy Cool." She has been amazed that foods like the pure vegetarian tacos have gone over so well. They got a 92% positive rating from kids. A chicken breast that contains 30% soy has also drawn rave reviews. She took ADM's Chili Fixin's (distributed by Dixie USA) into the homemakers groups and she exposed 3,500 people.

Linda also works with Steve Bucheim, who is the marketing director for ADM Foods. She is working to introduce people in Kentucky to ADM products, such as their Taco and Chili Fixins'. She helped in the development of a new product made by a company named Partin's Sausage, owned by Jeff Davis in Cunningham, Kentucky (Phone: 502-642-2195). The finished product contains 30% soy and only 12% fat. It will be on the market fairly soon. ADM supplied the formula and the ingredient mixture of soy protein isolates and concentrates. She is not working to promote ADM but to get soyfoods in Kentucky grocery stores.

David Winkels, from South Carolina, is in charge of domestic marketing for USB. His committee gave Linda's association their grant for the National School Project. Linda and David share a lot of the same philosophy about the health and nutrition benefits and future of soy. One of USB's major goals and objectives this year is new product promotion. So Linda is planning a soyfoods expo in Kentucky. It is scheduled to take place in 6 months and USB and David Winkels want to be involved, with the main funding from USB. It will involve institutional foods, plus commercial and retail foods, with emphasis on promoting the health benefits of soy–all tied into one.

Update. 1996 Aug. 13. Linda's contract with the Kentucky Soybean Board expired at the end of June and they chose not to renew it. They did invite her to bid on individual projects, but she declined because she could support herself on that income. The Sausage is on the market, but the Kentucky Board's interest in health and nutrition seems to be waning. Her future is uncertain. Dr. James Anderson's book is now out and in bookstores. She thinks Charles Day

PhD has at least one soy product on the market. Address: 236 Lakeview Dr., Ledbetter, Kentucky 42058. Phone: 502-898-8977.

843. Kwon, T.W.; Song, Y.S. 1996. The role of soybean in Oriental food systems. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 20-32. [19 ref]

• ***Summary:*** Contents: Introduction. Direct uses of soybeans. Nutritional significance of soybeans. Concluding remarks.

Page 22: "Most traditional soybean foods described so far are known to have originated in China, and then gradually have been introduced or have spread into other Asiatic countries. Of course, there are a few exceptions, such as soy sauce and Tempeh. As a matter of fact, ancient Chinese records indicate that soy sauce is not indigenous to China, but rather was introduced from Korea during the era of the Koguryo Dynasty (2nd century BCE to 668 CE). Another typical example is Tempeh, which was developed in Indonesia then introduced to neighbouring countries."

Tables: (1) Traditional nonfermented soybean food products: Fresh soybeans (*Put kong* in Korea; Edamame in Japan), toasted soy powder (*Kong ka ru* in Korea; Kinako in Japan), soy sprouts (*Kong na mool* in Korea; *Daizu no moyashi* in Japan), soymilk (*Kong kook, Doo yoo* in Korea; *Tonyu* in Japan), soymilk film (Yuba in Japan; Tou-fu-pi in Chinese), soy curd (*Doo bu* in Korea; *Tofu* in Japan).

(2) Traditional fermented soybean food products: Fermented whole soybeans (*Tempeh* in Indonesia and Malaya; Natto in Japan; Hamanatto in Japan) soy sauce (*Kang jang* in Korea; Shoyu in Japan), soy paste (*Ko chu jang* in Korea; *Miso* in Japan), fermented soy curd (Sufu in China), fermented soy pulp (Tempeh gembus [okara tempeh] in Indonesia; Oncom ampas tahu in Indonesia).

(3) Essential amino acid composition of rice and soybean and FAO/WHO reference pattern of amino acids (mg/gram of Nitrogen).

(4) Per capita daily soybean consumption for soyfood use in selected countries:

Taiwan 54.89 gm.
Korea 27.62 gm.
Japan 20.82 gm.
China 12.88 gm
Indonesia 11.51 gm.
Singapore 7.40 gm.
Malaysia 4.38 gm.
Thailand 1.64 gm.
Philippines 0.55 gm.

(5) Nitrogen balance data when feeding mixtures of beef protein and Supro isolated soy protein.

(6) Nutrient content of soyfoods (per 100 grams): Soybean, soy sauce, ko chu jang, soy paste. natto, chongkuk jang, tempeh, soy curd (tofu), soybean sprout.

(7) Major causes of mortality in selected countries (per 100,000 people). Countries: Korea, Japan, Singapore, America, Germany, Hungary. For the period 1991-1994 Cardiovascular disease is the leading cause of death in all of these countries, however the death rates are higher in Western countries.

(8) Animal and isolated soy protein foods used in study with hypercholesterolemic men in Canada.

Table 4. Per capita daily soybean consumption for soyfood use in selected countries (unit : gram)

Soyfoods / Country	Soy curd	Soy sauce	Soy milk	*Natto*	Soy paste others	Total
Korea [a]	8.50	1.50	1.78	-	15.68	27.62
Japan [a]	11.96	0.49	0.07	2.45	5.85	20.82
Taiwan [a]	45.88	-	5.48	-	2.74	54.89
China [b]						12.88
Indonesia [b]						11.51
Malaysia [b]						4.38
Philippines [b]						0.55
Singapore [b]						7.40
Thailand [b]						1.64

[a] source : American Soybean Association(1994)
[b] source : FAO(1980)

(9) Isoflavone contents of soy varieties of Korean soybeans: The isoflavones are genistein, daidzein and daidzein+genistein. The highest is the Danyop variety with 2317 mg/kg. The lowest is the Hwaum variety with 458 mg/kg. Thus, there is a huge range of variation among soybean varieties.

(10) Breast-cancer and prostate-cancer mortality in soyfood-consuming countries compared to the United States, per 100,000 people (age adjusted).

Korea is 2.6 and 0.5

China is 4.7 and unknown.

Japan is 6.0 and 3.5

Hongkong is 8.4 and 2.9.

United States is 22.4 and 15.7.

Source: American Cancer Society (Atlanta, Georgia). 1992. "Cancer facts and figures."

Figures show: (1) The effect of dietary proteins on plasma cholesterol in rabbits. Source: Carroll et al. 1975. Plant proteins lower blood cholesterol.

(2) Cytotoxicity of genistein–it kills cancer cells. Address: 1. Director, Inst. of Food Sciences; 2. Associate Prof., Dep. of Food and Nutrition. Both: Inje Univ., South Korea.

844. *Soybean Quarterly* (*Nebraska Soybean Board, Lincoln, Nebraska*). 1996. Baking with soy: Variety reference guide. 2(2):6. Insert.
• ***Summary:*** A full-page table shows products used in baking that are now on the market from the following companies: ADM (6 products), AGP (4 types of Agsoy flour and grits), Cargill (5), Central Soya (4), and Protein Technologies International (5).

845. Sheehan, Daniel M. 1996. More about phytoestrogens and isoflavones from soybeans (Interview). *SoyaScan Notes.* May 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Sheehan heard from a colleague in Canada that the soy protein isolates used in infant formulas in Canada have most of the phytoestrogens removed. The source of that information was Mr. Marshall Marcus of Protein Technologies International.

People use terms such as phytoestrogens or isoflavones differently depending on their background and orientation. For example, people interested mostly in biological activity tend to use the term "phytoestrogens," whereas those interested mostly in chemical structure tend to use the term "isoflavones." Additional terms include "flavonoids" (pronounced FLAY-vuh-noids, which refers to a large class of chemicals), and "isoflavonoids" (which are isomers of the flavonoids). "Genistein" and "daidzein" are what chemists call "trivial names." Real chemists provide the actual name of the chemical structure. Note: The first isoflavone found in tempeh was 6,7,4'-trihydroxyisoflavone.

Not all isoflavones are phytoestrogens; only some have biological activity as estrogens, and most of them are inactive. Genistin is just a conjugated genistein. The conjugated forms such as genistin and daidzin are not biologically active, as such; the glucoside linkage must be cleaved by intestinal bacteria before they become biologically active. Biologists usually use the term "prohormones" to refer chemical substances such as daidzin or genistin; they are precursors of hormones that require metabolic action before they become active. So when we eat a soyfood such as tofu, the biologically inactive prohormones are converted to active hormones in our digestive system. On the other hand, equol has estrogenic activity, but it is a metabolite of genistein. Of the three major conjugated forms in soybeans, daidzin, genistin, and equal, all of the digested forms have biological activity. Address: Dep. of Health and Human Services, Food and Drug Administration, National Center for Toxicological Research, Div. of Reproductive and Developmental Toxicology, Jefferson, Arkansas 72079-9502, and Dep. of Biochemistry, Univ. of Arkansas for Medical Sciences, Little Rock, AR 72205. Phone: 501-543-7561.

846. Kuhn, Mary Ellen. 1996. Soy in the spotlight: Disease-fighting benefits may change the image of the once-lowly bean. *Food Processing* (*Chicago*). May. p. 52-53, 55, 58.
• ***Summary:*** This is a cover story; on the cover is written: "Unlocking the secrets of soy," with four large color photos. The article begins: "What a difference a couple of decades make." Twenty or 30 years ago, most foodservice operators and consumers used soy with hesitation, sometimes scornful comments. "Today, however, the once-maligned soy protein has a much better image, thanks to a fast-mounting stack of research data suggesting it may help prevent and treat high blood cholesterol, cancer, osteoporosis, and symptoms of menopause." And this good news has begun to reach health and nutrition professionals. With better products on the market, "soyfoods marketers may soon be dealing with a new generation of mainstream consumers who–far from spurning soy-based products–actively seek them out.

"Much of the current soy research is focused on isoflavones, a unique class of phytoestrogens or plant hormones found primarily in soy protein." The main soy isoflavone is genistein. Now soyfoods manufacturers are starting to take isoflavone content into consideration when they formulate, label, and promote their products. The isoflavone content of unprocessed soybeans can vary considerably among varieties, years, and place of harvest. Heat treatment does not appear to significantly reduce isoflavone content, but an alcohol wash (used with most soy protein concentrates and isolated soy proteins) removes most isoflavones in the product. The well-known Supro brand of isolated soy proteins are not subject to an alcohol wash, which helps preserve their isoflavone content.

Rick McKelvey, president of the Soyfoods Association

of America, has attended the American Dietetic Association show for the past two years. Last year, most of the questions he heard were: "What is this soy stuff that I'm hearing about?" This year's questions concerned the level of isoflavones in specific products. "This shows how far we've come in the bast year," he observes.

ADM, which could easily extract isoflavones from soybeans and sell them has decided not to do so. Jerry Weigel, PhD, who is ADM's vice president of corporate nutrition and regulatory affairs thinks it is probably not legal to sell isoflavones because they do not have GRAS (Generally Recognized as Safe) status or food additive status. Few soyfoods marketers are presently publicizing the isoflavone or genistein content of their products or making specific health or disease-prevention claims.

William Helferich, PhD, an associate professor at Michigan State University's Department of Food Science and Human Nutrition, has been studying dietary phytoestrogens in laboratory animals for 3 years. He has found that "genistein can stimulate estrogen-responsive breast cancer-cell growth in cultured cells and in animals implanted with these cells. He believes that women at risk for estrogen-dependent forms of breast cancer should not consume high levels of phytoestrogens." Most researchers are concerned about consumers taking isoflavone supplements or pills. Yet such products are now on the market and they acknowledge that some consumers will be attracted to them, instead of simply increasing the level of soyfoods in their diet, eating a healthful, balanced diet, and living and healthy lifestyle. Photos show: A jar of Morningstar Farms Roasted Soy Butter (soynut butter) which will be introduced this spring. Jan Remak, president of marketing for Vitasoy U.S.A.

One sidebar, titled "Probing the soy/health connection," discusses the research of Dr. James Anderson and Mark Messina, PhD. "Scientists theorize that phytoestrogens in soy might help compensate for the loss of hormonal estrogen women experience at menopause."

Another sidebar, "Boom times for the bean," notes that starting soon after the research study by Dr. James Anderson was published in August 1995, many soyfoods companies experienced a substantial increase in sales. Peter Golbitz notes that "After years of steady 10% to 15% annual growth, soyfood sales have soared by about 30% in the past year... Many marketers of meat and dairy analogs are reporting sales increases of more than 100%." A 1995 study by the Soyfoods Association of America found that 75% of Americans have heard of tofu, 55% of soymilk, and 50% of soy burgers. Golbitz adds that in Australia, where soymilk based on soy protein isolates is widely available, per capita soymilk consumption is at least three times what it is in the USA. Vitasoy has adopted a niche-market approach to selling its soymilk; it adjusts the amount beany taste according to the taste preferences of each market. Address: Senior Editor.

847. Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease: September 15-18, 1996. Brussels Conference Center, Brussels–Belgium. 1996. American Soybean Assoc., Rue du Commerce 20-22 Box 4, 1010 Brussels, Belgium. 23 p. 30 cm.

• ***Summary:*** The cover of this attractive booklet has dark green ink on natural beige paper, with a square photo of soybeans in the middle. Contents: Invitation from the chairperson. The Second International Symposium On the Role of Soy in Preventing and Treating Chronic Disease: agenda. Satellite Symposium: agenda. Important deadlines and addresses. Instructions for abstracts. General information. Introducing Belgium and Brussels. Registration. Hotel accommodation. Social program. Symposium registration form. Hotel accommodation form. Social program form.

This symposium is being organized by Mark Messina, PhD (Chairman, USA), Roger Leysen, PhD (Secretary, Belgium), and Koen Descheemaeker, PhD (Scientific coordinator, Belgium). The international scientific advisory board consists of 12 members: Herman Adlercreutz, M.D. (Finland); Guiseppe D'Amico, M.D. (Italy); Stephen Barnes, PhD (USA); John Erdman, PhD (USA); Bernard Guy-Grand, M.D. (France); Takemichi Kanazawa, M.D. (Japan); Jean-Michel Lecerf, M.D. (France); Erik Muls, M.D. (Belgium); Marcel Roberfroid, PhD (Belgium); Risto Santti, M.D. (Finland); Cesare Sirtori, M.D. (Italy); Kurt Widhalm, M.D. (Austria).

Tentative agenda: Sunday, Sept. 15. Welcome and opening remarks. Overview of diet and cancer. Biotechnology of the soybean. Monday, Sept. 16. Soy and kidney function. Soy and bone health. Soy and heart disease: Hypocholesterolemic effects of soy (basic, mechanisms). Tuesday, Sept. 17. Soy and heart disease: Effects of independent cholesterol reduction. Soy and cancer: Animal studies, soybean anticarcinogens / anticancer mechanisms. Wednesday, Sept. 18. Soy and cancer: Human studies. Hormonal effects of soy.

Satellite symposium: A special satellite symposium will be held on Thursday, September 19, at the Sheraton Hotel, Place Rogier, Brussels; it will focus on two areas. The morning session on "Current understanding of soy and infant health" has been organized to better understand the effects of soy protein formula in infants and soyfoods in infants and young children–with particular emphasis on soybean isoflavones. The afternoon session on "Soybean isoflavones: measurement, levels in foods, and pharmacokinetics," will focus on isoflavone absorption and metabolism, and methodology for quantifying isoflavones in food and biological matrices.

The cost of both symposia, including lunches but not hotel accommodations, for a non-student paid before Aug. 1 is about $439.

Sponsors contributing more than $15,000: Alpro

natural soyfoods, American Soybean Association, Protein Technologies International, Nebraska Soybean Board, Sojaxa (The French Association for Soyfoods Promotion–Active members: Alpro, Nutrition et Soja, Sojasun, Sojinal), U.S. Foreign Agricultural Service, United Soybean Board, Ohio Soybean Board, Central Soya, ADM, Wyeth Nutrition International, Indiana Soybean Development Council.

Other sponsors: Illinois Soybean Association and Illinois Soybean Program Operating Board, American Institute for Cancer Research, Monsanto Company, Ontario Soybean Growers' Marketing Board, Soyfoods Association of America, Minnesota Soybean Research and Promotion Council, Iowa Soybean Promotion Board, Michigan Soybean Promotion Committee, Indiana Soybean Development Council, Morinaga Nutritional Foods, Inc., and Functional Foods for Health Program. Address: Brussels, Belgium.

848. Messina, Mark J. 1996. Thoughts on the nutritional value of soybeans (Interview). *SoyaScan Notes.* July 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The negative article by Fallon and Enig titled "Soy products for dairy products? Not so fast" has generated a unusually large amount of attention, given how poor the article is and what a minor magazine it was published in. Gary Null wanted Mark to appear on his show just to rebut it. The soybean would probably be better nutritionally if it didn't contain phytates and trypsin inhibitors (other than the Bowman-Birk inhibitor). Phytates do inhibit zinc and iron absorption, and this is important; calcium inhibition is not much of a problem. The soybean plant stores much of its phosphorus in the form of phytates. Of the trypsin inhibitors, most of the focus has been on the Bowman-Birk inhibitor (BBI) as having possible anticancer activity. BBI inhibits both trypsin and chymotrypsin. The other trypsin inhibitors (such as the Kunitz) are not hypothesized to have anticancer activity. Dr. Walter Troll and Dr. Ann Kennedy have been the leaders in research in this field. Ann Kennedy, who is now doing most of the work with BBI, will be speaking at the international soy symposium in Brussels this September. Mark thinks that BBI does have anticancer activity, and that it has a lot of potential as a chemopreventive agent. But he wonders if there is enough BBI remaining in typical soyfoods (such as tofu) to exert benefits but not so much as to exert adverse effects. Ann Kennedy is very smart and a very interesting person to talk with. Mark often asks her about the practical significance of her findings concerning BBI. One serving of tofu has something like 10% of the BBI required to reduce cancer risk.

Mark thinks that Steve Barnes unquestionably is the most knowledgeable person in the USA on isoflavones and phytoestrogens. But the many exciting findings is this area must be divided into those of academic interest and those of practical importance. When Mark looks at the epidemiological data, what he finds most exciting is that all these studies showing soy's protective effect, show that one serving of a soy product (usually tofu) is enough. Mark thinks that if there really is a protective effect against cancer, it is either because of isoflavones or some other substance we are not yet aware of. Whatever it is must be very potent and very unique. Mark does not think the effect is due to a combination of substances in tofu, or to a total lifestyle which happens to include tofu. With cancer research, we already have grounds for a hypothesis, some animal data, and plausible biological mechanisms. So the next step is to show that soy actually has a protective effect in humans.

Flatulence factors might seem like a good candidate for removal, but recent research has shown that they might have benefits. They are more a social than a nutritional problem. Japanese animal studies using oligo sugars [oligosaccharides] indicate that they may help reduce colon cancer risk and promote longevity by stimulating the bifidobacteria. A lot of interesting hypotheses concerning these sugars are waiting to be tested. No single food can be all things to all people, and the source of all nutrients.

Mark is not personally excited by the cholesterol-lowering properties of soy protein. It applies only to a small group of people with very high cholesterol levels and one must eat too much soy to experience modest results. In the Framingham study, 50% of the heart attacks occurred in people with serum cholesterol below 240, and 20% had below 200. 150 is very low; Mark's was 177 last time he had it measured, which puts him close to syndrome x. Genetics plays a big role. If we find that soy inhibits cholesterol oxidation, or stimulates vasodilation, or inhibits platelet aggregation, then we are on to something important. This could be very relevant to the 37 million Americans whose cholesterol level is above 240, which is considered high. PTI (Protein Technologies International) sees those 37 million Americans as a huge potential market for its product Take Care. In the Framingham study, the really solid data showing a relationship between blood cholesterol and heart attacks, applies only to a small group of men, ages 35-54. There is no connection in women or in older men. Several years ago, Mark read two long and very well-done reviews on blood cholesterol and heart disease in excellent peer-reviewed journals, he came to think that the cholesterol hypothesis has more holes in it than Swiss cheese. For example, vegetarian women do hot have a decreased risk of heart disease compared to non-vegetarian women. This is probably because estrogen is so strongly protective.

Implicit in the word "phytochemicals" is some beneficial effect–even though most phytochemicals are a two-edged sword, with both benefits and disadvantages. Thus the oligosaccharides in the soybean (which are biologically active and cause flatulence) should probably not be called a type of phytochemical; Mark is not sure whether or not they actually supply calories and are therefore nutritive substances. If they do supply calories, they are not "non-

nutritive" as phytochemicals must be. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

849. McCord, Holly; Yeykal, Teresa A. 1996. Menopause naturally: Got hot flashes? get soy! *Prevention* (*Emmaus, Pennsylvania*). Aug. p. 65-70. [1 ref]

• ***Summary:*** About 75% of American post-menopausal women experience hot flashes and night sweats, along with sleep disturbances and mood swings. Until now, the only antidote for these unpleasant symptoms has been hormone-replacement therapy (HRT), a prescription medicine the replace the estrogen that women's bodies start making less of. But recently researchers have found that the foods made from the soybean may offer a practical alternative.

"The trail of evidence linking soy with a hot-flash-free menopause starts in Asia." There isn't even a word for hot flash in Japanese. Sherwood Gorbach, M.D., at Tufts University School of Medicine, in Boston, Massachusetts, was one of the first to suggest that the reason for this may lie in the Asian diet, which is rich in soyfoods that contain isoflavones–a natural plant form of estrogen. In one day, a typical Asian woman–who eats about a quarter pound of soyfoods–may be getting 30 to 50 milligrams of isoflavones from her food.

Three clinical studies are now under way to see if and how soy isoflavones work to relieve menopausal symptoms. At Bowman Gray School of Medicine of Wake Forest University (Winston-Salem, North Carolina), Gregory Burke, MD, heads a study of 240 women over age 45 experiencing hot flashes or night sweats. Every day for 2 years the women will drink an 8-ounce soy beverage containing either 1 mg, 34 mg, or 50 mg of isoflavones without knowing which level of isoflavones they're receiving. Researchers will see if more isoflavones relieve their menopausal symptoms or anxiety or mood swings.

Two studies at Tufts University, in Dr. Gorbach's department, are following 60 women with hot flashes. For 3 months, these women will eat either two specially designed almond- or chocolate-flavored soy breakfast bars that each contain 20 mg isoflavones (for a daily total of 40 mg isoflavones) or two placebo bars without isoflavones. Researchers will track the women's reports of hot flashes and night sweats, and their levels of estrogen and other hormones. Though these studies have not been completed, preliminary data look promising says Dr. Gorbach.

A table (p. 67) shows the amount of isoflavones (in mg) in a typical serving of various soyfoods. In descending order: Nutlettes breakfast cereal* (½ cup): 122 mg isoflavones + 140 calories. Beef(Not) textured soy protein granules* (¼ cup dry): 62 mg + 70 calories. Roasted soy nuts (¼ cup): 60 mg + 195 calories. Tempeh (½ cup): 35 mg + 165 calories. Low-fat tofu (½ cup): 35 mg + 54-75 calories. Regular tofu (½ cup): 35 mg + 105-120 calories. Take Care High Protein beverage powder (Protein Technologies International; 2 scoops): 35 mg + 100-130 calories. Regular soymilk (1 cup): 30 mg + 130-150 calories. * = Available from Dixie USA, 1-800-347-3494.

Even if this research doesn't show positive results, other studies show that soy lowers cholesterol and may prevent breast cancer and osteoporosis. "A serving of soy every day could turn out to be a good bet," says Dr. Gorbach. Researchers recommend consuming in the range of 30-50 mg/day of isoflavones. More than 100 mg/day could be harmful, so its is best to get your isoflavones from food instead of pills. Contains two recipes: Creamsicle Cooler (shake with soft tofu; 35 mg of isoflavones). Southwestern Skillet (with Beef(Not); 62 mg of isoflavones).

850. *Soybean Quarterly* (*Nebraska Soybean Board, Lincoln, Nebraska*). 1996. Research shows soy protein awareness and usage are up. 2(4):3.

• ***Summary:*** "Weise Research Associates (WRA) recently completed a nationwide soy protein awareness and usage study using a randomized telephone survey of 500 consumers nationwide... The information in the study was compared with three earlier similar studies, 1988 and 1991 studies by Protein Technologies International, and a 1991 study for the American Soybean Association conducted by Burke Market Research. These research results describe a marked increase in consumers' desire to try and purchase foods with soy protein. This desire has led to an increased demand for soyfoods."

The key findings of the research: (1) During the last 5 to 8 years, awareness of soy proteins in specific foods has increased from 60% of households surveyed in 1988 to 80% 1996.

(2) Consumers today appear twice as willing to try products containing soy as in 1988. Consumer trials of foods containing soy protein increased from 25% of households in 1988 to 50% in 1996.

(3) Health and nutrition are the main reasons given by consumers for trying foods containing soy proteins.

(4) Future purchase intent by consumers of foods containing soy protein increased from 20% "more likely" in 1988 to 32% in 1996.

(5) In the 1996 study, 75% of consumers said they would not be surprised to see soy protein listed on a meat label. Moreover, the vast majority of consumers felt that this would be a positive step to inform consumers about the potential benefits of soy proteins.

(6) When offered a choice between animal and vegetable protein, 46% of those surveyed chose the later, largely because of health concerns and the perceived lower fat benefits of vegetable protein.

(7) The demographic profile of the "high potential" for soy protein usage consumer segment appears to be somewhat younger female consumers (median age of 38.8 to 40.3) from

middle income households ($30,000–$38,700). Frequent past trial of soy protein in other foods was also a strong indicator of willingness to consider textured soy protein in meat products.

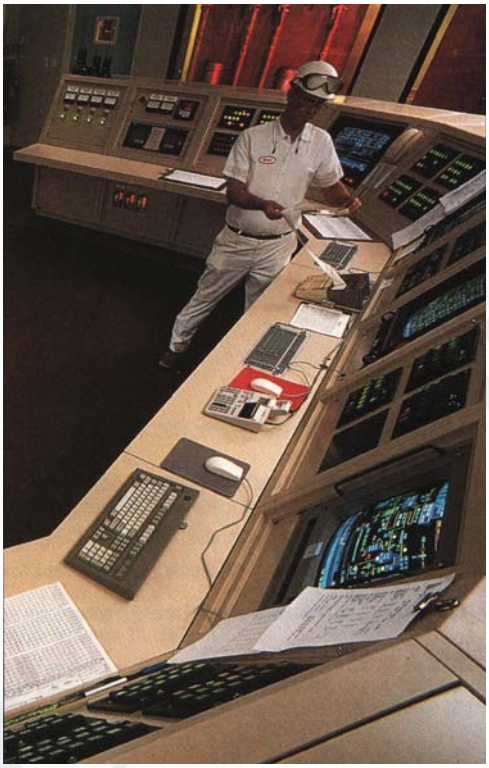
851. Ralston Purina Company. 1996. Annual report to shareholders. St. Louis, Missouri. 52 p.
• ***Summary:*** See also next page. Pages 10-11: In large, bold letters–"Protein Technologies International is the world's leading producer and marketer of high-quality dietary isolated soy protein and fiber food ingredients, and a leading marketer of polymer products worldwide."

"Supro brand isolated soy proteins comprise Protein Technologies International's core product line, with key applications in infant formulas, dietary foods and processed meat, poultry and seafood products. Additional key products for food and beverage markets include Supro Plus brand isolated soy proteins, and Fibrim brand soy fiber with applications in medical/nutritional beverages, baked goods and reduced calorie breads. Our Pro-Cote brand polymer products are sold to industrial paperboard and coated paper customers worldwide.

"In Fiscal 1996 PTI contributed $385,400,000 in sales and $84,500,000 in operating profit to Ralston Purina Company before amortization"–compared with operating profit of $82.8 million in 1995 and $67.1 million in 1994.

"Operating profit of the segment increased slightly for the year as higher volumes and prices were nearly offset by increased business development costs and higher raw material costs in the last half of the year.

"With six manufacturing facilities and approximately 1,200 employees, PTI serves a global customer base with technologists and account managers located in 35 countries. More than half its sales are generated outside the USA."



"Supro Success: Our Supro brand isolated soy protein continued to grow sales at a double-digit rate in Fiscal 1996, primarily due to strong sales to meat processors in Europe, North America, and Latin America.

"Supro is a high quality, complete protein that is highly digestible. This core product plays a significant role in providing required protein levels at affordable and stable costs.

"Protein Technologies International continues to support clinical research surrounding the health benefits of Supro.

"Benefits of Soy Protein: Protein Technologies International is committed to supporting research of existing soy protein sources in order to identify healthful food solutions and health benefits. For example, an article published in the *New England Journal of Medicine* in August 1995 emphasizes the value of isolated soy protein for lowering cholesterol in humans and the general health value of soy protein-based foods. The news gives consumers and industry an incentive to consider soy for a daily source of protein and develop foods which contain significant amounts of soy protein.

"We are currently working on a variety of new products to address this opportunity. One example is Take Care, a consumer beverage mail-order product which contains Supro. Take Care is an excellent source of soy protein, calcium and vitamins, and is low in fat and free of lactose and cholesterol. The product comes in a variety of flavors for mixing with water, fruit juice or other beverages.

"Plant Expansions Continue: Plant capacity expansions to address the increasing worldwide demand for isolated

RALSTON PURINA COMPANY

BUILDING GLOBAL FRANCHISES

RALSTON PURINA PET PRODUCTS

ENERGIZER

PROTEIN TECHNOLOGIES INTERNATIONAL

ANNUAL REPORT TO SHAREHOLDERS 1996

soy protein are underway on two continents. Our Memphis [Tennessee] facility [isolate plant] is in the midst of a $65 million expansion, and our Ieper, Belgium, plant has undertaken a multi-million dollar expansion. Both plants are key suppliers of Supro brand isolated soy protein and Fibrim brand soy fiber for customers worldwide.

"Opportunities for Growth, and Outlook: Protein Technologies International enjoys a number of competitive advantages, including a sophisticated manufacturing infrastructure, excellent customer relationships, and a leading technology position that is constantly upgraded to deliver value to our customers.

"Our account and applied technology managers form partnerships with our customers to uniquely meet their business needs with leading-edge food and nutritional science capabilities and solutions. While we operate in an increasingly competitive environment, we are confident our superior technological capabilities will prevail at the end of the day.

"Looking ahead, we believe the prospects for Protein Technologies International are excellent. On one hand, food processors in mature economies face intense competitive pressure to reduce costs. At the same time, in developing countries a compelling need for high-quality, affordable protein exists. Perhaps most encouraging is the increasing publicity surrounding health benefits of soy protein. Given this potential, we look forward to Fiscal 1997 and beyond."

Six color photos show subjects related to PTI, include a class container of Supro, a can of Take Care, and the computer control panels at one of the company's state-of-the-art facilities.

Page 32 states that sales of the Soy Protein Products segment increased by 7.0% in 1996 and 10.6% in 1995 on strong volume in food protein products. In 1995 operating profit increased 23.5%.

An announcement of the Annual Meeting of Shareholders (21 p.) is included. Address: Checkerboard Square, St. Louis, Missouri.

852. Brandt, Laura. 1997. The soy story: Making healthy taste better. *Food Formulating* (*Chilton's*). Jan. p. 46-47.
• ***Summary:*** The subtitle reads: "The recent news about soy's health benefits is good. Getting Americans to incorporate soy into their diets is another matter. Improved soy ingredients make it easier for formulators to create new soy foods with better taste and texture." Researchers that two isoflavones in soy, genistein and daidzein, provide many of the nutritional benefits, probably because they have properties similar to the hormone estrogen. "Several studies on peri- and post-menopausal women who consumed soy protein showed promising results toward alleviating menopausal symptoms and increasing bone density and bone mineral content. Soy supplementation (containing phytoestrogens) has been suggested as an alternative to still-controversial hormone replacement therapy."

Central Soya now has a new, improved soy protein concentrate, Soyarich B. The number of U.S. vegetarians has more than doubled in the last decade to more than 15 million. For the consumer of soy burgers, taste and texture are more important than fat content.

Beverages are an easy way for consumers to add soy protein to their diets. Protein Technologies International makes Take Care, a high protein beverage powder based on Supro brand isolated soy protein. PTI's latest isolate product is Health Source, a refrigerated non-dairy, nonfat beverage that will be test marketed this spring. It will also be made into yogurt-style desserts. These will contain the daily requirements for calcium and vitamin C. Address: Technical Editor, Radnor, Pennsylvania.

853. Ralston Purina Co. 1997. Chronology (1961-1996), dividends paid, and stock price performance. St. Louis, Missouri. 7 p. Unpublished report.
• ***Summary:*** 1961–The company began its transformation to a consumer products growth business. 1962–The stock was first listed on the New York Stock Exchange. 1966–Sales first topped 1 billion. The stock price was low and steady from 1961 to 1982, when it began to rise. 1981–W.P. Stiritz was elected President and CEO. In 1985 the company sold its soybean operations. 195–Sold Continental Baking Co. Address: St. Louis, Missouri. Phone: 314-982-3002.

854. **Product Name:** Personal Edge (Nutritional Beverage Powder) [Plain, Strawberry, Chocolate].
Manufacturer's Name: Nutritious Foods, Inc. (Distributor).
Manufacturer's Address: St. Louis, Missouri.
Date of Introduction: 1997 February.
Ingredients: Incl. Supro brand isolated soy protein.
How Stored: Shelf stable.
New Product–Documentation: Ann Behling. 1997. *Soybean Digest.* Feb. p. 90. "Soy-based beverage provides an edge." Personal Edge, a sports nutritional beverage made from Supro brand isolated soy protein, helps speed the repair and recovery of muscle tissue after training or competition, according to its manufacturer. It can be mixed with milk, water, or orange juice. It is being promoted by the Nebraska Soybean Board at various farm shows and related events.

855. Protein Technologies International. 1997. Supro and isoflavones update: Science & nutrition brief (Brochure). St. Louis, Missouri. 3 p. Feb. 28 cm. [17 ref]
• ***Summary:*** Table 1 shows the range (mg/gm of protein) of isoflavone content of Supro brand isolated soy protein products* (Footnote: *"All forms"). Daidzein 0.3 to 1.8. Genistein 0.6 to 2.8. Glycitein 0.1 to 0.4. Total isoflavones 1.0 to 5.0. Source: Protein Technologies International.

Note: A table with this same title and similar content was published in a March 1995 technical paper titled "Supro and

Isoflavones." The levels of isoflavones shown in the earlier paper were about 50 to 100% lower than those reported in this Feb. 1997 paper. The earlier table showed the range (mg/gm of protein) of isoflavone content of Supro brand isolated soy protein products* (Footnote: *"Aglucone units adjusted for molecular weights"). Daidzein 0.15 to 0.72. Genistein 0.48 to 1.51. Glycitein 0.05 to 0.26. Total isoflavones 0.68 to 2.49. Source: Protein Technologies International. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

856. Johnston, Trevor. 1997. Recent nightmares at Bean Supreme Ltd. in New Zealand (Interview). *SoyaScan Notes.* May 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The last 18 months have been a marketing nightmare for Trevor. The problems started when a toxicologist, who works for the government in New Zealand, fed his parrots a soy-based formula and they died. He blamed the soy. He and others formed "The Soy Toxin Team" and have been working ceaselessly to (1) get soy-based infant formula banned from the market in New Zealand, and (2) alert the public to what they feel are the dangers of the phytoestrogens in soybeans. Trevor has a huge file of anti-soy and anti-phytoestrogen articles published in New Zealand. Note that in the USA almost all of the many articles about the phytoestrogens in soybeans consider them to be one of the main benefits of soybeans.

The second major problem has been Roundup Ready soybeans–which are genetically engineered by Monsanto. Greenpeace in Australia has made these soybeans their major project; they are working to alert the public to the fact that most food products that contain soybeans–unless specifically labeled otherwise–probably contain at least a small percentage of Roundup Ready soybeans–which are not labeled as being genetically modified (GM). These soybeans offer no benefits to consumers and Greenpeace argues that they main contain some real dangers. They have conducted a number of media actions, such as taking soy products off supermarket shelves to point out that they contain soy–as the cameras roll. The result has been to give soy a negative image in Australia. A group called the Natural Food Commission (an offshoot of Maharishi's Transcendental Meditation or TM) has been formed and is now circulating a draft proposal on genetically modified organisms in foods–urging that they be labeled.

Trevor's sales have decreased by 25% over the past 18 months. His biggest specific problem is trying to find a source of soy protein isolates that are guaranteed to be free of GM soybeans. Protein Technologies International is refusing to deal with this issue by saying that their isolates are safe. There are other big users of soy protein isolates in Australia: A large sausage company and Sanitarium Foods. Of his various products, Trevor's isolate-based soymilk has suffered the greatest drop in sales. Sales of his tofu products have not decreased, and sales of his soy ice creams are down only a little. Address: Managing Director, Bean Supreme Ltd., P.O. Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: (09) 590 592.

857. Johnston, Trevor. 1997. Genetically modified foods update–May 13 (News release). Auckland, New Zealand: Bean Supreme, Ltd. 1 p. May 13.
• ***Summary:*** "This memo is to let you know what we are doing to ensure our consumers GMO (genetically modified organism) free soy products.

"At present we **can** control the source of our soybeans which we import. We do not and will not in the future import any genetically modified whole soybeans for our Tofu manufacture.

"The situation is more complex with soy derivative products which we also use in many of our products, e.g. soy protein powders [soy protein isolates]. These are highly nutritious and valuable food ingredients to us. We along with many other companies are lobbying our suppliers to guarantee us GMO free product. At present they can't give us this assurance because they draw their source beans from commodity stocks of beans which may or may not contain small quantities of GMO beans (Roundup Ready beans comprise approx. 2% of the US crop in 1997).

"There is presently no requirement in U.S. law to segregate GMO and conventionally bred stocks."

Johnson ends the new release with a suggestion: "If you wish to express your views directly to the manufacturer of soy protein powders such as those used widely in the industry write to; Michael W. Sel, Director, Product Quality, Protein Technologies International, 900 Checkerboard Square, St. Louis, Missouri 63814 USA. Fax 001 314 982 1841." Address: Marketing director, Bean Supreme Ltd., Box 12082, Penrose, Auckland, New Zealand]. Phone: 64 9 579-0592.

858. *Wall Street Journal.* 1997. Ralston issues denial of any plans to shed its Eveready Division. May 28.
• ***Summary:*** William Stiritz, the chairman and CEO of Ralston Purina Co., said the company is looking at various options for its soy protein products division [PTI], "a real

gem of a business," which last year had $421 million in revenue and $85 million in operating profit. These soy protein products are used as an ingredient in processed meats, infant formulas, and dietary foods. The company is considering the possibility of some kind of special stock for PTI. Ralston had once created a special class of stock for its Continental Baking unit, which it sold in 1995. Address: Staff reporter.

859. Erdman, John, Jr.; Potter, Susan M. 1997. Soy and bone health. *Soy Connection* (*The*) (*Chesterfield, Missouri–United Soybean Board*) 5(2):1, 6. Spring. [8 ref]

• ***Summary:*** "Osteoporosis is one of the major debilitating diseases of aging, especially for women. In the United States alone, some 1.5 million persons will have fractures yearly from this disease with a health care cost in excess of $10 billion. Women are protected to some degree from rapid bone mineral losses prior to menopause by the hormone estrogen. After menopause, circulating levels of estrogen dramatically drop, often with an increased rate of bone loss. After menopause some women elect to use hormone replacement therapy (HRT), in part, to reduce the bone loss. HRT can also have beneficial effects on blood lipids (total and LDL cholesterol) and menopausal symptoms, such as hot flashes. Unfortunately, there are often side effects including increased risk of breast and uterine cancer or return of menses.

"Recently there has been a great deal of interest in the potential role of plant estrogens, the so-called phytoestrogens, in improving the health of postmenopausal women. Soy is a rich and primary dietary source of the phytoestrogen class known as isoflavones. Isoflavones are present in relatively large amounts in virtually all soy protein-containing products with the exception of soy protein concentrates and isolates that have undergone alcohol extraction during processing. Genistein, the major isoflavones in soy, is known to be estrogen analog and will bind to estrogen receptors with an affinity of approximately 0.2 percent that of estradiol, the major circulating estrogen.

"Genistein, and daidzein, the other primary isoflavone in soy, are structurally similar to estradiol. In animal and cell culture studies genistein can be shown to have estrogenic or antiestrogenic effects depending upon tissue studied and dose level. In regard to bone, it is hypothesized that the isoflavones have estrogenic action or are estrogen agonists, and should improve bone health.

"Since postmenopausal women are at risk of estrogen deficiency-related health problems such as cardiovascular disease and osteoporosis, it is possible that consumption of soy products containing isoflavones may reduce the risk of these diseases. A study was designed at the University of Illinois at Urbana-Champaign to examine the impact of soy protein containing different concentrations of isoflavones on blood lipid profiles and bone density in hypercholesterolemic, postmenopausal women. This work was primarily supported by the Illinois Soybean Program Operating Board.

The Study: Postmenopausal, hypercholesterolemic women (n=66) with initial total cholesterol concentrations between 240-300mg/dl were placed on a low fat/low cholesterol diet (<30 percent of energy<300mg/day; National Cholesterol Education Program Step 1 diet). After two weeks on the basal diet, women were randomly assigned to one of three dietary treatment groups providing 40 g protein from one of the following: isolated soy protein containing moderate concentrations of isoflavones (ISP; Supro 675), isolated soy protein containing higher concentrations of isoflavones (ISP+, Protein Technologies International, St. Louis, MO), or casein/nonfat dry milk (control, New Zealand Milk Products, Wellington, New Zealand). Both isolated soy proteins were fortified with calcium (calcium phosphate) to amounts comparable to those found in casein. Test proteins were incorporated into a variety of food items including breads, muffins, drinks, milks, and soups. The entire study period lasted 26 weeks; 2 weeks for the basal, lead-in period, and 24 weeks for the intervention period. Women were excluded from participation if they used any medications known to alter lipid and/or bone/calcium metabolism, including HRT within the last six months or menstruated within the last 12 months prior to initiation of the study. On two separate days at the end of the two-week adaptation period (baseline) and every six weeks for the duration of the 24 week study, fasting blood samples were collected. Total plasma cholesterol (TC), HDL, and total triglycerides were quantified.

"Bone mineral measurements of the lumbar spine (L1-L4), the proximal femur (including the femoral neck) and Ward's triangle, and the total body were measured by dual-energy X-ray absorptiometry (DXA; Hologic QDR-200, Waltham, MA) prior to initiation of the intervention period and then again after the 24 weeks of consuming the test protein. All measurements were made and analyzed by the same two experienced operators.

"The Results: Subjects consumed test protein-containing products without difficulty. Of the skeletal sites tested, lumbar spine bone mineral content and density increased significantly (about 2 percent) at the end of the 24-week treatment period in the ISP+ group, but not in either of the other groups. No significant differences between groups were noted in bone mineral density or content in total body or other skeletal sites. While total cholesterol was not altered by dietary treatment, HDL cholesterol increased, starting at week six for the ISP group and week 18 for the ISP+ group ($p<.05$), and non-HDL (LDL + VLDL) cholesterol decreased at week 24 ($p<.05$) in subjects who consumed either ISP or ISP+ compared to control. Ratios of total cholesterol/HDL cholesterol were improved with respect to cardiovascular risk by both soy protein preparations. Dietary treatment did not influence total triglyceride concentrations.

"Results from this study indicate that soy protein is effective in modulating risk of both cardiovascular disease and osteoporosis in postmenopausal women. Interestingly, the amount of isoflavone consumed had little impact on blood lipid parameters, but was a factor in bone measurements. In fact, the ISP diet group with the moderate concentration of isoflavones significantly improved blood lipid profiles prior to 24 weeks while the group receiving higher concentrations (ISP+) did not have significant improvement until later in the study (18-24 weeks). The reason for this may be due to the possibility that the dietary concentration of isoflavones needed to affect lipid metabolism is different from that needed to influence bone metabolism. The possibility also exists that the cholesterol-modulating component of soy is not, or only partially, related to isoflavones.

"Implications: Our findings that the higher isoflavone-containing soy protein product (ISP+) produced significant increases in bone mineral content and density in the spine was of interest for at least two reasons. First, of all skeletal sites measured, the spine is the area that is thought to be the most sensitive to estrogen due to its higher content of trabecular bone. This type of bone undergoes remodeling at a much more rapid rate than the hip, which contains a higher proportion of cortical bone. Second, we had hypothesized that both isoflavone-containing soy proteins would be associated with a delayed decrease in bone density compared to control. The fact that there was a slight increase in bone density and mineral content (2 percent) was very intriguing. However, this is a very short study with respect to bone, and findings need to be confirmed by longer studies (e.g. at least two years).

"There have been a few studies in experimental animals that have focused on the effects of soybean isoflavones on hormonally-related bone loss, although the results have been mixed. A research team at the University of Illinois at Chicago campus headed by Dr. B.H. Arjmandi have shown in ovariectomized, female rats (a model for the postmenopausal women) that a diet with ISP containing isoflavones, started immediately after ovariectomy, was effective in preventing bone loss in the fourth lumbar vertebra. The isoflavone-containing ISP also reduced bone loss, although to a lesser extent, in the right femur. In a later study, this same team found that the ISP containing isoflavones did not restore bone, once lost due to ovariectomy, when there was a delay in feeding ISP until well after the ovariectomy. These two studies support the role of soy isoflavones in preventing bone loss in female rats without ovaries (and thus estrogen) as long as ISP is fed soon after loss of ovarian function (i.e. menopause).

"With regard to blood lipids, the cholesterol-lowering effect of soy protein was not as pronounced in women in our current study as what has been reported in the literature. Previously we reported an 11-12 percent reduction in total and LDL cholesterol concentrations in mildly hypercholesterolemic men consuming 50 g soy protein per day. Differences between our current findings in postmenopausal women and previous studies with men could be due to differences in responsiveness to soy between the sexes. The fact that we did observe a significant increase in HDL cholesterol, a finding typically not present in men fed soy protein, may indicate that part of the soy protein response in women is related to isoflavones and their interaction with estrogen receptors. However, we did not observe significant decreases in total cholesterol or significant increases in total triacylglycerols, common responses to estrogen given to postmenopausal women.

"Conclusion: Our data suggests that isolated soy protein at either concentration of isoflavones is protective against cardiovascular diseases by altering lipoprotein profiles in postmenopausal women. Furthermore, we observed a possible protective role of isoflavones on bone maintenance. Unfortunately many women in the U.S. either cannot or will not comply to standard hormone replacement therapy, which is the treatment of choice for prevention and treatment of cardiovascular disease and osteoporosis in this population. Thus, it is possible that addition of soy products containing isoflavones to the diet may provide a viable alternative mode of therapy in improvement of health in postmenopausal women." Address: 1. PhD, Prof. of Food Science and Human Nutrition, Univ. of Illinois; 2. R.D., Senior Nutrition Scientist, Protein Technologies International [St. Louis, Missouri].

860. *SoyaScan Notes.* 1997. The soy protein isolate industry and market worldwide (Overview). July 14. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** The following statistics were compiled, with permission, from one or more very reliable sources, which have asked to remain anonymous.

Protein Technologies International (PTI) in the USA–70,000 tonnes/year.

PTI in Belgium–15,000 tonnes.

ADM–15,000-20,000 tonnes.

Fuji-PTI in Japan–10,000 tonnes.

Sanbra in Brazil–8,000 tonnes.

Others worldwide: 6,000 tonnes.

Total worldwide: 124,000 to 129,000 tonnes/year.

The soy protein isolate market worldwide is pretty stagnant–growing quite slowly. By contrast, the soy protein concentrate market is growing very rapidly, and is expected to double in the next 4-5 years.

861. Deutsch, Claudia. 1997. DuPont to buy Ralston Purina soy protein unit. *New York Times.* Aug. 23. p. 35, 37.

• ***Summary:*** This acquisition for $1.5 billion in stock is part of DuPont's "fervent push into agricultural biotechnology."

Protein Technologies International (PTI) supplies about

75% of the world market for soy proteins used in processed foods.

The deal comes 2 weeks after DuPont bought a 20% stake in Pioneer Hi-Bred International Inc. for $1.7 billion.

DuPont is said to be ramping up its efforts to make improved soybean seeds, and the company needs to be sure they will have access to as many customers as possible.

Companies like PTI or ADM will contract with farmers to grow a specific type of soybean, and companies like DuPont or Monsanto want to be as sure as possible that its their soybeans that are being contracted for.

Biotechnology is beginning to blur the lines between the different parts of the food chain. It's a new field called neutriceuticals. The stakes are huge, now that seeds can be patented.

862. Kilman, Scott; Warren, Susan. 1997. DuPont to buy Ralston-Purina unit in building 'dirt-to-dinner' biotech line. *Wall Street Journal*. Aug. 25. p. A4, C2 (p. A8 East).
• ***Summary:*** DuPont says it has has signed a letter of intent to buy Ralston Purina's soybean processing unit, Protein Technologies International (PTI), for $1.5 billion in DuPont stock. PTI makes high-protein powder from soybeans, "a hot-selling ingredient for everything from infant formula to supplemental nutritional drinks for senior citizens. Recent medical studies suggesting that soybean compounds inhibit growth of some cancer cells and reduce the risk of osteoporosis are fanning strong interest in them for use in 'nutraceuticals.'" DuPont, a giant chemical company, wants PTI to process the soybeans genetically engineered by the biotech joint venture it recently formed with Pioneer Hi-Bred International Inc. of Des Moines, Iowa, the nation's largest seed company; DuPont purchased a 20% stake in Pioneer for $1.7 billion.

"Officials of the joint venture hope to design a soybean from which it is easier to extract isoflavones, a chemical with estrogen-like properties some researchers believe eases menopause symptoms." Industry observers were surprised at the high price (announced Friday) that DuPont offered to pay for PTI; it is more than 3 times the annual revenue of PTI, which last year had $421 million in sales and $85 million in operating profit. High offer fueled speculation that DuPont had to outbid its biggest biotech rival, Monsanto Co., which is spinning off its flagship chemicals business as it gobbles up seed and biotech companies. Some Wall Street analysts think Friday's developments put pressure on Monsanto to form some sort of alliance with ADM to process its genetically engineered crops into food ingredients.

Although the soy protein market that PTI helped to create is growing at about 10% a year, Ralston says it is selling the unit because it doesn't have the biotechnology resources to take it to the next level. DuPont said it expects to reach a final agreement with Ralston this fall, subject to corporate and regulatory approval.

Ralston's stock advanced $3.44 to $91.68 with the sale. ADM stock rose $0.94 to $21.875.

Note: As of 16 Oct. 1998, PTI has decided to remain at its former offices at the Ralston Purina building in St. Louis. Missouri. It still uses the Ralston Purina library, etc.

863. National Oilseed Processors Association. 1997. Yearbook and trading rules 1997-1998. Washington, DC. [iv] + 127 + 11 p. No index. 23 cm.
• ***Summary:*** On the cover (but not the title page) is written: Effective August 1, 1997. Contents: Constitution and by-laws. Officers and directors. Executive office. Members. Standing committees. Trading rules on soybean meal. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}), sampling of soybean meal {at origin} (automatic mechanic sampler, pneumatic probe sampler, probe sampler), sampling of soybean meal (at barge loading transfer facilities), official weighmaster application, semi-annual scale report, certification of installation of automatic sampler & mechanical divider (at origin), semi-annual certification of automatic sampler & mechanical divider (at origin), voluntary checklist for semi-annual certification of sampler & divider (at origin), certification of installation of automatic sampler & mechanical divider (at barge loading transfer facility), semi-annual certification of automatic sampler & mechanical divider (at barge loading transfer facility), voluntary checklist for semi-annual certification of sampler & divider (at barge loading transfer facility), official referee laboratories (meal), official NOPA soybean meal sample bag. Soybean meal export trading rules: Minimum blending procedures for export meal blended at ports, sampling of soybean meal (at vessel loading facilities), weighing of soybean meal (at vessel loading facilities), certification of installation of automatic sampler & mechanical divider (at vessel loading facility), semi-annual certification of automatic sampler & mechanical divider (at vessel loading facility), semi-annual certification of scales at vessel loading facilities. Trading rules on soybean oil. Sales contract. Definitions of grade and quality of export oils. Soybean lecithin specifications. Appendix to trading rules on soybean oil: Inspection, grading soybean oil for color (NOPA tentative method), methods of analysis (A.O.C.S. official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses (iodine value, unsaponifiable, break test); refining byproduct lipid, acidulated (refining byproduct lipid and tank bottoms), official weighmaster application, semi-annual scale report, official referee chemists (oil). Soybean oil export trading rules. Uniform soybean oil export contract. Foreign trade definitions (for information purposes only) Appendix 1.

The section on officers, executive committee, and board of directors (p. 7-8) gives the name, company affiliation, and phone number of each person. Officers (executive

committee)–Chairman: William B. Campbell, Central Soya Company, Inc. Chairman-elect: Richard Galloway, Quincy Soybean Company. Secretary / Treasurer: Albert J. Ambrose, Harvest States / Honeymead Processing and Refining. Immediate past chairman: John A. Burritt, Ag Processing Inc a cooperative.

Executive staff: President: Sheldon J. Hauck. Executive vice president: Alen F. Johnson.

Board of directors (alphabetically by company; each member company may have up to two representatives on the board; only the first of these may vote): James W. Lindsay & John A. Burritt, Ag Processing Inc a cooperative. John G. Reed, Jr. & John D. McNamara, Archer Daniels Midland Co. Archie Gwathmey & Charles Bussey, Bunge Corporation. Wayne Teddy & John March, Cargill, Inc. William B. Campbell & Carl Hausmann, Central Soya Co., Inc. James D. Tibbets & Al Ambrose, Harvest States / Honeymead Processing and Refining. Patrick E. Wright & Henry E. O'Bryan Owensboro Grain Co., Inc. Richard L. Wiley & L. Weldon Sander, Perdue Farms, Inc. Richard Galloway & Larry Horn, Quincy Soybean Co. Gerard A. Delatte & Richard E. Bell, Riceland Foods, Inc. Thomas L. Harper, Southern Soya Corp. Rodney Christianson & David Thompson, South Dakota Soybean Processors, D. Daryl Houghton & George C. White, Townsends, Inc. Cliff Meeuwsen & Arlen Meeuwsen, Zealand Farm Soya.

Executive office, Washington, DC: President, Sheldon J. Hauck (Email: shauck@nopa.org). Executive vice president: Allen F. Johnson. Director of regulatory affairs: David C. Allor. Executive asst.: Hady J. Nash. General counsel: Elroy H. Wolff, Sidley & Austin. Special consultant: C. Lockwood Marine, Ft. Wayne, Indiana.

Members (listed alphabetically by company; within each company, first the name of the official Association representative {who is on the Board and votes}, followed by the other personal members listed alphabetically by surname. For example, Archer Daniels Midland Co., the company with the most personal members, has 34. After the name of each personal member is given with his address and phone number. In the listing below, the number of personal members is shown in parentheses after the name of each company, followed by city and state of the various locations): Ag Processing Inc a cooperative (25); Eagle Grove, Iowa; Manning, Iowa; Mason City, Iowa; Sergeant Bluff, Iowa; Sheldon, Iowa; Dawson, Minnesota; St. Joseph, Missouri. Omaha, Nebraska. Archer Daniels Midland Co. (23); Archer Daniels Midland Co. (34); Little Rock, Arkansas; Augusta, Georgia; Valdosta, Georgia; Decatur, Illinois; Galesburg, Illinois; Granite City, Illinois; Taylorville, Illinois; Frankfort, Indiana; Des Moines, Iowa; Fredonia, Kansas; Destrehan, Louisiana; Mankato, Minnesota; Red Wing, Minnesota; Kansas City, Missouri; Mexico, Missouri; Clarksdale, Mississippi; Fremont, Nebraska; Lincoln, Nebraska; Fostoria, Ohio; Kershaw, South Carolina; Memphis, Tennessee. Bunge Corp. (16); Decatur, Alabama; Cairo, Illinois; Danville, Illinois; Emporia, Kansas; Destrehan, Louisiana; St. Marks, Mississippi; Vicksburg, Mississippi; St. Louis, Missouri. Cargill, Inc. (19); Guntersville, Alabama Osceola, Arkansas; Gainesville, Georgia; Lafayette, Indiana; Cedar Rapids, Iowa; Des Moines, Iowa; Iowa Falls, Iowa; Sioux City, Iowa; Washington, Iowa; Bloomington, Illinois; Chicago, Illinois; Wichita, Kansas; Burnsville, Minnesota; Minneapolis, Minnesota; South Savage, Minnesota; Wayzata, Minnesota; Kansas City, Missouri; Fayetteville, North Carolina; Raleigh, North Carolina; Sidney, Ohio; Memphis, Tennessee; Chesapeake, Virginia. Central Soya Co., Inc. (11); Gibson City, Illinois; Decatur, Indiana; Fort Wayne, Indiana; Indianapolis, Indiana; Belmond, Iowa; Bellevue, Ohio; Marion, Ohio; Delphos, Ohio; Chattanooga, Tennessee. Harvest States / Honeymead Processing and Refining. (5); Mankato, Minnesota. Owensboro Grain Co., Inc. (4); Owensboro, Kentucky. Perdue Farms, Inc. (4); Salisbury, Maryland; Cofield, North Carolina. Quincy Soybean Co. (4); Helena, Arkansas, Quincy, Illinois. Riceland Foods, Inc. (5); Stuttgart, Arkansas. South Dakota Soybean Processors (3); Volga, South Dakota. Southern Soya Corp. (2); Estill, South Carolina. Townsend's Inc. (2); Millsboro, Delaware. Zealand Farm Soya (3); Zealand, Michigan.

Associate Members: AC Humco, Memphis, Tennessee. ADM Agri-Industries Ltd., Windsor, Ontario, Canada. Alfred C. Toepfer International, Inc., Minneapolis, Minnesota. Amber, Inc., Tarrytown, New York. C&T Quincy, Richmond, Virginia. CanAmera Foods, Oakville, Ontario, Canada. Columbia Grain & Ingredients, Inc., Wellborn, Florida. Commodity Specialists Company, Minneapolis, Minnesota. Con Agra Poultry Co., El Dorado, Arkansas. Continental Grain Co., Chicago, Illinois. ContiQuincyBunge, New York City, New York. Garnac Grain Co., Overland Park, Kansas. Hunt-Wesson, Inc., Fullerton, California. Iowa Select Farms, Iowa Falls, Iowa. Lipton, Englewood Cliffs, New Jersey. Louis Dreyfus, Wilton, Connecticut. Noga Commodities (Overseas), Inc., New York City. Oleostates, Inc., Tucson, Arizona. Pilgrim's Pride Corp., Pittsburg, Texas. Procter & Gamble Co., Cincinnati, Ohio. Schouten USA Inc., Minneapolis, Minnesota.

Standing committees: For each committee, the function of the committee, the names of all members (with the chairman designated), with the company and company address of each are given–Crusher committees: Canola, flaxseed, safflower seed, sunflower seed. International trade committee. Government and public relations committee. Industry and grower relations committee. Soybean meal trading rules committee. Soybean oil trading rules committee. Technical, research, environmental, and safety, health, and loss prevention (TESH) committee. Technical. Address: 1255 Twenty-Third St., N.W., Washington, DC 20037. Phone: 202/452-8040. Fax: 202/835-0400.

864. *GMF–Genetically Modified Foods Market Intelligence* (*Genetic ID, Fairfield, Iowa*). 1997. DuPont next big player in ag biotech. No. 12. Sept. 1. p. 1.
• ***Summary:*** "In a bid to join Monsanto and Novartis in the top tier of developers of new genetically engineered crops, Wilmington, Delaware-based DuPont Co. is building a biotech food empire through acquisitions.

"DuPont has acquired a 20% stake in seed producer Pioneer Hi-Bred International of Des Moines, Iowa, which will give it a marketing outlet for its new seeds that are genetically engineered for special nutritional attributes. Pioneer had previously turned down purchase offers from Monsanto.

"As part of a strategy to create a vertically integrated structure to deliver its products, DuPont is also acquiring the Protein Technologies International (PTI) unit of Ralston Purina Co. PTI is a leading producer of soy protein powders that are ingredients in a wide range of nutritional products from infant formula to soy burgers. PTI will be the vehicle for processing and selling DuPont's soybeans engineered to contain altered nutritional components such as proteins and fats.

"The *Wall Street Journal* of August 25 reported that some Wall Street analysts are now expecting an alliance between Monsanto and Archer Daniels Midland Co. to process Monsanto's genetically modified crops into food products."

865. Thayer, Ann. 1997. DuPont's range now farm to table: purchase of Protein Technologies provides downstream avenues for ag products. *Chemical and Engineering News.* Sept. 1. p. 9.
• ***Summary:*** With its of Protein Technologies International (PTI) from Ralston Purina Co., DuPont signals its move into the fields of agriculture and biotechnology [genetic engineering] where it joins a powerful new set of rivals: Monsanto, Novartis, and DowElanco. This new direction might be called its "life sciences strategy." says "William F. Kirk, vice president and general manager of DuPont Agricultural Products.

For PTI, DuPont agreed to pay $1.5 billion in stock minus certain unspecified liabilities.

In 1996 PTI, a subsidiary of Ralston Purina, had sales of $421 million and operating earnings of $85 million. It "is a leading worldwide processor of soy proteins for the food, paper, and health care industries. PTI has about 3,000 customers, predominantly food companies, in 75 countries. It also has 1,200 employees, about 10% of whom are research and development professionals."

Also in August DuPont announced the $1.7 billion acquisition of a 20% interest in Pioneer Hi-Bred, the well known seed producer, which in 1996 enjoyed sales of $1.7 billion and net income of $223 million.

"With Pioneer, DuPont created seed R&D and marketing joint venture Optimum Quality Grains (C&EN, Aug. 11, p. 14)."

Before these life sciences acquisitions, DuPont Agricultural Products was primarily in the crop protection business–herbicides and seed protectants–which took 65 years to grow.

"When the latest transaction is completed, Ralston Purina will own nearly 2% of DuPont's stock." However the two companies must still complete a definitive final agreement and obtain regulatory approval.

A color portrait photo shows William F. Kirk of DuPont–the man who made two strategic moves and captured a big opportunity.

866. *Memphis Commercial Appeal.* 1997. Biotech–At last, DuPont in designer seed/food market. Sept. 4. *
• ***Summary:*** For months DuPont Co. has watched from the wings as Monsanto Co., Dow Chemical Co., and others have acquired the seed and biotech companies they need to market bioengineered crops. But last month DuPont spent $3.2 billion on two major purchases: (1) A 20% stake in Pioneer Hi-Bred International Inc., the world's largest seed company, and (2) Protein Technologies International, a division of Ralston Purina Co.

867. *Ontario Soybean Growers' Marketing Board Newsletter.* 1997. Profiles: Helin Oil Packers, Phil Iocavedes, and Jim Papadopoulos. Oct. p. 7.
• ***Summary:*** Helin Oil is a new oilseed crushing company, located on Hopkins Street in Whitby, Ontario, just east of Toronto–the site of a former Ralston Purina feed mill. By mid-winter Helin plans to buy 2 million bushels a year of Ontario soybeans, which it will convert into "high-quality partial-fat soymeal for dairy farmers in Ontario and nearby states," and a variety of soybean oil products to be sold in Canada and overseas.

Phil Iocavedes (whose photo is shown) "will manage the plant, reporting to Jim Papadopoulous, director of operations for Helin Oil and one of the principals in Empire Foods Ltd., the Markham wholesale food and paper company that three years ago decided the time was ripe to build a vegetable oil business in the province. Both Helin Oil and Empire Foods are now owned by Helin Industries Ltd., which will be traded publicly starting in mid-October on the Alberta Stock Exchange.

"Ontario's oilseed crushing industry may be dominated by international giants CanAmera Foods and Archer Daniels Midlands, which crush nearly 60 million bushels of soybeans a year at their Hamilton and Windsor locations, with a value in round terms of $500 million."

"Papadopoulos was born in Greece and moved to Canada at the age of 17 years."

"The company is considering becoming Canada's first

marketer of mechanically pressed crude oil

"With a staff of 35, the Whitby plant will be running its four expellers and six extruders 24 hours a day, seven days a week to crush 200 to 240 tonnes of cold-press oil per day." Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

868. Limpert, Bill. 1997. Functional and nonfunctional soy protein concentrates. Isoflavones in soy protein products (Interview). *SoyaScan Notes.* Nov. 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Cargill does not presently make soy protein concentrates; the two big manufacturers worldwide are ADM and Central Soya. Bill would guess that Central Soya may have a slightly larger market share–it is their flagship soy protein product. They each use two different methods to make these concentrates: the aqueous alcohol wash (for non-functional concentrates, which have high levels of denatured proteins) and the isoelectric wash (for functional concentrates, which have water absorption, higher solubility, etc.). Of the three major soy protein products (flour, concentrates, and isolates), soy flour has the highest level of all the different isoflavones. Since isoflavones are soluble in alcohol, they are absent in concentrates made using the aqueous alcohol wash. The normal way to get a *functional* soy protein concentrate is to use the an isoelectric wash–where only water (no alcohol) is used, at a pH of 4.2 to 4.5. A concentrate made in this way will have a fairly low level of isoflavones, but not as low as the level in soy protein isolates–even though not made using an alcohol wash. Bill is sure that PTI [Protein Technologies International] has far more people working on isolates than ADM.

One important, basic question is: Can you produce a functional soy protein concentrate using the aqueous alcohol wash system? The resulting product would not contain isoflavones.

ADM now pulls off one of their extraction streams to get concentrated isoflavones–which they plan to market as a separate product. They have all the pieces in place to make commercial isoflavones. At the IFT show they even had isoflavones on the front page of their catalog, even though they didn't offer the product inside! ADM's strength is that they offer all the soy protein products–and now they are offering "nutraceuticals" as well! Address: Research Chemist, Technical Services Manager, Cargill, Inc., Research Dep., P.O. Box 5699, Minneapolis, Minnesota 55440. Phone: 612-742-5365.

869. *SoyaScan Notes.* 1997. Chronology of major soy-related events and trends during 1997 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. 1–Novartis Seeds (headquartered in Golden Valley, Minnesota) is formed through the blockbuster merger of Ciba Seeds and Northrup King Co. That merger was possible because of the mid-1996 merger of pharmaceutical giants Sandoz and Ciba-Geigy. Novartis Seeds is now America's second largest seed company after Pioneer Hi-Bred International.

Feb. 3–Monsanto completes its acquisition of Asgrow Seed Co. of Kalamazoo, Michigan, for $240 million. From May 1968 to 1994 Asgrow had been owned by The Upjohn Co., which built the company into one of America's largest soybean seed companies. When Monsanto bought Asgrow it was called the Asgrow Agronomics business of Seminis Inc., a subsidiary of Empresas La Moderna, S.A. (ELM), a multi-national agricultural company based out of Monterey, Mexico. of Mexico.

March 4–Morinaga Nutritional Foods' new tofu plant in Tualatin, Oregon holds its official grand opening. Mori-Nu Tofu, previously made in Japan, starts to be made in America for the first time. The plant, 65,000 square feet worth about $15 million, is on the same property as Pacific Foods of Oregon, but in a separate building.

March 12–House Foods America Corporation holds the opening ceremony for America's largest tofu factory, in Garden Grove, California; the company closes its tofu plant in central Los Angeles. The new fully automated, state-of-the-art, 130,000 square foot plant cost $21 million, and will more than double the company's tofu production capacity to 150,000 pounds/day, from 70,000 in the old plant. The old factory has been operating at full capacity for years. The new plant will have three tofu production lines, and is located on 5 acres of land–which gives plenty of room for expansion.

Sept. Nasoya Foods (owned by Vitasoy) finishes moving into a much larger, state-of-the-art $13.5 million plant (125,000 square feet) in Ayer, Massachusetts, from its former location in Leominster. The first Vitasoy brand soymilk ever made in America starts to be shipped from the plant in mid-September. Nasoya's offices have now been moved to Ayer from Leominster, but tofu is still being made at the plant in Leominster.

Oct. 14–The Hain Food Group acquires Westbrae Natural, Inc. Westbrae's new name becomes Hain Food Group–Westbrae. Westbrae will continue to be headquartered in Carson, California.

Dec. 1–Phytoestrogens / isoflavones extracted from soybeans by ADM start to be sold commercially in the USA in pill form by supplement companies. ADM's name for the product is Mega Soy.

Dec. 3–DuPont purchases Protein Technologies International (PTI–the world's leading manufacturer of soy protein isolates), a wholly-owned subsidiary of the Ralston Purina Co. DuPont signed a letter of intent to acquire PTI on Aug. 24. PTI, which has offices worldwide, will continue to be headquartered in St. Louis, Missouri.

"How can I get more soy into my diet?" is the question most frequently asked by callers to Soyfoods Center–largely because of the FDA Health Claim. Soy appears to have a bright future.

870. Golbitz, Peter. 1997. DuPont ushers historic deal: Marriage of seeds, technology, and food processing signals change. *Bluebook Update* (*Bar Harbor, Maine*) 4(4):1, 7. Oct/Dec.

• ***Summary:*** "A new era in food processing is about to unfold as chemical and technology giant DuPont completes its plan to bring together seed breeder Pioneer Hi-Bred International, soybean processor Protein Technologies International, and its own Agricultural Products division. This 'dirt to dinner plate' alliance is sure to change the face of food and crop production as we know it and usher in a new level of interest in crop-based foods and feed ingredients.

"'The combination of DuPont, PTI and the recently announced joint venture with Pioneer bring together the technology and know-how to deliver high value food and materials to a growing and more demanding world population,' said DuPont president and CEO John Krol in a prepared statement.

"The deal should also help push a new wave of biotechnologically altered crops across America's farmland. The first biotech grains and oilseeds were designed to be 'farmer-friendly,' allowing farmers to plant soybeans, corn or cottonseed with reduced chemical input. This second wave introduces seeds which have been engineered to have enhanced nutritional characteristics or other food processor or consumer specific benefits. For example, a new variety of corn might contain specific amounts of certain amino acids for enhanced animal feeding or a soybean strain may be engineered to have lower saturated fat levels for improved food products.

"With this marriage, DuPont has now positioned itself to take the lead in developing and delivering these new crop-based food and feed ingredients to the world marketplace.

"An Alliance is Formed: The events of the deal began unfolding in August when Pioneer and DuPont announced their plans to form a research alliance and joint venture company to help both companies utilize new advances in seed breeding technology. The equally owned joint venture company, Optimum Quality Grains, plans to bring improved corn and soybean varieties to the marketplace by the end of the year. The alliance created one of the world's largest private agricultural research and development collaborations with both companies investing more than $400 million.

"The second step came two weeks later when DuPont announced the signing of a letter of intent to purchase Protein Technologies International (PTI) and its related affiliates from Ralston Purina for $1.5 billion. PTI is the world's leading producer and marketer of isolated soy proteins. In mid September, DuPont announced that they had completed a complex agreement wherein the company would invest a total of $1.7 billion in Pioneer, purchase 20% of its outstanding shares, and have two of the 15 seats on its board of directors. The agreement includes a standstill agreement prohibiting DuPont from buying any additional Pioneer stock for 16 years.

"The deal has created excitement for the future at DuPont.

"'It increases our confidence that we can supply the seeds that we need in order to grow our business,' says Matt Renkoski, Soybean Business Manager for DuPont Optimum Grains.

"Advances in Food Technology: Recently, PTI has been developing consumer products containing their isolated soy proteins with isoflavones–powerful phytoestrogens believed to exert a number of pharmacological effects on people such as cancer prevention, heart disease protection and reduction of menopausal symptoms.

"'We see crops as factories and soybean plants as the ultimate factory to produce nutraceuticals,' says Mr. Renkoski. 'We will eventually be pursuing those opportunities.'

"According to estimates prepared by Soyatech, Inc., about 10% of the world's soybeans are now used directly as human food, with about 86% used in soybean crushing. Industry estimates hold that about 2 to 3% of the meal from crush ends up in human food as value-added protein ingredients. According to Mr. Renkoski, these numbers should increase with the advances in seed technology.

"'We should see a fair increase in whole soybean use in the future, but there will be a bigger increase in soy ingredients from crush used in food products.'

"Improvements in processing aren't just happening as a result of new soybean varieties. New technology is also being developed which can take advantage of a new variety's specific characteristics.

"'The combination of better tasting soybeans and new technologies will provide the new products for the future,' says Mr. Renkoski.

"It appears that DuPont is prepared to put its money where its mouth is."

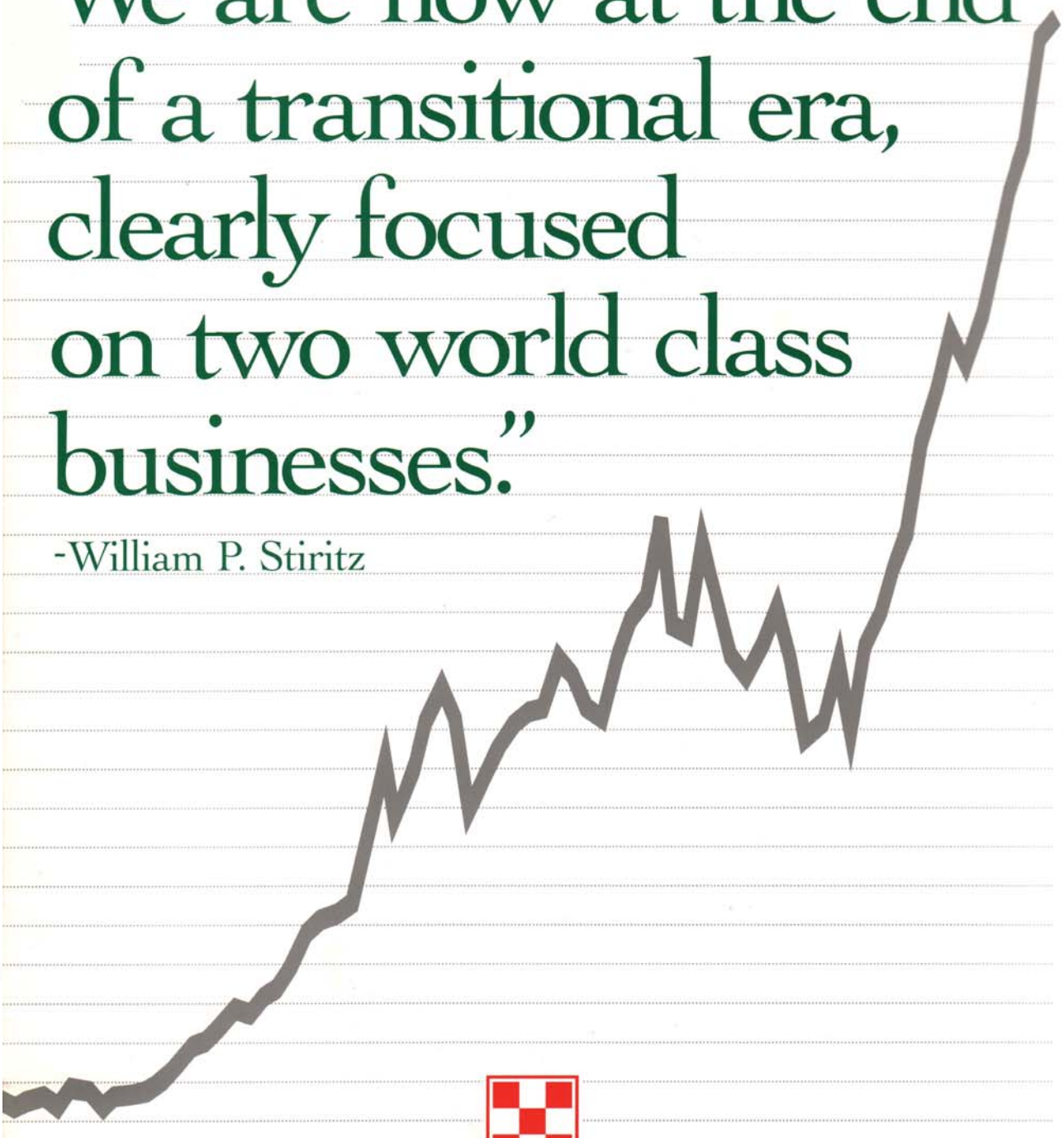
871. Ralston Purina Company. 1997. Annual report to shareholders. St. Louis, Missouri. 52 p.

• ***Summary:*** On the front cover is a statement in large letters by William P. Stiritz (Chairman of the board, and former CEO and president) which states: "We are now at the end of a transitional era, clearly focused on two world class businesses." These two businesses are the Ralston Purina Pet Products ("the world's largest manufacturer of dry dog and dry and soft-moist cat foods...") and the Eveready Battery Company ("the world's largest manufacturer of dry-cell batteries and flashlights," a global leader in providing portable power, and maker of the Energizer brand). Inside the front cover, a 2-page foldout shows the price of a share of the company's stock from 1961 (when the transformation to a "consumer products growth business" began) to 1997. That price rose from about 2 in 1961 to 20 in 1986, to 40 in 1990,

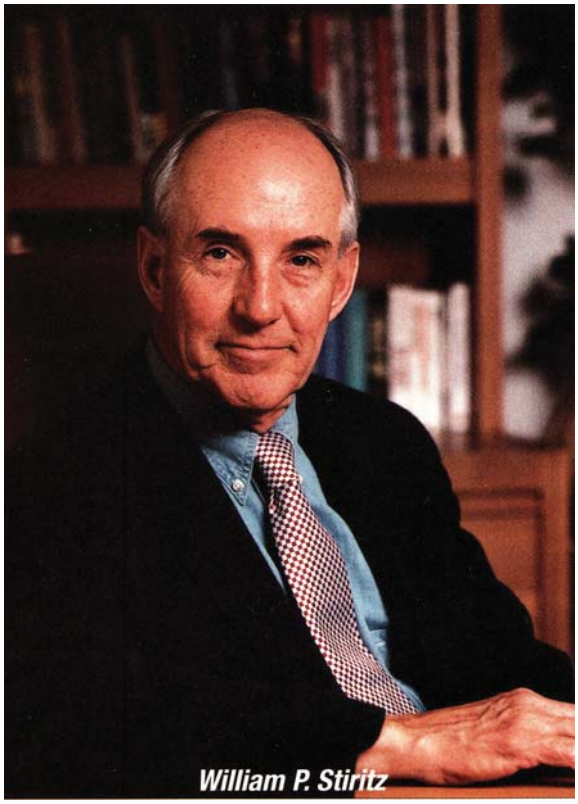
ANNUAL REPORT TO SHAREHOLDERS 1997

"We are now at the end of a transitional era, clearly focused on two world class businesses."

-William P. Stiritz



RALSTON PURINA COMPANY



to 60 in 1995, and to about 85 in 1997. The rapid growth started in 1982. Net sales in 1997 were $4,486.8 million, up 4.3% over the previous year. Net earnings/profits from continuing operations after taxes and before unusual items were $335.4 million, up 9.1%.

The chairman's letter (p. 1-2, from W.P. Stiritz) begins: "The ever increasing focus of Ralston Purina Company sharpened considerably in Fiscal 1997... RPI spin-off: On March 28, 1996, Ralston Purina's Board of Directors approved a plan to spin off its international agricultural products and animal feeds businesses tax-free to holders of Ralston Stock. We subsequently announced our intention to complete the spin-off transaction in early calendar 1998. The international agricultural products and animal feeds business is a leading producer of formula feeds with approximately 73 animal feed milling operations in 16 countries on four continents.

"Sale of Protein Technologies International to DuPont: In December, the Company reached agreement to sell its soy protein products operations to DuPont for approximately $1.5 billion comprised of DuPont common stock and the assumption of certain liabilities.

"The Protein Technologies International senior management team was instrumental in pursuing the ownership change. It is management's view that DuPont's pharmaceutical and biotechnology capabilities will allow PTI to realize fully the vast potential of its existing businesses and to better capitalize on the emerging health benefits of isolated soy protein. DuPont has indicated that it intends to operate PTI as an independent subsidiary based in St. Louis.

"Under Ralston ownership, PTI has consistently delivered high growth and excellent returns. The fact that PTI today is worth a considerable sum to one of the premier chemistry-based companies in the world underscores our enthusiasm about this transaction, and the subsequent value to Ralston shareholders."

"The amount received will be recorded in the first quarter of fiscal 1998. The Soy Protein Products business is the world's leading producer and marketer of high-quality dietary isolated protein and fiber food ingredients, and a leading marketer of polymer products worldwide" (p. 34). PTI was actually sold on 3 Dec. 1997 (p. 50).

Two newly-elected co-CEOs, W. Patrick McGinnis and J. Patrick Mulcahy, will replace W.P. Stiritz, the former CEO who orchestrated what one analyst called "one of the more amazing transformations in corporate America." Stiritz will retire from active management of Ralston Purina while remaining Chairman of the Board. Address: Checkerboard Square, St. Louis, Missouri.

872. Jenks, Belinda E.; Waggle, Doyle H.; Henley, E.C. 1997. Isolated soy protein technology–Potential for new developments. In: Paul A. Lachance, ed. 1997. Nutraceuticals: Designer Foods III–Garlic, Soy, and Licorice. Trumbull, Connecticut: Food & Nutrition Press, Inc. xx + 375 p. See p. 203-17. Chap. 22. [41 ref]

• ***Summary:*** Contents: Abstract. Introduction: Epidemiological observations, soy consumption, isolated soy protein technology, cardiovascular disease incidence, plasma cholesterol-lowering effect with isolated soy protein, proposed cholesterol-lowering mechanisms, implication of dietary modification on heart disease risk, cancer incidence in western populations, the mechanism of the anti-cancer effect, challenge to the food industry, technology for the future. Conclusion and summary. References. Address: Protein Technologies International Inc., Checkerboard Square, St. Louis, Missouri 63164.

873. Messina, Mark J. 1998. Soy phytoestrogen pills–The biggest soy-related story of the year (Interview). *SoyaScan Notes.* Jan. 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Phytoestrogens extracted from soybeans, made by ADM and sold in pill form, went on the market in the USA in about November 1997. The first company to sell them was the Life Extension Institute in Wilton Manors, Florida. They call the product Mega Soy Extract; in their catalog it is listed under the category Soy Supplements. They sell the capsules in two sizes: 135 mg and 700 mg. ADM is not mentioned in the catalog, but they have their own ADM brand name for the product: Novasoy. Two research scientists to talk to at ADM are Eric Gugger (phone 1-800-637-5850 X-4380) and Rasik Daftary. Mark has the highest

regard for these two men as scientists. They are dedicated to the facts as shown by scientific research.

Central Soya is now also making and selling the same kind of soy phytoestrogen pills, but ADM's were on the market first. What would happen if a person (such as a teenage girl wanting larger breasts) took 60 of these 135 mg pills at once? Mark has no idea; you'd have to know more about the absorption and blood levels. Many studies now suggest that a person needs to consume 70 to 100 mg/day of these soy isoflavones (equivalent to about 2 servings of tofu or 2 cups of soymilk) to derive the benefits. This is clearly much more than most Americans would be willing to consume day after day. So the supplements make it much easier for people to get their isoflavones. The average intake of these isoflavones among people in Asia is actually quite low, probably about 15-25 mg/day; this is much lower than was formerly thought to be the case, yet epidemiologic studies suggest that even these low levels confer benefits.

Solid studies increasingly show that these isoflavones give benefits in the areas of bone health (osteoporosis), reduced risk of heart disease, and reduction of menopausal symptoms. The benefits appear to be dose related–though there may be a threshold. There seem to be more benefits to women than to men, and little or no danger of any harm if taken at the recommended doses. Though the results are not yet definitive, there may be reduced prostate cancer risk for men. Some studies have also looked at the individual isoflavones. So Mark believes that many Americans will want to try these pills. They may take their place on the dining room table next to vitamins, minerals, and other supplements.

The area of greatest controversy concerns the effect of these isoflavones on breast cancer. Mark thinks it is very unlikely that they would increase the risk of breast cancer–even though some studies do seem to indicate that, and therefore further research is needed. Many difficult ethical questions are raised by how information in this area is presented to consumers.

Concerning soy and bone health, a 2-year study of monkeys without ovaries found that soy did not favorably affect bone health, even though estrogen did. That was one of the best studies conducted to date, yet it is never mentioned at any of the soy meetings. Mark is very concerned that there is a real bias in the way this information is being presented. This is such a "hot" area right now. There are so many fortunes to be made, so many researchers with patents, and so many trying to establish their careers on the basis of soy right now. Clinics all over the USA are now doing studies with isoflavones and with soy. Discussion groups on soy and breast cancer are taking place. "This is as hot as it gets."

A big-name researcher in this field, with a reputation in nutrition research going back 20 years, recently proposed the "soy protein hypothesis" in a scientific paper. It had to do with the possibly favorable effects of protein on kidney function, with no acknowledgment of previous research in this area. But this idea/hypothesis was out 4-6 years ago, and a summary in *The Simple Soybean and Your Health* (published April 1994) concluded that soy protein favorably affected kidney function. This appears to be but one of many examples where researchers are trying to establish their niche in soy and ride it to fame–and sometimes fortune. Now in nearly every major university in America, there is at least one researcher who is seriously interested in soy. That is really good for the field, and will help its progress.

The biggest event of 1997 is ADM starting to make soy isoflavone pills and thus taking soy isoflavones to the next level. These isoflavone pills are even sold on TV, in home shopping clubs–an amazing development. Many new books are being written on this subject by well-known authors, and soy plays a leading role. "There is a soy bandwagon here and everyone is jumping on it. The pills will take soy to the next level because there is more money to be made, and they are accessible to everyone. Now anyone can get the benefits (whatever they may turn out to be) without having to eat tofu or drink soymilk. Even with a bland soy powder, it was difficult for most people to consume enough of it (60 gm/day) to get benefits. Now that the soy isoflavones are available as pills, many researchers will now do clinical studies with them. Even now, there are studies underway all over the country. Three years ago, few people were aware of soy isoflavones. Now the research is almost one step removed from mainstream medicine. Virtually all researches involved with progressive health and nutrition, or with women's health, known about soy and phytoestrogens. It's just incredible. Being able to give out two placebo pills and two 'soy pills' a day makes it much easier to conduct controlled studies." People used to think of soy as strongly connected with tofu. Then they began to think of the isoflavones separately and independently. Isoflavones are a type of phytoestrogens, but when the word "phytoestrogens" began to replace the word "isoflavones" a quantum leap took place. Every physician knows what estrogens are, and the word has a power that resonates. For example, Mark recently gave a talk last year at a meeting of the American Dietetic Association (ADA). He titled it: "Soybean phytoestrogens: Possible alternatives to hormone replacement therapy."

So, in the field of soy, ADM and their soy pills is the big story of late 1997 and early 1998. ADM is a huge, respected company, and they plan strong promotion for these soy pills. Granted there were soy isoflavone pills available last year, but because they were made from the ground sprouts (hypocotyls) of soybeans, they had very low levels of genistein and they weren't nearly as potent as ADM's pills. Moreover, ADM is learning ways of processing soybeans to further concentrate the isoflavones, which will make the pills even more potent. Mark believes that the "halo effect" of these soy pills will soon benefit the whole category of soyfoods as well.

Mark has no plans to take these pills; he gets plenty of isoflavones from his natural diet, which contains lots of soymilk, plus some tofu, and other soyfoods.

An Australian newspaper reported that Protein Technologies International (PTI) recently paid $15-20 million to Novagen, an Australian pharmaceutical company that will be marketing Promensil (made of isoflavones from red clover). Note: As of 3 Feb. 1998 Novagen is not listed in the text of any article in the *Wall Street Journal* since March 1984. It is not clear to Mark exactly what PTI got for this large amount of money (perhaps patent right to claims about a product containing isoflavones). This last weekend, PTI helped to sponsor a symposium at UCLA, attended by only about 45 people, but with good press coverage that made the wire services. The point is, a lot of money is being spent on this subject. Whereas ADM does not live or die by its new isoflavone business, some smaller companies do.

The proceedings of the Brussels symposium have been in the hands of editors at the *American Journal of Clinical Nutrition* since Sept. 1997; they have been reviewed, the comments have gone out, but they will not be published before Sept. 1998. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

874. **Product Name:** Health Source (Soy Protein Health Drink) [Chocolate, Mocha, or Orange Dream], Health Source Plus [Chocolate, or Orange Dream].
Manufacturer's Name: Nutritious Foods, Inc. Wholly owned subsidiary of Protein Technologies International, Inc.
Manufacturer's Address: 1034 Danforth Drive, St. Louis, Missouri 63102. Phone: 1-888-769-9136.
Date of Introduction: 1998 January.
Ingredients: Health Source Plus [Orange Dream]: Water, Purasoy isolated soy protein, sugar, fructose, natural and artificial flavors, potassium citrate, cellulose gel, Yellow 5, Yellow 6, dipotassium phosphate, Red 3. Vitamins & Minerals: Calcium phosphate, magnesium phosphate, sodium ascorbate (vitamin C), vitamin E acetate, ferric orthophosphate, niacinamide, zinc oxide, calcium pantothenate, pyridoxine hydrochloride (vitamin B-6), riboflavin, vitamin A palmitate, thiamin mononitrate, folic acid, biotin, potassium iodide, vitamin B-12, vitamin D-3.
Wt/Vol., Packaging, Price: 1 quart (32 fl oz). Recommended retail price: Health Source ($1.89-1.99, Los Angeles, California), Health Source Plus ($2.39-2.49).
How Stored: Refrigerated, 60 day shelf life from date of manufacture.
Nutrition: Per 8 fl oz.
New Product–Documentation: Talk with Art Mio. 1998. March 3. These products are now being test marketed in the Los Angeles area. Health Source contains 10 gm of Supro soy protein per 8-oz serving and Health Source Plus contains 25 gm per serving.

Ad (full page, color) in *People* magazine. Feb. 23. p. 126. "If you discovered the fountain of youth, wouldn't you want to dive in?"

Talk with Barry Dunn of PTI in Fullerton, California. 1998. March 4. These products first arrived on the shelves of stores in Los Angeles in late January of this year. The first ads broke in late February. Michael Derrington at the Nutritious Foods division of PTI is in charge of the whole program.

Talk with Michael Derrington, product manager, at Nutritious Foods Inc. 1998. March 6. These products are now being made by Ryan Foods (a subsidiary of Dean Foods, a major dairy company) in Murray, Kentucky.

875. **Product Name:** Health Source (Yogurt-Style Snack–Cultured Desserts with Live & Active Cultures), and Health Source Lite [Black Cherry, Strawberry, Strawberry-Banana, or Raspberry].
Manufacturer's Name: Nutritious Foods, Inc. Wholly owned subsidiary of Protein Technologies International, Inc.
Manufacturer's Address: 1034 Danforth Drive, St. Louis, Missouri 63102. Phone: 1-888-769-9136.
Date of Introduction: 1998 January.
Ingredients: Health Source Lite [Raspberry]: Water, Purasoy isolated soy protein, raspberries, dairy whey, modified food starch, cellulose gel, natural and artificial flavors, wheat fiber, pectin, calcium phosphate, guar gum, artificial color, sodium ascorbate, aspartame, vitamin E acetate, salt, Red 40, vitamin B-12, riboflavin, folacin, Blue 1, thiamin hydrochloride, phenylketonurics: contains phenylalanine / with active cultures.
Wt/Vol., Packaging, Price: 6 oz (170 gm) plastic cup. Recommended retail price ($0.69-0.89, Los Angeles, California), Health Source Plus ($2.39-2.49).
How Stored: Refrigerated, 45 day shelf life from date of manufacture.
Nutrition: Per cup (6 oz): Calories 90, calories from fat 0, total fat 0 gm (0% daily value; saturated fat 0 gm), cholesterol 0 mg, sodium 140 mg (6%), total carbohydrate 19 gm (dietary fiber 4 gm [16%], sugars 11 gm), protein 7 gm. Vitamin E 50%, vitamin B-12 50%, folate 50%, vitamin C 20%, calcium 20%, riboflavin 15%, phosphorus 15%, iron 6%, thiamin 4%. Percent daily values are based on a 2,000 calorie diet.
New Product–Documentation: Talk with Art Mio of Morinaga Nutritional Foods. 1998. March 3. These products are now being test marketed in the Los Angeles area.

Ad (full page, color) in *People* magazine. Feb. 23. p. 126. "If you discovered the fountain of youth, wouldn't you want to dive in?"

Talk with Barry Dunn of PTI in Fullerton, California. 1998. March 4. These products first arrived on the shelves of stores in Los Angeles in late January of this year. The first ads broke in late February. Michael Derrington at the Nutritious Foods division of PTI is in charge of the whole

program.

Talk with Michael Derrington, product manager, at Nutritious Foods Inc. 1998. March 6. These products are now being made by Ryan Foods (a subsidiary of Dean Foods, a major dairy company) in Murray, Kentucky.

Package with Label sent by Art Mio. 1998. March 6. The 3-inch diameter lid is white, yellow, and red on green. "New! A nonfat cultured dessert for people who love yogurt!" On the sides: "1/3 fewer calories than regular nonfat cultured dessert. Good source of soy protein. Excellent source of calcium & vitamin C." The American Heart Association logo shows a white check on a red heart: "This product meets American Heart Association food criteria for healthy people over age two when used as part of a balanced diet."

876. Protein Technologies International. 1998. Supro the soy protein of science (Ad). *Natural Foods Merchandiser.* Jan. p. 56.

• ***Summary:*** See next page. In the top two-thirds of this quarter-page color ad is a tall stack of scientific articles and reports. A person's hands are holding the top one as that person (not visible) apparently reads it. The text on the bottom one-third of the ad reads: "The evidence of emerging health benefits of soy protein are [sic, is] mounting every day. Current studies suggest it may even help lower blood cholesterol levels which helps reduce the risk of heart disease. Other studies indicate it may promote improvement in bone health and women's health.

"The majority of the completed studies used Supro Brand Isolated Soy Protein. Why Supro? That's easy. It works.

"You can count on products containing Supro Brand Isolated Soy Protein to have the highest quality protein ingredient backed by years of clinical scientific research. That's why consumers look for the Supro name on the products they buy. Supro. The soy protein of science."

Note: This ad also appeared in March 1998 (p. 60), July 1998, Nov. 1998 (p. 71), and December 1998 (p. 2). The last two were full-page ads. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 800-467-8776.

877. *Soybean Digest.* 1998. DuPont forms ag enterprise. Jan. p. 90.

• ***Summary:*** DuPont, long known for its crop protection products, is a leader is the $30 billion global crop protection industry. Now it is forming a new "Agricultural Enterprise," with William Kirk as president. Having formed a research alliance with Pioneer Hi-Bred International, DuPont is now acquiring Protein Technologies International from Ralston Purina Co. and has started a joint venture called Optimum. Its goal is to speed the discovery, development, and delivery of new crops with value to farmers and consumers worldwide.

878. Smith, Rod. 1998. Ralston sharpens focus around batteries, pet products. *Feedstuffs.* Feb. 9. p. 6, 22.

• ***Summary:*** The company, which has been undergoing restructuring away from commodities and toward higher-margin consumer products, said in its letter to shareholders in its fiscal 1997 annual report:

"It decided to sell its Protein Technologies soy protein business to DuPont Co. in a debt and stock transaction valued at $1.5 billion, an activity that the two companies expect will be completed soon, and

"It decided to spin off its Ralston Purina International (RPI) agriculture feeds business, an event that the company expects will be completed early this year." Address: Staff Editor.

879. Nutritious Foods, Inc. 1998. If you discovered the fountain of youth, wouldn't you want to dive in? (Ad). *People.* Feb. 23. p. 126.

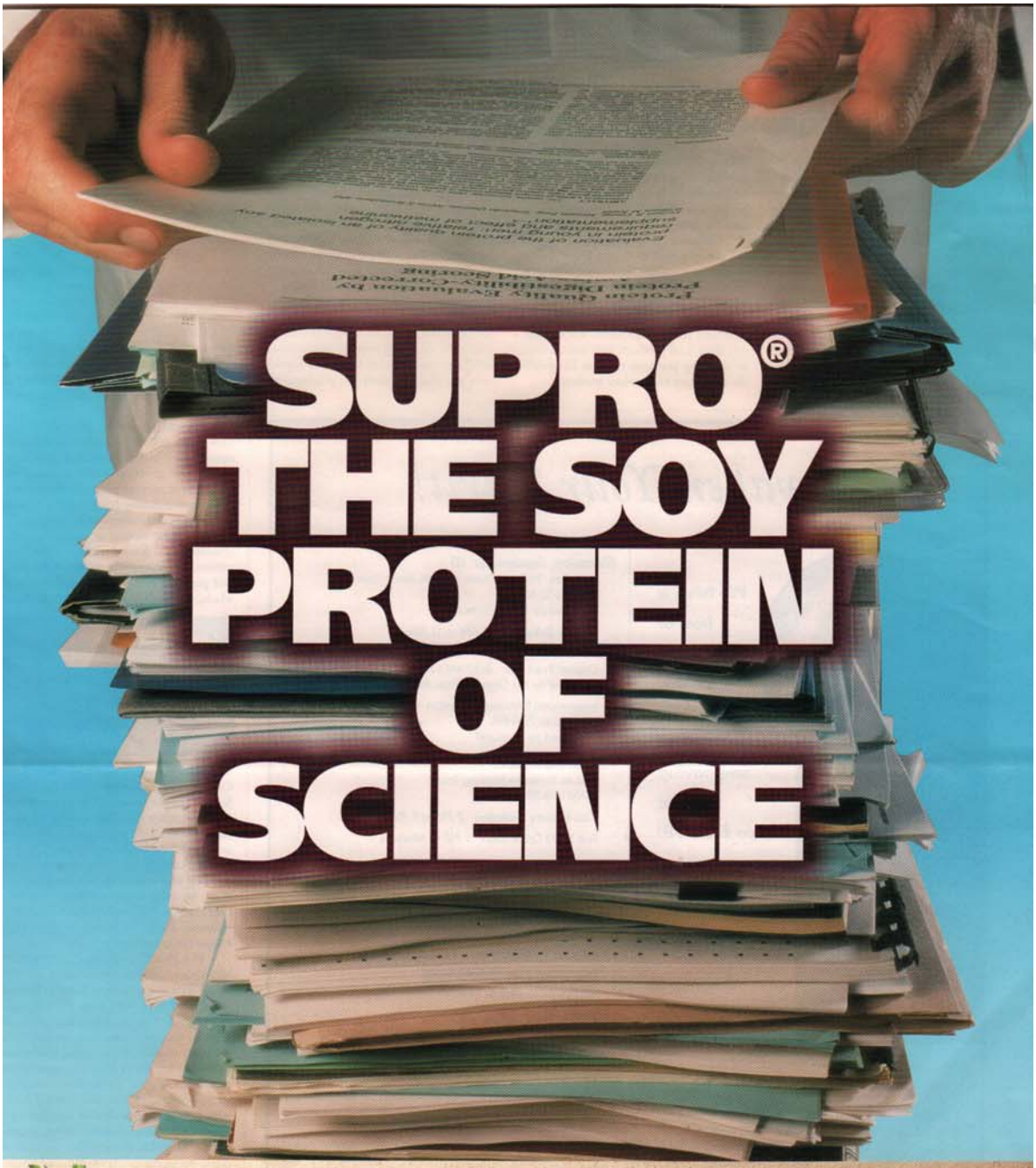
• ***Summary:*** This full-page color consumer ad (copyright 1997 by Nutritious Foods, Inc.) is for new, "soy protein-rich Health Source drinks and yogurt-style snacks. Years of Asian history and numerous studies suggest the same conclusion: substituting soy-protein foods for significant amounts of animal-protein foods can have a real nutritional impact on your health. Some researchers are already pointing to soy protein's power to reduce high cholesterol levels. Several universities are now also investigating soy protein's role in reducing the risk of osteoporosis and some forms of cancer.

As if that weren't enough, Health Source is an excellent low-fat source of calcium, high in vitamin C, and a good source of fiber." Flavors include strawberry, raspberry, and black cherry. "If you'd like more information about the benefits of soy protein, call toll free 1-888-769-9136." The slogan at the bottom of the ad reads: Healthy today. Healthy tomorrow."

A large color photo in the middle third of the ad shows a spoon dipping into a cup of yogurt, which is surrounded by fruits. In the lower right corner is a small photo showing two cups of the soy yogurt, a gable-top carton of the beverage, and the beverage in a glass, with a straw in it. Address: St. Louis, Missouri.

880. Mio, Art. 1998. Health Source: A new line of soy protein products from Protein Technologies International being test-marketed in the Los Angeles area (Interview). *SoyaScan Notes.* March 3. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Michael Derrington and Barry Dunn visited Morinaga in mid-February and presented their new line of Health Source consumer products and the ad campaign and media schedule (local radio, newspapers, and magazines for 60 days) that will be used to launch them. Some of the ads have been paid for by the Iowa Soybean Board. They are first test marketing the whole concept in Los Angeles. The



Research is now revealing the extraordinary health benefits of soy protein. Studies show it lowers high blood cholesterol levels, which helps reduce the risk of heart disease. Other studies indicate it may promote improvement in bone health and women's health. The majority of this research used SUPRO® Brand Isolated Soy Protein.

Why SUPRO? That's easy. It works.

You can count on products containing SUPRO to have the highest quality protein ingredient with naturally occurring Isoflavones, backed by years of clinical scientific research. Insist on SUPRO in the products you purchase.

Only SUPRO stacks up.

Supro™ BRAND A SUPERIOR PROTEIN

To find out more about products containing SUPRO call **1-888-GO-SUPRO**

Visit our website at www.protein.com

SUPRO® is a registered trademark of Protein Technologies International

Circle Reply #146

two basic products in the line are a soy protein drink sold in a 1 quart gable-top cartons and a yogurt sold in a 6-ounce yogurt-style cup. Each of these products comes in two types: Regular (which provides 10 of soy protein per serving) and Health Source Plus (which provides 20 gm of soy protein per serving). They will be sold only in supermarkets and grocery store chains–not in natural- or health food stores. The milk is sold next to the Lactaid and Mocha Mix in the non-dairy part of the dairy case, and the yogurt is sold next to the regular dairy yogurts. Michael Derrington, who is managing director of consumer product sales, is the main person in charge of these products (Phone: 314-982-5414; Fax 314-982-3627).

Talk with Barry Dunn of PTI in Fullerton, California. 1998. March 4. These products first arrived on the shelves of stores in Los Angeles in late January of this year. The first ads broke in late February. Michael Derrington at the Nutritious Foods division of PTI is in charge of the whole program. Address: National Sales Manager, Morinaga Nutritional Foods, Inc., 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638.

881. Nutritious Foods, Inc. A subsidiary of Protein Technologies International. 1998. Health Source™ (Portfolio). St. Louis, Missouri: Nutritious Foods, Inc. 5 p. [6 ref]

• ***Summary:*** This portfolio contains 5 sheets:

(1) "Health Source™: Where to get it. Health Source drinks and yogurt-style snacks can be found in almost any Southern California grocery store. Conveniently located in the dairy case,

"Health Source is a fresh, great tasting way to incorporate soy protein into the daily diet. Specifically, Health Source can be found at: Vons, Ralphs, Hughes, Lucky Stores, Albertsons.

(2) "Introducing new Health Source™! Come to the Source. Refrigerated Ready-To-Drink Beverages & Yogurt-Style Snacks The Great Tasting Way to Help You Protect Your Health!

"Great tasting, good nutrition was never simpler. Health Source drinks and yogurt-style snacks are perfect anytime of day with breakfast, lunch or as a snack. New Health Source is a delicious way to enjoy cholesterol-free soy protein and its benefits every day, and it's easy to find, fresh in the grocer's dairy case.

"Soy Protein Made with PURASOY™ soy protein (water processed to retain a minimum of 2.85mg of isoflavones per gram of soy protein), Health Source products are low in fat and cholesterol free. New Health Source Plus drinks deliver 25 grams of soy protein in just one 10 ounce serving. An article in the *New England Journal of Medicine* (August 1995) confirmed that substituting soy-protein foods for significant amounts of animal-protein foods resulted in significantly decreased total cholesterol and triglycerides (fat content was the same).

"Vitamin C and Calcium: 20% of the daily Vitamin C you need.

"More Calcium than a glass of milk.

"Low Fat & Cholesterol Free...

(3) "Soy Protein: Promising developments for good health. A color leaflet printed front and back. explaining how "Diet makes a difference," "How soy protein can help." One large table gives the serving size, soy protein content, fat, calories, and total isoflavones (all forms) for about 15 soyfoods including 4 Health Source products.

(4) "What are you doing for the rest of your life? (The Iowa Soybean Farmers want to know)." A 12-page booklet with a color coupon for any Health Source product.

(5) "The Health Source guide to healthy eating." A color leaflet printed front and back with a coupon for any Health Source product. Address: St. Louis, Missouri.

882. Derrington, Michael. 1998. Health Source–A new line of soy protein products from Nutritious Foods, Inc., a wholly owned subsidiary of Protein Technologies International, Inc. (Interview). *SoyaScan Notes.* March 6. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The plans of Health Source, so far as we can tell, never got past the planning stage.

883. Demos, Steve. 1998. New developments with soymilk at White Wave. Part I (Interview). *SoyaScan Notes.* March 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Morningstar Group is owned by a Texas-based company named Suiza (pronounced SUI-zuh) which is bigger than Morningstar. Suiza Foods Corp. is one of the very big, modern consolidators of the dairy industry. Dean Foods (which owns Vitamite) and Suiza are head-on competitors in the dairy product area. White Wave's Silk brand soymilk is packaged in an ESL (extended shelf life) gable top carton at the plant of Morningstar Foods Inc. (formerly Avoset, now owned by Suiza), 299 Fifth Avenue, Gustine, California 95322. Phone: 209-854-6461. Contact: Gary Veuve (pronounced Vev, rhymes with rev), the plant manager. Gustine is located just off Highway 5 between San Jose and Merced in Northern California. This plant focuses on dairy products, packaged in both aseptic and ESL cartons, but it also packages Lactaid, Dole juice, a goat milk, etc. In addition, it packages Trader Joe's soymilk, indirectly via TAN Industries and San Diego Soy Dairy–which Steve believes breaches the contract between White Wave and TAN. Actually Gary Stein at San Diego Soy Dairy apparently has no hand in making the product–he just does the invoicing. The soy base mix is made at Soyfoods of America (owned by Ken Lee, in Duarte, Southern California) using equipment installed by TAN Industries (Ted Nordquist and Wally Rogers). When some other company moved out of Ken Lee's plant, Ted moved his company in. The installation began about a year ago [March 1997] and it became

operational about 6 months ago [Sept. 1997]. This mix is then shipped by tanker-truck up to the Avoset-Morningstar plant, where it is processed. Avoset Food Co. is probably the predecessor which sold itself somehow to Morningstar which sold itself to Suiza. Steve is not aware of any relationship between Morningstar and the former nondairy pioneer Presto Food Products, which introduced Mocha-Mix Coffee Creamer in 1950 (Note: This product was later renamed Mocha Mix Non-Dairy Creamer).

Ted Nordquist has not been buying soymilk from International ProSoya Corp. (IPC) in British Columbia, Canada, for the last six months–to the best of Steve's knowledge. The soy base mix currently used to make Steve's Silk is made using TAN's plant at Soyfoods of America. There were numerous problems with the Silk product during the 6 months that TAN was making the transition from IPC to Soyfoods of America. Because of the nature of Steve's contractual relationship with TAN, Steve had no information about what was happening so he was unable to help smooth the transition. He inherited the problems and had to deal with them in a hindsight fashion.

Steve has an exclusive supply contract with TAN for all nondairy beverage in the USA as long as he meets specified minimums of purchase from TAN; he has always exceeded these minimums. Steve now believes it is no longer exclusive because of the new Trader Joe's soymilk. This will probably be grounds for a lawsuit. Steve feels that TAN has used White Wave and Silk as his springboard–while the contract is still in effect. Ted has a good product and he is going to be a competitor, and he has made plenty of money from the sale of Silk.

TAN decided (about 6 months ago) to stop buying soymilk from IPC and not the other way around. TAN made the switch for two reasons–both economic. First, TAN realized it would be more profitable the make the soymilk closer to Gustine, where it was packaged. The transportation cost of shipping soymilk from Vancouver to central California was about $2,000 per tanker-truck, compared with only about $1,500 for shipping from Duarte to Gustine. At least one truck is shipped per week–sometimes two. Second, since TAN now owns the equipment on which the soymilk is made, the profit margin associated with making the concentrate is now TAN's.

Steve has tasted several of the SoNice soymilk products made by IPC. He thought one of them was good tasting and competitively priced. The others he thought were typical soymilk formulations that were relatively weak. They had some off flavors and problems with balance, color, thickness. Steve thinks "there are a couple of fracturings of focus with the way they are approaching the market." They have both an aseptic line and a refrigerated line (in five flavors and two different sizes). The essence of refrigerated soymilk production is the ability to turn it fast enough so that you never have spoilage on the shelf. White Wave has never suffered returns on its refrigerated soymilk (Silk) but it took a lot of hard work to get their minimums up to that critical mass point where the product was turning fast. With soymilk in an ESL carton, the carton, not the soymilk, is the limiting factor. Silk has a use-by 84 days from the date of manufacture, but it will usually last for 100 days.

Steve has found it very difficult to work with the contract set up by Ted Nordquist, so much so that he plans to terminate the relationship. Steve feels this is unfortunate–"its like working with a black box." Steve has no idea how Silk is processed at the Soyfoods Unlimited or at the Avoset plant–or what the costs are. Steve flew with his people to San Francisco, and Ted and his people flew to Boulder–but they were unable to resolve the problems to Steve's satisfaction. "We have a great name, a great package, and a great product–but we have no control over costs." That means that if White Wave proves to the market that refrigerated soymilk is a big category, they will be "beat up" by competitors because of their inability to control costs. Ted basically says: "I will deliver the product to you at the following cost per gallon." Steve would like to continually lower the price of Silk–and he plans to do so soon. It will go under $3.00 per half gallon. Steve suggested that Ted take a royalty for the rest of his life and let White Wave deal with all manufacturing and cost reduction issues. But Ted wants control. Steve thinks he was "burned" in Sweden; he is a very good product developer but not such a skillful businessman. IPC tried to introduce SoNice into the U.S. market with a low price strategy, but White Wave and beat them to it. White Wave has contracts with all of the major chains that they exist in so that their pricing plus their support programs will pretty much negate IPC's attempt to come in at a lower price. If IPC really wanted to do so, they would have to cut their prices again–which is a hard way to go with a new product.

Which soymilk does Steve like the best, simply in terms of organoleptics (flavor, color, consistency, etc.)? One SKU from Vitasoy is very good, the Silk made by TAN is a little bit better, but Steve feels that the new version of Silk developed by Jonathan Gordon (completely independently from TAN and not yet on the market) is better than either of those two products.

During the last year, White Wave has worked on new formulations with Tetra Pak at their research facility in Chicago, Illinois. The first major tanker-truck production run was last Friday. White Wave is now in full production with this new formulation of Silk. It will be processed at one plant in Utah and one on the East Coast. Many taste tests have shown that this new Silk is superior to the former Silk made and formulated by TAN. Silk will remain a refrigerated product; it will never be sold in aseptic cartons in the USA–that will be a fracture of focus that sends a mixed message. On the new carton will be two quotations: One from Suzuki roshi about "Beginner's Mind," and the other from Yogi Berra ("You can't hit and think at the same time")! Also at

the top front of the carton is written: "32 mg isoflavones per serving." Plus, there is an offer for more free information on isoflavones. White Wave is working to start the educational process on isoflavones–and is also using its Web site and toll-free 1-800 number.

The big ad campaign in Los Angeles from Protein Technologies is teaching about isoflavones but the products (Health Source) are not doing well. So the publicity is helping White Wave. "Like a guy on a bicycle, we're drafting. We're going to try to stay in the draft of the ADMs and PTIs and see where it takes us. We don't have that much pride." Continued. Address: President, White Wave Inc., 1990 North 57th Court, Boulder, Colorado 80301.

884. Crouse, John R., III; Burke, Gregory L. 1998. Soy protein containing isoflavones reduces plasma concentrations of lipids and lipoproteins (Abstract). *Circulation* 97(8):816 (Abst. #17). March 3. *
• ***Summary:*** This study, now in abstract form, has been submitted to JAMA. It is available on the DuPont website. PTI paid for the study. 156 moderately cholesterolemic humans were studied for 9 weeks. They were divided into five groups, all getting the same amount of protein: One fed casein, one alcohol-washed soy with trace isoflavones, then 25, 42, and 58 mg of isoflavones per day. They found a stepwise reduction in cholesterol content with increasing isoflavone content of the soy protein isolate they consumed. The high-cholesterol group had about a 10% reduction in LDL ('bad') cholesterol. Address: Bowman Gray [North Carolina].

885. Lang, Paul. 1998. Membership in the Soyfoods Association of North America: Some big new companies have joined (Interview). *SoyaScan Notes*. April 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Paul has been in charge of Soyfoods Association membership for the last 3 years. When he arrived the Association had about 22 members. During this year, the number of members has increased from about 33 in Feb. 1997 to 34 at present (as of 23 March 1998). Three large soy companies, each of which paid $3,000 in annual membership dues, are now members: ADM, Protein Technologies International (PTI), and Central Soya. DuPont joined under the name "Optimum Quality Grains" for a much lower fee. Nancy Chapman was largely responsible for bringing on Central Soya and PTI. Paul Lang brought on DuPont and 6-7 smaller new members.

Update: 1998 July 8. The Board of the Soyfoods Association is not happy that Nancy Chapman & Associates is charging the Association so much per hour. Some board members are wondering "Is this worth it?" When they went to Peter Golbitz and said the work was going to take more time and money, Peter said he was not willing to change the written agreement. "If they are not doing a good job for the Association and bringing in new members, they will be out in a year." Address: Natural Products, Inc., 798 Hwy 6, Grinnell, Iowa 50112. Phone: 515-236-0852.

886. Nutritious Foods, Inc. 1998. Remember the old story about the guy who trades in his cow for some magic beans?: Come to the source (Ad). *Vegetarian Times*. April. p. 56.
• ***Summary:*** This full-page color ad is for Health Source Soy Protein Health Drink and yogurt-style snack. Contents: These beans aren't magic but they sure try hard. Introducing Health Source. Soy protein and a whole lot more. Your body likes this stuff. Now you can, too.

"Healthy Today. Healthy Tomorrow™.

"If you'd like more information about the benefits of soy protein, call toll free 1-888-769-9136."

In tiny letters at the lower left: "Copyright 1997 Nutrition Foods Inc." Address: St. Louis, Missouri.

887. Ralston Purina Company. 1998. Agribrands International, Inc. St. Louis, Missouri. 95 p. April 1. 28 cm.
• ***Summary:*** Ralston Purina Co. has decided to create a new company, Agribrands, by spinning off its international animal feeds and agricultural products operations. The company, whose stock symbol will be AGX, will be traded on the New York Stock Exchange. Shareholders of record of Ralston stock as of 1 April 1998 will receive one share of Agribrands Stock for every ten shares of Ralston stock they own. The spinoff will occur on April 1.

The production and sale of animal feed was the primary business of Ralston when it was established in 1894. Animal feeds and agricultural products continued to be the dominant business until the 1950s. "The development at that time of a new extruded dry dog food by Ralston revolutionized the pet food industry and transformed Ralston into primarily a consumer products company. Since then, the pet food business has continued to grow in importance to Ralston while the relative contribution of the animal feeds and agricultural products business declined. In the 1980's, Ralston's focus became increasingly directed away from the animal feeds and agricultural products business as Ralston acquired Continental Baking Company, the nation's largest wholesale baker, in 1984, and the worldwide Eveready battery business in 1986. The intention of Ralston's management to focus on consumer packaged goods and its stable of leading brands culminated in the sale of its U.S. animal feeds and agricultural products business to a subsidiary of British Petroleum in 1986. British Petroleum did not acquire Ralston's international animal feeds and agricultural products business, which became a non-core business, having limited synergies with Ralston's other international businesses."

"In 1994, Ralston spun-of Ralcorp Holdings, Inc., a subsidiary to which Ralston had contributed its breakfast cereal, baby food, cracker and cookie, coupon redemption

and all-seasons resort businesses. In 1995, Ralston sold all of the capital stock of Continental Baking Company. In 1996, Ralston sold its assets associated with its cereal business in the Asia Pacific region (which it had retained in the Ralcorp spin-off), and terminated its European cereal operations. In 1977, Ralston sold its international soy protein technologies business. In line with this focus on its core businesses, Ralston attempted to sell its international animal feeds and agricultural products business to PM Holdings Corporation in 1994, but negotiations broke off as the parties were unable to agree on key terms of the transaction."

Agribrands' principal properties are its animal feed manufacturing facilities and property, which are located in the following countries: Brazil (7 plants), Canada (7), Colombia (6), France (7), Guatemala (1), Hungary (2), Italy (5), Korea (3), Mexico (8), People's Republic of China (4, incl. 3 joint ventures), Peru (3), Philippines (2), Portugal (2), Spain (7), Turkey (2), Venezuela (4, plus a hatchery) (p. 41-43; notes which are leased, joint venture, under construction, or to be divested). Address: Checkerboard Square, St. Louis, Missouri 63164.

888. Messina, Mark J.; Messina, Virginia. 1998. Does consumption of soy increase or decrease a woman's risk of breast cancer (Interview). *SoyaScan Notes.* May 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Mark: In the area of possible adverse effects of soy (especially soy isoflavones), Mark's greatest concern is with soy and breast cancer. "It still bothers me tremendously." There have been 3-4 animal studies in which soybeans or isoflavones have been fed to animals and then they have been given a breast carcinogen. In none of these studies have scientists found an increase in the number of tumors or in the incidence of breast cancer. Several of the studies show "modest protective effects" from soy. So this is good news. The epidemiologic studies are not that supportive of the hypothesis that soy reduces the risk of breast cancer, but none of them have suggested that soy increases breast cancer risk. There were one or two studies showing that fried tofu increased risk of breast cancer, but that nonfried tofu did not. So within an individual study, one soyfood might pop up as being problematic. "But overall, you would not look at those kinds of studies and conclude that soy is risk factor for breast cancer." The fact that Japanese women have about one-fourth the incidence and mortality of breast cancer compared with American women is worth noting. Several basic facts about soy must be kept in mind. (1) It is clearly estrogenic, containing phytoestrogens. (2) When you add genistein to cancer cells that are estrogen receptor positive, it will stimulate their growth over the typical physiologic concentration, but at higher levels it will inhibit their growth. In the range at which it stimulates growth, this is probably due to an estrogenic effect, but at the higher range, genistein is probably inhibiting one of the enzymes that cause the cancer sells to stop growing. At least ten scientific papers have raised the question of what is happening with these isoflavones, and they sound a little cautionary note. The criticism of these studies, where a little genistein is added to cells growing in a petri dish, is that there is absolutely no estrogen in the medium, and that even in post-menopausal women estrogen is present. So some people would say the petri dish does not represent a physiologic condition–you need to add some estrogen. Mark has heard that a researcher in Minnesota has added estrogen to the medium and she still gets a 20% increase in breast cancer cell growth. So genistein may still be an estrogen in that situation. One animal study showed that if you implant estrogen receptor positive cancer cells into rats who don't have ovaries, then you give them a significant amount of genistein, it will stimulate the growth of those cancer cells (tumors). But one criticism of this design is that there is very little estrogen in these rats and fairly high doses of genistein were used.

It is the three human studies (two of which have been published) which are troubling, and cannot be ignored. One is "Stimulatory Influence of Soy Protein," by Nicholas Petrakis at UCSF (1996) in *Cancer Epidemiology, Biomarkers, and Prevention* (5:785). A second is an abstract from the 1997 Brussels symposium by McMichael Phillips. Third, McMichael Phillips told Mark about a study in England that was 4 months in duration. They looked at nipple aspirate fluid and also got an increase in estrogen-regulated gene products. Mark has not seen the actual study and it is a long way from being published. These studies are troubling not because they are scary, but because they do not make sense. Malcolm Pike, from UCLA, a leading endocrinologist, said after studying McMichael Phillips' actual paper (not the abstract), that his must be a short-term effect, because that kind of stimulus would cause an increase in breast cancer, as (for example) in the Japanese population. Given that the other epidemiology does not suggest that soy increases risk, and given that the animal studies don't either, and given that the Japanese have a low breast cancer mortality rate, there is probably something else that could explain this phenomenon. Again, it could be a short-term effect that is actually preventive in the long run. But if it was a short-term effect, it still might be possible that soy should not be given to a person who already had estrogen-receptor positive cancer. So Mark is very reluctant to think that soy could increase risk of breast cancer risk; for one thing, it is very hard to identify any kind of food that increases or decreases breast cancer risk. And it is so unlikely that such a food would be soy, because there is very little supporting evidence. Nevertheless, Mark has about 25 scientific studies at the end of which the authors have expressed a cautionary note. The latter range from "Wow! These soy isoflavones are stimulatory; we've got to find out what is going on here," to "It's clear that we need to understand more about the estrogenic / antiestrogenic effects of these compounds before

we recommend them to the public."

Mark does not differentiate between soyfoods such as tofu and isoflavone pills in terms of toxicity. He asks: "Would anyone use the above studies to recommend that people stop consuming tofu? No! When you look at the data collectively, it's hard to conclude that soy would increase the risk of breast cancer–especially for normal women. On the other hand, if it weren't for the low breast cancer mortality rate in Japan, and we just had the animal studies and the individual case control studies (neither of which show that soy increases breast cancer risk) plus the human studies, there would be more of a movement to look into this." When Nick Petrakis' study was published, it didn't get much attention; Mark thinks there is a built-in bias to assume that soy is either beneficial or (at the worst) has no effect. It will be interesting to see what the response will be when McMichael Phillips' paper is published as a full paper as part of the proceedings of the Brussels symposium (in Sept. in a supplement to the *American J. of Clinical Nutrition*). It is quite powerful; they actually took biopsies and found an increase in DNA synthesis.

Virginia: Ginny is well aware of the research showing possible adverse effects of soy (especially soy isoflavones) on breast cancer. She definitely thinks about this in planning her diet–in part because she has a fairly high risk for breast cancer; she has had two biopsies. "This is uppermost in my mind almost every day." Ginny wasn't eating a lot of soy products before this new research was published (she probably ate them 3-4 times a week), so she has not reduced her consumption based on the new information. Because of the concern with soy and breast cancer, Ginny would not eat soy products 2 or 3 times a day. "I certainly still eat soy products and I do not feel that I need to avoid them."

Ginny eats soyfoods because she is a vegetarian, because she likes them, they are easy to include in the diet, and they are generally good, healthy foods. Ginny has never calculated how may milligrams of isoflavones she is consuming per day. "I'm really into food, into good, healthy, whole food, with lots of fruits and vegetables, and whole grains. I don't think about things like isoflavones, vitamin C. I just figure I eat a really good diet." Address: 1. PhD; 2. MPH, RD. Both: Nutrition Matters, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

889. Messina, Mark J. 1998. Soy phytoestrogens–Update (Interview). *SoyaScan Notes.* May 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The hottest area of current estrogen research is "selective estrogen receptor modulators" (SERMs). A selective estrogen can have an estrogenic effect on one site in the body and an antiestrogenic effect on another site. One key question is: Are isoflavones selective?

It has been known for several years that soy isoflavones inhibit angiogenesis. But this raises many interesting questions. Do they therefore inhibit nose bleeding? Josh Korzenik at Yale Univ. School of Medicine [in Connecticut] is conducting a study on patients who have a hereditary disease that causes their noses to bleed. They have a genetic defect which causes abnormal blood vessels to form. In this ongoing unpublished study, results to date on about 8 patients show that about 40-50% of those who take soy isoflavones experience a reduction in their nosebleeds. He found some benefit on gastrointestinal bleeding and a major benefit on migraine headaches. This confirms the finding that in petri dishes, genistein also inhibits blood vessel growth.

Do these isoflavones affect fertility? Mark thinks that fertility has more to do with ovulation. How about slowing wound healing? The key point seems to be that if soy isoflavones are potent enough to exert beneficial effects, why aren't they potent enough to exert adverse effects? For example, they may slow wound healing, but only by a few days. But if they chronically prevent angiogenesis in tumors, that would be an acceptable trade-off.

Many people who cite Japanese intake of isoflavones do not realize that the average Japanese level of isoflavone intake (about 30 mg/day) is far below the level needed to get benefits. The daily intake to get benefits in the area of bone health and reduced osteoporosis seems to be about 90 mg/day.

Concerning the exciting studies involving Raloxifene and prevention of osteoporosis and cancer announced this week: Mark uses Raloxifene in his demonstrations because it is antiestrogenic for the breast, and doesn't cause estrogenic effects on the endometrial tissue. But Raloxifene may cause "hot flashes" or make them worse, and it is probably not as effective for reducing risk of heart disease as estrogen is. "But that is an extremely beneficial trade-off; you can work on heart disease in many different ways, and weak bones are much more difficult to fix. As you know, I am a strong believer in the importance of food, nutrition, and prevention, but I think our greater understanding of molecular biochemistry and what on goes at the cellular level, and our ability to design drugs to specifically get estrogenic effects in some tissues and antiestrogenic effects in other ones–I think all that research is incredibly promising. They are using the isoflavones as a model and then designing better drugs from them, maximizing benefits and decreasing disadvantages." Mark believes that soy isoflavones will not be as potent as estrogen for bone health or heart disease–but the beauty of isoflavones is that there has never been any concern whatsoever about their safety. That is why it is so critically important to figure out some of the unexplained findings concerning soy and breast cancer. In addition, we must do the studies to see if soy isoflavones promote cognitive function (or delay impairment of it)–like estrogen probably does. If they do not, they won't be nearly as popular–because that is going to be such a big issue with an aging population.

Will people who raise concerns about adverse effects of

soy isoflavones be invited to speak at the Third International Symposium? Mark thinks they will definitely be invited to participate, in part because he has chosen a large advisory board. However they may end up doing a poster session rather than a major speech–unless their data look extremely important. The politics of soy and isoflavones is still real and pervasive.

As an almost comic example of this, Mark heard of a man who is an M.D. and PhD in nutrition who was holding a small meeting about soy. He had been studying soy for 2 weeks. When Mark called him and asked if he could attend the meeting, the man yelled at him on the phone (quite arrogantly) for 10 minutes. He objected to some statements that Mark had made on possible adverse effects of soy. Mark said he would be happy to discuss the subject. The man said Mark could come to the meeting if he promised not to bring up that subject. Apparently he wants to make a name for himself in the field of soy. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

890. Kilman, Scott; Warren, Susan. 1998. Old rivals fight for new turf–Biotech crops. *Wall Street Journal*. May 27. p. B1, B7.
• ***Summary:*** "Monsanto Co. and DuPont Co. are betting the farm in bids to transform themselves into the Coke and Pepsi of genetically engineered crops." Although the first transgenic seeds were introduced only 3 years ago, today about 50% of U.S. cotton fields, 40% of soybean fields, and 20% of corn fields grow genetically altered crops.

Monsanto (of St. Louis, Missouri) and DuPont (of Wilmington, Delaware) have long competed as major chemical companies. But now both have started to compete in the new field of biotechnology by paying big money for major acquisitions. DuPont has paid $1.7 billion for a 20% stake in Pioneer Hi-Bred International Inc., the No. 1 U.S. seed producer, and $1.5 billion for Protein Technologies International, the nation's leader in making soy protein products.

Monsanto has paid $2.3 billion for the rest of DeKalb Genetics Corp, the No. 2 U.S. seed producer, and more than a $1 billion for Delta & Pine Land Co., the giant cotton seed producer.

Monsanto is forming a joint venture with Cargill, which will use Cargill's vast system of "rural grain elevators to contract with farmers to grow genetically engineered crops." Note: This could eventually lead to a restructuring of the farm industry, to resemble that of the poultry industry.

The decreasing number of independent seed companies is making both U.S. farm organizations and consumer groups nervous. Address: Staff reporters.

891. James, Richard F. 1998. Re: Answers to questions by William Shurtleff related to photocopies sent by James. Letter (fax) to William Shurtleff at Soyfoods Center, May. Handwritten. Undated.
• ***Summary:*** (1) Columbit (NZ) Ltd. is the sole importer of soy protein isolate. It is owned equally (50/50) by Protein Technologies International (PTI) and Bruce Kirk. Kirk is the heavy-breathing late night phone call expert who was handing out threats of hell fire, etc. to Prof. Irvine, Dr. Fitzpatrick and his employees, Bill Grayson, and us.

(2) "Tofu shop" at the top of a fax (with fax #631 0616) is a suburban health food shop in Penrose, Auckland, on the north island of New Zealand. It is a retail outlet for Trevor Johnston's business, Bean Supreme (Brings Happiness). Address: 1868 Whangarei Heads Road, Rural Delivery 4, Whangarei. Phone: +64 9 434 0564.

892. Chajuss, Daniel. 1998. Soy protein concentrate: Current status. *Oils & Fats International* 14(3):35-36. June.
• ***Summary:*** The three main commercial soy products are (1) Full fat and defatted soya flours and textured soya flour–current world production and sales about 80,000 tonnes (metric tons). (2) Soya protein isolates–current world production and sales about 130,000 tonnes. (3) Soya protein concentrates–current world production and sales about 284,000 tonnes, and growing at about 15% a year. More than 75% of all concentrates are now used for human consumption, the rest being used in pet and animal feeds. In human foods, concentrates are used mainly in meat alternatives or extenders. In animal feed they are used in formulations for calves and piglets as a milk replacer, in pet foods and in special feedstuffs such as 'fish-flavour-free' bland fish feeds, and for mink and other animal feeds. Concentrates are devoid of the antigenic protein components present in most other soya products.

Production of soy protein concentrates worldwide is presently concentrated in the hands of two companies: ADM and Eridania Béghin-Say (Central Soya). About 95% of all soy protein concentrates worldwide are now made by the counter-current aqueous alcohol was system, originally developed in the late 1950s by the Hayes Company of Israel. A table shows estimates of world production (in metric tons) by company and country in 1998:

ADM, Netherlands 70,000 AAW (Aqueous alcohol wash).
ADM, USA 60,000 AAW.
Central Soya, USA (several factories) 60,000 AAW.
Central Soya, Aarhus, Denmark 50,000 AAW.
Sogip (Central Soya group), France 15,000 AAW.
Solbar Hatzor (formerly named Hayes Ashdod) (with Soya Mainz, an ADM subsidiary), Israel 15,000 AAW.
Sopropech, France 6,000 AWL (Acid/water leach).
Sanbra (Bunge), Brazil 5,000 Acid wash.
ADM, USA 3,000 Acid wash.
Lucas Ingredients, UK 2,000 (unconfirmed, Acid wash).
Total worldwide 284,000 metric tons.
The margins on soy protein concentrates are much

more attractive than those from crushing soybeans into oil and meal–which in recent years have been either small or negative. The cost of making a tonne of concentrates ranges from US$459 to $600. For food applications, the sales price obtained by manufacturers for powder and small grits forms ranges from $1,200 to $1,600 per tonne, but for textured or functional forms this increases to $1,500 to $3,000 per tonne. The sales price for the pet food, milk replacer, and special feed industries ranges from $1,000 to $1,200.

Another high-value product, a potential source of additional income, is soya molasses, a by-product of making soy protein concentrates. It is a rich source of soya phytochemicals and soya oligosaccharides.

A second table shows estimates of world production (in metric tons) of soy protein isolates, with estimates for 1997 and forecasts for 1998.

Protein Technologies International (PTI, USA) 60,000 in 1997, 70,000 in 1998.

ADM, USA 15,000, 25,000.

PTI Belgium 15,000, 15,000.

Fuji-PTI Japan 10,000, 10,000.

Sanbra (Bunge) Brazil 5,000, 10,000.

Others worldwide 6,000, 8,000. Total worldwide 110,000, 138,000. Address: Managing Director, Hayes General Technology Co. Ltd., Misgav Dov 19, Mobile Post, Emek Sorek, 76867 Israel. Phone: +972-8-8592925.

893. Messina, Mark J. 1998. Problems with the media hyping soy: Concerns about Alzheimer's disease, breast cancer, and thyroid function (Interview). *SoyaScan Notes.* July 18. Conducted by William Shurtleff of Soyfoods Center. • ***Summary:*** Mark feels that, when presenting an overview of the scientific research concerning health benefits of soy, he is the only person who is presenting a balanced and accurate picture; the media is clearly hyping the subject and many of the scientists are going along with the media–even though they know better. Much of what the media is saying is not supported by the scientific evidence. "It's just getting carried away, and I feel it is very unfortunate. The exaggeration on the positive side, will probably come around to hurt you when they hype the negative side on the second time around. All of this is only interesting because people are now very excited about soy."

Shurtleff notes that he agrees completely with Mark's position and analysis, and that he too refuses to go along with the hype. The difference, however, is that Mark is in a more difficult position, because he is "doing the rubber chicken circuit" where he is paid to give lectures on the health benefits of soy.

For three years, Mark has been trying to explain this problem to the United Soybean Board's (USB) PR firm in Seattle (EvansGroup, now renamed something like Publiciste) and to encourage them to conduct a workshop to deal with and refute the growing number of concerns about soy (Alzheimer's, thyroid function, etc.). They haven't been interested, then recently they learned that a woman's magazine plans to do a story on soy that is negative for breast cancer. So now they are really concerned, and Mark will meet with them next Monday to try to plan a workshop, with 10-12 professionals present to deal with Alzheimer's disease, breast cancer, and thyroid function as they relate to soy. For the Alzheimer's disease, hopefully they could get Lon White from Hawaii, and the person in Seattle who is doing the study to present their data. He would also invite 3-4 people who are doing animal studies, to summarize what we know about soy and Alzheimer's disease. Then two things from that: (1) To make research recommendations to the USB to try to resolve the situation–if that is possible, and (2) from a PR standpoint, to prepare a statement that would put as much of a positive spin as possible on the Honolulu data.

Steve Barnes (in Mark's opinion) knows more about isoflavones than anyone else in the USA. When Mark has a question about them, he calls Steve. In a recent speech, Steve dismissed the papers on thyroid function from the NCTR (National Center for Toxicological Research). He noted simply that a large proportion of the polyphenolics and flavonoids (pronounced FLAY-vuh-noids) have the same effects of isoflavones in vitro, and we are supposed to be eating foods that contain these substances. But the scientists at NCTR are not stupid; they know that and they even discussed it in their papers. Moreover, in Mark's opinion, the last three epidemiologic studies have found, at least in Europe, that the average flavonoid intake is 40-50 mg/day. So if anyone recommends 100 mg/day of isoflavones, that is doubling the average flavonoid intake. This is a big deal–at least theoretically. The NCTR researchers found an effect on thyroid function at a concentration of 1 micromolar; that is a lower concentration than is used to inhibit the growth of cancer cells and all the other wonder beneficial effects.

The NCTR is rarely completely objective, because they are always looking for funds to do more research. The FDA may be the only organization can look at these matters in an objective and balanced way–since their mandate is to safeguard the public health. So FDA is looking for a clear understanding of the situation, but much of the information they are getting may be biased. Hopefully, they know these biases and can take them into account.

One new area, which is a complete surprise and broadens our perspective–Several studies show that the effect of genistein is sometimes different from the effect of a complex mix of isoflavones, and that in turn could be different from the effect of a whole soy food (such as soy flour). Scientists realize that soy contains much more than isoflavones, but nowadays many focus solely on the isoflavones–especially genistein.

Mark likes ADM's pills because he believes that the amounts people need may be very difficult for most people to

consume without pills. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

894. Zind, Tom. 1998. Making the case for soy: Soy protein merges into the fast lane as a functional food ingredient. *Food Processing* (*Chicago*) 59(7):31-32. July. Foods of Tomorrow section.
• ***Summary:*** Soy protein is getting more attention in the budding functional foods/nutraceuticals arena in large part because of the isoflavones in soy which have many health benefits. A number of companies have developed isoflavone-rich extracts–such as Novasoy from ADM. Big companies like General Foods and Nabisco are now working with soy and see a bright future ahead. ConAgra Frozen Foods is promoting soy in its Advantage\10 line, recommended by Dean Ornish, M.D. A color photo shows the front of one package. ADM markets a powdered soy drink named Nutribev and is test marketing a soy-based frozen dessert, named Dairylike, in Southern California. Protein Technologies International says it has found new scientific evidence that soy isoflavones can control cholesterol.

895. Stipp, David. 1998. Nutraceuticals–Engineering the future of food: A revolutionary blurring of foods and drugs is transforming the industries that make them and promising to help us age gracefully. *Fortune* 138(6):128-30, 134, 136, 140, 144. Sept. 28. [1 ref]
• ***Summary:*** This is a very (perhaps overly) optimistic portrayal of the future of genetic engineering. In January 1998 Charles "Chad" Holliday was installed as the CEO of DuPont. A few months later he acquired Protein Technologies International (PTI), a subsidiary for Ralston Purina Co., for $1.5 billion. Analysts were puzzled by the deal, and the very high price that DuPont paid. On the day the deal was announced, DuPont's shares slipped $0.31 to close at $65.63, while Ralston's jumped $3.44 to $91.69.

This acquisition was part of the "life science" revolution, an example of how chemical and agribusiness companies are increasingly envisioning their future in biology, and especially biotechnology. Last year Monsanto (an old-line chemical firm) spent over $6 billion for seed companies, while DuPont paid $1.7 billion for a 20% stake in Pioneer Hi-Bred International. Yet the prize in the life-sciences revolution is seen as lying, not in seeds, but in food–and in the blurring of the distinction between food and drugs, between edibles and pharmaceuticals. For example, in 1996 there was the $29 billion merger of Sandoz and Ciba-Geigy to form Novartis.

These new health-enhancing foods go by several names. The food makers call them "functional foods" while the pharmaceutical companies prefer the name "nutraceuticals." A functional food might be spaghetti enriched with soy protein to prevent osteoporosis. Unfolding scientific research suggests that men with prostate cancer may be able to slow the progression of the disease "by eating lots of tofu and other soy-based foods." According to Clare Hasler, executive director of the interdisciplinary functional-foods program at the University of Illinois, the emphasis is shifting from removing the bad components from food (fat, cholesterol, salt) to enhancing the good. One example is the trend to fortify foods with calcium; it took off in 1995 when Tropicana started fortifying its orange juice with bone-building calcium. Today calcium is added to a host of foods to make them more nutritious.

Marketing these foods will be aided by FDA health claims (which can be printed on the front of each package) based on clinical studies. DuPont is working to gain FDA approval of a health claim for products containing soy protein–which is rich is isoflavones. Steven Potter, DuPont's Director of agriculture business development, believes that if this health claim is approved, the $1.5 billion DuPont paid for PTI will look like "chump change." People think of the U.S. pharmaceutical market as a huge one, but it is actually only about one-fifth as large at retail as the $500 billion food market.

The soul of the new life-sciences machine will probably turn out to be phytochemicals–such as the isoflavones found in soy protein foods or the lycopene found in tomatoes (which could lower the risk of prostate cancer). Other popular fortifiers are fiber, antioxidants, and zinc.

The government has played an important role in drawing or blurring the line between foods and drugs. In 1976 Congress passed a law prohibiting the FDA from limiting the potencies of vitamins and minerals. Then in 1986 the National Cancer Institute worked with the Kellogg Co. (Battle Creek, Michigan; without consulting the FDA) to put the first health claim on a mainstream food–Kellogg's All Bran. The message on the front of each package stated that high-fiber foods may lower the risk of certain cancers. FDA officials were furious, but they decided not to take action against Kellogg, in part because the statement had been proven true by science and the food was a healthy one.

So in 1990 Congress created a legal basis for such claims when it passed the NLEA (Nutrition Labeling and Education Act). But the FDA got the last laugh by interpreting the law so strictly that only 11 claims, each very carefully worded, have been allowed to date. For example: "Diets low in sodium may reduce the risk of blood pressure, a disease associated with many factors."

Finally, in 1994 Congress passed the Dietary Supplements Health Education Act (DSHEA, also called the Hatch Act), a "bulldozer" of a law that allows companies selling dietary supplements to print health claims on their packages without seeking FDA approval. Although the law forbids claims that supplements can treat diseases, it does allow claims linking phytochemicals to good health. The law took away most of FDA's power to regulate supplements, according to Stephen DeFelice, who coined the word

"nutraceuticals" and started the nonprofit Foundation for Innovation in Medicine (Cranford, New Jersey), which promotes natural remedies.

A sidebar is titled "Can soy cut cholesterol." Studies suggest it can. Our writer tries to replicate them using himself as a guinea pig." Before the experiment, his total cholesterol was 223 ("borderline high") and his LDL (bad cholesterol) was 165 ("dangerously high"). He added 30 gm/day of soy protein isolates to his diet and cut back on his "American soul food" such as hamburgers. After two weeks his total cholesterol was unchanged, but his LDL fell 5.5% to 156 ("high")–not bad in only two weeks.

Note: This study uncritically assumes that consumers will accept genetically engineered crops and foods.

896. Food and Drug Administration. 1998. Food labeling, health claims: Soy protein and coronary heart disease. *Federal Register* 63(217):62977-63015. Nov. 10. [72 ref]
• ***Summary:*** Contents: Summary. Dates: Written comments by January 25, 1999. Address to submit written comments. For further information contact. Supplementary information: Background, petition for soy protein and reduced risk of CHD (coronary heart disease) (background {on 4 May 1998 Protein Technologies International submitted a health claim petition to FDA}, review of preliminary requirements), review of the scientific evidence, decision to propose a health claim relating soy protein to reduction in risk of CHD, description and rationale for components of health claim (relationship between soy protein and CHD and the significance of the relationship, nature of the claim, nature of the substance, nature of the food, optional information, model health claims), environmental impact, analysis of impacts, paperwork reduction act, effective date, comments, references (72). Part 101–Food labeling. Tables: (1) Summary of clinical trials. (2) Studies of subjects with Type II or familial hypocholesterolemia. Address: FDA Center for Food Safety and Applied Nutrition, 200 C St. SW, Washington, DC 20204. Phone: 202-205-4500.

897. *Wall Street Journal.* 1998. FDA mulls proposal to allow soy protein to carry health label. Nov. 11. p. B2, col. 5.
• ***Summary:*** The Food and Drug Administration (FDA) has proposed allowing foods that contain a minimum amount of soy protein to carry a labeling claim that they reduce the risk of heart disease–America's leading cause of death. Last spring Protein Technologies International, a unit of DuPont Co., petitioned the FDA to make this heart-health claim.

898. Golbitz, Peter. 1998. New business opportunities emerge as biotech creates ripples across the market. *Bluebook Update* (*Bar Harbor, Maine*) 5(4):4-5. Oct/Dec.
• ***Summary:*** "It would be an understatement to say that the past few years have been an interesting time in the field of agricultural products. The rapid introduction of biotechnology into farming practices and food products was like a stone being thrown into a still pond, with ripples emanating slowly outward until the whole body of water has in some way become stirred and affected.

"One immediate result has been a virtual wave of acquisitions, joint ventures and business mergers in the seed and processing industry. Another has been the formation of new smaller businesses, designed to fill fresh niches created in the marketplace.

"What both large and small companies have in common is a realization that we are at the threshold of a new age in agricultural and food production, and that there are new market and business opportunities to develop in this time of change.

"'The introduction of GMO soybeans has created an opening in the niche market for non-GMO and organic soybeans, and has brought to light the whole area of identity preservation,' says Marlyn Jorgensen, Vice President of Iowa Soy Specialties in Vinton, Iowa.

"The Influence of Biotechnology: When one looks at the widespread use of biotechnology in agriculture today, its hard to believe that commercially, agricultural products produced using biotechnology have only been in the market for five years. In fact, it's been only two years since we saw the first planting and harvesting of genetically modified soybeans in the U.S. designed to be resistant to Monsanto Company's Roundup Ready herbicide. In that short time, the planting of Roundup Ready soybeans has increased 25 fold in the U.S. alone and varieties with this trait are being tested or planted in Canada, Argentina and Brazil. Monsanto estimates that 40% of the U.S. crop and 20% of the world crop in 1998 was planted with Roundup Ready soybeans.

"Roundup Ready soybeans are part of the 'first generation' of biotech seeds–those which offer benefits to the farmer, such as lower chemical input and reduced farming costs. Other seeds which are part of this first generation include those with specific pest, disease or virus resistance.

"The 'second generation' of seeds now being introduced offer processor, end-user and consumer specific benefits such as increased levels of protein, modified and healthier fats, modified carbohydrates, changes in flavor characteristics and increased levels of desired phytochemicals. Many of these processor beneficial varieties have been derived using traditional, non-transgenic breeding practices, while others have been born in the biotech lab.

"Now that we have this new technology stirring up the once relatively placid waters of the market, what new business opportunities will eventually become clear?

"Non-GMO Commodity Soybeans: Since there are no apparent differences or distinct features in the first generation of farmer-beneficial GMO-soybeans in regards to basic composition, U.S. government regulations do not require that GMO soybeans be separated from non-GMO soybeans on the commodity level. Accordingly, both types are freely

mixed at county elevators and grain terminals.

"As a result, opportunities exist for those businesses which can procure and process large quantities of segregated non-GMO commodity soybeans at near commodity price.

"'We initially approached our business from more of an IP perspective than non-GMO, but now that we have looked into it, the non-GMO potential has become more significant,' says Jim Skiff, President of U.S. Soy LLC, a new Mattoon, Illinois-based specialty soybean dealer. 'I have just returned from a trip to Europe and was surprised to see just how big the GMO issue there still is. I didn't meet with one company who can use GMO soybeans due to consumer backlash. I feel that we [United States] have definitely lost markets in Europe due to the GMO issue and that Brazil has picked up the business. The market for non-GMO soybeans is huge.'

"GMO Soybeans with Processor Benefits: New business opportunities exist as well based on using new GMO or IP varieties of soybeans to create new food or pharmaceutical products. 'We expect that much of our future growth will come from selling processed products made from identity preserved soybeans, such as those which can produce specialty soy oils and textured soy products,' reports Mr. Jorgensen, whose company processes IP soy- beans into food ingredients. "Eighty-five to ninety percent of the demand for new products is coming from the concern for specific traits and healthful attributes of the soybean." The seed breeders themselves also realize the need to clear a path directly to the processors and beyond. For example, last year, DuPont not only formed a joint venture with seed producer Pioneer Hi-Bred, but also acquired Protein Technologies International, the world's largest processor of isolated soy proteins. And Monsanto, in addition to the acquisition of a number of seed companies during the past year, announced a joint venture with the grain processor Cargill.

"With value-added soybeans, opportunities exist not only for seed companies and processors, but also for farmers willing to grow particular varieties and harvest them as IP soybeans.

"'Because there will be good premiums available to the grower, a large number of farmers are interested in growing IP varieties,' reports Mr. Skiff.

"Identity Preserved Soybeans: The introduction of the processor-beneficial second generation of seeds will help to shine light on an already existing, but small segment of the soybean market–specialty soybeans sold as identity preserved or IP soybeans. IP soybeans are already segregated from commodity soybeans and are sold on the basis of specific processor benefits. This could mean higher protein levels, lower flavor, or even that they are grown organically. It is difficult to get accurate figures on the size of the market for IP soybeans, although it would be safe to assume that they make up no more than a few percentage points of total soybean trade. Currently, IP soybean marketers cater primarily to soyfoods processors in the U.S., as well as those in Japan, Taiwan, Korea, China and Europe.

"GMO soybeans are not excluded from being IP soybeans as long as they are grown, harvested and sold as a particular variety with specific characteristics.

"Based on the reasoning that new improved varieties of soybeans may eventually become a very large part of the market, we may soon see a restructuring of the commodity market as we know it today, or, at the very least, a much larger market for specialized soybeans and a need for new businesses and facilities to process and handle them.

"'By next year, Roundup Ready soybeans will be near 65% of the U.S. market and non-GMO soybeans will become the niche market, with good premiums available and a number of farmers interested in growing non-GMO soybeans," reports Mr. Skiff.

"Organic Soybeans: The ripple effect of GMO soybeans in the marketplace has also inadvertently helped to further develop another small, but specialized niche of the market–organic soybeans.

"Although this is a relatively minuscule segment of the world soybean market, in 1996 and 1997 one of the only ways to acquire non-GMO soybeans was to buy certified organic soybeans. This put a tremendous strain on the supply of organic soybeans in the U.S., and prices jumped dramatically. In fact, for the past two years, the U.S. found itself becoming an importer of organic soybeans from both China and Brazil to fill domestic demand.

"'The introduction of GMO has heightened awareness of organic soybeans due to their certification and their being GMO-free,' says Mr. Jorgensen. 'Buyers are now drawn more positively to organics.'

"Simply put, organic farming requires that no synthetic farm chemicals are used on the plant or in the soil for at least three years. New regulations forthcoming from USDA will also not allow the use of biotechnology in organic food production. According to Agriculture Secretary Dan Glickman, 'food produced with these products and practices will not be allowed to bear the organic label.'

"Things May Never be the Same: Like the after effect of the stone thrown into the pond, the ripple in the market should eventually smooth out and the waters will once again become clear. But the market may never be the same again."

899. *Soyafoods* (*ASA, Europe*). 1998. PTI provides non-GMO soya isolate. 9(3):2. Autumn.

• ***Summary:*** Protein Technologies International (PTI) says it will offer its Supro brand of isolated soy protein as Identity Preserved (IP) "in response to the present uncertainty surrounding the labelling of genetically modified soya in processed foods.

"PTI has established an IP system which covers every aspect of isolated soya protein production... The IP system is independently validated by third party audit, and backed by documentation which provides full traceability."

For further information contact Jane Lilleywhite Marketing Coordinator, PTI, 16 Princewood Road, Earlstrees Industrial Estate, Corby, Northants NN17 4AP, UK. Phone: +44 (0) 1536 267325, fax: +44 (0) 1536 261147.

900. Karp, Jonathan. 1998. Adding U.S. soybeans to India's spicy diet faces big roadblocks: Protein-loaded legume could help the hungry, if only they'd eat it. Hiding 'that beany taste.' Currying favor? *Wall Street Journal.* Dec. 8. p. A1, A6.

• ***Summary:*** Virgil Miedema, the American Soybean Association's director for South Asia, is the son of a soybean farmer from North Dakota and speaks near-fluent Hindi. He believes that adding American soybeans to Indian diets can do wonders for their health. But there are two problems: (1) India, the world's fifth largest soybean producer, already grows so many soybeans that it exports the soy protein, although the country has a shortage of dietary protein; (2) Indians dislike the beany taste of soy–according to food scientist V.D. Devdhara, who shares Mr. Miedema's mission. The population of India is now growing by 16 million people a year–devouring the gains of the 1960s Green Revolution. Some 53% of Indian children under age 5 are malnourished. Per capita availability of lentil protein is half what it was in 1947, so the Indian government is producing lentil alternatives made of soy protein and wheat flour. The brown pellets, designed to look and taste like dal, contain 60% more protein.

The American Soybean Association (ASA) opened an office in India in 1996. It hired Mr. Miedema who had spent 17 years in South Asia with the Peace Corps and the U.S. Agency for International Development (USAID). His mission is to repeat ASA's success in China, where in just 15 years it helped turn that soybean producer into a major importer. In 1997, China bought $657 million of U.S. soy products. "Of course, the Chinese have been eating soybeans–as soy sauce and tofu, among other things–for millennia." Mr. Miedema's approach is to encourage Indian companies to add soy to everyday Indian foods–such as the wheat flour used to make chapatis.

One company, AFM Foods, Mr. Miedema's first partner, is making soy-fortified flour for chapaties that contains 35% more protein than wheat–"and can reduce the risk of cancer and the aches of menopause."

But attempts to use soy as food in India have failed before. A decade ago the ASA backed three local companies that failed in trying to popularize soymilk. RJR Nabisco Inc. quit making soy oil and Nestle SA (the Swiss food giant) recently withdrew its soymilk powder and soy-based baby food because of poor sales.

Sanjeev Chaudhry (formerly involved with Nabisco's soy oil factory) is head of the India office for Protein Technologies International. He uses Supro brand soy protein isolate to develop turbocharged soy products. He sells about 100 tons a year to 25 customers, mostly food manufacturers.

Large-scale cultivation of soybeans in India began in the 1970s to reduce dependence on imported edible oils. Soy oil still is not popular, and for Indians see soybeans as an evil threat. Ms. Vandana Shiva believes that free trade in agriculture, inevitably controlled by multinational corporations selling expensive genetically engineered seeds, will destroy India's farmers and local foods.

Yet Mr. Verghese Kurien, a famous Indian nationalist from the western town of Anand, has decided to join the soybean forces. As head of India's National Dairy Development Board, he was largely responsible for making India self sufficient in milk and the world's largest producer of cow's milk–while thwarting foreign dairy firms. He then branched out into edible oils to help his country cut costly imports. Though he retired last month, his main project is now developing the lentil alternatives.

The idea has been simmering for a decade, starting with U.S.-funded soybean research at an Indian university. The dairy board, whose sister organization, Amul, is one of India's largest food marketers, accepted the challenge of developing an inexpensive, uniquely Indian protein alternative. Mr. Kurien argues that if soy can be made into chicken and bacon, why not into dal? After years of fine tuning, the product launch is at hand. If it succeeds, the ASA could try for a second wave of products (made from U.S. soybeans) such as "soymilk and tofu, which looks and feels like Indian cottage cheese, called paneer." Indians say that tofu does not taste as good as paneer, but Mr. Miedema responds that its better for you. An illustration (dot-style) shows Mr. Miedema. Address: Staff Reporter.

901. Chapman, Nancy. 1998. Update on managing the Soyfoods Association of North America (Interview). *SoyaScan Notes.* Dec. 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Nancy's organization specializes in food policy issues, not in managing trade associations. The Soyfoods Association of American (SAA) has used almost none of her expertise in food policy issues during the past year. Her company does publish newsletters related to food policy, so those newsletter skills have been of use in managing the SAA account.

Concerning the health claim for soy protein reducing the risk of heart disease: She has been following this issue closely during the past year and she believes that the probability that the claim will be approved by the FDA is "extremely good–about 99.5%!" She expects the approval to be granted in the spring or summer of 1999–hopefully in time for Soyfoods Month in April.

Nancy assumes she will be managing the SAA account in 1999–but she is not sure. This past year the main problem is that Chapman Associates has had to do much more work than she contracted for. Her organization has increased

membership from 29 members to 52 at present. Three of the new members are big companies: Monsanto, Central Soya, and Protein Technologies International. She believes that the dues for these very large companies should be much higher than the present highest dues of $3,000 year. As it is now, Monsanto is paying the same dues as White Wave. To increase revenues, the Association has decided to increase dues for the smallest members. For example, membership dues for an individual (such as Soyfoods Center) will increase from $350 last year to $500 in Jan. 1999.

Alan Routh, president, was out for 6 months because of his accident, but as of Nov. 1 he reassumed the job of president. While he was out Yvonne Lo did an excellent job filling in for him. Throughout the past year Peter Golbitz has been extremely generous in the amount of volunteer time he has contributed. Address: Founder, N. Chapman Associates, 1723 U. Street, N.W., Washington, DC 20009. Phone: 202-986-5600.

902. *SoyaScan Notes.* 1998. Chronology of major soy-related events and trends during 1998 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** June–WholeSoy Co. of San Francisco (Ted Nordquist) launches Creamy Cultured Soy (soy yogurt) in 3 flavors. In about 2001 the product is renamed WholeSoy Soy Yogurt.

June–Britain's Prince Charles, who practices organic farming and is a patron of the Soil Association, writes an article attacking genetically modified food that is published in Britain's *Daily Telegraph.* Explaining that he wouldn't eat such food or knowingly give it to his family or guests, he concludes, "I happen to believe that this kind of genetic engineering takes mankind into realms that belong to God and God alone." The prince's surprise article helped unleash a wave of anti-GMO activity and sentiment, that continued for weeks in the British press and carried over to the Continent.

Sept.–New European Union (EU) labeling laws, requiring labeling of genetically modified ingredients, go into effect. However the regulation exempts foods which contain no soy protein but do contain soy oil or soy lecithin.

Sept.–Imagine Foods of Palo Alto, California, the natural foods leader in nondairy beverages, launches Soy Dream (soymilk), the company's first soy product. They support the product with an extensive and very creative advertising campaign.

Sept.–Protein Technologies International starts to offer certified non-GMO soy protein isolates.

Oct.–The Hain Food Group (which owns Westbrae) has announced that it will start to label some of its products as GMO-Free (i.e. free of genetically modified / engineered organisms). It has developed a "Pure Food" logo and a "Just Say No to GEOs" slogan.

Oct. 16–Worthington Foods purchases the Harvest Burger product line from ADM; by agreement, ADM will continue to make the Harvest Burgers at its Illinois plant.

Nov. 1-2–Conference titled "Estrogen, phytoestrogens and cognitive function" held in Seattle, Washington (organized by Mark Messina), largely to learn more about the research of Lon White on tofu and dementia/Alzheimer's disease.

Dec. 31–DE-VAU-GE acquires Bruno Fischer GmbH, which sells bottled soymilk; both companies are located in Germany.

Major trends: (1) The steady expansion of genetically engineered Roundup Ready soybeans. This year an estimated 30% of America's soybean acreage was planted to genetically engineered soybeans. This is one of the hottest and most controversial stories in most countries of the world–except the United States, where it gets unbelievably little media coverage. (2) The hype about the health benefits of soyfoods continues to increase. There are definitely some health benefits, but the exaggerated statements that now routinely appear in articles and advertisements go far beyond what can be supported by scientific evidence. The media seems intent on making as much money as possible as it whips up the story of soy's health benefits. The bigger the story it becomes, the more money they can make later debunking it. (3) The natural foods industry is changing into a supplements industry because of the higher profit margin on supplements. Many consumers are being misled into thinking that supplements are more important than healthy foods in determining good health. (4) Among commercial soy products this year, the ratio of supplements to foods has increased sharply.

Areas of potential danger on the horizon: (1) Lon White of Hawaii and his data on tofu and dementia/Alzheimer's disease. (2) Young girls discovering that overdoses of soy isoflavones could be useful in growing breasts, then publicizing that information using the Internet and World Wide Web. (3) The danger that the media will start to debunk its own hyped story of the health benefits of soy. (4) The concern that the FDA health label claim for soy will not include traditional soy products–such as tofu and soymilk–which contain too much fat. Therefore manufacturers will be tempted to add soy protein isolates to raise the protein to a level that will trigger the health claim.

903. Golbitz, Peter. 1998. Proposed labeling rule may turn soy to gold. *Newsletter of the Soyfoods Association of North America* (*Washington, DC*). Dec. p. 1-2.
• ***Summary:*** A proposed health claim for food labeling, now under review by the U.S. Food and Drug Administration (FDA), would authorize the use of a health claim on food products which contain soy protein. The rule, published for comment in the U.S. Federal Register on 10 Nov. 1998, resulted from a petition originally filed on 4 May 1998 by Protein Technologies International (PTI) of St. Louis,

Missouri. This petition summarizes years of clinical studies related to the cholesterol-lowering effects of consuming products that contain a significant amount of soy protein. The comment period ends on 25 Jan. 1999.

According to FDA, "studies show 25 grams of soy protein per day have a cholesterol-lowering effect. Therefore, for a food to qualify for the health claim, each serving of the food must contain at least 6.25 grams of soy protein, of one-fourth of the 25 gram amount shown to have the cholesterol-lowering effect. The exact wording to be allowed on packages won't be finalized until after the comment period ends, but an example of how the health claim might be used on a package is: "Diets low in saturated fat and cholesterol that include 25 grams of soy protein per day may reduce the risk of heart disease. One serving of (name of food) supplies ___ grams of soy protein.

Since a typical serving of most soyfoods (such as tofu, soymilk, tempeh) etc. contain the required 6.25 grams of soy protein, manufacturers and marketers of these foods will clearly benefit if the rule is approved. But perhaps even more important, food processors will probably consider including soy protein products as an ingredient in a wide variety of foods ranging from breakfast cereals to pasta.

The last four proposed health claim rules were all approved by the FDA, which has up to 540 days from the original filing date to complete action on the proposal. So the two key dates to watch are January 25 and late October 1999.

904. Messina, Mark; Erdman, John W., Jr. eds. 1998. The role of soy in preventing and treating chronic disease: Proceedings of a symposium held on September 15-18, 1996, the Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, and a satellite symposium held on September 19, 1996, in Brussels, Belgium. *American J. of Clinical Nutrition* 68(6S):1329S-1544S. Dec. Supplement.

• ***Summary:*** This symposium was organized by Mark Messina, PhD, and sponsored by Protein Technologies International, the soybean growers from Nebraska, Indiana, and Iowa, and the United Soybean Board.

33 papers by various authors (each cited separately), were presented at this conference. They were arranged under the following categories: Introduction. Soy and kidney function. Soy and bone health. Soy and heart disease. Soy and cancer: Animal studies, soybean anticarcinogens and anticancer mechanisms, human studies. Current understanding of soy and infant health. Soybean isoflavones: analysis, amounts in foods and biological matrices, and pharmacokinetics. Isoflavones and alcohol metabolism. Abstracts of oral and poster presentations. Address: 1. Nutrition Matters, Inc., 1543 Lincoln St., Port Townsend, Washington 98368; 2. Div. of Nutritional Sciences, Univ. of Illinois, 451 Bevier Hall, 905 S. Goodwin Ave., Urbana, IL 61801-3852. Phone: 360-379-9544 (Messina).

905. Ralston Purina Company. 1998. Annual report: A year of global growth and action. St. Louis, Missouri. 53 p.

• ***Summary:*** On the front cover is chronology of major events in the company from 1 Oct. 1997 to the present, including: 1997 Oct. 1–Co-CEOs take office (Patrick Mulcahy and W. Patrick McGinnis are replacing William Stiritz). 1997 Dec. 3–Protein Technologies International (PTI) sold to DuPont. 1998 April 1–International agricultural brands spun-off as an independent company, Agribrands. 1998 May 28–Board authorizes three-for-one stock split. 1998 Sept. 11–Tianjin, China, Energizer plant opened.

PTI was sold to E.I. du Pont de Nemours and Company (DuPont) for approximately $1.554 billion, comprised of DuPont common stock and the assumption of certain liabilities. The after-tax next profit was $705.1 million.

So now Ralston Purina is comprised of and focused on two leading businesses in global industries: Pet products (the world's largest producer of dry dog and dry and soft-moist cat foods) and battery products (the world's largest manufacturer of dry cell battery products, including Energizer and Everready brand products).

Net earnings in fiscal 1998 were $1,105.7 million, up dramatically from $423.7 million in 1997 and $359.6 million in 1996. The major reason for this huge increase was the sale of PTI (see p. 12, 14).

Also contains a notice of annual meeting of shareholders. Address: Checkerboard Square, St. Louis, Missouri.

906. Holt, Stephen. 1998. The soy revolution: The food of the next millennium. New York, NY: M. Evans and Company, Inc. xiii + 214 p. Index. 26 cm. [28 ref]

• ***Summary:*** Contents: Special note (disclaimer). Foreword by T.V. Taylor, M.D., FRCS, Prof. and Chief of Surgery, Veterans Administration Hospital, Baylor College of Medicine, Houston, Texas. Preface, by the author. 1. I've heard about the benefits of soy, but... 2. What makes soybeans so special? 3. The ingenious soy isoflavones. 4. Soy and your heart. 5. Soy and weight control. 6. Soy and diabetes mellitus. 7. Keep your genito-urinary tract healthy: kidneys and prostate. 8. Soy and digestive problems. 9. Omnipause: both sexes should read this. 10. Thinning bones and creaking joints may not be inevitable. 11. Soy and cancer. 12. Dairy versus soy: is there one answer? 13. Soy and the special needs of active adults and athletes. 14. Soy and your children. 15. Many other benefits of soy. 16. Safety and application of soy. 17. The champions of soy and health: Chai-Won Chung (M.D., pediatrician in Korea), T.W. Kwon (PhD, Prof. and Director of the Food Science Inst. of Inje, Korea, and founder of the Korean Soyfood Assoc.), Mark Messina, William Shurtleff, Kenneth D.R. Setchell, Earl Mindell, Donald F. Othmer, Dr. Robert Atkins, E.C. Henley (of Ralston Purina Co.), Dr. James Anderson, Cathy Read.

As of Nov. 1999 this book is available in an inexpensive paperback pocketbook edition (Dell Publishing, a division of Random House; $5.99). Dr. Holt is at BioTherapies, Inc., 9 Commerce Road, Fairfield, New Jersey 07004.

In 2000 this book was issued in an inexpensive paperback pocketbook under the title: *The soy revolution: discover how the use this powerful nutritional miracle to prevent or treat a wide variety of illnesses* (New York: Bantam; London: Kuperard). Address: M.D., F.R.C.S., President and CEO, Biotherapies, Inc., Fairfield, New Jersey, and Clinical Prof. of Medicine at Seton Hall Univ. and Director of the Roseland Surgical Center.

907. Dibb, Sue. 1999. Re: Docket No. 98P-0683 Food labelling: Health claims; soy protein and coronary heart disease. Letter to Dockets Management Branch (HFA-305), Food and Drug Administration, 5630 Fishers Lane, Room 1061, Rockville, Maryland 20852, Jan. 25. 5 p. Typed, without signature. [4 ref]

• ***Summary:*** "The Food Commission wishes to submit comments on the above proposal. The Food Commission is an independent consumer organisation and publishers of the *Food Magazine*. In the UK we are one of many NGO's working under the umbrella of the National Food Alliance to establish acceptable criteria, for the use of health claims on food in the absence of any specific regulations. Certainly any new approvals for health claims in the US influence companies and regulatory bodies in other countries. We are therefore concerned to ensure that only legitimate, scientifically substantiated claims, which are genuinely beneficial to public health, are permitted.

The writer expresses her concerns in four areas: (1) Scientific validity of evidence: PTI focuses on the role of isoflavones as being the component of soy protein responsible for lowering cholesterol and LDL cholesterol. However the FDA concludes that "the evidence is not sufficient to establish that the presence of isoflavones accounts for or is related to the effect on blood lipids (p. 62988). Furthermore the FDA's concludes 'Given the limited number of studies and the contradictory outcomes, FDA is not persuaded that the isoflavone component of soy protein is a relevant factor to the diet-disease relationship' (p. 62988)."

The Food Commission supports these conclusions that the active component has not yet been identified and quantified. (2) The Food Commission questions whether the general public will be willing or able to consume 25 gm of soy protein per day. (3) Misleading impressions: A health claim would create a misleading impression of the health benefits of soy as a food. (4) Safety issues: (a) Isoflavones in adult women cause changes to the sex hormone status (Cassidy et al. 1994). (b) Soy can stimulate breast cell proliferation (Petrakis et al. 1996). (c) Soy isoflavones can cause thyroid dysfunction in humans. Malignant goitre has occurred in experimental animals fed soy (Kimura et al. 1976). (d) For children, is there a safe age at which soy is considered beneficial? (e) An increasing percentage of soybeans are now genetically engineered. How does such genetic modification affect levels of naturally occurring components such as isoflavones and other potentially biologically active components? "These examples above clearly show that there are many outstanding safety concerns and therefore it would be highly inappropriate to advocate that the general population increase its consumption of soy which such concerns remain outstanding." Address: Co-director, The Food Commission, London, England.

908. Fitzpatrick, Mike G. 1999. Re: Docket No. 98P-0683 [Food labelling: Health claims; soy protein and coronary heart disease]. Letter to Dr. S.M. Pilch, Centre for Food Safety and Applied Nutrition (HFS-465), Food and Drug Administration (FDA), 200 C St., SW, Washington, DC 20204 USA, Jan. 25. 9 p. Typed, without signature (carbon copy). [40 ref]

• ***Summary:*** "My submission does not address the issue of the health claim that soy protein reduces the risk of coronary heart disease *per se*. Rather, it opposes the claims by PTI [Protein Technologies International] that soy protein is a GRAS foodstuff and that there are no risks associated with the daily consumption of between 25 g and 100g of soy protein.

"In fact, the FDA has never granted soy protein GRAS status. I would submit that the proof required to make such a claim is lacking. Also, there are very real risks associated with consuming soy protein. These risks appear to have been ignored by PTI and it is essential that the FDA give their full attention to the exposures to isoflavones and nitrosamines that will occur on daily exposure to 100g of soy protein.

"In this regard, FDA must fully disclose to consumers the possible risks of soy protein as well as the possible benefits." Address: PhD, MNZIC, Senior Consultant, Kingett Mitchell & Associates Ltd., Environmental Consultants, ASDA Plaza, Fred Thomas Dr., P.O. Box 33-849, Takapua, Auckland, New Zealand. Phone: (09) 486-8068. Fax: 486-8072.

909. Otto, Pam Erickson. 1999. FDA issues proposed health claim for soy protein. *Food Product Design.* Jan. p. 20, 22.

• ***Summary:*** Consumer interest in soy protein has been growing ever since *The New England Journal of Medicine* published its meta analysis in 1995.

Then in May 1998 Protein Technologies International (PTI) of St. Louis, Missouri, submitted a petition to the U.S. Food and Drug Administration (FDA) for a health claim for soy protein.

"Although the agency concurred with the majority of research submitted by PTI, it discounted two studies suggesting that isoflavones play a role in the cholesterol-lowering effect. Citing insufficient evidence. FDA wrote

in its research review that it was 'not persuaded that the isoflavone component of soy protein is a relevant factor to the diet-disease relationship."

"Once a part of Ralston Purina Co., St. Louis, PTI was purchased by DuPont Co., Wilmington, Delaware, in December 1997. PTI manufactures and markets isolated soy protein under the brand name Supro®."

"Foods containing soy protein may soon join those made with oat bran and psyllium as products authorized to carry U.S. Food and Drug Administration-approved health claims. FDA in November issued a proposed rule that, if enacted, would allow the labels of certain soy foods to state that the product may reduce the risk of coronary heart disease."

"FDA published its proposed rule in the November 10 *Federal Register,* and is accepting written comments on the proposal until January 25. Correspondence should be sent to: Dockets Management Branch (HFA-305), Food and Drug Administration, 5630 Fishers Lane, Room 1061, Rockville, MD 20852."

910. *Soybean Digest.* 1999. FDA supports soy protein health claim. Jan. p. S24.
• ***Summary:*** Protein Technologies International has presented petitions to the U.S. Food and Drug Administration (FDA) containing data from more than 50 studies that show a link between consumption of 25 grams/day of soy protein and reduction of blood cholesterol. FDA has already given initial approval for a health claim on labels of products that contain soy protein. If FDA gives final approval, it will have a worldwide impact on sales of soy protein, and consumers seek these soy protein foods for their health benefits.

911. Harter, Lisa. 1999. The Take Care line of consumer products containing soy protein isolates was sold to Ross Laboratories by Protein Technologies International within the last 6 months (Interview). *SoyaScan Notes.* Feb. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The sale took place in Oct. 1998 after DuPont acquired PTI from Ralston Purina Co., but it had been planned long before that time. The toll-free number is still the same (1-800-445-3350) and the company is still located in St. Louis, but it is now called the "Take Care Division of Ross Products." They have only one product (i.e. one SKU, which is the powdered beverage in one flavor in a 1-pound can). It is not yet clear whether Ross will ever sell the Take Care products in retail stores.

Note: A color brochure sent by Nutritious Foods of St. Louis in Feb. 1999 shows that Take Care has five products, including Take Care in strawberry, chocolate, and vanilla flavors. Address: Account Representative, Checkerboard Square St. Louis, Missouri 63164. Phone: 800-325-7108 PTI.

912. Harter, Lisa. 1999. Protein Technologies International now offers certified non-GMO isolates suited to each customer's needs (Interview). *SoyaScan Notes.* Feb. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** PTI began to offer certified non-GMO isolates in the fall of 1998. The demand for this type of product was driven largely by enquiries from customers in Europe, but also from Australia and New Zealand. Starting September 1, 1998, food manufacturers in the EU (European Union) were required by labeling laws to list GMO products in the ingredients listing. More than 65% of PTI's business is outside the United States.

In order to ensure that the isolates are free of genetically engineered soybeans, PTI (starting in 1998) contracted with farmers to grow non-GMO soybeans; after they were harvested, the soybeans were stored in special silos. The beans are crushed (by a crusher with whom PTI has a contract), the oil extracted, and the resulting flakes made into soy protein isolates using the water-wash process– the same process to make all PTI isolates–which keeps isoflavone levels high. PTI audited the process (which they call an "identity preserved" {IP} process), and can provide certification to any customer that buys one of these products saying "This product comes from a non-GMO source."

PTI has to schedule production runs of non-GMO isolates in advance, and the company attempts to notify existing or potential customers far in advance as to when these runs will take place. Each time PTI does such a run, they have to shut down the plant and clean out their entire production line, to ensure there is no "contamination"–which is quite expensive and complicated. Thus the non-GMO isolates are more expensive than the regular isolates.

It is important to understand that PTI develops each product to suit the needs of individual customers. Although they now offer more than 100 different types of isolates, they are a customer-driven rather than a product-driven company. They do not send out a laundry list or a catalog. They do not have a brochure describing their policies on non-GMO. Their product offerings are changing constantly.

Talk with Jim Skiff (phone: 217-235-1020) of US Soy, LLC. 1999. May 12. PTI makes the isolates that it calls GMO-Free from STS soybeans, which are resistant to DuPont's powerful herbicide named Synchrony, but are not genetically engineered. So STS soybeans, bred by DuPont and others from mutant lines and first marketed in 1993, are kind of midway between traditional soybeans and GMO-soybeans. A deal involving STS soybeans makes sense since PTI is owned by DuPont, which has a major alliance with Pioneer Hi-Bred, which is the source of STS soybeans! When Jim and his partner, Ramlakhan Boodram, called PTI recently to ask their R&D people if they sell isolates which are guaranteed to be GMO-Free, they said that they did not, "because that would be impossible and the liability would be too great." PTI processes its STS soybeans in Bloomington, Illinois, at a plant owned by DuPont. It is extremely

expensive to stop and clean out a plant such as this one. Address: Account Representative, Checkerboard Square St. Louis, Missouri 63164. Phone: 800-325-7108 PTI.

913. Lamp, Greg. 1999. Soyfoods health claim nears FDA okay: Heart-risk labeling should boost soybean demand. *Soybean Digest.* Feb. p. 68.
• ***Summary:*** Funds from the soybean checkoff helped generate the research and information that was submitted to the FDA. The process began in 1995 with financial assistance from the Illinois Checkoff Board and the United Soybean Board (USB). Roughly $1 million in soybean checkoff funds were invested in the project. "A coalition to develop the soy health claim involved ASA [American Soybean Association], USB, state checkoff boards and industry partners, such as Protein Technologies International, Central Soya and the Archer Daniels Midland Company."

An estimated 20% of all Americans (54.2 million adults) have high blood cholesterol levels–over 240. ASA predicts that if each of these people consumed 25 grams (less than 1 ounce) of soy protein each day, annual demand for soybeans would increase by more than 55.2 million bushels.

Consumption of U.S. soybeans in the United States now totals about 1.2 billion bushels a year.

A color photo shows two 3-shelf racks of American foods. Those on the left rack already contain soy protein: Mori-Nu Tofu, Take Care, GeniSoy bars, Harvest Burgers, Galaxy Veggie Slices, SoNice soymilk, Edensoy, Morningstar Farms [Worthington Foods] meat alternatives, etc. Those on the right rack are foods with potential to have soy protein added: Cream of Wheat, Raisin Bran, puddings, Snackwell's cookies, etc.

914. American Association of Cereal Chemists. 1999. Functional foods: Strategies for the food industry (Brochure). 3340 Pilot Knob Road, St. Paul, MN 55121-2097. 12 panels. 22 x 14 cm each.
• ***Summary:*** This brochure announces a conference will be held on 14-15 June 1999 at the Newport Beach Marriott Hotel & Tennis Club, Newport Beach, California. The program and speakers are given. One breakout group on "Soy and Its Components" will be chaired by E.C. Henley, Vice President of Protein Technologies [International]. A session titled "Highlights from the Strategic Breakout Groups" will be moderated by Clare M. Hasler, Executive Director, Functional Foods for Health Program, University of Illinois. Address: St. Paul, Minnesota.

915. *Monthly Insight* (*Galaxy Foods, Orlando, Florida*). 1999. Veggie Milk pouring on sales. April. p. 1.
• ***Summary:*** Wal-Mart ordered two truckloads of Veggie Milk for its 510 supercenters. A truckload of Veggie Milk was also shipped to Puerto Rico. "We expect Veggie Milk to be available nationwide soon." Note: A major ingredient in the product is soy protein isolate, supplied by Protein Technologies International, a subsidiary of DuPont. A test by PTI comparing Veggie Milk with other milk alternatives found that it ranked No. 1 on every nutritional component, including vitamins, minerals, calcium, soy protein, fiber, and folic acid.

According to the newsletter *Nutrition Business Journal* (April/May 1998), soymilk sales in 1997 were valued at $200 million, and projected to grow to more than $350 million by the year 2000.

Consumers are becoming increasingly aware of the "negative health implications associated with traditional dairy products, such as heart disease, digestive problems, exposure to antibiotics, growth hormones, and more. This increased awareness is fueling a significant shift to soy-based products." Address: Galaxy Foods Company, 2441 Viscount Row, Orlando, Florida 32809. Phone: 800-441-9419 or 407-855-5500.

916. Protein Technologies International. 1999. Soy health claim update: All signs point to final decision by mid '99. *SuproVision* (*PTI, St. Louis, Missouri*). Winter. 4 p.
• ***Summary:*** This inaugural issue is subtitled "A newsletter for business visionaries." The editor is Jean Caton, M.S., R.D., Director, Health Benefits Communications. Page 1 is about the health claim and the FDA. Page 2 contains a letter from Terry Hatfield, Co-President, PTI–A DuPont business. The center of the centerfold, titled "Who's talking about soy," gives excerpts from *Fortune* magazine (28 Sept. 1998), Oprah Winfrey (20 Oct. 1998; To Dr. Bob Arnot she said: "This is my new thing. This is gonna replace potato chips for me," as she drank a soy protein shake as part of an episode on Arnot's "The Breast Cancer Prevention Diet"), *Wall Street Journal* (11 Nov. 1998, "FDA mulls proposal to allow soy protein to carry health label"), *HeartWatch* (Nov. 1998), and *The Washington Post* (5 Jan. 1999, "The soybean and health: What's proven?).

Page 3 asks "Is your company ready?" and suggests steps to take. Page 4–"PTI, Cardiovascular doctors get to the 'Heart of the Matter' at American Heart Association Annual Conference, 9 Nov. 1998 at Dallas, Texas." Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 800-467-8776.

917. Beyers, Jim. 1999. Work with ADM and Westward Industries, Inc. making textured soy protein (Interview). *SoyaScan Notes.* May 3. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In 1969, when Jim graduated from Southern Illinois University, he was hired by ADM to work on extruding soy protein. He worked with Bill Atkinson, who was using an old vintage extruder to make TVP, which was used primarily for pet food. Jim was hired to do research on adding value to the pet food by making it fit for human

consumption, and to diversify the product catalog to include meat analogs. They soon were testing beef, ham, and chicken flavors in different sizes, shapes, and colors. Before long they were experimenting with some "wild and crazy things" such as fruit replacements, vegetable replacement, and nut replacements–all with TVP. At the beginning, only Beyers and Atkinson were working on this project. This was before the settlement of the big patent dispute between ADM and Ralston Purina in 1970. That dispute grew out of the fact that Atkinson and Robert Boyer (both of whom once worked together for Henry Ford) both came up with the idea of extrusion at about the same time. Bill Atkinson was extruding 50% protein soy flour and Ralston apparently said they were extruding soy flour. Atkinson fortunately kept the little desktop extruder that he used to make his first trials; it made a little rope of TVP about the size of an ink pen refill [about one-eighth inch in diameter]. "We reenacted those early experiments of his time and time again for the courts–to the point where we had miles of this little bitty TVP rope piled up." Each company thought that it had invented the extrusion process first. "So they went to war with each other. They spent at least several hundred thousand dollars on attorney's fees, until they finally resolved it out of court. Swift and Staley were just standing on the side lines in the last half of the battle waiting for the judge to tell them who to pay the royalty checks to. Finally, the process patent was awarded to Ralston Purina and the product patent to ADM–which is kind of ludicrous. How can you have a process without a product, or a product without a process." Ralston Purina went out to everyone they could find who was extruding a 50% soy protein product (for pet food or human food) and asked them to buy a license on the process; the license fees were quite high, because the life of the patent was half gone, so they decided to charge twice what they would have ordinarily charged. Ralston Purina made a great deal of money from PMS Foods in Hutchinson, Kansas. Swift paid the fees for a while, then stopped making the product. Cargill was a big manufacturer of a TVP-type product; they have a plant in Cedar Rapids, Iowa. Jim does not know anything about the fees they paid. Ralston Purina itself never made much extruded soy using its patented process. Ralston had two extrusion lines in Memphis, Tennessee, for several years, making mostly human foods–but they were never price competitive and the quality was not very good. ADM could have done the same thing, but they didn't. Jim does not know why ADM didn't pursue this.

Today ADM is by far the world's biggest manufacturer of extruded, textured soy flour. "ADM has an extrusion capacity to generate the entire world's supply of TVP. I know that for a fact because I put those extruders in place myself." ADM runs on high volume and low margins. They won't enter a field unless they can generate enough capacity to dominate. They streamline and automate the process until they are the low-cost producer. This has long been the philosophy of Jim Randall, the retired president. He was the engineer for ADM for many, many years. "The commodity mind-set has always been trainloads, truckloads, and shiploads. When I was at ADM we made one type of bacon bit, packed it in 50-pound boxes with ADM's labels on it, sold it at 20,000 pounds minimum order. That was it." Jim's present company works on smaller volumes and higher margins. "We don't want to compete with the commodity processors. We have a nice little specialty niche that ADM and Cargill can't mess with. Generic bacon bits are becoming a commodity, but it is private labeling that keeps some of them in the specialty field. The big processors won't put in a label room for 70 different private labels."

Jim worked for ADM in R&D for about ten years. He worked very closely with Bill Atkinson, a very bright man and an excellent inventor, but he also came on like a raging bull–a cantankerous man. "But he and I got along great! I never knew for sure why. I used to enjoy listening to him talking about Henry Ford and his years of work there with soy. At one time Ford thought people were being gouged [paying too much] for eye glasses. So he set up a bank of grinding machines, to crank out glasses for a nickel each." Ford and ADM both liked to operate on the principle of high volume, low margin. In his Later years, Atkinson began to suffer from Alzheimer's disease. But until just before he retired, his memory was crystal clear, with 100% total recall. In Jan. 1979 he left ADM and went to work for Westward Industries, where for the next 18 years he made bacon bits. Ken Towers was the original owner of Westward Industries; he and his researchers developed a lot of new technology for flavoring systems in-house. When he went to and helped to start Westward Industries, it would take any order from 50 cases on up, and put the but the customer's label on it if so desired. Initially Westward bought its TVP from ADM, then added its own flavoring system. Later, they bought a license to produce the TVP-type base then added their own unique flavors by their own system.

In Jan. 1979 Westward Industries started making standard textured soy protein products in Kansas at 1819 S. Meridian, Wichita. Westward didn't sell any products under its own brand; it was either sold in bulk to foodservice or private labeled for all the glass-packers in the country like John R. Sexton, Durkee Foods, R.T. French, McCormick, Safeway, CFS-Continental, Ponderosa Steak Houses, Pizza Hut–any company that sold bacon-bits in jars. "We were the largest processor of imitation bacon bits in North America, probably for about ten years." The company still makes and sells these products. At one point, they got rid of the extruders and made rice crispies for 15 years.

In about 1984 or 1985 Westward introduced the Soft and Chewy concept, with many of the old flavors, but a few new ones–such as Bacums. In late 1997 he bought Westward from its founder, Ken Towers, renamed it to Westwind Industries, and started his own production. He did not buy the corporate

charter from Ken; rather he filed his own corporate charter, which required a new name. Westward Industries still exists, and Jim's manufacturing plant is at a new location. The company makes two types of textured soy flour (crisp texture, and Soft and Chewy) and a line of nut replacements (Terra Nuts, which are pressure cooked, then dry roasted, and used to replace pecans and walnuts).

Greg Caton is an interesting guy. He's exuberant, energetic, and very innovative. He needs to stop, settle down for about ten minutes, and think things through just a little bit. Jim thinks Greg will take his business worldwide "when he finally gets his focus on what he's doing. This non-GMO is really a big thing in Europe these days; it'll never make a splash here in the States. Greg believes that's where his new-found wealth will be." Jim believes that GMO foods will not become widely accepted in the USA during our lifetime. "World-wide it's really catching on, and I think later on it may be somewhat important. What's more important now with soy is if you can process it hexane-free. Even though the residual hexane is in the parts per billion, there are enough folks around here that say 'A little bit's too much.' I think that'll get more mileage than whether it's Roundup Ready or not. Anyway, those are foreign markets that Greg is looking at." Address: Owner, Westwind Industries, Inc., 3930 W. 29th St. South, Suite 55, Wichita, Kansas 67217. Phone: 316-943-3212.

918. Boismenue, Clyde. 1999. Soy protein isolates: ADM has some excellent new products and PTI is concerned (Interview). *SoyaScan Notes.* May 27. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** ADM got into the isolate business by buying two existing product lines. In the mid-1980s they bought the Promine line from Central Soya; these products were made at an aging plant in Chicago, Illinois. ADM replaced the Promine brand with Ardex, and cleaned up the production process and product consistency, but never did much to improve the somewhat beany flavor or to market the product. In the early 1990s ADM purchased the ProFam isolate line from Grain Processing Corp., which was a company that focused on corn processing, and especially on making maltodextrins. ADM shut down both of those early plants and built its own plant in Decatur.

During the 1980s most of the isolates made in the USA were sold to Eastern Europe, where they were added to sausages, but often did not appear on product labels. The second largest use was in infant formulas.

ADM's new line of isolates, introduced about 1 year ago, is sold under the ProFam brand. ADM has built two big plants in Decatur, Illinois, and a third huge plant in Brussels, Belgium, will come on line later this year. The product named ProFam 891 is completely new–unlike anything that PTI has. It is made from alcohol-washed concentrates. It has good solubility, great viscosity (very much like casein), almost no beany flavor, but a beige (not pure white) color. Of course, it will not melt like the casein in cheese does. Both ADM and PTI "tweak" their isolates–they set aside isoflavones at one step of the process then add them back later–to raise the isoflavone level. Is this way they can say that they are not actually adding isoflavones, so they do not have to list isoflavones as an ingredient on the label. ADM guarantees 2 mg of isoflavones per gram of product, whereas PTI guarantees only 2 mg of isoflavones per gram of protein. Address: Basic Foods Co., P.O. Box 240070, Los Angeles, California 90024. Phone: 310-473-0719.

919. Balu, Rekha. 1999. Ralston to spin off Energizer division: struggling battery business buffeted by two rivals: new focus on pet foods. *Wall Street Journal.* June 11.
• ***Summary:*** "Ralston's Energizer brand, famous for advertisements featuring its high-stamina bunny, is stuck in the middle of the battery market. It must battle with the premium image of Gillette Co.'s Duracell brand and at the same time fight Rayovac Corp.'s sizable price discounts. In addition, the battery business has been hurt by economic turmoil in Asia."

As of Sept. 30, 1998, Ralston Purina's pet products have sales that are 23% greater than its battery products. Moreover the pet products have profit that is almost twice as great as its battery products.

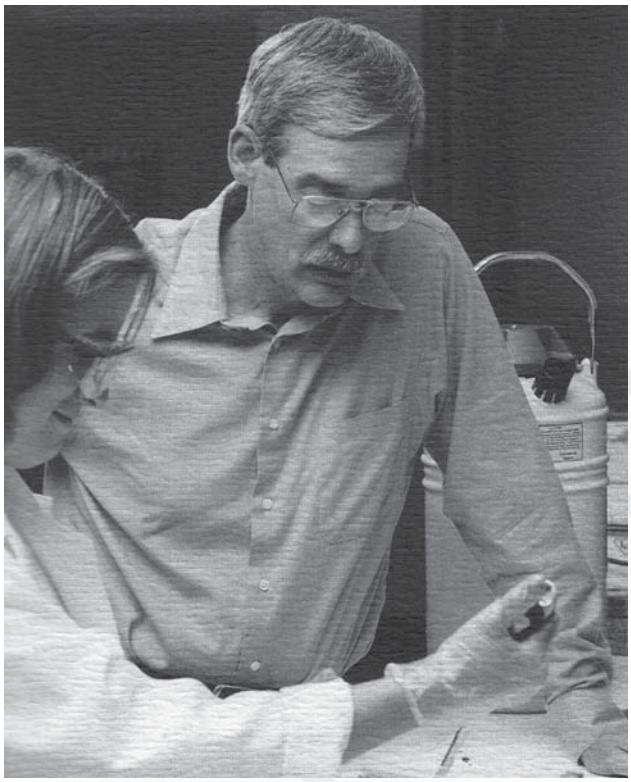
Batteries come in two basic types: single use (like Energizer) and rechargeable (like Panasonic). Address: Staff Reporter of the WSJ.

920. Mack, Eric. 1999. Sales of soy protein isolates to Eastern Europe during the 1980s (Interview). *SoyaScan Notes.* June 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Eric worked as a salesman for PTI in eastern Europe from 1980 to 1982. Soy protein isolates started to be sold into Eastern Europe in the late 1970s, and by the early 1980s large amounts were sold into the former Soviet Union, Romania, and Yugoslavia. They were used mostly in sausages and other processed meats as a binder and emulsifier for the water and fat.

Eric was responsible for selling to four countries: East Germany, Czechoslovakia, Poland, and Hungary. Isolates were outlawed by the government in East Germany, where the pure food policy was similar to that in west Germany. In Czechoslovakia there was little interest. He had a good market in the meat industry Poland, and he was working with the very modern poultry industry to design and make poultry sausages. Poultry can convert feed into meat more efficiently than pork, beef, etc. But the Polish market collapsed in December 1981 when vice-president George Bush arrived to say that the U.S. would no longer guarantee payments to U.S. grain exporters. 36 hours later martial law was imposed (to crack down on Solidarity) and the Polish poultry industry

was wiped out. There was a very good and growing market in Hungary for isolates in processed meats. Then in mid- to late-1981 a Hungarian invented a soy protein powder somewhat like an isolate, that was much less expensive and worked about half as well. It was soon made locally in Hungary, and that was the end of PTI's isolate market in Hungary. Address: Owner, Erioco Ltd., P.O. Box 6425, Chesterfield, Missouri 63006. Phone: 636-527-3616.

921. *NSRL Bulletin* (*National Soybean Research Laboratory, Urbana, Illinois*). 1999. Soy moves to the front line in the war on heart disease: it is becoming clear that increased consumption of soy protein offers one of the most promising ways to lower blood cholesterol levels without the use of drugs. 6(2):4-5. June.



• ***Summary:*** "Despite persistent warnings about the need for changes in the average American diet, more than 750,000 people die each year in the United States from coronary heart disease for which moderate to high cholesterol levels are a contributing cause. At least 20 percent of adults have blood cholesterol levels greater than 240 milligrams per deciliter (mg/dL). Another 31 percent fall into the borderline-high category with cholesterol levels over 200 mg/dL.

"The U.S. Food and Drug Administration (FDA) estimates that 52 million Americans over the age of 20 are candidates for some type of dietary or drug intervention to lower blood cholesterol. Today, however, it is becoming clear that increased consumption of soy protein offers one of the most promising ways to lower blood cholesterol levels without the use of drugs.

"In 1995, a comprehensive review, or meta analysis, of 29 previously published studies, including two from the University of Illinois, confirmed that an average of 47 grams of soy protein per day can produce significant decreases in total cholesterol, low-density lipoprotein (LDL) cholesterol, and triglycerides, without affecting desirable high-density (HDL) cholesterol levels.

"'Until that meta analysis took place, few health care professionals noticed that there was a lot of support in the published literature for the idea that soy protein was a dietary factor that could lower cholesterol,' says John W. Erdman, Jr., director of the U of I's Division of Nutritional Sciences. 'The effect goes beyond the impact of lower fat and cholesterol intake. It is a direct impact of soy protein.'

Most recently, Erdman has collaborated on a major new study measuring the long-term effects of soy protein on cholesterol levels in postmenopausal women. Other researchers in the study were from the Division of Nutritional Sciences, the Department of Food Science and Human Nutrition, and the Department of Veterinary Pathobiology at the University of Illinois at Urbana-Champaign and the Division of Epidemiology and Biostatistics at the University of Illinois at Chicago.

"In this research, postmenopausal women who had slightly high cholesterol levels received a milk-based supplement with 40 grams of soy protein a day or one of two soy supplements in the form of isolated soy protein. They received this diet for six months and were measured for total cholesterol and for LDL and HDL levels. Primary funding for the study came from the Illinois Soybean Checkoff Board, with additional support from Protein Technologies International, a division of Dupont.

"'The bottom line from the study was that LDL-the bad cholesterol-went down, while HDL cholesterol-the good stuff-went up in both the soy groups in the study,' Erdman says.

"He emphasizes that these findings are especially important because few studies have evaluated women specifically, and post-menopausal women have never been distinguished from women in general, even though heart disease is a leading cause of death in older women.

"'Not only were the changes statistically significant, they were maintained over the whole six-month period,' Erdman says. 'What makes that even more important is the fact that this was the longest study that's every been published on soy.'

"In another study funded by the Illinois Council on Food and Agricultural Research (C-FAR), Erdman and other researchers have been examining the impact of the level of soy protein consumption on cholesterol lowering. This study focused on men with mildly high cholesterol levels. They were fed diets with 20, 30, 40 or 50 grams of soy protein a day for six weeks.

"'Initial evaluation of the results suggests that as little as 20 grams of soy protein–which you certainly can get in one or two servings of soy foods-could reduce cholesterol in this group,' Erdman says. 'If this data is confirmed, we will be able to show that just a moderate alteration in the diet can result in a significant reduction in serum cholesterol.'

"The results of this study will be especially relevant because the Food and Drug Administration has proposed a new rule that would authorize the use of health claims on food labels linking soy protein with reduced risk of heart disease. The agency has tentatively concluded from the scientific evidence that 25 grams of soy protein included in a daily diet that is low in saturated fat and cholesterol may reduce the risk.

"'Acceptance of this food labeling rule would be recognition that soy protein is, in fact, important in lowering cholesterol,' Erdman says. 'It also could be a big boon to soybean farmers as more and more companies would have the incentive to incorporate soy at higher levels in their food products.'

"If finalized, this new rule would allow for labeling on food products that contain at least 6.25 grams of soy protein in a single serving. Four servings a day would make up the recommended daily minimum intake of 25 grams. Most of the traditional soy foods, such as tofu, would meet the labeling requirements.

"Erdman also expects that FDA approval would have a major impact on the soybean industry by spurring commercial manufacturers to develop many new soy food products.

"'What's so exciting to me personally is that much of the research on which that proposed rule is based was conducted at the U of I,' Erdman says. 'This is the culmination of an effort that has been going on since the 1980s. The soybean farmers through the Checkoff Board have had faith in us and supported this work all along. It's taken some years, but we now can see a real outcome from all that support.'"

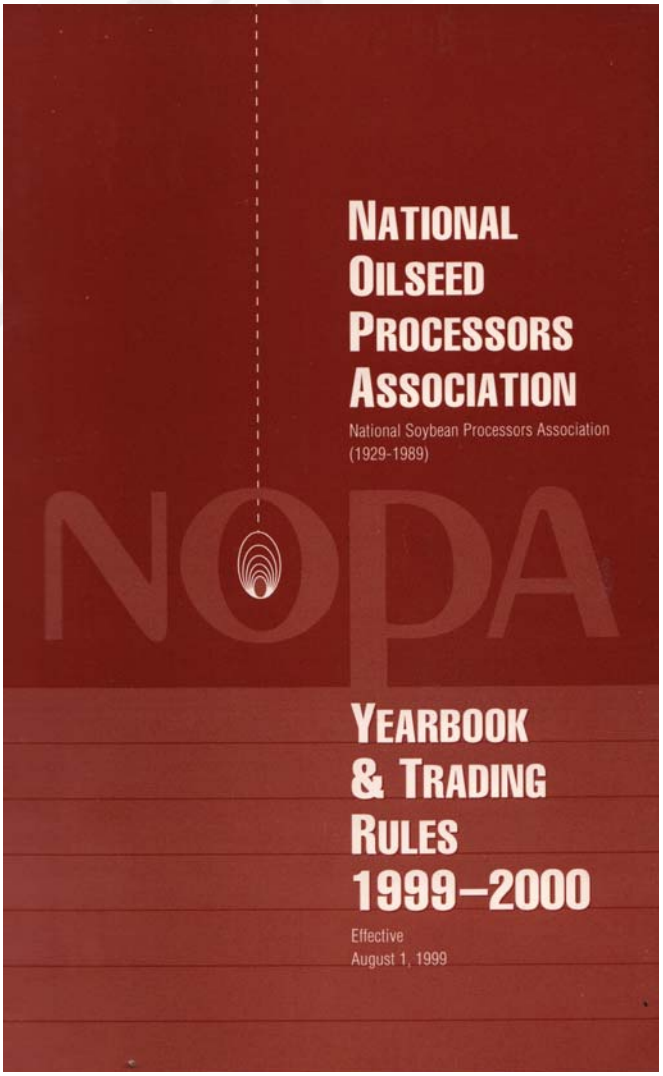
A photo shows: "John W. Erdman, Jr. (Left), director of the Division of Nutritional Sciences at the U of I, observes as graduate assistant Christine Atkinson prepares a blood serum sample for a cholesterol study on subjects eating soy products. This research has resulted in a proposed rule that would authorize the use of health claims on food labels linking soy protein with reduced risk of heart disease."

922. *Nutrition Business Journal* (*San Diego, California*). 1999. Australian company champions isoflavones as supplements and drugs: Novagen unbundles isoflavones to discover specific biological functions. 4(6):18. June.
• ***Summary:*** Novagen Inc. has its U.S. headquarters in Stamford, Connecticut. All legumes (not just the soybean) are important sources of isoflavones. Novagen has identified four main isoflavones in the human diet: daidzein, genistein, formononetin and biochanin. Red clover, used in Novagen products, is the richest source of all four of these main estrogenic isoflavones. The soybean contains virtually no formononetin or biochanin.

Protein Technologies Inc. (PTI), a wholly owned subsidiary of DuPont, paid Novagen a license fee of $9 million enabling PTI and its parent to operate worldwide under a pharmaceutical isoflavone patent owned by Novagen. "PTI is a major supplier of isolated soy protein."

Other human hormones include insulin and cortisone.

923. National Oilseed Processors Association. 1999. Yearbook and trading rules 1999-2000. Washington, DC. ii + 126 + 11 p. 22 cm.
• ***Summary:*** On the cover (but not the title page) is written: Effective August 1, 1999. Contents: Constitution and by-laws. Officers and directors. Executive office. Members. Standing committees. Trading rules on soybean meal. Appendix to trading rules on soybean meal: Official methods of analysis (moisture, protein, crude fiber, oil {only method numbers listed}), sampling of soybean meal {at origin}



(automatic mechanical sampler, pneumatic probe sampler, probe sampler), sampling of soybean meal (at barge loading transfer facilities), official weighmaster application, semi-annual scale report, certification of installation of automatic sampler & mechanical divider (at origin), semi-annual certification of automatic sampler & mechanical divider (at origin), voluntary checklist for semi-annual certification of sampler & divider (at origin), certification of installation of automatic sampler & mechanical divider (at barge loading transfer facility), semi-annual certification of automatic sampler & mechanical divider (at barge loading transfer facility), voluntary checklist for semi-annual certification of sampler & divider (at barge loading transfer facility), official referee laboratories (meal), official NOPA soybean meal sample bag.

Soybean meal export trading rules: Minimum blending procedures for export meal blended at ports, sampling of soybean meal (at vessel loading facilities), weighing of soybean meal (at vessel loading facilities), certification of installation of automatic sampler & mechanical divider (at vessel loading facility), semi-annual certification of automatic sampler & mechanical divider (at vessel loading facility), voluntary checklist for semi-annual certification of sampler & divider (at vessel loading facility), semi-annual certification of scales at vessel loading facilities. Trading rules on soybean oil. Sales contract. Definitions of grade and quality of export oils. Soybean lecithin specifications. Appendix to trading rules on soybean oil: Inspection, methods of analysis: (AOCS official methods): Soybean oil, crude; soybean oil, refined; soybean oil, refined and bleached; soybean oil for technical uses (iodine value, unsaponifiable, break test), refining byproduct lipid, acidulated refining byproduct lipid and tank bottoms. Official weighmaster application, semi-annual scale and flowmeter report, official referee chemists (oil). Soybean oil export trading rules. Uniform soybean oil export contract. Foreign trade definitions (for information purposes only) Appendix 1.

The section on officers, executive staff, board of directors, and executive office (Washington, DC), (p. 8-9) gives the name, company affiliation, and phone number of each person. Members (p. 10-19) (listed alphabetically by company; within each company, first the name of the official Association representative {who is on the Board and votes}, followed by the other personal members listed alphabetically by surname). Standing committees: For each committee, the function of the committee, the names of all members (with the chairman designated), with the company and company address of each are given. Address: 1255 Twenty-Third St., N.W., Washington, DC 20037. Phone: (202) 452-8040. Fax (202) 835-04000. E-mail nopa@nopa.org. Website: www.nopa.org.

924. *SoyaScan Notes*. 1999. Novagen and the Novagen patent (Overview). Sept. 9. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Novagen is an Australian company. Novagene is an isoflavone extracted from red clover; it is the subject of a patent application that is pending; it has not yet been issued. It was applied for in about 11 months earlier than U.S. Patent issued to Gorbach, Golden, and Adlercreutz, assignors to Tufts University. Both are concerned with treating menopausal symptoms with isoflavones. The Novagen patent is for isoflavones extracted from red clover, but they are named as genistein, daidzein, etc. Novagen has a U.S. company in Stamford, Connecticut, that sells a product made from isoflavones derived from red clover. Novagen has licensed its rights under the patent application to Protein Technologies International, now owned by DuPont, for any soy-derived isoflavones, even though the patent doesn't make a distinction between the source of the isoflavones–they just split it up by source material. PTI basically bought the rights to make a claim–even though the patent has not been issued. Some industry observers think there will be a fight between Tufts University and Novagen over these patents. Novagen could theoretically win, because there applied earlier, but under U.S. law, the first to be issued the patent has the rights; most countries assign the rights to the inventor who first applies for the patent. Thus, filing date dictates in almost every country except the USA. Since Novagen is a foreign applicant, our laws do not allow them to go back further than the application filing date, but the Tufts people can go back to records before they applied for the patent.

Why wasn't the Novagen patent ever issued? The examiners of the Tufts patent should have noted that it was prior art, but they didn't.

Update: 1999. Sept. 26. According to Mark Messina, Novagen has been in the news quite a bit recently. Two studies were recently published looking at the effect of Promensil on hot flashes. Both studies showed no effect, yet Novagen still promotes Promensil as effective in relieving hot flashes. That precipitated an editorial in the journal in which the articles were published. In both the Promensil group and the control group, urinary daidzein levels were correlated with a reduction in hot flashes–which means nothing.

925. Food and Drug Administration, U.S. Department of Health and Human Services. 1999. FDA Approves new health claim for soy protein and coronary heart disease. *FDA Talk Paper* T99-49. Oct. 20.

• ***Summary:*** "On October 26, 1999, the FDA will authorize use of health claims about the role of soy protein in reducing the risk of coronary heart disease (CHD) on labeling of foods containing soy protein. This final rule is based on the FDA's conclusion that foods containing soy protein included in a diet low in saturated fat and cholesterol may reduce the risk of CHD by lowering blood cholesterol levels.

"Coronary heart disease, one of the most common and

serious forms of cardiovascular disease, is a major public health concern because it causes more deaths in the U.S. than any other disease. Risk factors for CHD include high total cholesterol levels and high levels of low density lipoprotein (LDL) cholesterol.

"This new health claim is based on evidence that including soy protein in a diet low in saturated fat and cholesterol may also help to reduce the risk of CHD. Recent clinical trials have shown that consumption of soy protein compared to other proteins such as those from milk or meat, can lower total and LDL-cholesterol levels.

"Foods that may be eligible for the health claim include soy beverages [soymilk], tofu, tempeh, soy-based meat alternatives, and possibly some baked goods. Foods that carry the claim must also meet the requirements for low fat, low saturated fat, and low cholesterol content except the foods made with the whole soybean may also qualify for the health claim if they contain no fat in addition to that present in the whole soybean.

"Scientific studies show that 25 grams of soy protein daily in the diet is needed to show a significant cholesterol lowering effect. In order to qualify for this health claim, a food must contain at least 6.25 grams of soy protein per serving, the amount that is one-fourth of the effective level of 25 grams per day. Because soy protein can be added to a variety of foods, it is possible for consumers to eat foods containing soy protein at all three meals and for snacks.

"An example of a health claim about the relationship between diet and the reduce risk of heart disease is:

"Diets low in saturated fat and cholesterol that include 25 grams of soy protein a day may reduce the risk of heart disease. One serving of (name of food) provides ____ grams of soy protein.

"This new health claim rule responds to a petition submitted to the FDA by Protein Technologies International. This rule is based on the proposed rule that was published in the Federal Register on November 10, 1998, and comments received by the FDA. Use of the claim in food labeling is authorized immediately." Address: Public Health Service, 5600 Fishers Lane, Rockville, Maryland 20857.

926. Rosenberg, Daniel. 1999. FDA approves new health claim for soy protein. *Dow Jones News Service* (*New York, NY*). Oct. 20. [Eng]

• ***Summary:*** "Chicago (Dow Jones)–Products containing soy protein will be allowed to boast new health claims on their labels starting next Tuesday, the Food and Drug Administration said Wednesday.

"Foods containing at least 6.25 grams of soy protein per serving will be allowed to claim on their labels that soy protein can reduce the risk of coronary heart disease."

The new health claim is in response to a petition submitted to the FDA by Protein Technologies International.

927. Agulnick, Seth. 1999. Tout soy's possible benefits, FDA rules: DuPont Co., Delaware farmers to gain. *News Journal* (*The*) (*Wilmington, Delaware*). Oct. 21. p. 1.

• ***Summary:*** In 1999 DuPont bought Protein Technologies International (PTI), based in St, Louis, Missouri, for $1.5 billion. It is the world's largest maker of isolated soy proteins. If the health claim leads to an increase in soy consumption, it could be a windfall for DuPont, Delaware's largest employer.

"'We made the investment in PTI with this in mind,' said Thomas C. Humphrey, president of DuPont Nutrition and Health. 'We're very excited about this claim.'" Address: Staff reporter.

928. Jacobi, Dana. 1999. Impressions of the Natural Products Expo in Baltimore, Maryland (Interview). *SoyaScan Notes.* Oct. 26. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Expo was great! There were an unusually larger number of new companies selling soy products; Dana picked up many sell sheets. The Soyfoods Association had a meeting at the Expo at which Peter Golbitz announced that the FDA health claim concerning soy protein and heart disease will allow traditional, whole soyfoods (such as tofu and soymilk) to bear the claim–even though they contain more fat than allowed under the claim. This was an unexpected development–and very good news. The claim says that 25 grams of soy protein in a low-fat diet may reduce the risk of heart disease. The Association also presented a new position paper on genetically engineered soybeans in soyfoods, stating that foods containing GMO ingredients should be so labeled. The Association did not oppose the use of GMO soybeans in soyfoods, noting that genetic modification will be used for many different purposes, some of which may have health benefits.

Two prepared soy puddings were debuted at the Expo–one from Westbrae and one from Zen Don. Both came in two flavors: chocolate and vanilla. The chocolates were both delicious; the vanillas were not so good. Zen Don is run by a young man age 30-32 who has introduced a soymilk under the brand Zen Don, which has a picture of a panda on the package, and which he has positioned for the mainstream market to compete with Silk. Dana believes that with this name and graphics, the product is mispositioned; moreover she finds it much too sweet.

White Wave debuted Silk eggnog in quarts. They were also dispensing Silk in four new flavors from a cooler and asking for comments: Lemon (which Dana found delicious), strawberry, chai, and cappuccino.

Abbott Laboratories (Chicago, Illinois) is now the mother company for HealthSource (formerly Health Source, from a subsidiary of Protein Technologies International–PTI), the protein powder drinks from Ross Products. This is not cleared stated on sales sheets.

Dana did not see the FDA health claim in today's

(Tuesday's) *New York Times.* It will probably be in the Wednesday edition, which has a special food section–as do many other major newspapers. Address: New York City.

929. Ross Products Div., Abbott Laboratories. 1999. News that's good for your heart. Take Care now Health Source (Leaflet). Shawnee Mission, Kansas. 2 panels each side. Each panel: 21 x 14 cm.
• ***Summary:*** Take Care Soy Protein Health Shake has been renamed Health Source Soy Protein Shake. The product line has been purchased by Abbott Laboratories from Protein Technologies International. A color photo on the front panel shows the old and new cans.

On the inside 2-panel spread: "Your source for good health." "One serving of Health Source provides: 20 grams of soy protein, 70% of daily value for calcium, 55 mg of isoflavones. For more information call 1-800-445-3350. Or visit our website at www.healthsource.com."

Note: Abbott Laboratories is headquartered in Chicago, Illinois.

930. *Nutrition Business Journal* (*San Diego, California*). 1999. Soy protein is big news for suppliers. 4(10/11):5-6. Oct/Nov.
• ***Summary:*** The health claim for soy protein, approved Oct. 26, was granted under the Nutritional Labeling and Education Act (NLEA). The claim was submitted in 1998 by Protein Technologies International (PTI), a company of DuPont. On the day the claim was approved, PTI ran full-page ads in the *New York Times* and *Wall Street Journal*–a good idea since neither paper ran the story. Both Kellogg and General Mills are rumored to be developing a breakfast cereal containing soy protein.

In 1998 sales of soyfoods totaled an estimated $1.7 billion and should reach over $2 billion in 1999. During 1998 sales of soy milk grew to almost $200 million (up 20%), tofu to $200 million (up 15%), and tempeh $17 million (up 5%)–according to Peter Golbitz of Soyatech Inc. In 1999, with interest in soyfoods skyrocketing, Golbitz predicts overall growth of 20%, with soymilk up nearly 40%, and meat alternatives, tofu, and other prepared foods containing soy gaining between 20% and 50%, depending on the product.

931. *Nutrition Business Journal* (*San Diego, California*). 1999. Sales of soy protein isolate set to grow. 4(10/11):21-22. Oct/Nov.
• ***Summary:*** The market for soy protein isolate is dominated by two manufacturers: Protein Technologies International Inc. (PTI, St. Louis, Missouri, a business of DuPont) and Archer Daniels Midland. PTI claims to have sales of $500 million in 1999 and to have captured about 75% of the soy protein isolates market. By extrapolation, this implies a U.S. market of $700 million/year.

About 40% of PTI's isolate sales are to meat and fish processors, 16% to nutritional and sports beverages, 10% to infant formulas, 9% to the paper industry, 5% to young animal feed (milk replacers), and 20% to "developing opportunities."

Other manufacturers of soy protein isolates are Santista of Brazil, and Fuji Oil of Japan.

A new PTI product is Supro XG, an isolate enriched with genistein. Top customers include Ross Laboratories (Ensure), Nestle, SlimFast, and Weider.

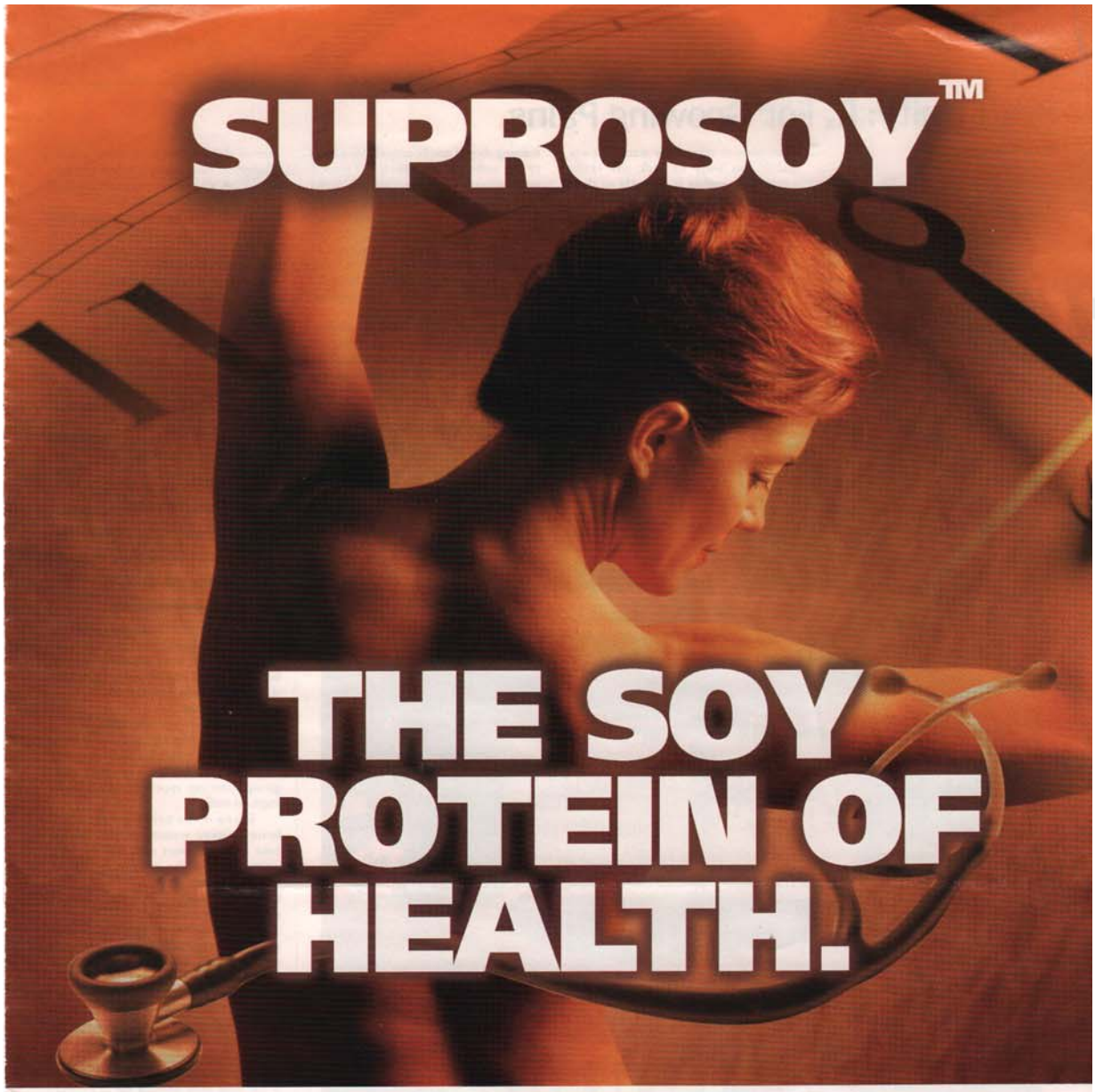
The second half of the article discusses ADM's efforts to educate mainstream consumers–in part is using the umbrella brand, Nutrisoy. This tradename will start appearing on supermarket shelves during the first quarter of 2000. Del Cahill, North American manager for ADM's specialty proteins, sees a new trend. The mainstream food industry, recognizing that the U.S. has an aging population, believes that the easiest way to prevent long-term chronic disease is through diet. These companies are now trying to develop and market better food choices.

932. Protein Technologies International. 1999. SuproSoy: The soy protein of health (Ad). *Natural Foods Merchandiser.* Nov. p. 21.
• ***Summary:*** See next page, In the top two-thirds of this full-page color ad shows a beautiful woman, viewed from the back, naked from the waist up, looking to her right and perhaps doing some gentle exercise. Behind her are parts of a huge clock; in front is a floating stethoscope.

The text begins: "Soy protein research has uncovered some amazing health benefits. Studies show that soy protein, with bio-active ingredients like naturally occurring isoflavones, helps lower cholesterol levels which in turn, reduces risk of heart disease. Other studies suggest that it may promote improvement in bone health and research in progress suggest [sic] it may play a role in the prevention of hot flushes [flashes] and the prevention of cancer." "To find out more about SuproSoy visit our website at www.protein.com."

Note: DuPont, which now owns PTI, has renamed Supro to SuproSoy. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-888-GO-SUPRO.

933. *SoyaScan Notes.* 1999. Chronology of soy protein isolates for food use. Dec. 9. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1939–The Glidden Company in Chicago, Illinois, becomes the world's first company to manufacture a soy protein isolate for use in food. Named Albusoy and called "soy albumen," it is an enzyme-modified isolate used as a whipping agent to replace egg whites. 1950–Gunther Products of Galesburg, Illinois, introduces an enzyme-modified soy protein isolate. By 1967 roughly 1 million lb/year of enzyme-modified soy protein isolates were being made in the USA.



Soy protein research has uncovered some amazing health benefits. Studies show that soy protein, with bio active ingredients like naturally occurring isoflavones, helps lower cholesterol levels which in turn, reduces risk of heart disease. Other studies suggest that it may promote improvement in bone health and research in progress suggest it may play a role in the reduction of hot flushes and the prevention of cancer.

The majority of this research uses SUPROSOY™ Brand Isolated Soy Protein. Why? Because SUPROSOY™ is the highest quality protein and has naturally occurring isoflavones, a key factor for using SUPROSOY™ in most of the studies.

So the next time you are looking for a high quality protein backed by years of clinical research, look for SUPROSOY™ on the label of the products you purchase. **Only SUPROSOY™ stacks up.**

SuproSoy FOR HEALTH. FOR LIFE.

The Soy Protein of Health

Circle Reply #111

To find out more about SUPROSOY™ visit our website at **www.protein.com**

Or call 1-888-GO-SUPRO SUPROSOY™ is a registered trademark of Protein Technologies International a DuPont Business

1957–The Glidden Company in Chicago becomes the world's first company to start large-scale production of today's regular (non-enzyme modified) food grade soy protein isolate. Their $4 million plant at Indianapolis, Indiana, makes Promine brand isolated soy protein.

1957 July–ADM purchases The Drackett Company (Evendale, Ohio), which makes commercial industrial soy protein isolates and is experimenting with edible isolates.

1958–The Glidden isolate plant at Indianapolis is purchased by Central Soya–which now enters the isolate business.

1958-1959–ADM starts to sell small amounts edible isolates to Consolidated Foods in Texas. William Atkinson developed the product, which was quite satisfactory and practical. But the patent was about to expire, so ADM turned its attention elsewhere.

1959 Oct.–Central Soya opens a huge new plant to produce their Promine brand of soy protein isolate. By 1966 Central Soya is making 30 million lb/year of soy protein isolates.

1962 Oct.–Ralston Purina starts making food grade soy protein isolates in Louisville, Kentucky, under the Edi-Pro brand, using technology largely developed by Frank Calvert and Robert Boyer when they worked as researchers for Henry Ford. Anderson Clayton and Carnation started to make soy protein isolates soon thereafter.

1964–The USDA allows the use of soy protein isolates in meat sausages at the 2% level by weight.

1965 Oct. Skippy Peanut Butter with Smoky Crisps introduced. The "Smoky Crisps" are bacon-like bits made by General Mills from spun soy protein fiber.

1965 Dec.–General Mills introduces Bac*O's, meatless fried bacon bits made from spun soy protein fiber in several test markets.

1966 May–General Mills introduces its Bontrae line of meat analogs based on spun soy protein fibers, including Ground Beef Analog, Diced Ham Analog, and Diced Poultry Analog.

1969 Dec.–Bac*Os, meatless bacon bits, are now available nationwide.

1970 Dec.–Bontrae spun soy protein fiber starts to be made at General Mills' new plant in Cedar Rapids, Iowa.

1973 March–Hamburger prices reach all-time highs. Hamburger extended with 25% Bontrae (spun soy protein fiber) goes on sales at Red Owl Stores in Minnesota.

1973 summer–Grain Processing Corp. of Muscatine, Iowa, starts making soy protein isolates under the Pro-Fam brand.

1974 Oct.–General Mills introduces meatless Country Cuts, made from spun soy protein fiber, in ham or chicken flavors.

1976–Ralston Purina has become the world's leading manufacturer of edible soy protein isolates. Their flagship plant is still in Louisville. 1977 May–Dawson Foods buys (for about $10 million) the Bontrae spinning line, plus exclusive rights to General Mills' soy isolate and patented spinning technology, equipment, and frozen spun products marketed to food processors and institutional customers. Dawson moved the equipment to Minnesota, and broke ground for a new plant in Feb. 1978.

1979 March 31–Dawson Mills' soy protein isolate plant opens 1½ miles east of Dawson, Minnesota, on a 220-acre site.

1980 May–Dawson Mills introduces its Anaprime line of meat analogs based on spun soy protein fibers and technology purchased from General Mills; they are very similar to the Bontrae line.

1980 Aug.–Central Soya sells all of its soy protein isolate operations to Archer Daniels Midland Co. With this purchase, ADM enters the edible isolate business, and Central Soya gets out. ADM names its first four edible isolates Ardex D, Ardex DHV, Ardex F, and Ardex SP-6–simply replacing Central Soya's brand "Promine" by the brand "Ardex."

1982–ADM demonstrated Ardex isolated soy protein sweetened with CornSweet 42 high-fructose corn syrup, at a major Food Expo.

1985–ADM moves its soy isolate plant from Chicago to Decatur, Illinois.

1986–ADM doubles the size of its soy isolate plant in Decatur.

1987-1988–ADM builds a second isolate plant in Decatur.

1988 June 23–ADM buys from Grain Processing Corp. (GPC) their soy protein isolate technology, brand names (Pro-Fam), and customers–but not their equipment. ADM soon begins to produce the Pro-Fam line of isolates in Decatur, Illinois.

1988–The price of imported casein rises above the price of soy isolates–and stays there due to loss of subsidies by foreign governments.

1988–ADM starts to make industrial soy protein isolates in Decatur.

1995–ADM builds a third edible isolate plant in Decatur, adjacent to its other two plants.

1997–ADM sells its industrial isolate business in Decatur to PTI (Protein Technologies International).

1997 June–ADM starts producing soy protein isolates at its plant in Europoort, Netherlands.

934. Messina, Mark. 1999. U.S. Food and Drug Administration approves soy protein health claim. *Soy Connection* (*The*) (*Jefferson City, Missouri*) 8(1):1, 6. Winter. Special Edition. [1 ref]

• ***Summary:*** Includes a history of the health claim, which began in 1995 after the publication of "Meta-analysis of the effects of soy protein intake on serum lipids" by Dr. James Anderson and colleagues in the New England Journal of

Medicine (Aug. 3). After this publication appeared, Lyle Roberts, executive director of the Illinois Soybean Program Marketing Board, initiated a task force to investigate the prospect of securing a health claim for soy protein from the FDA. By 1996 this had become a national effort and the United Soybean Board agreed to fund efforts to gather information that could be utilized by the soybean industry for the health claim.

On 10 Nov. 1998 in the *Federal Register* the FDA proposed to authorize the claim in response to a petition from Protein Technologies International, one of the original partners in the health claim effort coalition. After nearly a year of FDA study and public comment on the issue, FDA approved the health claim effective 26 Oct. 1999. Address: PhD.

935. Protein Technologies International. 1999. FDA approves health claim label for soy protein: stage set for introduction of new, great-tasting soy protein products. *SuproVision* (*PTI, St. Louis, Missouri*). Dec. 6 p.

• ***Summary:*** See next page. "St. Louis, Missouri–In a landmark announcement hailed by consumers and food manufacturers alike, the U.S. Food and Drug Administration (FDA) announced on October 26 that it has approved for use a health claim, to be used on food labels and in food labeling, on the association between a daily consumption of 25 grams of soy protein and the reduced risk of coronary heart disease. The health claim came in response to a petition filed by Protein Technologies International (PTI), a DuPont Business, in May 1998.

"Food manufacturers now can tout the heart-health benefits of products containing a minimum of 6.25 grams of soy protein per serving through one of two approved claim labels (see sidebar for details on label language). By carrying these FDA-approved labels on their packages, products containing the required amount of soy protein per serving will be easily identified by health-conscious consumers as products that can help them fight heart disease."

Note: The format of this periodical "leaflet" is a tryptic. First you see the front page (above). When you open it you see a 3-page spread. Two of the three inside pages, under the heading "Look who's talking about soy," show how the FDA health claim was covered by major media such as *The New York Times, USA Today, Associated Press, The Washington Post, The Denver Post, The Plain Dealer* (*Cleveland*), plus three television channels, and 3 radio stations.

Fold over the right page and a you will see a full-page letter from Terry Hatfield, Co-president, Protein Technologies International–A DuPont Business. In the top right is the PTI logo; in the bottom right is a color portrait photo of Terry Hatfield. The letter states:

"Dear Valued Customer:

"This is the letter I've looked forward to sending you for more than a year and a half, ever since Protein Technologies International, a DuPont Business, petitioned the Food & Drug Administration in May of 1998 for a health claim connecting consumption of soy protein to a reduced risk of heart disease.

"I'm extremely pleased to announce that this health claim has been approved by FDA. This is a truly momentous announcement with important ramifications for those of you in the food industry who are striving to develop cutting-edge, great-tasting, nutritious products that fulfill the unmet needs of the millions of consumers who are looking for such products.

"As you know, PTI has taken great pride in leading the research efforts that validated the health benefits of soy protein, as well as in our pursuit of this health claim.

"We at PTI had two goals: One, to get this claim approved; the second, to help raise the profile of soy in the mind of the American consumer. The media coverage you see inside this newsletter is just a small sample of the ways we've reached millions of consumers through our extensive advertising and public relations programs. As a result of this outreach, the consumer public–your customers–is ready and asking for new soy-based foods. They not only know that soy is good for them, they know that soy products can be great-tasting. The FDA's endorsement seals the deal–more than ever before, America is looking for ways to incorporate soy into their everyday diet.

"Now it's up to food industry leaders like yourself to meet the increasing demand for familiar, good-tasting products that contain enough soy protein to meet the claim's requirements. Health claims for foods are rare, and the effect they can have on sales of food products can be exciting. It wasn't that long ago when sales for Quaker Oats Hot Cereals grew six percent versus two percent for the category after the FDA approved the Oat Bran health claim. Now a similar opportunity exists in the soy protein-based products category.

"I know you agree that PTI's SUPRO® and SUPROSOY™ Brand Isolated Soy Protein are the key ingredients to creating success through soy. Together, we will pave the way for the innovative, healthy products of the next century, and help fight heart disease–the number one killer in the United States–in the process.

"We look forward to continuing our work together and to the promise this claim holds for your company, your products and your customers. Thank you so much for your support of our efforts.

"Best regards..."

Note: Consider the differences between the soyfoods category and this new "soy protein-based products category." Both have the potential to reduce consumption of meat and poultry, and thus to lead to healthier, less diets and much less harm to our planet. Address: P.O. Box 88940, St. Louis, Missouri 63188. Phone: 800-325-7108.

936. *SoyaScan Notes.* 1999. Major soy-related company

A NEWSLETTER FOR BUSINESS VISIONARIES

SUPRO® VISION©

DECEMBER 1999

PROTEIN TECHNOLOGIES INTERNATIONAL
A DuPont Business

SuproSoy FOR HEALTH, FOR LIFE Supro A SUPERIOR PROTEIN

FDA APPROVES HEALTH CLAIM LABEL For Soy Protein

Stage Set for Introduction of New, Great-Tasting Soy Protein Products

ST. LOUIS, MO -- In a landmark announcement hailed by consumers and food manufacturers alike, the U.S. Food and Drug Administration (FDA) announced on October 26 that it has approved for use a health claim, to be used on food labels and in food labeling, on the association between a daily consumption of 25 grams of soy protein and the reduced risk of coronary heart disease. The health claim came in response to a petition filed by Protein Technologies International (PTI), a DuPont Business, in May 1998.

Food manufacturers now can tout the heart-health benefits of products containing a minimum of 6.25 grams of soy protein per serving through one of two approved claim labels (see sidebar for details on label language). By carrying these FDA-approved labels on their packages, products containing the required amount of soy protein per serving will be easily identified by health-conscious consumers as products that can help them fight heart disease.

New Products on the Horizon

According to PTI Co-President Terry Hatfield, the company firmly believes the approved health claim will encourage Americans to include soy protein in their diet each day. A recent study conducted by PTI prior to the health claim approval indicated that nearly 2 out of 3 Americans would eat their favorite foods enriched with soy protein as a way to help improve their overall health. Coupled with the FDA's approval of the health claim for soy protein, it seems likely that an even greater consumer demand for great tasting soy protein products will continue to support the ongoing development and introduction of new soy products, enabling more Americans to easily and conveniently include the 25 grams of soy protein needed daily to reduce cholesterol and the risk of heart disease.

"The authorization of the health claim by the U.S. Food and Drug Administration is an important milestone in the growing movement toward lifestyle changes to reduce the risk of certain diseases, which begins with healthy eating. To reach this goal, we have been working with food manufacturers to include the recommended amount of soy protein in many of today's favorite foods, as well as bring hundreds of tasty new foods and beverages to America's breakfast, lunch and dinner tables," Hatfield explains.

Hatfield adds that over the past year, PTI has reached out to consumers through the media to, in essence, prepare them for the claim approval. As a result of this initiative, news of the claim approval has been covered by major consumer media such as *ABC World News Tonight* and the *Today Show*, as well as nearly every major daily newspaper in the nation.

(continued on back cover)

FDA Approved Labeling

The soy protein health claim FDA has approved will now allow food manufacturers to place a label on packages touting their product's heart-healthy benefits. The FDA has approved the use of two model claims, one of which reads: "25 grams of soy protein a day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease. A serving of (name of food) supplies ___ grams of soy protein."

The other claim food manufacturers may use reads: "Diets low in saturated fat and cholesterol that include 25 grams of soy protein a day may reduce the risk of heart disease. One serving of (name of food) provides ___ grams of soy protein."

FDA
U.S. Food and Drug Administration

acquisitions and mergers worldwide 1990-1999 (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1990 Jan.–Worthington Foods acquires La Loma Foods of Riverside, California (formerly Loma Linda Foods, owned by the Seventh-day Adventist Church).

1990 (early)–Daniel Gevaert purchases the Lima Andiran site at Andiran (near Mezin) in southern France from Lima Foods–but not the Lima trademark. In June 1990 Daniel and his wife, Valerie, established Danival.

1990 Aug. 3–Hong Kong Soya Bean Products Co. Ltd. (makers of Vitasoy soymilk) acquires Nasoya Foods of Leominster, Massachusetts.

1990 Dec. 21–The Haldane Foods Group (a subsidiary of British Arkady Ltd., which is in turn owned by ADM) acquires Unisoy Milk 'n' By-Products Ltd. of Cheshire, England.

1991 Jan. 1–The Haldane Foods Group acquires Granose Foods Ltd. of Watford, Hertfordshire, England (formerly owned by the Seventh-day Adventist Church).

1991 Jan. 28–Tetra Pak International acquires Alfa-Laval AB.

1991 April–Huegli Naehrmittel A.G. acquires Soyastern Naturkost GmbH / Dorstener Tofu Produktions GmbH.

1991 Dec.–Specialty Food Ingredients (SFI) Europe BV acquires Solnuts BV (Netherlands) and Solnuts Inc. (Hudson, Iowa).

1992 Oct.–Central Soya Co. acquires the Protein Division of Aarhus Oliefabrik in Denmark.

1993 June–Vitasoy purchases Azumaya Inc. (America's largest tofu manufacturer, and the low-price leader) in California, for an estimated $4-$5 million. Vitasoy is now in the tofu business.

1993 June–21st Century Foods acquires Farm Foods from Barricini Foods.

1993–House Foods of Japan purchases the remaining 50% of House Foods & Yamauchi, Inc. from Mr. Shoan Yamauchi. The new company is named House Foods American Corporation.

1993 July–Nutrition et Santé (part of the Sandoz Group) acquires Société Soy of Saint-Chamond, France. The latter company was renamed Nutrition et Soja, and on 15 Oct. 1994 it moved into a new factory at Revel (near Toulouse), France.

1993 (mid)–B & K Holdings of Switzerland acquires Sojinal of Issenheim, France.

1993?–Kineret (pronounced kuh-NAIR-et) Acquisition Group acquires Farm Foods from 21st Century Foods, then in Nov. 1993 the Hain Food Group acquires Kineret plus some assets of Barricini Foods Inc.

1996 April 22–Alpro (Belgium) purchases Sojinal (France).

1995 April 21–Irene and Len Stuttman buy back control of their company, INARI Ltd. (dba. Sycamore Creek) from J. Charles Follett (former CEO) and Peter L. Pairitz (accountant).

1995 April–Quest International, a unit of Unilever, acquires A.E. Staley's Gunther Products Division.

1997 Feb. 3–Monsanto purchases Asgrow Seed Co. from Seminis Inc., a subsidiary of Empresas La Moderna, S.A. (ELM).

1997 Aug. 24–DuPont signs a letter of intent to acquire Protein Technologies International, a wholly-owned subsidiary of Ralston Purina Co.

1997 Oct. 14–The Hain Food Group acquires Westbrae Natural, Inc., makers of soymilk. Westbrae's new name becomes Hain Food Group–Westbrae. 1997 Dec. 3–DuPont finalizes its purchase of Protein Technologies International (PTI–the world's leading manufacturer of soy protein isolates).

1998 Oct. 16–Worthington Foods purchases the Harvest Burger product line from ADM; by agreement, ADM will continue to make the Harvest Burgers at its Illinois plant.

1998 Dec. 31–DE-VAU-GE acquires Bruno Fischer GmbH, which sells bottled soymilk; both companies are located in Germany.

1999 Jan. 4–W.G. Thompson & Sons Ltd. of Blenheim, Ontario, Canada, purchases Sycamore Creek Co., a maker of soynuts and soynut butter (located in Mason, Michigan).

1999 Oct. 4–The Kellogg Co. (famous maker of breakfast cereals, Battle Creek, Michigan) buys Worthington Foods Inc., America's leading maker of meat alternatives.

937. Agulnick, Seth. 2000. DuPont cooks up deal to develop soy foods: General Mills partnership may yield product by fall. *News Journal* (*Wilmington, Delaware*). Jan. 14.
• ***Summary:*** Since DuPont bought Protein Technologies International (St. Louis, Missouri) in 1997 for $1.5 billion, it has been looking for ways to collaborate with large U.S. food companies. Yesterday DuPont announced a deal with General Mills to develop and sell new soy-based foods. They hope to have their first product on the market this fall. According to DuPont, sales of soy foods are expected to top $2.5 billion this year and continue to grow 15-20% a year through 2005. Tom Vierhile of Market Intelligence Inc., who tracks the food industry, notes that soy use "exploded" in 1999, and has gone from fringe to mainstream. Address: Staff reporter.

938. Reuter. 2000. General Mills, DuPont target soy health market. *Mannitoba Cooperator* (*Winnipeg, MB, Canada*). Jan. 20.
• ***Summary:*** "Wilmington, Delaware (Reuter)–No. 1 U.S. chemical company DuPont Co. and cereal-maker General Mills Inc. said last week they would form a joint venture to develop soy foods in hopes of capitalizing on recent U.S. Food and Drug Administration approval of soy health claims."

"Sales for soy foods are expected to top $2.5 billion in 2000 and grow at a 15 to 20 per cent compound rate over the

next five years."

939. Messina, Mark J. 2000. Update on soy and nutrition (Interview). *SoyaScan Notes.* March 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Even though ABC's TV program 20/20 did a positive story about soymilk, they will soon be airing a very negative program on soy. They started by focusing on Lon White's study associating tofu and Alzheimer's in Hawaii. They then added the idea that there is a conspiracy between the soy industry and the FDA for the health claim. Mark has spent six hours on the phone with the 20/20 people, and he expects the program to be very negative. He is concerned.

Another important negative article titled "Eating well: Doubts cloud rosy news on soy," by Marian Burros (*New York Times,* 26 Jan. 2000) concerns soy and breast cancer. She argues that soy may be contraindicated for breast cancer and quotes Steve Barnes as saying that women with ER-positive tumors (that means the estrogen receptors respond to estrogen) tumors should not consume soy. There was a second article on tofu and Alzheimer's by Rosie Mestel in the *Los Angeles Times* that was much more negative than the first article by Susan Essoyan. Moreover, Rosie is confused about what constitutes "moderation," because Lon White's study indicated that 2-4 servings of tofu per week caused brain problems, whereas most studies show that you must consume at least 1½ servings of tofu a day to get any benefits. In short, Mark believes that the media is and will be increasingly running negative stories on soy. Ken Setchell feels like "everybody has now jumped the soy ship and he's the only one still promoting it." "It's now hitting the fan right and left–so that we have gone to the other extreme." In July of this year, a panel on soy and safety is scheduled for the NNFA (National Nutritional Foods Association) show. The toxicity issues are now starting to take center stage–as Mark has been warning for several years. Mark does not see how any food company could consider coming out with a new soy product in the current atmosphere–with all the controversies being raised." The newspapers are carrying the negative stores because the magazine stories that are running now were written 6 months ago.

Over the past few years, many people in the soy industry have accused Mark of being an alarmist for presenting the whole truth–both sides of the issue. For example, Mark was telling dietitians that soy might be contraindicated for women with ER-positive breast tumors. Steve Barnes did not agree with Mark on this point. David Heber (a "big shot," M.D., PhD at UCLA) was hosting a soy meeting at UCLA on Jan. 20th 1998, in cooperation with PTI, to try to calm any concerns that some UCLA endocrinologists had about soy and breast cancer. It was a sort of "one-day dog and pony show" with five positive talks on soy by UCLA-associated people. He was very critical of Mark's position on the subject and even shouted at Mark on the phone for 10 minutes for scaring women away from soy when soy was so wonderful.

The last four studies on the ability of soy protein to lower blood cholesterol levels have shown no effect. We must be clear that there are two separate issues in these studies: (1) Does it work? and (2) Does it matter? If it does work, it probably doesn't matter, because those people with very high cholesterol levels would probably be put on drugs anyway.

In a recent position paper on women's health, the American Dietetic Association recommended that women avoid phytoestrogen supplements. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

940. Messina, Mark. eds. 2000. Third International Symposium on the Role of Soy in Preventing and Treating Chronic Disease [Proceedings of a symposium held in Washington, DC, on Oct. 31 to Nov. 3, 1999]. *J. of Nutrition* 130(3S):653S-711S. March. Supplement.
• ***Summary:*** These proceedings are divided into three parts: Introduction and six papers. Oral presentation abstracts. Poster presentation abstracts.

Nearly 600 delegates attended this symposium–more than twice as many people as attended the first symposium in 1994.

The symposium was sponsored by Archer Daniels Midland Co., Cargill Inc.-Protein Products, Central Soya, Co., Dr. Chung's Food Company, Monsanto, Personal Care Products Company, Protein Technologies International, SoGood Int., Solbar Plant Extracts, SoyLife/Schouten, Whitehall-Robins Healthcare, the United Soybean Board and the following State Soybean Associations: Illinois Soybean Board, Indiana Soybean Board, Kentucky Soybean Promotion Board, Michigan Soybean Promotion Committee, Minnesota Soybean Research and Promotion Council, Nebraska Soybean Board, Ohio Soybean Council, South Dakota Soybean Research and Promotion Council. Publication of symposium proceedings was supported by educational grants from the United Soybean Board and the Soyfoods Association of North America. Address: 1543 Lincoln St., Port Townsend, Washington 98368.

941. *ADM Nutrition & Health Update* (*Decatur, Illinois*). 2000. Successful soy conference. 2(1):4. Winter.
• ***Summary:*** "Evidence of the interest in the health benefits of soyfoods and soybean isoflavones was clearly apparent from the number of delegates attending the Third International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, which was held October 31–November 3, 1999, in Washington, DC. During the four days of the conference nearly 600 researchers and health professionals heard presentations that focused on a range of topics. That attendance figure represents a twofold increase over the first symposium held in 1994. In addition to 48

oral presentations, there were over 100 poster presentations, which is three times more than were presented at the first meeting. Furthermore, in addition to cholesterol reduction, cancer, and osteoporosis, topics covered at the previous symposia, research at this third symposium addressed areas such as hot flashes, hypertension, and cognitive function.

"The number of exhibits was also impressive and clearly illustrated that soy products have become mainstream. During the Tuesday luncheon, six pioneers of the field were recognized for their contributions: Herman Adlercreutz, University of Helsinki (Finland); Chai-Won Chung, Dr. Chung's Food Company (Korea); Cesare Sirtori, University of Milan (Italy); David Kritchevsky, Wistar Institute (Philadelphia, Pennsylvania); Kenneth D.R. Setchell, Children's Hospital (Cincinnati, Ohio); and Doyle Waggle, Protein Technologies International (St. Louis, Missouri). The session on coronary heart disease was held in honor of the late Kenneth K. Carroll, for his work on the cholesterol-lowering effects of soy protein.

"As is always the case with scientific meetings, the research presented probably raised more questions than it answered but there is no doubt that those who attended left with greater enthusiasm for their field. The abstracts from the conference are expected to be published in the *Journal of Nutrition* sometime next year."

942. Potter, Susan. 2000. Soy: Good news for the heart. *Healthy & Natural Journal* 7(2):68-71. April.
• ***Summary:*** While experts are not sure exactly how soy protein works, they are convinced that a significant improvement in America's cardiovascular health can be achieved by the consumption of as little as 25 grams/day of soy protein. A large color photo shows a tall glass of soymilk, a white bowl of dry soybeans, a cake of tempeh broken in half, and a cake of tofu–all on a wooden cutting board, placed on a woven cloth mat.

Note: Until recently, Dr. Potter was with the Dep. of Food Science and Human Nutrition, University of Illinois, Urbana, Illinois. Address: PhD, Research Scientist, Director of Nutrition Science, Protein Technologies International.

943. *Nutrition Business Journal* (*San Diego, California*). 2000. General Mills joint ventures with PTI to develop soy products: General Mills feels benefit of health claims, but says taste must come first. 5(5):14-15. May.
• ***Summary:*** General Mills is developing new soy-based products to take advantage of the soy-heart disease health claim approved by the FDA in Oct. 1999. In Jan. 2000 they announced a joint venture with DuPont's Protein Technology International to develop new soy food products, but no information is available about these potential new products. PTI now offers GMO-free soybeans through its "Identity Preservation" program. GeniSoy was one of the first manufacturers to make use of these GMO-free soybeans in its Ultrasoy line of shakes and protein powder. General Mills recently acquired two organic-foods companies: Muir Glen and Cascadian Farm.

944. Soy & Health 2000: Clinical evidence, dietetic applications–Second announcement (Brochure). 2000. Kortrijk, Belgium. 8 panels. 21 x 10 cm each. [Eng]
• ***Summary:*** This symposium will be held on 13-14 Oct. 2000 at Palais de Congrès, Brussels, Belgium. Contents: Introduction. Program–Friday: Soy protein and heart disease, new products and technology, soy and cancer. Saturday: Obesity, hypertension, health implications of soy lecithin, oil, phytosterols, hormonal effects, from science to market. Website: www.soyconference.com. Registration form. Conference format. Call for posters. Symposium venue. Exhibits. International advisory board. Gold sponsors: Protein Technologies International (a DuPont business). American Soybean Association. United Soybean Board. Eridania Béghin-Say: Health & Nutrition Group. Marks & Spencer. Silver sponsors: ADM, Sojasun. Address: Kortrijk, Belgium.

945. Bechard, Theresa. 2000. Health benefits drive soy's popularity, Protein's expansion. *Memphis Business Journal* (*Memphis, Tennessee*). June 22.
• ***Summary:*** "St. Louis-based Protein Technologies International (PTI) is launching a $61 million expansion of its Memphis plant to boost production of an increasingly popular health food–soy protein.

"Protein Technologies, a DuPont business, is a leading researcher, manufacturer and marketer of isolated soy proteins and soy fiber ingredients."

Memphis is one of PTI's three food protein plants where soybeans are crushed, the oil is further removed, and the protein is further processed to make various forms of isolated soy protein.

For more information visit www.protein.com.

Note: This link is still active in Sept. 2020.

946. *Illinois Agri-News* (*La Salle, Illinois*). 2000. New soybean uses could be one key to feeding growing world population. July 7.
• ***Summary:*** According to Protein Technologies International (PTI), more than 300 new products containing soy were introduced just this year.

World population is growing so fast that there will be another one billion mouths to feed every 13 years. The feed all these people, PTI believes that we will have to use biotechnology [genetic engineering].

"PTI, originally owned and developed by Ralston Purina Co., is now owned by DuPont; it has "direct sales to 75 countries totaling around $500 million annually."

Here are some tips from PTI for adding soy protein to your daily diet:

"Sprinkle isolated soy protein powders in your favorite soups, sauces or beverages.

"Try mixing a serving of isolated soy protein powder with your favorite beverage for a quick snack when you're on the go.

"Create you own delicious shakes with isolated soy protein powder and fruit.

"Top your hot breakfast cereal with isolated soy protein powder as an easy way to get in a serving of soy every day.

"Stir in a serving of isolated soy protein powder into a cup of sugar free hot cocoa."

947. *Supro Vision* (*Protein Technologies International, St. Louis, Missouri*). 2000. PTI leads the way in publicizing soy health claim. Spring. p. 1, 4.
• ***Summary:*** PTI petitioned the FDA in 1998 for the now-approved heart health claim, and followed up until the claim was approved. After approval in Oct. 1999, they played a major role in garnering publicity for the claim. "Of particular note were stories on soy protein and the health claim in *Time, U.S. News & World Report, Good Morning America, Business Week, The Washington Post, ABC World News Tonight, The Chicago Sun-Times* and *The Wall Street Journal.* In addition, a print advertising campaign in the United States and Europe garnered an additional 33 million-plus impressions for PTI and the health claim."

"Within hours of FDA's approval of the health claim, PTI's health claim press release was on the wire, as well as faxed directly to more than 500 print and electronic media. Simultaneously, every national television network and each network affiliate in the top 25 U.S. markets was personally contacted about the news of the health claim. Accompanying this effort was extensive outreach to national and local radio stations, national and local newspapers, women's and men's consumer magazines and health, food and retail trade publications."

"In addition, PTI was the first company to have a video 'b-roll' package and a radio news release distributed (via satellite) on the day of claim approval. The b-roll package generated a total of 231 stories about the health claim on more than 136 television stations, reaching an audience of more than 17 million viewers. Together, the PTI b-roll package and the radio news release generated a total combined audience reach of more than 23 million.

"PTI's press materials were distributed via overnight mail to a group of 100 carefully selected leadership media within hours of claim approval, and outreach continued throughout the following weeks."

948. *Supro Vision* (*Protein Technologies International, St. Louis, Missouri*). 2000. The joy of soy–Survey finds Americans looking to soy for good health: 2 out of 3 Americans willing to add soy to their diet for healthy lifestyle. Spring. p. 3.
• ***Summary:*** "Americans, it seems, are more soy savvy than ever. A new survey, commissioned by Protein Technologies International, reveals that about 2 out of 3 Americans would eat their favorite foods enriched with soy protein as a way to help improve their overall health. American interest in soy actually exceeds our admitted willingness to eliminate fatty foods or junk foods from our diet, according to the American Attitudes on Soy & Health Survey."

"This trend cuts across all demographics, according to the survey, with 66 percent of women, 66 percent of Baby Boomers and 68 percent of Generation X willing to eat their favorite foods enriched with soy protein."

The survey, initiated and sponsored by PTI, was conducted by the independent firm of Bruskin-Goldring Research. 1,000 adults (age 18 and older) participated in the telephone survey, which had a 3.2% margin of error.

"Why soy? Research has demonstrated that soy can play a role in cardiovascular health, and suggests a potential role in women's health and cancer prevention. Although the PTI survey shows that only 6.7 percent of Americans currently eat soy-based foods on an 'often basis,' there is great potential for growth. Much of the growing interest in including soy protein into the diet stems from the recently approved FDA health claim–petitioned by PTI–that connects consumption of soy protein to a reduced risk of coronary heart disease."

949. *Supro Vision* (*Protein Technologies International, St. Louis, Missouri*). 2000. BOTH initiative: Looking to bring health benefits of soy to nation's meat coolers. Spring. p. 4.
• ***Summary:*** "BOTH" stands for the "Benefits of Taste and Health." PTI wants to create "a new food and meat category based on combining the great taste of familiar foods with enough soy protein to provide health benefits."

"Meat products are regulated by the U.S. Department of Agriculture, which currently does not have a process for approval of a health claim. In an April 1998 Federal Register, the Agency indicated they will consider paralleling guidelines established by the U.S. Food and Drug Administration for health claims as the meat industry expresses a desire to include health claims as part of their business strategies.

"Preliminary discussions with representatives of several meat industry organizations indicate a significant interest in the possibility of a new category of healthy, blended meat products, which could drive growth."

950. Wolf, Walter. 2000. Soy-related documents–Business records (Archival collection). Peoria, Illinois.
• ***Summary:*** In July 2000 Dr. Walter Wolf, as he was preparing to retire from the Northern Center for Agricultural Utilization Research in Peoria, Illinois, sent to Soyfoods Center many file folders of soy-related documents that he had collected between about 1968 and the present. Most

are in the field of soy protein, and none are confidential / proprietary. Each one is neatly dated, and the documents are in reverse chronological order in each manila file folder.

Dr. Wolf earned his PhD degree at the University of Minnesota, where he studied soy proteins. He began work at NCAUR in 1956; at that time it was named the Northern Regional Research Center. He worked as a chemist in the Meal Products Research Group. He did mostly pure research, rather than applied. At the time there was little interest in food uses of soy protein. One of his main contributions was collecting and publishing statistics on the annual production and price of soy flour, soy protein isolates, soy protein concentrates, and textured soy protein products.

The following files (listed alphabetically) were received by Soyfoods Center. Unless otherwise stated, only one file on each company or subject was received. A thin file contains less than about 20 sheets of paper; a thick one contains more than 20 sheets: ADM (Archer Daniels Midland Co.; 2 thick files 1970-2000). Anderson Clayton (thin, 1971-81). Cargill (thin, 1970-2000). Central Soya (4 thick files, 1959-1999). Dawson Mills (thick, 1974-1983). Edible Soy Products, Inc. (Hudson, Iowa; Maker of Pronuts; thin, 1971-78). EMI Corp. (Des Plaines, Illinois, thin, 1971-74). Erie Casein Co. (thin, 1966-73). Fuji Oil Co. Ltd. and Fuji Purina Protein Ltd. (of Japan, thick, 1972-1993). Farmland Industries and Far-Mar-Co (thin, 1970-1993). Food Ingredients–Dale Johnson (thick, 1964-1998). Garrison Products (extrusion, thin, 1977-78). General Foods (thin, 1974-1981). General Mills (thick, 1965-1976). Gerber Products (thin, 1969). Grain Processing Corp. (1968-1976). Griffith Laboratories (thick, 1968-1986). Gunther Products (purchased by A.E. Staley, thick, 1963-1975). Honeymead Products (Mankato, Minnesota, thin, 1978-1986). Industrial Grain Products (Montreal, Canada, thin, 1973-1975). Kikkoman (thick, 1972-1997). Kraft, Inc. (1965-1984). Lauhoff Grain (1 thin, 1973-86). Loma Linda Foods (thin, 1969-1986). Miles Laboratories (thick, 1970-83). Nabisco (1974-81). Meals for Millions Foundation (1 thin file, 1976). Protein Advisory Group of the United Nations, PAG Guidelines (thin, 1969-1978). Quaker Oats (thin, 1970-97). Joe Rakosky, consultant (1979-83). Ralston Purina Co. (4 files, very thick, 1962-1999). Soy protein products (2 files, thick, 1970-1986). Soy protein production statistics and estimates (two thick files, 1970-1996). Staley (A.E., 1 thick, 1969-1986). Swift & Co. (thin, 1961-1971). Takeda Chemical Industries (thin, 1970-1984). Textured soy proteins (1 thin, 1969-71). Tofu equipment (thin, 1970s). Tokuji Watanabe tofu studies at Peoria, Illinois (thick, 1960-61). United Nations Industrial Development Organization (UNIDO, thick, proceedings of Nov. 1969 meeting at Peoria, Illinois), Unilever (thin, 1974-79). Wenger Manufacturing Co. (thin, 1975-76). Worthington Foods (thick, 1965-1998). Address: NCAUR, Peoria, Illinois.

951. *Nutrition Business Journal* (*San Diego, California*). 2000. GeniSoy markets to an expanding demographic: Soy manufacturer introduces new products, expands distribution and secures non-GMO supplies. 5(7/8):10-11. Annual Industry Overview 2000.

• ***Summary:*** GeniSoy's parent company, MLO Products, was founded 36 years ago [in Nov. 1964] as a sports nutrition company that relied heavily on soy protein. Today its subsidiary, GeniSoy Products Co., launched only three years ago (in March 1997), accounts for about 50% of total sales–of about $40 million, to which GeniSoy contributed $18 million in FY 2000 (ended April 30). More remarkable, GeniSoy's $18 million is double what it was a year ago, and it is expected to double again next year.

MLO had traditionally marketed soy protein drinks aimed at athletes between the ages of 15 and 40. GeniSoy products are targeted to an entirely different market–those (mostly women ages 35 to 69) areas in which soy provides benefits, such as heart disease, menopause symptoms, etc. The idea come to MLO quite by accident about 5½ years ago when they were asked by another company to produce a soy protein bar for a university study on soy and cancer. After GeniSoy was launched, its products were sold mainly through MLO's established distribution channels. But soon they picked up many new distributors.

When the FDA announced its soy-heart health claim in Oct. 1999, soy became a very hot category. Many retailers began to develop a "soy set" in their stores–an area where soy products are grouped together. General Nutrition Centers (GNC), for example, are developing such a set, and GeniSoy's products tend to sell more quickly when they are placed in such a set than when they are placed with other bars.

Many consumers believe that soy products don't taste so god, but when they try GeniSoy bars they quickly change their minds and tell their friends. So bars are a great way to introduce consumer to soy.

In Feb. 1999 GeniSoy introduce their first products guaranteed to be free from genetically engineered organisms (GMOs); these included two shakes and one protein powder in the new UltraSoy line. The company says these were made more for the European than for the American market. Later in 1999 the GeniSoy secured a long-term supply contract for non-GMO isolated soy protein from Protein Technologies International, then announced in October 1999 that its entire product line would be made with non-GMO soy.

Recently MLO Products completed a new plant at its Fairfield headquarters, thus bringing its total office and manufacturing space to 125,000 feet. Its extruded candy production capacity has grown to 20 million bars/month. It plans to bring in-house its formerly contracted soynut roasting facilities with a capacity of 2 million lb/month.

Today GeniSoy has 29 SKUs in the U.S. market, 26 in Canada, and 15 in Australia. Two new products are scheduled for release next year: (1) A kind of a soy chip,

between a potato chip and a mini rice cake, that will meet the FDA health claim; (2) A Soy Nutty Bar, made with toasted soy nuts, and tasting like a candy bar.

Note: This is the earliest document seen (Sept. 2000) that gives statistics for larger U.S. nutrition bar companies.

952. McMann, Mary Carol. 2000. Soy protein: What you need to know. New York, NY: Penguin Putnam Inc. (Avery). 60 p. Index. 22 cm. Avery's Nutrition Discovery Series. [74 ref]

• ***Summary:*** Contents: Introduction. 1. What makes soy so special? 2. Cardiovascular disease. 3. Cancer. 4. Osteoporosis. 5. Menopause and menopausal symptoms. 6. Incorporating soy (protein) into your diet. Conclusion. Glossary. References. About the author.

Note: This book is copyrighted by Protein Technologies International. Address: MPH, RD, LD [Licensed Dietitian], Houston, Texas.

953. Deogun, Nikhil; Ellison, Sarah. 2001. Ralston board backs $10.1 billion offer from Nestle, as final deal seems close. *Wall Street Journal.* Jan. 16. p. A3, A4.

• ***Summary:*** Nestle SA, the world's largest food company, is trying to become one of the world's largest pet-food companies. Its cash offer, already approved by the Nestle board, values Ralston stock at $33.50 a share, 36% above Ralston's Friday closing price. Ralston presently has about 23% of the U.S. pet-food market and Nestle has about 12%. The pet-food industry is now enjoying 4% a year growth. Address: Staff Reporters, Wall Street Journal.

954. Chajuss, Daniel. 2001. Soy protein concentrate: Processing, properties, and prospective. Paper presented at the 92nd Annual Meeting of the American Oil Chemists' Society. 13 p. Held 13-16 March 2001 in Minneapolis, Minnesota.

• ***Summary:*** This paper consists of 13 PowerPoint presentation graphics / frames photocopied on 13 pages. 1. Title page. 2. Main presently available industrial soy protein ingredients for the food industry (4 types of soy flours, enzymatic treated soy products, soy protein isolates, soy protein concentrates {SPC}). 3. Soy protein concentrates (three processes: Aqueous alcohol washed "traditional" {Hayes System} concentrates–about 450,000 tonnes {metric tons} per year. Acid washed concentrate–about 20,000 tonnes per year. Hot water washed concentrate–none currently produced). 4. Aqueous alcohol washed soy protein concentrates are usefully applied in (minced meat products, minced and canned fish products, meat analogs and alternatives, bakery products, dietetic foods, infants' formulas, calves milk replacers, fish and piglets feeds and pet foods, other food products). 5. Nutritive advantages of aqueous alcohol washed soy protein concentrate (6 advantages). 6. Technological advantages of aqueous alcohol washed soy protein concentrate (5 advantages). 7. Alcohol washed soy protein concentrate typical material flow. 8. Functional soy protein concentrates (3 types). 9. Typical gross analysis of traditional aqueous alcohol washed ("Hayes System") soy protein concentrate (Moisture 6.0–10.0%. Protein {N x 6.25} dry basis 68.0–72%). 10. Major world processors of soy protein concentrates (table). 11. Cost and margins–Soy protein concentrates by aqueous alcohol wash. 12. Prospective–Soy protein concentrate (Steadily growing market, about 15% per year. "Functional" concentrates with tailor made properties are expected to see rapid future growth). 13. Hayes General Technology Company Ltd.

The table of major world processors of soy protein concentrates shows: ADM (Netherlands) AAW (aqueous alcohol washed). Solae LLC–Central Soya Aarhus (Demark)* AAW. Solae LLC–Central Soya Sogip (France)* AAW. Solbar Hatzor (Israel) AAW. Shemen / Soyprotec Industries (Israel) AAW. ADM (USA) AAW. ADM (USA) Acid washed. Solae LLC–Central Soya (USA)* AAW. Solae LLC–Ceval Alimentos / Bunge (Brazil)* Acid washed. ADM China AAW.

Note: Letter (e-mail) from Daniel Chajuss. 2006. July 8. Asterisks mean that these plants that had once belonged to several firms now (2006) all belong to Solae. The main reason for the two plants using the acid wash process is that these manufacturers had soy isolate plants before they got soy concentrate plants, and this already had the equipment needed (such as a spray drier, decanter, centrifuges, etc.) to produce acid wash soy protein concentrate. The acid washing system is much less widely used today; it was a prior technology.

There is now concern among infant nutrition experts about the high levels of phytoestrogens, and their estrogenic activity, in infant formulas and foods fed to young growing people. "Thus an advantage of the aqueous alcohol wash SPC process, for certain and very special foods, is that it retains *less and not more* of the soy phytoestrogens in the final concentrate."

Nutritional advantages of aqueous alcohol washed SPC: (1) Devoid of antigenic protein components (2S, 7S, 11S proteins, glycinin and beta conglycinin). (2) Devoid of soy "antinutrients" (hemagglutinins, phytates, non-digestible sugars, saponins, etc). (3) Low in antiproteolytic enzyme activity (trypsin and chymotrypsin activity–Kunitz and Bowman Birk trypsin inhibitors). (4) Low estrogenic activity (low in isoflavones / phytoestrogens). (5) Balanced amino acid ratio. (6) Help to reduce the risk of coronary heart disease (CHD). All these make traditional SPC better suited for making calf milk replacers, piglets starters and fish feeds, and a more nutritive product than other industrial soy protein products, especially for the above noted purposes as well as for young human infants.

It is true today that essentially all soy-based infant formulas are made from soy protein isolates. However, in

the past, they have also been made from traditional SPC. So why don't isolate makers use the aqueous alcohol wash process to make isolates (with low estrogenic activity) specifically for use in infant formulas and feeding? Because it is technically difficult and costly–although it would be an ideal product for infant feeding. "Personally I believe that 'refolded-functional' soluble alcohol washed SPC would be better nutritionally, safer, and a more economical product for infants."

SPC producers do not compete (and never have competed) on the high levels of isoflavones / phytoestrogens in their concentrates, as all alcohol washed SPC has low levels of these substances. Address: Managing Director, Hayes General Technology Company Ltd., Misgav Dov 19, Mobile Post Emek Sorek, 76867 Israel. Phone: (972) 8 592925.

955. Stephens, Roger; Stephens, Jane Ade. ed. and comp. 2001. Soyfoods guide 2001: Helpful tips and information for using soyfoods. Indianapolis, Indiana: Stevens & Associates, Inc. Distributed by the Soy Protein Partners. 24 p. Illust. No index. 28 cm. [23 ref]

• ***Summary:*** Subtitle: "Soy to the world: Information on the health benefits of soyfoods, and our favorite recipes."

This guide is available only on a limited basis to dietitians and health professionals.

Contents: Foreword. Keep your heart healthy: Super soy protein smoothie. Beans, beans, good for the heart: The more you eat, the better your chances of lowering your blood cholesterol levels. Cholesterol: What's in a claim. Sample soy meal planner (4 meals a day for 5 days, to get 25+ grams/day of soy protein).

Dietary guidelines for Americans. Composition of soyfoods (table). The healthy bean: Isoflavones, heart disease, menopause and osteoporosis, allergies, diabetes and kidney disease, fat. Isoflavone content of soyfoods (table). The state of soy research. Protein content of soyfoods (table).

Soy resources: Web sites, books. Soyfood substitution chart. Descriptions of soyfoods: Traditional soyfoods, soy-based products, soy ingredients.

Recipes: Meat alternatives. Textured soy protein. Soy flour. Whole soybeans. Soymilk. Tofu. Soy snacks and smoothies. Soy–Good for your heart.

The Foreword (p. 2) states: "Welcome to the 2001 edition of the Soyfoods Guide. More new soyfoods than ever are hitting the mainstream market and, to help consumers appreciate the versatility and health benefits of soyfoods, we've updated the guide with new information.

"In 1999, soyfood sales reached just over $2 billion, with soymilk sales showing a 60 percent increase. That's a dramatic change from just 20 years ago when we had a total of only $2 million in soyfood sales.

"The surging popularity of soyfoods can be traced in part to the U.S. Food & Drug Administration's approval for a health claim on soy protein's role in reducing cardiovascular disease. For details on the health claim see page 3.

"Soy's role in chronic disease prevention continues to be a top priority for scientists around the world. Soy research continues to look promising in cancer prevention, osteoporosis and heart research.

"Additional soyfoods information can also be found at the Internet site at www.soybean.org.

"The *2001 Soyfoods Guide* is distributed by the Soy Protein Partners. Partners include state soybean boards from: Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, North Carolina, South Dakota, Tennessee, Texas, Virginia, and Wisconsin. Industry partners include: American Soybean Association, Archer Daniels Midland Company, Central Soya Co., Minnesota Soyfoods Association, Protein Technologies International, Soy Protein Council, Soyfoods Association of North America, Soyfoods Council and the United Soybean Board." Address: 4816 North Pennsylvania Street, Indianapolis, Indiana 46205. Phone: 317-926-6272.

956. *SoyaScan Notes.* 2001. General Mills and DuPont announce launch of new soymilk product in joint venture (Overview). May 14. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** About 8th Continent soymilk, made with soy protein isolates (made by Dupont's Protein Technologies International) instead of the usual whole soybeans.

957. Terman, James. 2001. Update on White Wave's Silk soymilk (Interview). *SoyaScan Notes.* May 29. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Vanilla Silk was introduced in quart and half-gallon cartons in Jan. 1996; but the word "Vanilla" did not appear on the carton until "Plain" was introduced in July 1998. Chocolate Silk was introduced in quart cartons in April 1996 and half gallon cartons in April 1998. Plain Silk [dairylike, only two-thirds as sweet as vanilla] was introduced in quart cartons in July 1998 and half gallon cartons in April 1999.

Today, half-gallons are outselling quarts; quarts are more of an introductory size. Plain [dairylike] is now the best-selling flavor. White Wave has never sold just plain soymilk with nothing added; moreover, James is not aware of any other major soymilk company that offers such a product.

Silk is doing very well financially; it is quite profitable. White Wave is working to bring their margins up by bringing their costs down, now that they have their own soymilk extraction facility, which will pay for itself quickly. Silk just got into Walmart, which is a huge nationwide account.

General Mills is planning to introduce a soymilk named 8th Continent in July or August. It will be based on soy protein isolates from DuPont's Protein Technologies

International and will be sold in quarts (32 oz) and 8 oz plastic (PET) bottles. James has heard that General Mills plans to spend a lot of money putting this new product in dairy cases nationwide.

White Wave plans to introduce Silk in an 11-ounce single-serve PET bottle (chocolate and vanilla) in July 2001.

James is very excited about the future of White Wave's baked tofu; it will be repackaged, it will be cubed to make it more convenient, and new flavors will be introduced. When America really starts to consume tofu, it will be as a baked, flavored, ready-to-eat product–that is very convenient. "We're only one Mad-Cow outbreak away from having tofu sales shoot for the stars." The sleeper is baked tofu; James thinks it could be as big as or bigger than Silk, in part because America consumes more meat than dairy products.

James has just read a very interesting book, *The Cultural Creatives,* by marketing expert Paul Ray. His premise is that these people are not connected or part of any network. Its 55 million people who all think they are unique individuals and mavericks, and don't think there is anyone else like them out there. Its a psychographic, not a demographic, profile. Financially they range from just below the very poor to just below the very wealthy. But they are not materialists and they do not subscribe to the consumer society or worldview. They are careful consumers. Address: Vice President–Marketing, White Wave Inc., 1990 North 57th Court, Boulder, Colorado 80301. Phone: 303-443-3470.

958. Ellison, Sarah; Wilke, John R.; Shishkin, Philip. 2001. Nestle's deal to buy Ralston Purina gets nod in Europe. *Wall Street Journal.* July 30. p. B9.

• ***Summary:*** The European Commission gave its conditional approval to Swiss food Giant Nestle SA in its $10.1 billion bid to acquire Ralston Purina Co., the American pet food maker. But the deal has not yet been approved by the U.S. Federal Trade Commission (FTC).

959. *Philadelphia Inquirer* (*Philadelphia, Pennsylvania*). 2001. DuPont plans to position its Solae brand of soy protein. Aug. 9. p. 35.

• ***Summary:*** "Business news in brief: In the region."

"DuPont Co., Wilmington [Delaware] introduced a consumer ingredient-branding program for soy protein. The company said it expected the brand to be used on meat, dairy, baked goods, cereals, healthful beverages and snack foods. DuPont said the program was designed to position its healthful-food ingredients under the Solae brand. The first product to carry the Solae mark is 8th Continent soy milk, which was produced under a joint venture of DuPont and General Mills Inc."

Note: This is the earliest published document seen (Sept. 2020) that mentions "Solae" in connection with soy protein.

960. **Product Name:** 8th Continent Soymilk [Vanilla, Chocolate, Original].
Manufacturer's Name: 8th Continent, L.L.C. [General Mills].
Manufacturer's Address: Box 200, Minneapolis, MN 55440. Phone: 1-800-247-6458.
Date of Introduction: 2001 August.
Ingredients: Soymilk (water, soy protein [isolate], soybean oil, calcium phosphate), sugar, fructose, potassium citrate, color added, cellulose gel, salt, dipotassium phosphate, soy lecithin, sodium hexametaphosphate, natural and artificial flavor, cellulose gum, xanthan gum, vitamin A palmitate, vitamin B-12, vitamin D, vitamin B-2 (riboflavin). Contains soy ingredients.
Wt/Vol., Packaging, Price: 1 quart (946 ml) plastic bottle with screw-on cap. Retails for $2.29 (2001/10, Lafayette, California).
How Stored: Refrigerated, 7 day shelf life.
Nutrition: Per 8 fl oz.: Calories 90, calories from fat 25, total fat 3 gm (4% daily value; saturated fat 0 gm), cholesterol 0 mg, sodium 170 mg (7%), total carbohydrate 11 gm (dietary fiber less than 1 gm [3%], sugars 10 gm), protein 7 gm. Vitamin A 10%, vitamin C 0%, calcium 30%, iron 4%, vitamin D 25%, riboflavin 25%, vitamin B-12 15%. Percent daily values are based on a 2,000 calorie diet.
New Product–Documentation: Talk with James Terman, Vice President of Marketing, White Wave Inc. 2001. May 29. General Mills is planning to introduce a soymilk named 8th Continent in July or August. It will be based on soy protein isolates from DuPont's Protein Technologies International and will be sold in quarts (32 oz) and 8 oz plastic (PET) bottles. James has heard that General Mills plans to spend a lot of money putting this new product in dairy cases nationwide.

Talk with Dmitry Torba of Orinda, California. 2001. Oct. 8. This product is sold at Safeway supermarkets in a plastic bottle. He likes it better than Silk.

Product with Label purchased in dairy case at Safeway supermarket in Lafayette, California. 2001. Oct. 15. Plastic bottle covered with dark blue and white shrinkable sleeve. Lettering in yellow and white. On the front panel: "Simple change, better health." Low fat. Excellent source of calcium. Naturally and artificially flavored." On one side: "Shake well. Keep refrigerated. Use within 7 days of opening. ME 5¢ dep." Back panel: "8th Continent is more than a place... its an attitude about wellness. It's knowing that sticking with small changes can be more important than waiting for miracle cures. 8th Continent... A simple change that can make a difference." "Helps lower cholesterol" (heart health claim; 8th Continent contains 7 grams of soy protein per serving"). American Heart Association logo. Nutrition facts. Quality guarantee. Solae logo (green on white). "Solae is a trademark of Protein Technologies International, Inc. Made with Solae™ soy protein, the soy protein with proven health benefits." "Lactose free." Note in the ingredients listing that

the word "isolate" is omitted.

Talk with sales rep at 8th Continent. Their first and only product is soymilk. All three flavors come in the quart plastic bottle; vanilla and chocolate also come in 8 oz single-serve bottle. The product was launched in Aug. 2001 on the East Coast.

Note: This is America's first soymilk made with soy protein isolates rather than whole soybeans. It is packed by Jasper Products in Joplin, Missouri.

Nutrition Business Journal. 2001. Oct. p. 9. General Mills has launched 8th Continent soymilk, the first product out of its joint venture with Protein Technologies International. It competes with Silk, the refrigerated market leader.

Product (Vanilla quart) purchased at Safeway supermarket in Lafayette, California. 2003. Dec. 3. $2.49. Titanium dioxide is not listed among the ingredients. A special offers two ½-gallon vanilla bottles for the price of one = $6.00. The word "isolate" is still omitted in the ingredient listing.

961. Soto, Ricardo. 2001. The utilization of soybean distillation in Mexico. In: Richard F. Wilson, ed. 2001. Proceedings of the World Conference on Oilseed Processing and Utilization. Champaign, Illinois: AOCS Press. viii + 213 p. See p. 183-87. [6 ref]

• ***Summary:*** Contents: Abstract. Introduction. Utilization of soybean distillate: Tocopherols, sterols. Production and storage of soybean distillate: Deodorization, storage. Technologies for producing soybean value-added products: Tocopherol concentration process, vitamin E production process. Sterol production process. The actual situation in Mexico. Conclusions.

"Deodorization is generally the last step in the process of traditional oil refining, and is done to improve taste, odor, color, and stability of the oil. In this process, many volatile materials are removed from the oil and recovered as a valuable by-product known as distillate. This distillate is a mixture of free fatty acids, tocopherols, sterols, aldehydes, and ketones, among others." Much of the soybean distillate recovered in Mexico is exported to producers of tocopherol (vitamin E). Address: Nutritional Science Dep., Protein Technologies International, Inc. (a DuPont business), St. Louis, Missouri 63188.

962. Yan, Lin. 2001. Health benefits of soy protein. In: Richard F. Wilson, ed. 2001. Proceedings of the World Conference on Oilseed Processing and Utilization. Champaign, Illinois: AOCS Press. viii + 213 p. See p. 176-82. [76 ref]

• ***Summary:*** Contents: Abstract. Soy protein and cardiovascular disease. Soy protein and cancer. Soy protein and bone health. Soy protein and menopausal symptoms. Protein quality. Conclusions. Address: Nutritional Science Dep., Protein Technologies International, Inc. (a DuPont business), St. Louis, Missouri 63188.

963. *SoyaScan Notes.* 2001. Historical perspective on ADM and soy protein isolates (Overview). Oct. 26. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** The following information is from one or more long-time and very well informed insiders in the soy protein isolate industry; they have asked to remain anonymous. ADM started making edible soy protein isolates at a very late date. ADM is a very technologically oriented company. They never put much effort into selling their isolates, even though that little Protein Products Division has always been the pet of Dwayne Andreas. ADM got into edible isolates after Central Soya shut down their isolate plant in Chicago because it was causing too much pollution. The plant had formerly been an old Al Capone brewery, within walking distance of Lake Michigan. ADM actually bought the plant from a junk dealer. ADM has a small but full-time staff that monitors used equipment nationwide, so that when they want to start a new plant they can buy the equipment inexpensively.

When ADM bought the plant, they hired most of the same people who had worked there previously. Within about 2 months they were back up to speed producing edible isolates. They used their technical expertise to get the production line operating at ADM's high standards, so the product quality was stabilized at higher levels and effluents were decreased. ADM renamed Promine to Ardex and continued the same line of four isolate products. Thus Promine D (Central Soya's flagship isolate) became Ardex D, etc. ADM improved the quality of the products somewhat, but they did not introduce any new products, so they fell further and further behind Ralston Purina and Grain Processing Corp. (GPC, whose main problem was that their volume was too low).

ADM tried to compete by being a very, very efficient manufacturer. Ralston at that time, for example, had a problem with the inconsistency of their bulk density–which was a problem for the "muscle powder market." ADM quickly got uniform bulk density, consistent flavor, no dark particles, and good bacteriological quality. They priced their products a little below the going market price because they were a new entrant, but not much–because the profit margins were already slim due to excess capacity in the industry.

In June 1988 ADM bought GPC's edible isolate business and shut down the plant–in part to get rid of this excess industry capacity and in part because ADM considered GPC's diverse line of Pro-Fam isolates to be of superior quality. ADM's isolate line now consisted of many Pro-Fam products and a few of the old Ardex products. Soon ADM built a new isolate plant in Decatur and shut down the Chicago plant. ADM was now becoming a serious competitor to Ralston's new PTI division.

A large quantity of these isolates went into baby foods, soy-based infant formulas, diet foods, and muscle powders. The industry always had high hopes for isolates in meat applications, but the USDA was very suspicious of them because, as purified proteins, they were hard to detect in meats and they could bind a lot of water. Consequently USDA required a titanium dioxide tracer and spoke of potential "adulteration with water."

Moreover, a huge market was developed in Eastern Europe, where Communist administrators mandated its use in all processed meats. The key to capturing this market was having the lowest price product; there was little motivation to improve quality.

About 5-6 years ago ADM started putting a lot of effort into their soy isolate lines. They developed a line of new products that were functionally superior–including the Pro-Fam 890 series and 825 series (to add to fruit juices). ADM and PTI make many different isolate products in terms of functionality, solubility, etc. But over the past 20 years PTI has made great progress in every aspect of isolate quality (viscosity, bulk density, dispersibility, flavor, color, etc.), new product development, manufacturing, and marketing, so that they have come "to absolutely dominate the market" with approximately 90% market share. In part, this was because PTI could focus all of its attention on isolates–since that was their only product line. ADM, by contrast, has hundreds of other products.

One of our sources is one of the oldest operating distributors of ADM protein products. He is a recognized expert in applications of soy proteins. He has heard (industry scuttlebutt) that Cargill might come into the isolate field, and that they might buy PTI. DuPont paid much too much for PTI (something like 5 times annual sales), so they have been cutting costs furiously and ruthlessly. They have dismissed their entire R&D staff and cut back even on their sales staff. "Anyone would be insane to get into this market with a brand new plant."

The world market for soy isolates is growing nicely. When ADM built its two new isolate plants in Decatur, the production capacity was sold out before either one was finished. They also have a plant in Europe. He does not think that the FDA heart health claim has much of an effect on the market for isolates. "People used to say that soy was really good for you, but..." Now things have changed, and they buy soy. For example, USDA is now actively encouraging the use of soy in the school lunch program (especially textured concentrates since kids won't eat things unless they taste good) and as an extender in meats. Some new isolate plants in China have started production and disrupted the international market–even though the isolate quality is poor.

"TVP–which we all thought would revolutionize the world's diet–has been a bust. Just a bust!" There were 11-13 manufacturers of textured soy flour 20 years ago. Now there are only a few, a majority of it goes into pet foods (the TVP chunks look like chunks of meat), plus commercial burritos, pizza toppings, meat alternatives, etc. but the profit margins are low.

The following are ADM prices F.O.B. plant, per truckload (based on records from files): Recent ADM prices: Soy protein concentrate: 1989–54 cents/lb. 1993–60 cents/lb. 1996–69 cents/lb. 2001–73 cents/lb. Soy protein isolate: 1989–121 cents/lb. 1993–121 cents/lb. 1996–140 cents/lb. 2001–151 to 159 cents/lb. PTI prices would typically be 2-3 cents/lb higher.

964. *Nutrition Business Journal* (*San Diego, California*). 2001. Functional Foods V. 6(10):1, 3-8. Oct.
• ***Summary:*** The U.S. retail food market in the year 2000, worth $495 billion dollars, is divided into the following eight categories, listed in descending order of size: Meat, fish and poultry $108.7 billion. Beverages $88.9 (not incl. milk or liquor). Fruit and vegetables $84.9. Bread and grains $59.7. Dairy $53.4. Packaged/prepared foods $51.7. Snack foods $30.0. Condiments (incl. oils, dressings, spreads, sauces, spices, sweeteners) $17.6.

The top five U.S. functional food companies in terms of U.S. functional food sales ($ million) are Pepsico U.S. $3,530, General Mills $1,400, Kellogg $1,370, Kraft $780, and Coca-Cola $650. Smaller top companies include: Clif Bar $130, Stonyfield Farms $100, Imagine Foods $90, and White Wave $90. 90% of Imagine Foods' total sales come from functional foods, compared with 100% for White Wave. Imagine Foods launched a big campaign in 2001 to market Organic Power Dream Soy Energy drinks to athletes and fitness enthusiasts.

"Soy is the functional food star of the last two years with an estimated 300 soy products introduced in 2000 alone." Ingredient suppliers in the field of soy are now bearing heavy responsibility for functional food research. ADM, Cargill, Central Soya, and Protein Technologies International (PTI, owned by DuPont) are all investing in research, education, and consumer outreach–plus innovation in processing and new ingredients. One of the largest uses of soy protein is SlimFast, but the health benefits of soy are not the shopper's first consideration.

965. *Nutrition Business Journal* (*San Diego, California*). 2001. Suppliers refine next generation of soy ingredients: Suppliers market to consumers and improve taste, texture, and functionality of soy ingredients. 6(10):18-20. Oct.
• ***Summary:*** Cargill, with sales of $49 billion/year, has long been a supplier of soy flour and textured soy flour. But it is a relative newcomer to higher-end soy ingredients. Last year Cargill announced that it is expanding into soy protein isolate, according to Ted Ziemann, president of Cargill Nutraceuticals. According to Kevin Marcus, director of marketing for Cargill Soy Protein Products, Cargill now has an operational pilot plant and is working with about 20 food,

sports nutrition, and weight loss companies on full-scale production–which is slated for 2003.

In the summer of 2001 Cargill Nutraceuticals officially launched AdvantaSoy isoflavones, which is available in regular and non-GMO versions, is not produced using solvent extraction, and keeps the isoflavones in their natural state. Meanwhile the Soy Protein Products group is developing six isolates and six process patent applications.

Today, about 150-200 million pounds of soy protein isolate are used in the USA–according to Marcus. At $1.65 to $2.10 per pound, this would be worth an estimated $280 to $375 million.

ADM, the world's largest supplier and processor of soybeans, has been selling Novasoy, which contains 40% soy isoflavones. Increasingly ADM is turning its attention to consumer marketing, by branding its products–according to Tony DeLio, president of ADM's Natural Health and Nutrition, whose focus is to identify, create, and develop nutraceuticals and functional food ingredients, backed by solid science. ADM has developed the NutriSoy consumer trademark. Today Novasoy has about 50 branding partners in the USA. DeLio estimates worldwide soy isoflavone sales at wholesale to be $30-40 million worldwide. ADM is also making water dispersible phytosterols and sterols under the CardioAid trade name.

A sidebar titled "Large corporations dominate soy proteins market" contains estimated worldwide manufacturers' sales and market shares compiled by ADM: Soy flour, comprising about 25% of the value of the market for soy protein products, has annual sales of about $388 million. Cargill and ADM each have about one-third of the market.

Soy protein concentrates: $487 million. ADM is the leader with about 48% of the market, followed by Central Soya, then Ceval Alimentos of Brazil. The largest end uses for concentrates are meat extensions and alternatives (49%), animal feed/pet food (30%), functional foods (5%), and dairy replacement/infant foods (5%).

Isolated soy proteins: $651 million. Protein Technologies International (PTI) is the leader with about 67% of the market, followed by ADM (19%) and Ceval Alimentos (8.8%). The largest end uses for isolates are infant foods and dairy replacements (40%), meat extensions and meat alternatives (20%), and use in other functional foods (10%).

ADM believes that soy concentrate's share of the market may slowly decrease due to strong demand for isolates and improvements in isolate quality. Strong demand for isolates in the USA and abroad lead to projections that this product will grow from 43% of the soy protein market in 1998 to 45% by 2002.

Note: This is the earliest document seen (July 2020) that mentions "Cargill Nutraceuticals."

966. Endres, Joseph G. ed. 2001. Soy protein products: Characteristics, nutritional aspects, and utilization. Revised and expanded ed. Champaign, Illinois: AOCS Press. ix + 53 p. Index. 23 cm. [106 ref]

• ***Summary:*** Contents: 1. Historical aspects. 2. Definitions and methods of preparation. 3. Protein quality and human nutrition. 4. Health and soy protein. 5. Functionality of soy proteins. 6. Uses in food systems. 7. Regulations regarding usage. 8. Future considerations.

Soy Protein Council member companies: ADM, Central Soya Co., Cargill. Note that Protein Technologies International is not a member. The Introduction (p. 1) states that more than 1 billion pounds of soy protein products are produced for human consumption each year in the USA–about 4 pounds per person.

Note: This is an updated and expanded edition of: Soy Protein Council. 1987. "Soy protein products: Characteristics, nutritional aspects and utilization." 43 p. Address: PhD, The Endres Group, Inc., Fort Wayne, Indiana. Phone: 219-625-3616.

967. Joyce, Amy. 2001. FTC clears Nestle to buy Ralston Purina; Combined company will dominate world pet-food market. *Washington Post.* Dec. 12. p. E3.

• ***Summary:*** Yesterday the Federal Trade Commission (FTC) approved the acquisition of Ralston Purina Co. by Nestle SA for $10.3 billion–despite the disapproval of consumer groups. The company agreed to sell two of Ralston's dry cat-food brands. After the merger, Nestle (based in Switzerland) and Ralston Purina (based in St. Louis, Missouri) together will have about 45% of the world market for dry cat food. The new organization, which will be named Nestle Purina PetCare, will be based in St. Louis.

968. *SoyaScan Notes.* 2001. Chronology of major soy-related events and trends during 2001 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** April 12–Bill Bolduc, founder of Eden Foods and natural foods pioneer, dies in Southern California.

April 17–Martha Stewart, on her popular nationwide TV program *Living,* has a very positive segment on South River Miso Co.

April 18–Richard Rose, a soyfoods pioneer, sells Rella Good Cheese Co. to Tree of Life. He retains his company HempNut, Inc. in Santa Rosa, California. His Hempeh (hempseed tempeh) still contains soy.

May 11–The Kerry Group (of Wisconsin and Iowa) purchases Iowa Soy Specialties, LLC of Vinton, Iowa.

June 12–The Hain Celestial Group acquires Yves Veggie Cuisine (Vancouver, BC, Canada).

Aug. 24–Wildwood Natural Foods (Fairfax and Santa Cruz, California) and Midwest Harvest, Inc. (Grinnell, Iowa) merge to form Wildwood Harvest, Inc. Iowa Agricultural Finance Corporation (IAFC) invests $3.3 million in the new

company, and the Iowa Farm Bureau Federation (IFBF) invests an additional $700,000. This investment will be used to build and equip a 20,000 square foot soyfoods plant in Grinnell and to remodel and equip another 20,000 square foot soyfoods plant in Watsonville, California.

Aug. 3–Bunge, in its initial public offering (IPO), raises $278 million by floating 23% of its shares on the New York Stock Exchange. Bunge his been a private grain trading company since it was founded in 1818 in the Netherlands by Johann Peter Gottlieb Bunge.

Sept.–SunRich's new soymilk plant in Wyoming starts production. By Nov. the plant is at full capacity and expansion begins.

Oct. 21–The USDA's National Organic Program and its standards take effect.

Oct.–The Coca-Cola Co. acquires Odwalla, Inc. of California for $181 million. Odwalla has annual sales of about $130 million, mostly in fresh, refrigerated juices plus some delectable soy beverages.

Nov. 4-7–Fourth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease held at San Diego, California. General chairpersons and proceedings editors: Stephen Barnes and Mark Messina.

Dec. 10–The Hain Celestial Group, Inc. acquires Lima NV, the leading Belgian natural and organic foods manufacturer and marketer, and its Biomarché operations. Hain appoints Lima's Chairman, Philippe Woitrin, as Managing Director of Hail Celestial Europe. Lima is also a European pioneer in macrobiotic foods and soyfoods.

Dec. 11–Ralston Purina Co. (St. Louis, Missouri, a soy pioneer) is acquired by Nestle SA for $10.1 billion cash; on this date the deal is approved by the U.S. Federal Trade Commission. The new company is named Nestlé Purina. The merger brings together such household names as Ralston's Dog and Cat Chow and Nestle's Friskies cat food and Mighty Dog brands.

Dec. 24–The Federal Trade Commission approves the merger of Dean Foods and Suiza Foods Corp. (which owns 14% of Horizon Organic Dairy). A federal judge throws out White Wave's lawsuit arguing that White Wave has the right to buy back its own stock at the market price before the merger.

In 2001, for the first time in modern history, the USA lost the distinction of supplying more soybeans and soybean products (oil and meal) than all other countries combined. This year it supplied about 46% of the world's soybean exports. South America (mainly Brazil and Argentina) now supply more than 50%. Devalued currencies in Brazil (the *real*) and Argentina (the *peso*), plus the strong U.S. dollar, make it difficult for U.S. exporters to compete based solely on price. To compete in the future, U.S. growers must find a new strategy, which will focus on soybean quality.

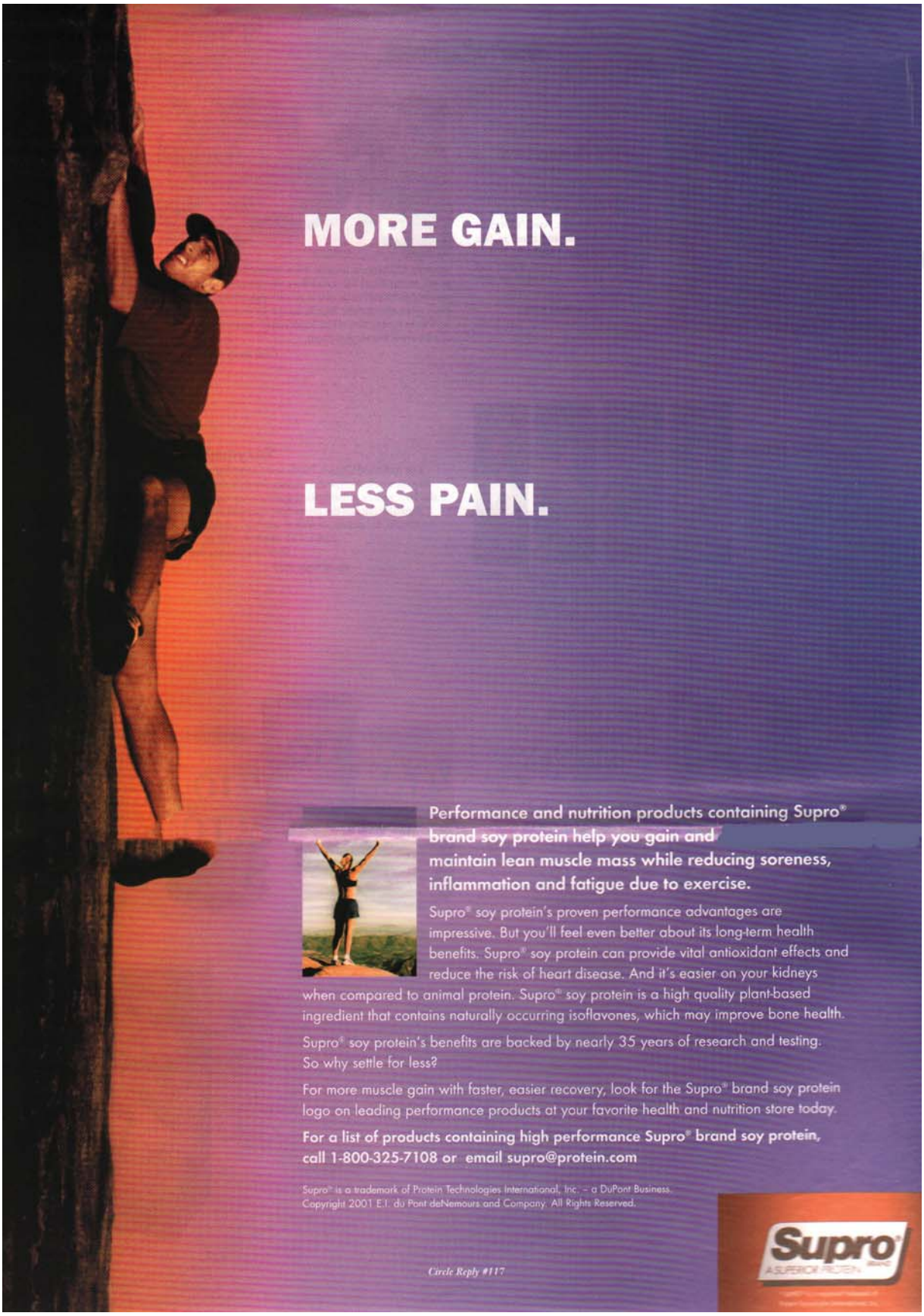
969. *Soyfoods Canada Newsletter.* 2002. 2001 annual meeting a great success. Jan. p. 1.
• ***Summary:*** Soyfoods Canada held its second annual meeting on 28 Sept. 2001 in Toronto at the Crowne Plaza Hotel. Speakers included Toby Davidson and Jeanne Cruikshank. A new board of directors was elected to serve during the coming year: Bill Hawes, President–President of Tofutti-Cholac Foods. Maheb Nathoo, Past-President–President and CEO of SoyaWorld. Eric Hart, Vice-President–Business Development Officer with Galaxy Nutritional Foods. Andrew McVittie,–Secretary–Soybean Sales Representative for W.G. Thompson & Sons and Sycamore Creek. Ron MacDougall, Treasurer–Soybean farmer representing the Ontario Soybean Growers. Paula Travado–OntarBio/Organic Meadows. Nick Feldman–Nutrisoya Foods. Peter Joe–Sunrise Soya Foods. Vivian Chiang–Momo's Kitchen. Garnet Pigden–PTI.

970. Protein Technologies International. 2002. More gain. Less pain (Ad). *Natural Foods Merchandiser.* Feb. p. 54.
• ***Summary:*** See next page. In the top two-thirds of this full-page color ad shows a man rock climbing on a vertical cliff with an orange and purple sky behind him.

The text begins: "Performance and nutrition products containing Supro brand soy protein help you gain and maintain lean muscle mass while reducing soreness, inflammation, and fatigue due to exercise." PTI is a DuPont business. Copyright 2001 E.I. du Pont deNemours and Company.

971. Barnes, Stephen; Messina, Mark. 2002. Introduction and satellite session at the Fourth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease. *J. of Nutrition* 132(3):545S-46S. Supplement. March. [6 ref]
• ***Summary:*** This is the fourth in a series of symposia on this topic that began in 1994 in Mesa, Arizona. The number of attendees was reduced by security concerns and air transportation problems following the terrorist attacks on Sept. 11, 2001 in the United States. Nevertheless, scientists representing 21 countries and 5 continents attended the symposium held on Nov. 4-7, 2001, in San Diego, California; 36 scientists gave oral presentations, including four overviews of soy research–metabolism of soy isoflavones, breast and prostate cancer, hormonal effects in women, and the benefits and risks of soy infant formulas. The rest of the talks presented new research information. Two poster sessions were also held on various subjects: the effects of soy on coronary heart disease and atherosclerosis (31 posters), cancer (15 posters), bone (14 posters), kidney (5 posters), blood pressure (3 posters), and cognition (1 poster). There were 17 posters on the metabolism and analysis of isoflavones and another 21 posters on a variety of miscellaneous categories.

This symposium was supported by: Central Soya Co.;



Monsanto; Protein Technologies International; SoyLife Nederland BV [Netherlands] / Schouten USA Soylife; United Soybean Board; Archer Daniels Midland Co.; Cargill Soy Protein Products / Cargill Nutraceuticals; Illinois Soybean Association / Illinois Soybean Checkoff Board; Indiana Soybean Board; Cyvex Nutrition; Nichimo International, Inc.; Nutri Pharma Inc.; Revival Soy; Solbar Plant Extracts Ltd.; Soyatech Inc.; AOCS Press; Dr. Soy Nutrition; Eurofins Scientific / Product Safety Labs; and Optimum Nutrition. This publication was supported by (in alphabetical order) the Indiana Soybean Board, the Kentucky Soybean Board, the South Dakota Soybean Research and Promotion Council, Soyfoods Council, Cargill, and the United Soybean Board. Address: 1. Dep. of Pharmacology and Toxicology, Univ. of Alabama at Birmingham, AL 35294; 2. Nutrition Matters, Inc., Port Townsend, Washington 98368.

972. Du Pont (E.I.) deNemours and Company. 2002. The ingredient that helps great-tasting, healthy foods and beverages fly off the shelves (Ad). *Natural Foods Merchandiser.* March. p. 49.
• ***Summary:*** This full-page color ad is about Solae brand soy protein, which is the soy protein used in 8th Continent Soymilk. For more information visit solae.com or contact Protein Technologies (a DuPont business) at 800.325.7108.

973. Nestle, Marion. 2002. Food politics: How the food industry influences nutrition and health. Berkeley, California: University of California Press. xii + 457 p. Illust. Index. 24 cm. Series: California Studies in Food and Culture, 3. [767* endnotes]
• ***Summary:*** A superb, eye-opening exposé by a food policy insider. Contents: Preface. Introduction–The food industry and "eat more": What is a "healthy" diet?, does diet matter?, do Americans overeat?, the U.S. food industry, marketing imperatives (taste: make foods sweet; fat and salty, cost: add value but keep prices low; convenience: make eating fast; confusion: keep the public puzzled), promoting "eat more" (advertise, advertise, advertise, introduce new products, serve larger portions), issues and themes. Part I: Undermining dietary advice. 1. From "eat more" to "eat less," 1900-1990. 2. Politics versus science: Opposing the food pyramid, 1991-1992. 3. "Deconstructing" dietary advice.

Part II: Working the system. 4. Influencing government: Food lobbies and lobbyists. 5. Co-opting nutrition professionals. 6. Winning friends, disarming critics. 7. Playing hardball: Legal and not. Part III: Exploiting kids, corrupting schools. 8. Starting early: Underage consumers. 9. Pushing soft drinks: "Pouring rights."

Part IV: Deregulating dietary supplements. 10. Science versus supplements: "A gulf of mutual incomprehension." 11. Making health claims legal: The supplement industry's war with the FDA. 12. Deregulation and its consequences. Part V: Inventing techno-foods. 13. Go forth and fortify. 14. Beyond fortification: Making foods functional. 15. Selling the ultimate techno-food: Olestra. Conclusion: The politics of food choice. Appendix: Issues in nutrition and nutrition research. Notes. List of tables. List of figures.

In the chapter on "Beyond fortification" is a section on "soy protein" which describes the FDA heart-health claim–in a rather unbalanced way. In May 1998, Protein Technologies International, a company that manufactures isolated soy proteins, petitioned the FDA to permit claims that soy protein could help reduce the risk of coronary heart disease. Address: Prof. and Chair of the Dep. of Nutrition and Food Studies, New York Univ.

974. *Bluebook Update* (*Bar Harbor, Maine*). 2002. New isolate, new thinking: Cargill rewrites its script. 9(2):8. April/June.
• ***Summary:*** "'It's a whole new product line for us,' says Kevin Marcus, Director of Marketing for Cargill Inc.'s Soy Protein Solutions business. He's talking about a recently announced proprietary isolate which has been in development for the last two and a half years. But he might just as well be talking about Cargill, since 'whole' and 'new' are new directions in which the commodities giant insists it is taking itself these days.

"The world's largest private company, Cargill has always had the reputation for playing its cards close. But now, as it diversifies into refined products, ingredients, and nutraceuticals, Cargill realizes that it has to 'open up a little more,' Mr. Marcus says. 'If someone buys this product (the new soy isolate), its not the end of a relationship, just the beginning. They are buying into our technical expertise.'

"That know-how is part of a Cargill initiative called Food System Design (FSD). Soy Protein Solutions, one of four business units under the FSD umbrella, is working with customers to provide new ingredients and other ideas that will fill consumers' needs. The new isolate is a product of this process.

"'It's made with brand new technology,' Mr. Marcus says. 'Some people don't realize that Cargill has been in the protein isolate business for 30 years but it got lost in the oil business. It's been separated out again for the past three years.'

"Now Cargill can focus on its protein. To produce this new isolate, a plant is being built in Sidney, Ohio, with an operational date set for fall, 2002. Soy Protein Solutions expects to capitalize on soy protein's 'dramatic revolution during the past couple of years, thanks to the FDA's health claim,' says Mary Thompson, VP of the Soy Protein unit. But don't expect it to be operating on a high volume/low price model. Instead, says Mr. Marcus, Soy Protein Solutions, with the rest of Cargill, is focusing on superior products and customer relationships.

"Other recent Cargill debuts have included a new sugar, Trehalose, which is absorbed at a slower, more sustained rate

than other sugars and a highly concentrated isoflavone called AdvantaSoy Clear. Cargill's transformation has included unveiling a new corporate logo and slogans such as 'I am a problem solver,' designed to remold the mindset of the company."

Note 1: Talk with Bill Limpert of Cargill's Soy Protein Solutions. 2002. July. There was a one-word error in this article: Cargill has been in the soy protein business for 30 years, but has not previously manufactured soy protein isolates. When Cargill changed Soy Protein Products to Soy Protein Solutions about 6 months ago, the company made a major commitment to customer service and to helping customers develop new products using existing or new Cargill protein products. PTI has long been doing this with its isolates, Central Soya with its concentrates, and Cargill with its soy flour. Cargill's new isolate plant is expected to open in Nov. 2002.

Note 2. Industry insiders note that ADM supplies the entire range of soy protein products but offers little service in order to keep its position as the low-price supplier.

Note 3. As of 8 Oct. 2002 Cargill has offered an organic soy protein isolate to at least one potential customer. However in a follow-up call, their sales manager says they definitely have no plans to make organic soy protein isolates.

975. DuPont Protein Technologies. 2002. That little extra something makes all the difference (Ad). *Prepared Foods* 171(9):59. Sept.
• ***Summary:*** A full-page color ad featuring three large photos of smiling, happy people. "To learn more about Solae brand soy protein contact us today. www.protein.com or 1-800-325-7108... DuPont: The miracles of science. Solae is a trademark of Protein Technologies International, Inc."

Note: This is the earliest document seen (Sept. 2020) that uses the word "Solae" to refer to a registered trademark.

976. Du Pont (E.I.) de Nemours and Company. 2002. The Solae promise (Ad). *Natural Foods Merchandiser.* Oct. p. 78.
• ***Summary:*** See next page. This full-page color ad is about Solae brand isolated soy protein. "Your customer seeks great-tasting, Better-for-her and her family products–and the Solae™ logo helps her find them.

"Products made with Solae™ brand isolated soy protein deliver great taste and clinically proven health benefits. That's the Solae™ promise.

"A promise backed by a name you can trust DuPont Protein Technologies.

Three large photos show happy, active family members. The young lady in the lower left is drinking a glass of soymilk. For more information visit www.solae.com or contact DuPont Protein Technologies.

"DuPont–The miracles of science®."

"Solae™ is a trademark of Protein Technologies International, Inc."

977. Du Pont (E.I.) de Nemours and Company. 2002. The Solae promise. Better-for-you foods, great taste you and your family will love (Ad). *Natural Foods Merchandiser.* Nov. p. 23.
• ***Summary:*** This 1/3-page vertical color ad is about Solae brand isolated soy protein. A photo shows a bottle of Frulatte: Fat-free smoothie (Orange-Mango flavor). For more information visit www.solae.com or www.frulatte.com or contact DuPont Protein Technologies. "DuPont: The miracles of science."

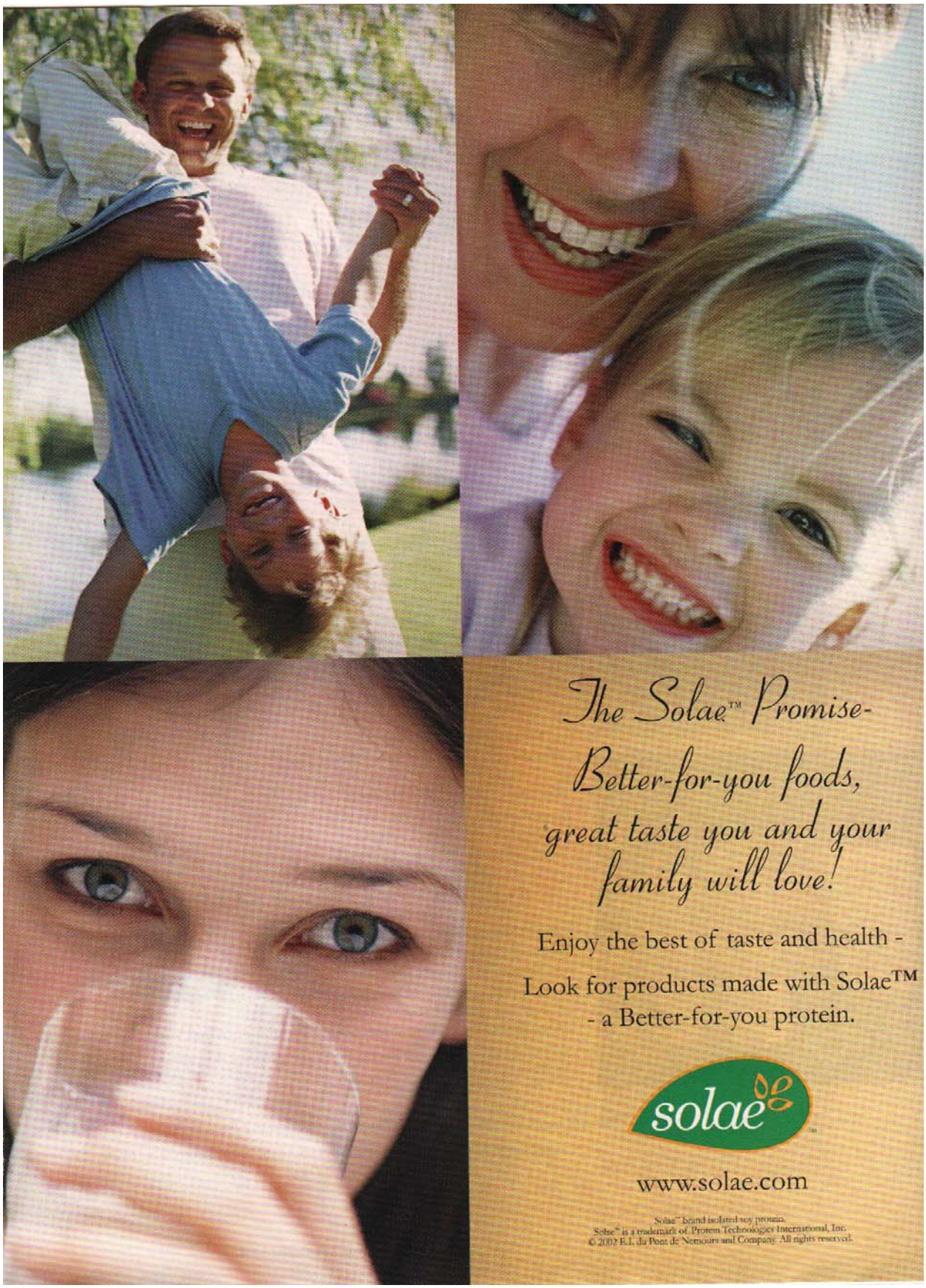
978. *News-Sentinel* (*Fort Wayne, Indiana*). 2003. Soybean processor seeing changes: Local division to be Solae Decatur plant takes Bunge name. Jan. 7. p. 1A. *
• ***Summary:*** "Central Soya Co. will disappear as a corporate name after almost 70 years when its operations are integrated into a business of Bunge Ltd. and a joint venture the company has started with DuPont." Central Soya Co. employs 350 people in Fort Wayne [Indiana] and 150 in Decatur [Illinois]. The Fort Wayne work force is expected to shrink when Bunge integrates soybean processing and refined soybean oil operations into Bunge North America, which is headquartered in St. Louis. Missouri.

979. Reuters. 2003. DuPont and Bunge join in soy-based food venture. *New York Times.* Jan. 7. p. C4.
• ***Summary:*** Bunge Ltd., the world's largest oilseed processor, and the DuPont Co. announced yesterday they are forming a joint venture named Solae to make soy ingredients for the fast-growing health-food market. The companies predicted Solae's annual revenue will be more than $800 million.

Note: This is the earliest document seen (Dec. 2015) that uses the word "Solae" to refer to a new joint venture / enterprise.

980. Sosland, Josh. 2003. Matching grain-based foods and specialty proteins. *Baking & Snack.* Feb. 1. *
• ***Summary:*** "Incorporating specialty proteins into the diet represents a red hot health trend." This idea was reinforced by the creation last month of Solae L.L.C., a joint venture between DuPont and Bunge–based in St. Louis [Missouri], the home of Protein Technologies International. "While agricultural biotechnology and farmer services will be part of Solae, it is the specialty protein business that is at the heart of the venture." The first product introduced under the Solae brand was 8th Continent soy milk, developed in another joint venture between DuPont and General Mills, Inc. (Minneapolis, Minnesota).

Gives a detailed description of ADM's work with and market segmentation for soy proteins. Anthony DeLio of ADM says that "a lack of familiarity and wariness about taste stand as two central challenges facing the category...



Perception problems have been and will be a challenge. It can be difficult to convince consumers to even give soy-based products a try." "Texture and flavor continue to be the focal areas for formulators," says Phil Gentlesk.

"Nutriant [Cedar Falls, Iowa] is the two-year-old nutritional division of Kerry Ingredients, the global ingredient company headquartered in Ireland."

981. *Soyfoods Canada Newsletter.* 2003. Soyfoods Canada membership list. Winter. p. 4.
• ***Summary:*** "For 2002/2003 there are 26 members in Soyfoods Canada. They are:

ADM Protein Specialties
Advantage Seed Growers and Processors
Cold Springs Farms
Concord National Inc.
DuPont Protein Technologies
First Line Seeds
Galaxy Foods
Hensall District Co-operatives
J.L. International
Maple Leaf Foods International
Momo's Kitchen
Nutrisoya Foods Inc.
Ontario Soybean Growers
Parmalat Canada
ProSoya Inc
Saskatchewan Nutraceutical Network
South West Ag Partners
SoyaWorld Inc.
Soylutions Inc.
Stake Technologies
Sunrise Soya Foods
Superior Tofu Ltd.
Tetra Pak Canada Inc.
Tofutti-Cholac Foods
W.G. Thompson & Sons Ltd.
Yves Veggie Cuisine.

982. Du Pont (E.I.) de Nemours and Company. 2003. The Solae promise–Better-for-you foods, great taste you and your family will love! (Ad). *Vegetarian Times.* March. p. 22-23.
• ***Summary:*** This full-page color ad is about Solae brand soy protein. Three large photos show happy, active family members. The young lady in the lower left is drinking a glass of soymilk. For more information visit solae.com or contact Protein Technologies (a DuPont business) at 800.325.7108.

983. Jordan, Joe. 2003. Solae looks to corner soy protein market. *Bluebook Update* (*Bar Harbor, Maine*) 10(1):1. Jan/March.
• ***Summary:*** "When Solae L.L.C., a Bunge / Dupont joint venture announced in January, opens its doors for business this spring, it will be a giant in the soy protein world with sales exceeding $800 million and operations in more than 80 countries.

"The new business takes its name from Dupont's proprietary soy protein as Dupont will assume a majority share of the venture in exchange for its Protein Technologies business. Bunge will contribute its specialty foods business for a 28% share with an option to hold up to 40% of the company. Solae L.L.C. will be headquartered in St. Louis, Missouri, with regional offices in Brazil, Europe and Hong Kong.

"The move creates a major player in soy proteins. Dupont Protein Technologies has an established U.S.-based business with several joint ventures in the potentially huge Chinese market. Bunge's strengths lie in its dominant South American crushing business (access to raw materials) and its newest acquisition, Cereol/Central Soya. Through Cereol, Bunge will contribute six processing plants and two R&D facilities in North America and Europe.

"The agreement also makes plans for joint development of biotech projects, beginning with soybeans containing improved traits. Dupont will also be able to use Bunge's contacts to market their pesticides and herbicides to farmers in South America and elsewhere.

"'This joint venture creates a premier global ingredients company,' says Drew Burke, Managing Director of Bunge Ingredients and the man set to be Vice Chairman of the new company. 'Its growth will be driven by the replacement of meat and dairy proteins in a wide range of food applications.'

"As the new company integrates its assets, the industry awaits clear indications of the direction this newborn giant expects to take."

984. *Oils & Fats International.* 2003. DuPont and Bunge form agriculture, nutrition alliance: Will form joint venture, Solae LLC. 19(2):2.
• ***Summary:*** On 13 Jan. 2003 DuPont and Bunge announced this alliance, which has three main parts: (1) A joint venture–Solae LLC–to manufacture and distribute specialty food ingredients, starting with soy proteins and lecithin; (2) An agreement to develop genetically engineered (GE) soybeans with improved traits–biotech research; (3) An alliance to offer more services and products to farmers.

DuPont will own 72% of Solae, in exchange for its ownership of Protein Technologies International (PTI). Bunge will own the remaining 28% and US$260 million in exchange for its soybean ingredients business.

Note 1. In exchange for the 28%, Bunge contributed Central Soya's Specialty Process Division (formerly Chemurgy Div.)–a leading manufacturer of soy protein concentrates and soy lecithins–which Bunge acquired on 1 Oct. 2002 when it acquired Cereol S.A. (based in Paris). In exchange for the $260 million, Bunge contributed its two soy protein isolate plants in Brazil; that deal (involving minority Brazilian shareholders) was finalized on 1 May 2003.

Bunge North America announced in mid-January 2003 that it would postpone a planned expansion of its soybean crushing plant in Morristown, Indiana; that plant was owned by Central Soya, a subsidiary of Cereol SA, which Bunge acquired in Oct. 2002.

The name "Central Soya" will disappear as the company is integrated into Solae or Bunge. Central Soya presently has 350 staff in Fort Wayne, Indiana, and 150 in Decatur, Illinois.

DuPont is headquartered in Wilmington, Delaware; Bunge Limited is in White Plains, New York.

Note 2. Stephen Tanda has been appointed CEO of Solae–which is based in St. Louis, Missouri; Erik Fyrwalk is chairman.

Note 3. Talk with Hunter Smith, head of corporate and investor relations at Bunge Inc. 2003. May 12. Solae officially began operations on 1 April 2003. At about that same time, for marketing purposes and from the public's viewpoint, "Protein Technologies International" and "Central Soya" (long venerable business names in the soyfoods industry) ceased to exist. Of course the latter two names, although they are now being phased out, will continue to exist for several more months on legal documents such as contracts.

985. American Soybean Association. 2003. American Soybean Association hosts soyfoods luncheon for Congress: Showcases how soy combines good taste with health benefits in U.S. and overseas (News release). 600 Pennsylvania Ave., SE, Suite 320, Washington, DC 20003. 2 p. April 1.
• ***Summary:*** "April 1, 2003–Washington, DC: To highlight the many great-tasting soyfoods and their health benefits, the American Soybean Association (ASA) hosted its first Soyfoods Luncheon" today in Washington, DC. Members of Congress and their staff sampled modern soyfoods and received information about soy's health benefits for domestic as well as international consumers. Representative Jo Ann Emerson (R-MO) served as the Congressional host of the event. One of Washington, DC's premier restaurants, Kinkead's Executive Sous Chef Todd Schiller conducted a cooking demonstration at the luncheon that also featured many recipes from award-winning chef and cookbook author Dana Jacobi.

"White Wave, Solae, Soyatech, Inc., and the Soyfoods Association of North America (SANA) sponsored the event that showcased many soyproducts that helped fuel the 16.9 percent increase in U.S. soyfood sales between 2000 and 2001. U.S. soyfood sales reached $3.234 billion in 2001, according to SANA." Address: Washington, DC.

986. *ASA Today* (*St. Louis, Missouri*). 2003. Soyfoods enjoy growing popularity. 9(6):4-page insert after p. 2. April.
• ***Summary:*** Attractive (with 5 color photos), interesting, and original. This is the first such insert in this 4-page newsletter, and the first time this newsletter has contained a significant amount of information about soyfoods. Below the title is printed: "A special publication from the American Soybean Association." On the back page we read: "ASA thanks the sponsors of this publication...: Solae [DuPont & Bunge], Soyatech, and White Wave. Below the logo of each company is 4½-inch-long column describing the company, its history and activities.

Contents of the insert: Introduction. Soyfoods become mainstream. The most common [widely used] soyfoods. U.S. consumers more aware of soyfoods. The push for soymilk in schools. Soyfoods for the future. Export demand for food ingredient beans.

It begins: "No longer are soyfoods considered unusual or hard to find. No longer are they considered the kind of foods only eaten by so-called 'granola-crunchers' or 'health fanatics'... The menu at the recent American Soybean Association (ASA) awards banquet featured a serving of delicious edamame (sweet green soybeans) that soybean growers and guests alike enjoyed with enthusiasm."

987. Bloomberg News. 2003. Bunge sells a business to its DuPont partnership. *New York Times.* May 6. p. C3.
• ***Summary:*** Bunge Ltd., the world's largest oilseed processor, sold a Brazilian business for $256 million to Solae, its joint venture with the DuPont Co. "Bunge expects a net gain of $111 million, or $1.12 a share on the sale,..."

988. Bunge Ltd. 2003. Global roots: 2002 annual report. 50 Main St., White Plains, NY 10606. 81 p. May. 28 cm.
• ***Summary:*** This year's annual report focuses on Bunge's history and operations worldwide. Consolidated net sales for 2002 (year ended Dec. 31) were $14,074 million, up 22.5% from 2001 ($11,484 million). Net income from 2002 was $255 million, up 90.2% from 2001. Shareholders' equity (net worth) is $1,472 million, up 6.9% from 2001.

In 2002 Bunge became the world's largest oilseed processor and the world's leading seller of bottled vegetable oil. "The acquisition of Cereol was the defining event of the year." As a result, Bunge increased its oilseed processing capacity by 70% to 34 million tons per year, from 20 million, greatly expanded its presence in the European market, and enhanced its strong positions in North America.

In Jan. 2003, Bunge announced an important partnership with DuPont that includes the creation of a stand-alone ingredients company, Solae, and alliances in agricultural production and biotechnology.

Bunge traces its roots back to Amsterdam [Netherlands] almost 200 years ago. Today the company has operations in 29 countries on five continents. "Bunge's goal is to be the best integrated agribusiness and food company in the world." Key dates: In Europe since 1818. In South America since 1884. In North America since 1923. In Asia since 1930.

Bunge's main divisions are: Agribusiness (incl. oilseeds). Fertilizer. Food products (incl. vegetable oil).

Accompanying the annual report is a "Notice of Annual General Meeting of Shareholders" (29 p.). Surprisingly, no information is given about the amount of money paid to individual company officers. Address: White Plains, New York. Phone: 914-684-2800.

989. Fitzgerald, Anne. 2003. DuPont to move ag headquarters to D.M. [Des Moines, Iowa]: A key subsidiary in that division, Pioneer Hi-Bred, is already based in the city. *Des Moines Register* (*Des Moines, Iowa*). June 26. p. 35.
• ***Summary:*** On June 25 DuPont announced that it is "moving the head quarters of its Agriculture and Nutrition Group from Wilmington, Delaware, to Des Moines."

DuPont also announced that, effective July 1, "Erik Fyrwald, a chemical engineer and longtime DuPont employee, will become vice president in charge of the group."

As head of the Agriculture and Nutrition group, "Fyrwald will oversee Pioneer, DuPont's farm chemical business and DuPont Nutrition & Health, which includes The Solae Co., DuPont Qualicon, Liqui-Box and Food Industry Solutions."

For the past three years, Fyrwald "has been a top executive with DuPont Nutrition & Health." Address: Register Agribusiness Writer.

990. *ASA Today* (*St. Louis, Missouri*). 2003. ASA/India spurs major growth in soy consumption. 9(8):6. June.
• ***Summary:*** In March, the American Soybean Association had a booth at the premier food and beverage trade show in India, the 18th International Food Exhibition, called AAHAR 2003, in New Delhi. "Aahar" means food in Hindi. Eight companies participated in ASA's Soy Pavilion: (1) General Food Ltd. (maker of soy nuts, soy oil, soy flour). (2) M.P. State Oilfed (soy biscuits, soy nuggets [TVP]). (3) Protein Technologies International (soy protein isolates). (4) Ruchi Soya Industries (soy flour, soy chunks, soy oil). (5) Soy Appetite (Soy milk, soy rusk, tofu). (6) Sonic Biochem Indore (Full fat soy flour, defatted soy flour). (7) S.S. Agro Industries (fermented black soybeans, soy chunks, soy granules). (8) S.S.P. Ltd. (SSP, soy milk equipment / machinery).

991. Andreas, Lowell. 2003. History of work with soybeans (Interview). *SoyaScan Notes*. July 9. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Lowell grew up the youngest of six children, who were born in the following order: Osborn (born in 1903), Albert, Lenore (the only sister), Glenn, Dwayne (born 4 March 1918), and Lowell (born in 1922). Their parents were married in Sterling, Illinois, on 27 Nov. 1902, and soon moved to Minnesota. Four of the five boys (except Osborn, who later became a concert pianist with the Washington Symphony Orchestra, English teacher, and author), shared an almost lifelong involvement in the family's feed and oilseed processing businesses. Osborn was also involved, but only briefly in the mid-1930s.

In about 1927 Lowell's father, Reuben P. Andreas, started a feed compounding business named R.P. Andreas & Son, in Lisbon, Iowa; the "Son" was Albert. He obtained his soybean meal from A.E. Staley Mfg. Co. in Decatur, Illinois; the meal did not come from Joe Sinaiko [who began processing soybeans in the spring of 1928 at Iowa Milling Co. in Cedar Rapids, Iowa]. Reuben's products were sold as "Andy's Feeds." In 1934 Reuben took three more sons (Osborn, Glen, and Dwayne) into the business and changed its name to R.P. Andreas & Sons. Lowell, the youngest, was still in high school.

In 1938, on the advice of his son, Dwayne (who was so advised that year by Mr. A.E. Staley), Reuben decided to start a soybean processing company in Cedar Rapids, Iowa. The family bought an animal feed manufacturing mill in Cedar Rapids, contracted for a soybean processing plant to be built next to it, and imported solvent extraction equipment from Italy; the manufacturer may have been Bonotto. Next to the solvent extraction plant they had a livestock feed plant built. The family (Reuben, Lowell, Dwayne, Glen) moved to Cedar Rapids (12 miles to the northwest) and in 1938 the new company, named Honeymead Products Co., began processing soybeans into oil and meal.

The name "Honeymead" was coined by one of Lowell's brothers (he does not remember which one) in about 1938 in Lisbon, Iowa. The company was incorporated in Iowa.

In about 1944 Honeymead bought land in Washington, Iowa, and had a soybean crushing plant built on it. Shortly thereafter Honeymead had another soybean crushing plant built in Spencer, Iowa. The soybean oil and meal from both plants were sold on the open market.

Note: In May 1945 Cargill purchased the Honeymead plant at Cedar Rapids, Iowa. By March 1947 Cargill also owned the former Honeymead plants in Spencer, Iowa, and Washington, Iowa. Reuben Andreas, Lowell's father, was an entrepreneur and a good businessman. His sons learned much about business from him. Lowell recalls, "We never talked about sports at the dinner table." Reuben was a Mennonite in his youth, but Lowell recalls that "we did not grow up in a Mennonite home–even though Dwayne likes to eulogize about that"–his Mennonite upbringing and values. Reuben remained actively involved on a day-to-day basis with the family solvent extraction plants and the businesses until they were sold to Cargill.

Glen, Dwayne, and Lowell Andreas each learned a lot about soybean processing from Joe Sinaiko–who let them (his competitors) observe operations in his plant in Cedar Rapids. "In those days, there was room for a lot of competitors," Lowell recalls. "Joe was honest and stuck by his word." He also recalls learning about controlling the moisture in the soybeans being processed and the moisture

in the meal being sold, controlling the fat content of the meal produced, and doing everything with a few people as possible. Lowell did this by observation in Joe's plant; Joe never "taught" these things to the Andreas brothers.

Lowell's mother, Lydia, died in 1938, when he was age 16. Lowell's father, Reuben Andreas, had several strokes during World War II (which removed him from business life), later remarried, and died in about 1958.

Lowell first attended Wheaton College in Illinois for 2 years, then went for 2 more years to the University of Iowa in Iowa City. He majored in philosophy (medieval) at both places. Today Lowell believes that philosophy, which taught him to think, reason, and concentrate on a subject, is an excellent major for business leaders–much better than an MBA degree. Reuben was the only member of the Andreas family who entered the military during World War II. He volunteered and served in the Army Medical Corps in the U.S. for 4½ years; he was in limited service because of his eyesight, so he developed plans to train medics. During the war he married Nadine Hamilton. After the war he returned to Cedar Rapids, where he worked in one of the family owned businesses that insured turkeys; he was an adjustor for turkey insurance for about a year, then the family heard that a soybean plant in Mankato [Mankato Soybean Products Co.] was for sale.

In 1947 Dwayne and Lowell bought that plant and renamed it Honeymead, and Lowell and his wife moved to Mankato from Cedar Rapids to run the plant; "Dwayne was the visionary; I was the manager." Dwayne continued to reside in Minneapolis, where he was vice-president of Cargill, but he would visit the Mankato plant from time to time.

In 1960 Dwayne and Lowell sold the Honeymead plant in Mankato to the Farmers Union Grain Terminal Association (GTA). Lowell had a contract with GTA to manage the company for them for 10 years. After the sale, in 1964 Dwayne and Lowell started National City Bank in Minneapolis; it was Dwayne's idea, but Lowell was interested in finance and had it looked like a good business to be in. In 1965 Shreve "Bud" Archer, Jr. of ADM offered to sell Dwayne and Lowell a block of ADM stock [100,000 shares at about half its book value, for a total of $3.3 million], which amounted to effective control or the company, if they would agree to come in and run ADM–a company that was in decline, had too many workers and was very poorly managed. Dwayne and Lowell saw ADM as a company with great potential if they could turn it around. Dwayne owned 60% of the block of stock and Lowell owned 40%.

Both Dwayne and Lowell moved to Minneapolis, where ADM was headquartered. Lowell stayed there for 1 year. Both men quickly realized that ADM needed "total reorganization" and the first step required moving the headquarters from Minneapolis to Decatur, Illinois,–where they built a new office building. All employees were offered their same jobs in Decatur or generous severance pay if they chose not to move. ADM lost 200 people in the move–without laying off anyone and without problems. Downsizing was the main reason for the move, yet the employees felt they had been treated fairly. By early 1967 Lowell was executive vice president of ADM, and by mid-1968 he was president–focusing on processing and trading. In about 1967 Lowell moved to Decatur with the company, but he told Dwayne at the time that, if he could afford to, he would like to retire at age 50–his ambition since he had gone into business. At age 49 Lowell reminded Dwayne that he had one year left and that he had hired and groomed the man (Donald B. Walker, former vice president of Ralston Purina, and a good friend) to replace him. True to his word, Lowell retired in 1972 at age 50 and moved with his wife back to Mankato. He still owns his ADM stock and today he has residences in Mankato, Naples (Florida, on the Gulf of Mexico), and Grand Cayman (Cayman Islands, in the Caribbean northwest of Jamaica). Lowell has a daughter, Pamela, and a son, David. Dwayne has one son, but he can never return to ADM. Address: Mankato, Minnesota.

992. FBX. 2003. Soyfoods Latin America: September 29-30, 2003. Grand Hyatt, Sao Paulo, Brazil. www.foodbevx.com (Brochure). Bar Harbor, Maine. 8 p. 28 cm.
• ***Summary:*** This brochure begins: "The Food & Beverage Exchange proudly presents the next event in the Soy Series." In association with Soyatech. Summit sponsor: Solae. A list of the main speakers is given. Summit chairmen: Peter Golbitz, President, Soyatech, USA. Leon Klein, President, Klein Commodities Inc., Brazil. Opening address: Roberto Rodrigues, Minister of Agriculture, Brazil.

The program is described in detail on pages 3-5. Page six discusses 7 available tours of Brazil. Page 8 is sponsorship and exhibition opportunities.

The price is $1,299 for those who register by Aug. 1, but $1,599 after Sept. 15.

993. Day, Sherri. 2003. Tricking the taste buds: Science seeks sweet disguise. *New York Times.* Aug. 26. p. C1.
• ***Summary:*** "In April the Linguagen Corporation, a biotechnology company in Cranbury, New Jersey, that is conducting taste research, received a patent for the first molecular compound that will block bitter tastes in foods, beverages, and some pharmaceuticals. The compound, named adenosine 5'-monophosphate, or AMP–occurs naturally," as in breast milk.

Coca-Cola Co., Kraft Foods, and Solae Company (a soy-foods firm owned by DuPont and Bunge Ltd.) have each expressed interest in the new product.

994. Bruemmer, Bruce. 2003. Recent research on vitamin E and tocopherols (Interview). *SoyaScan Notes.* Sept. 17.

Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Recent research on vitamin E has showed that supplements containing natural mixed tocopherols (alpha, beta, and gamma) are the most effective. Most vitamin E supplements contain only alpha-tocopherol, and many brands are synthetic rather than natural–which has greater bioavailability.

Paul previously worked for 4 years at Protein Technologies International (PTI) in their business unit. Address: Archivist, Cargill Corp., Minneapolis, Minnesota.

995. Nelson, Tina. 2003. SANA [Soyfoods Association of North America] 25th anniversary celebration. September 4, 2003. Washington, DC: Soyfoods Association of North America. 2 p. 28 cm.
• ***Summary:*** A brief and superficial story of the founding of the Soyfoods Association of North America in July 1978 in Ann Arbor, Michigan. Steve Demos and Lester Karplus, who were present at both the founding and at this reception, shared their reflections of the past 25 years. She thanks the chefs who created the evening's soy delicacies: Kim Galaez, Patricia Greenberg, Dana Jacobi, and Akasha Richmond. She also thanks and acknowledges the sponsors of the evening: ADM, Cargill, Hain-Celestial Group, Kellogg / Worthington Foods, Light Life, Solae LLC, Sunrich, Tetra Pak, Vitasoy-USA, and White Wave. And she welcomes special guests from USDA, FDA, and Capital Hill.

The talks ends: "Thank you all for coming and enjoy the soy treats and the historical documents and photos with your colleagues." Address: Galaxy Foods.

996. Corbin, James. 2003. The origin (in 1954) and development of extruded pet foods at Ralston Purina in St. Louis, Missouri (Interview). *SoyaScan Notes.* Nov. 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jim earned his PhD in 1950 then went to work for the National Oats Co. He was not very interested in this work and "not much was happening," so he went across town to Ralston Purina (RP) at Checkerboard Square, St. Louis, Missouri, and applied for a job. They knew of his work and were happy to hire him to do animal feeding trials with feeds and pet foods. He was in charge of the microbiological laboratory. In those days most dry pet foods were made by a process called pelleting, which producing hard little cylinders the shape of a short piece of chalk. Jim's coworker was Joseph M. Vandepopulaire, who had started work at RP 2 weeks earlier. Joe, who now resides in Columbia, Missouri, had a master's degree in biochemistry and animal nutrition from the University of Missouri. Jim and Joe replaced two older men.

Douglas Hale (who now lives in Connecticut) worked across the hall in the RP breakfast cereal division trying to develop a cereal that would not get soggy so quickly after milk was added. He modified a small machine so that it worked something like an Anderson extruder, except it had no holes or slats in the side; rather all the contents came out of a small hole in a die at one end. Douglas Hale, working with Penny Nichols, had developed the first extrusion cooker–for breakfast cereals! Dough was a born politician and like to take credit for things–which created some animosity.

Jim and Joe were assigned work to do each day; they usually finished about noon, so they asked their boss, Harold Wilcke, what they should do the rest of the day. He told them to do something useful for RP. They visited Doug Hale and asked him if they could borrow his machine. He said "yes," so they carried it across the hall to their lab and began experimenting with different mixtures to run through it. The early mixtures contained dried meat scraps and meal, grains, soybeans, and a vitamin-mineral premix. They were astonished at the material that burst out of the machine at the end after having been cooked in the barrel under pressure from a screw.

When Walter Montgomery, who was in sales at RP, saw the first prototype products, he too was impressed. The final prototype was called X-24 because it was the 24th formula they had tested and it contained 24% protein. The first man to see commercial possibilities in the extruded product was Geoffrey Baker, who was in the human foods division of RP. In 1954 they test marketed the dry dog food in multiwall paper bags at Phelps Grocery Co. in Little Rock, Arkansas. It was a commercial success–in part because each bag was 3 times as large as the competing dog food made of baked oats–even though both bags weighed the same. Before long, the product was named Purina Dog Chow.

Ralston Purina decided to keep the process and equipment secret by not patenting it. So they found a machine shop in St. Louis which would make them more and larger extruders. George Lanz, an engineer, tested and improved the machines. The Wenger Manufacturing Company (an early maker of extruders) did not even exist at this time. But the two men who founded Wenger saw RP's extruded product and went to work trying to figure out how it was made. They slowly developed a machine that would make a similar product, but RP continued to use their own machines.

Ray Porter designed and built factories for Ralston Purina. The first factory that commercial Purina Dog Chow was in St. Louis. The machinery was soon installed in existing plants at Davenport, Iowa, and Denver, Colorado.

The rest is history. Today the market for dog and cat foods in the USA is worth $19.3 billion. Address: 186 Animal Sciences Lab., 1207 W. Gregory Dr., Urbana, Illinois 61801. Phone: 217-333-3132.

997. Boone, Carolyn. 2003. Central Soya will cease to exist on Dec. 31 of this year (Interview). *SoyaScan Notes.* Nov. 19. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** On Dec. 31 Central Soya will close its long-time headquarters in Decatur, Indiana, and turn the building over to Bunge, which purchased Central Soya in April. Central Soya has basically been folded into Solae. Carolyn has worked for Central Soya for 11 years and has a deep interest in and dedication to the company's history and corporate culture. She is working very hard to preserve Central Soya's historical records before they get lost. Since Central Soya no longer has a librarian, she has tried to preserve important documents that were part of the library. She has taken some to the Decatur (Indiana) Historical Society. She has scanned hundreds of photographs and historical documents (such as old company newsletters back to 1934) into PowerPoint and Microsoft Word, then burned that information into CDs; it now fills five CDs. She is now in the middle of several large scanning projects. Using a Cannon Multifunction Machine she is scanning all laboratory research notebooks, so that each notebook is stored as one document. Then she imports it into Lotus Notes take create a database. She is adding descriptive and indexing terms which users can use to search the database.

Central Soya's research center and sales office in Decatur will be moved to St. Louis, Missouri. Some of the higher company officers have been invited to move also, but most of the lower employees (incl. those in customer service) have not been invited to move. Central Soya's plants, for example in Gibson City, Illinois [dedicated by Central Soya in May 1948], and in Bellevue, Ohio [constructed by Spencer-Kellogg & Sons in 1945 and purchased by Central Soya before 1976] will continue to be operated by Bunge/Solae. Central Soya also has plants in Remington, Indiana; and Pawtucket, Rhode Island. Address: Central Soya Co. Phone: 260-425-5380.

998. Saunders, David. 2003. Update on the Soy Protein Council (Interview). *SoyaScan Notes.* Nov. 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Soy Protein Council has not been very active during the past few years. They have no annual budget except for a fixed management fee (overhead, which pays indirect costs including part of David's salary), deal mainly with regulatory issues (such as USDA, FDA, and school lunch programs), and are paid on a project by project basis. There are three members: Cargill, ADM, and Solae (a joint venture of DuPont and Bunge).

The member companies do promotion at the company level. They have seen much growth in demand for soy protein products since Oct. 1999 when the FDA issued its heart health claim for soy proteins.

Since one of the members was involved in anti-trust and price-fixing issues several years ago, that company's attorneys have advised that they should not be meeting in a closed room with their competitors. When they do meet, David hires an anti-trust attorney to be present at the meeting, makes sure that there is a clear agenda that is adhered to, and that detailed minutes are kept.

NOPA (formerly NSPA) used to be managed by Sheldon Hauck & Associates, but they left for another management firm. Address: Executive Director, Washington, DC.

999. Nordquist, Ted. 2003. Big companies increasingly active in the soyfoods industry. DuPont is pushing for an organic standard for a new soy protein isolate made without using hexane (Interview). *SoyaScan Notes.* Dec. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Big companies like DuPont, ADM, and Solae are increasingly active in the Soyfoods Association and at industry conferences. An increasing percentage of the money seems to be coming from them. Soy protein isolates are widely discussed as "soy" but Ted has never heard anyone discuss how they are made–using hexane solvent. Address: TAN Industries, Inc., 253 Sacramento St., Suite 1120, San Francisco, California 94111. Phone: 415-495-2870.

1000. Jacobi, Dana. 2003. Serving soyfoods on Capitol Hill (Interview). *SoyaScan Notes.* Dec. 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Each year the American Soybean Assoc. (ASA) has a board meeting in Washington, DC. At that time they have an event for Congress. This year ASA decided to "host its first Soyfoods Luncheon," which they announced in a 2-page news release. Representative Jo Ann Emerson (R-MO) served as the Congressional host of the event. White Wave, Solae, Soyatech, and SANA sponsored the event but it (incl. Dana and her food) was paid for by ASA.

Apparently Nancy Chapman of the Soyfoods Association told ASA that Dana was a professional chef with expertise in soyfoods. So Dana got a call from Anna Pavolva of ASA inviting her take responsibility for catering this event. Dana ended up hiring a local caterer, because she lives in New York City and could not make all the preparations at such a long distance. Dana supplied the recipes and supervised the food preparation.

The event took place at lunchtime on Tuesday, 1 April 2003 at the Rayburn Building in Washington, DC. Dana was told to prepare for 200 people, but about 250-350 showed up–most of them staffers, but there were a few members of Congress. The room (29 by 52 feet, or 1,508 square feet) was packed, with standing room only. Food was served on four draped tables, buffet style like a real catered party, with real China plates (no paper plates), and spoons and forks. The attendees ate *all* the food. Dana's meatless recipes (the majority of which came out of her latest cookbook), all on one long table were: Sweet & sour meatballs. Beans and franks (Using Bratos for the franks). Macaroni salad (using ADM's Soy-7 macaroni). Honey mustard with tofu (served 3 kinds of donated soyburgers from Boca and Morningstar Farms). Chocolate velvet mousse. Edamamé. Finger

sandwiches with soynut butter and jelly.

ASA hired a chef (Tod Schiller) from one of Washington, DC's premier restaurants, Kinkead's, and he conducted a cooking demonstration at the luncheon; at a second table he served a very elegant soyfoods recipe that included edamamé.

White Wave / Dean Foods had a 3rd table at which they served Silk Cappuccino soymilk out of a cooling machine. On a 4th table at the end of the room was Solae 8th Continent soymilk and Luna Bars (cut into pieces for finger foods). ASA and United Soybean Board had a 5th long table on which was information (leaflet, pamphlets) and exhibits about soybeans and soyfoods.

Dana mingled anonymously and talked with many of the staffers. "They were astounded by all the good food. This sort of event helps greatly to dispel the negative image that soy still has in terms of how it tastes and looks." Dana notes: "My interest in not in preaching to the converted, it is in introducing soyfoods to the rest of the people." Address: New York City.

1001. *SoyaScan Notes.* 2003. Chronology of major soy-related events and trends during 2003 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. ENSA, the European National Soyfoods Association is established. All members produce soyfoods from whole soybeans that have not been genetically engineered.

Jan. 13–DuPont and Bunge announce an important partnership that includes the creation of a stand-alone ingredients company, Solae, and alliances in agricultural production and biotechnology.

April 1–Solae officially begins operations, owned by DuPont (72%) and Bunge (28%). To the partnership, DuPont contributed its Protein Technologies International business and Bunge contributed its North American (Central Soya and CanAmera Foods) and European soy ingredients operations. At about that same time, for marketing purposes and from the public's viewpoint, "Protein Technologies International" and "Central Soya" (pioneering and venerable business names in the soyfoods industry) were quietly and unceremoniously "disappeared."

April–The 63-year-old name of *Soybean Digest* is changed to *Corn and Soybean Digest*. The subtitle on the cover now reads: "Maximizing production and marketing for profit." The magazine also has new graphics and a new look.

April 26–Soyfoods Center and H.T. Huang, PhD (an expert on the history of food and agriculture in China) finish a two-year project to translate into English all known passages that mention soy in the Chinese literature from 1100 B.C. to 1923–from 236 different documents–and to make this information available in electronic form in the SoyaScan computerized database.

May–Bunge sells its Brazilian soy ingredients operations (Samrig Division of Santista Alimentos) to Solae for $251 million in cash, realizing a tax-free profit of $111 million on the sale.

July 9–FDA and U.S. Department of Health and Human Services announce that the trans-fatty acid content of all packaged foods sold in retail stores (but not in restaurants) must be listed on the "Nutrition Facts" portion of food labels starting 1 Jan. 2006. "Trans fats," like saturated fats, are considered "bad fats" which contribute to heart disease and obesity. Trans fats rarely occur naturally; they are created by hydrogenation of vegetable oils–including soy oil.

Sept. 21-24–Fifth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held in Orlando, Florida. Proceedings published in *J. of Nutrition,* 2004 May Supplement (p. 1205S-1293S).

Oct. 31–Stake Technology Ltd. (of Canada, which owns SunRich) changes its name to SunOpta.

Trends: (1) Soybeans are starting to be seen as an enemy of the environment, especially in Brazil where they are expanding onto and leading to deforestation of environmentally precious or sensitive land, as in tropical rain forests, as world demand for high-protein feeds to produce animal products (meat, poultry, and fish)–especially in China.

(2) The FDA decision on labeling of trans fatty acids will clearly lead to a rush (by both private and public soybean breeders) to develop soybean varieties whose oil is low in linolenic acid and therefore does not have to be hydrogenated. These specialty soybeans, which will be grown on at least a million acres, will have to produced and marketed using the "identity preserved" system rather than the traditional "commodity" system. This change will probably transform the way all soybeans are handled in America. Today only organically grown, non-GE (non-GMO), and specialty soybeans are identity preserved.

1002. FBX. 2003. Soyfoods Summit: February 18-20, 2004. Hyatt Regency La Jolla, San Diego, California. www.foodbevx.com (Brochure). Little Falls, New Jersey: IQPC. 12 p. 28 cm.
• ***Summary:*** This brochure begins: "The Food & Beverage Exchange is proud to present its 7th Annual Soyfoods Summit." In association with Soyatech. Media partners: Nutrition Business Journal, The Soy Daily, Nutraceuticals World. The conference, which is being organized by The Food & Beverage Xchange, a division of IQPC (London, England), will have two separate tracks of presentations: (A) Technology & applications, and (A) Health benefits of soy. Summit chairs: Peter Golbitz, president, Soyatech, is chair of track A. Geri Berdak, Director, Public Affairs, The Solae Company, is chair of track B.

The facts: (1) "The US Soyfoods market has grown at an average annual rate of 14% per year for the past ten years and hit $3.65 billion in 2002." (2) "Per capita soy

consumption will rise by 50% in the next 5 years." The main speakers, with their organization, track, an outline of their talk, and a small photo are given. Track A: Dr. Jonathan F. Gordon, Firmenich Inc. Hiraoki Iwamoto, Tendre Corp., Japan (frozen tofu). Phil Fass, ADM. Dr. Michael Shemer, Tivall Corp., Israel. Motohiko Hirotsuka, Fuji Oil Co Ltd, Japan. Brad Strohm, Wenger Manufacturing Inc. Mian Riaz, Texas A&M University. KeShun Liu, Univ. of Missouri at Columbia. Victor Braverman, Braverman & Associates, Mexico. Jorge Arturo Canas Diaz, Central Heledra Diaz, Costa Rica.

Track B: Milagros Virginia C. Lim, Nestle Philippines Inc., Philippines. Mark Messina, Nutrition Matters Inc. John L. Williams PhD, Univ. of South Dakota. Prof. Fujian Yang Zhenhua 851 Bio-Science Co Ltd, China. Omer Kucuk M.D., FACN, Wayne State Univ., Karmanos Cancer Inst. Helen Kim PhD, Univ. of Alabama at Birmingham. Prof. Mindy S. Kurzer, Univ. of Minnesota. Dr. Ari Babaknia, DrSoy. Wendy Barrett, Eat Smart. Deborah Miller, The Solae Group.

Day 1–General session at end of day: John A. Schillinger, PhD, Heartland Fields, LLC. Peter Hannam, First Line Seeds.

Day 2–General session running all day: Paul Lang, Natural Products Inc. Seth Tibbott, Turtle Island Foods. Tom Woodward, Tetra Pak, Singapore. Ted Nordquist, WholeSoy Co. Hsien-Hsin Chang, Lightlife Foods. Gerard Klen Essink, Prosoy Research & Strategy, The Netherlands. Frank Daller, Soyadairy, Canada. Daniel Burke, Pacific Soybean & Grain. Garnet Pigden, The Solae Company. Gerry Amantea, Hain Celestial Group Inc. Johanna McCoy, Soy Happy. Kim C. Kristoff, Gemtek.

Post-conference interactive workshops: Tim Redmond, formerly with American Soy Products. Patricia Godfrey & Danielle Karleskind, Cargill Soy Protein Solutions. Peter Golbitz, Soyatech.

For those who register and pay in full by Dec. 5, the Gold Package of conference plus three workshops the price is $2,999. By Dec. 31 it rises to $3,099. By Jan. 9 it rises to $3,199. After Jan. 9 the full price is $3,299. This does not include lodging and food. The price is $1,299 for those who register by Aug. 1, but $1,599 after Sept. 15.

Note: Talk with two people who will speak at this conference. They are paid no honorarium for speaking, and they must pay their own transportation both ways and all room and board expenses while at the conference. Why do they go? Both say this gives them an opportunity to attend the conference free of charge, to have a nice vacation in a warm and beautiful part of California, and to meet now people and promote their ideas and (informally) their products.

1003. Mescher, Kelly. 2003. Community based clinical trials may help to prove soy to be excellent protein source for HIV/AIDS patients: Investing Checkoff dollars. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*) 15(3):20. Dec.

• ***Summary:*** Cade Fields-Gardner made a trip to Coimbatore, India, "to test the benefits of soy protein on people infected with HIV. The trip was co-sponsored by the World Initiative for Soy in Human Health (WISHH) organization and The Solae Company, a joint venture established by DuPont and Bunge Limited.

"Fields-Gardener is a HIV nutrition consultant with The Cutting Edge, an organization created to address nutrition-related issues in HIV disease." The 2-year trial will test 3 questions: (1) Is additional protein beneficial in the diet of a person who is HIV infected? (2) Is there a difference in benefit between adding a local protein and a soy-based protein? (3) Are the food products with added soy protein acceptable?

"Fields-Gardner believes protein does play a crucial role in slowing down and reducing the effects of HIV and AIDS," since people with these diseases "burn up protein very quickly. That means their body starts burning up body cell mass, such as muscle tissue, to activate immune cells. And if the body goes into survival mode, it will burn up some of the organ tissue to survive. It's the people who have a higher level of quality protein intake that tend to hold onto that body tissue better."

1004. **Product Name:** Soy Protein Isolates (Bland Flavored) [SPI 6000, SPI 6200, SPI 6240, SPI 6500].
Manufacturer's Name: Protient.
Manufacturer's Address: 1751 West County Road B, Suite 200, St. Paul, Minnesota 55113. Phone: 651-638-2600.
Date of Introduction: 2003.
Ingredients: Soybeans.
New Product–Documentation: Ad (4 x 5 inches) in The Non-GMO Source. 2004. Feb. p. 11. "Protient: The future of protein." Website: www.protient.com.

Talk with Penny Garcia, R&D for Proteint. 2004. May 5. She worked for PTI for 5 years before coming to Proteint, a company that was founded to make whey protein isolates and concentrates. They now offer two soy protein isolate products: SPI 6200 (their basic product, with excellent flavor, neutral pH and high solubility) and SPI 6200. Both were introduced in early 2003. They make these isolates from defatted soybean flakes, which they buy. Their selling points are excellent bland flavor (from membrane filtration), good functionality, and competitive lower prices. They are a small company.

1005. Deutsch, Claudia. 2004. Advertising: A dish of protein with a side of comedy is being use to promote foods with a soy additive. *New York Times.* Feb. 27. p. C2.

• ***Summary:*** Most people believe protein is good. But should they get it from steak and eggs, or from soy? The Solae Company, a joint venture formed last year between DuPont

and Bunge, is already racking up $1 billion in annual sales of Solae–its soy protein additive. It is being used to turn drinks and other products into high-protein foods. Now Solae is promoting the phrase "Solae inside"–but its not easy. The TV ads must convince consumers to look for the Solae logo on foods and drinks, and to think of this soy protein isolate as tasting good and being a healthy protein source.

The approach: To make viewers laugh at absurd ads. A series of four 15-second commercials, titled "Protein in unexpected places" show classic blind taste tests. In each a chef with a white toque and a dark-suited host waylay unsuspecting passersby, blindfold them, then subject them to the Solae Protein Quiz, a taste test between a popular protein source and a food or beverage enriched with Solae (such as Snapple). On learning that Snapple contains protein, the victim says "Cool." The tag line: "Proof of protein," near the Solae logo. Among the 40 foods and drinks that include Solae are 8th Continent soy milk and Gardenburger. Many more are in the pipeline. Mainstream consumers now connect food choices not just with health (as before), but with lifestyles and taste. People already love the foods that now contain Solae.

Todd Sutton, Solae's global marketing director, says "consumers buy more than $3 billion worth of soy products per year." In the USA? Worldwide?

1006. Drosihn, Bernd. 2004. Update on soyfoods in Europe. Part II (Interview). *SoyaScan Notes.* March 15. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Soymilk: A major new soymilk maker in Europe is named Wild (www.wild.de), an old German food company that specializes in fruits and ingredients; their retail soymilk is named Soy and Joy. Their most famous brand is Caprisun, a non-soy drink in a foil pouch, well known in the USA. They and So Good, the Australian soymilk now made with Solae, are both strong competitors of Alpro.

Several weeks ago Hain-Celestial of New York purchased two German soymilk makers, both owned by Bruno Fischer, Jr.: Natumi and Gut Honneroth. He sold both companies at a low price–probably because he had to. Bruno had gotten his soymilk into Aldi, the mother company of Trader Joe's and the No. 1 discounter in Germany–and maybe in all of Europe, and he developed a large soymilk business with Aldi–perhaps so large he could no longer handle it himself. Bruno also made a lot of private label soymilk. With Hain, Bruno found a large German dairy to make soymilk for Aldi under a new Aldi brand. The new European CEO of Hain-Celestial is Philippe Woitrin, who was CEO of Lima Foods when Hain acquired it.

Triballat makes the best soy yogurts (Sojasun brand) in the world–in Bernd's opinion. They have a new brand, Sojadé, which are delicious creamy yogurt drinks–maybe organic. The Japanese Yakult concept of drinking live beneficial probiotic bacteria each morning has now caught on in a big way in Europe. Yakult is one of the best entries into the European food market in years. Bernd just saw White Wave's Silk Alive [the name was soon changed; it was sold commercially only under the name "Silk Live"], a similar product, at the Anaheim Natural Products Expo. But he liked the Wildwood smoothie even better, and the WholeSoy fermented soymilk best of all American products.

In France a small company named Sojami (pronounced so-zha-MEE), which started about 10 years ago, makes very creative, unique, and interesting soy cheeses and cultured soy yogurts. The founder has a university research background and is a very nice guy.

Tofu: Tofu consumption in Europe has expanded steadily over the past 5-7 years, but it is still a very small product. The largest maker of the tofu and tofu products sold in Germany is Life Food GmbH / Taifun Produkte, run by Wolfgang Heck and Guenter Klein. Heuschen-Schrouff B.V. (Landgraaf, Netherlands) and Viana are tied for second place. About 10 years ago, Heuschen-Schrouff started selling their tofu under the organic So Fine brand (www.sofine.nl). An Indian-run company in Kerkrade, Netherlands, run by the brothers Singh (both Sikhs), makes tofu mostly for the Asian (Indonesian) market. In 2001 Viana started selling its tofu to the mainstream market under the Veggie Life brand; this English-language brand name communicates well to people speaking many different languages throughout the EU (European Union)–though distribution is still limited to Germany and Austria. Soto Tofu, formerly run by Rolf Barthof has been sold to a very large dairy company, Algäuland. Viana's main products are tofu and tofu products–such as meat and cheese alternatives. Viana is #1 in Germany in meat alternatives. Germans buy soyfoods for three main reasons: They are good for one's health, they taste good, and good for the environment. Bernd is a vegan, but about 90% of Viana's products are sold to non-vegetarians.

Early tofu companies still active in Europe include Sojafarm (founded and still run by Lothar Stassen), Albert's Tofuhaus (Albert Hess; exports lots of his products to France). A basic problem with the smaller, early tofumakers in Germany is that they didn't have the creativity or power to put a brand on the market. So both these companies produce a lot of tofu under private labels. Lothar bought the Svadesha brand (Svadesha was the first German tofu company) and produces tofu under the Svadesha brand. About 2-3 years ago he also purchased the Nagel's Tofu brand from Christian Nagel, who now markets the tofu under his former brand. So Lothar makes tofu under 3 brands. Berief Feinkost (in Beckum [Bochum?], northern Germany), started 10-15 years ago, tries to cover the mainstream tofu market, but not very successfully. Kassel Tofu Kato (started by Gyoergy / Yuri Debrecini, who was at Soyastern). Thomas Karas is no longer involved with soyfoods; he tried to enter the computer business but Bernd does not know what he is doing now. In Spain, the market leader is Natursoy near Barcelona. Nearby

is Salvador Sala of Vegetalia. In Spain, there is a lot of interest in and rapid growth of soyfoods and organic foods. In Italy the Ki Group (Schenker) owns a tofu company–fairly old but not very creative.

In the United States, Pulmuone now has three U.S. factories; their first one in Southgate, southern California, a new one at Fullerton, California, and a 3rd one in New York. The Fullerton factory is the most modern Bernd has ever seen. There they make Gourmet Tofu, introduced in about Jan. 2004, which is presliced and marinated, in 4 flavors / styles: Baked, Sliced, and Marinated.

Meat alternatives: Nestle now owns Osem which owns Tivall, the Israeli maker of meat alternatives. Since all of Tivall's products are held together by eggs or egg whites, none of them are vegan–and none are organic. Quorn, which also contains lots of egg protein, is owned by AstraZeneca [Marlow Foods]–which wants to sell the company because growth and profits have been lower than expected. DE-VAU-GE in Germany is a very big company, they make large amounts of meat alternatives (incl. burgers), and they do a lot of business with Aldi in breakfast cereals–not in soyfoods. Bernd thinks they are good, and very economical manufacturers, but they are not very creative and they have no USP (unique sales point); moreover, many of their products contain egg protein, but their quality is lower than that of Tivall. Bernd believes his meat alternatives are as good as Tivall's, but more expensive, in part because of organic ingredients. Tivall makes its raw materials in Israel, then exports these to Europe for cutting and flavoring.

Klaus Gaiser owns Topas which sells Viti brand meat alternatives based on wheat gluten, with no soy; he owns the brand and markets the products, but he has meat companies manufacture them. However, when his typically 3-year contract with the manufacturer expires, he has to find a new manufacturer, but the previous one keeps making his products under their own brand. In the USA: At Turtle Island Foods (Hood River, Oregon), Bernd met Hans Wrobel, a German who does product development. Note: Hans and Rhonda Wrobel of The Higher Taste developed Tofurky in Portland, Oregon. Bernd makes Pizzarella, a tofu-based cheese alternative. Address: Founder and president, Viana Naturkost GmbH, 54578 Wiesbaum / Vulkaneifel, Germany. Phone: +49 06593-99670.

1007. Market Wire. 2004. FDA reviews health claim petition regarding reduction in cancer risk (News release). www.findarticles.com. 2 p. April

• ***Summary:*** The U.S. Food and Drug Administration (FDA) confirms that it is in the process of reviewing a petition for a health claim that suggests the consumption of soy protein-based foods may reduce the risk of certain types of cancer, including breast, prostate, and colon cancer. The Solae Company submitted the petition. Address: Fort Wayne, Indiana.

1008. Bunge Ltd. 2004. Life grows with us: 2003 annual report. 50 Main St., White Plains, NY 10606. 98 p. May. 28 cm.

• ***Summary:*** Consolidated net sales for 2003 (year ended Dec. 31) were $22,165 million, up 59.6% from 2002 ($13,882 million). Net income in 2003 was $411 million, up 61.2% from 2002. Shareholders' equity (net worth) is $2,377 million, up 61.5% from 2002.

Bunge's goal is "to be the world's best integrated agribusiness and food company." The strategies to get there are: Position for growth, focus on efficiency, deliver superior service and product quality, and leverage the company's unique operating model. Three bar charts (p. 10) show demand (yearly from 1999 to 2003) for soybean meal (global), fertilizer in Brazil (NPK), and vegetable oil (global; it has grown 4.8% a year on average over the past 15 years). Long-term trends of population and income growth drive demand for Bunge products. Bunge's alliance with DuPont in Solae is outlined (p. 22).

Under "Acquisitions, dispositions, and alliances" we read (p. 41): "Acquisition of Cereol. In 2002, we acquired 97.38% of the shares of Cereol S.A. and in April 2003, we acquired the remaining 2.62% of the shares..., resulting in 100% ownership of Cereol for $810 million in cash (net of cash acquired of $90 million)...

"Alliance with DuPont. In April 2003, we entered into an alliance with DuPont and together formed Solae by contributing DuPont's Protein Technologies [International] business and our North American [Central Soya] and European soy ingredients operations. Solae is a soy ingredients joint venture and a key component in our broader strategic alliance with DuPont. We have a 28% interest in Solae. In May 2003, we sold our Brazilian soy ingredients operations to Solae for $251 million in cash, net of sale-related expenses of approximately $5 million. We recognized a tax-free gain on sale of $111 million in the second quarter of 2003 relating to this sale. We used the proceeds from the sale to reduce indebtedness..."

"Saipol joint venture. In July 2003, we sold Lesieur, a French producer of branded bottled vegetable oils, to Saipol, an oilseed processing joint venture between Bunge and Sofiproteo. We received approximately $240 million in cash... We own 33% of Saipol."

Accompanying the annual report is a "Notice of Annual General Meeting of Shareholders" (30 p.). Surprisingly, no information is given about the amount of money paid to individual company officers. Address: White Plains, New York. Phone: 914-684-2800.

1009. Messina, Mark; Erdman, J., Jr.; Setchell, K.D.R. eds. 2004. Fifth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease. *J. of Nutrition* 134(5S):1205S-1293S. Supplement. May. Held 21-24 Sept.

2003 in Orlando, Florida.
• ***Summary:*** Findings of special interest include: In older Chinese women, higher intakes of soy protein and isoflavones were associated with greater bone density.

Supplements of isoflavones, calcium, and vitamin D resulted in an increase in bone density in Chinese women.

When breast-feeding women consume soy, soy isoflavones appear in their breast milk and are absorbed by their infants. The significance of this is not known, although researchers speculate that early exposure to soy may protect against chronic disease in adulthood.

An analysis of a number of studies on soy and hot flashes found that, overall, use of soy products reduced the frequency of hot flashes.

Isoflavone supplements reduced the severity of headaches and other symptoms of premenstrual syndrome (PMS).

Soy protein may be useful in reducing risk of prostate cancer because it affects male hormone levels.

Preliminary results suggest that soy isoflavones can improve brain functions, such as memory, in older people. Symposium chairpersons: Mark Messina and Kenneth D.R. Setchell.

Advisory Board: Herman Adlercreutz, Stephen Barnes, Koen Descheemaeker, Brent D. Flickinger, Patricia Godfrey, Omer Kucuk, Mindy S. Kurzer, Gregory L. Paul, Susan M. Potter, Cesare R. Sitori, and Anna H. Wu.

"Sponsors: The Solae Company; United Soybean Board; Archer Daniels Midland Company; Cargill Health and Food Technologies; Cargill Soy Protein Solutions; Dr. Chung's Food Co., Ltd.; Illinois Soybean Association / Illinois Soybean Checkoff Board; Indiana Soybean Board; Nichimo International Inc.; Solbar Plant Extracts Ltd.; Soyatech, Inc.; Wyeth Consumer Healthcare; AOCS; DrSoy Nutrition; and Soyfoods Association of North America." Address: 1. Nutrition Matters, Inc., Port Townsend, Washington 98368.

1010. Kreijkamp-Kaspers, Sanne; Kok, L.; Grobbee, D.E.; et al. 2004. Effect of soy protein containing isoflavones on cognitive function, bone mineral density, and plasma lipids in post-menopausal women: A randomized controlled trial. *JAMA: J. of the American Medical Association* 292(1):65-74. July 7. [55 ref]
• ***Summary:*** A year-long study showed that soy protein isolate (made by Solae) did not increase bone density, lower cholesterol, or improve memory in 175 post-menopausal women. Address: Julius Center for Health Science and Primary Care, Univ. Medical Center Utrecht, P.O. Box 85500, Room D 01.335, 3508 GA Utrecht, the Netherlands.

1011. Soy Online Service. 2004. Uncovering the truth about soy (Website printout–part). www.soyonlineservice.co.nz Retrieved Oct. 28.
• ***Summary:*** A virulently antisoy website, with many links to other sites, anti-soy articles and books, etc. It was clearly initiated in New Zealand by the small group containing Richard and Valerie James and Mike Fitzpatrick. They were soon joined by Sally Fallon in the USA, and others (unknown) in the UK.

Contents: Home page–Site map (7 p.). 1. Introduction (4 p.). 2. History. 3. Hot reading. 4. Phytoestrogens: Soy & DES, the thyroid, male health, your baby, infertility, menopause, birth defects, cancer/leukemia, diabetes: Type 1, immune function, your pets, cognitive function [Lon White]. 5. Phytosterols. 6. GM soy. 7. Soy sauce. 8. Other toxins. 9. Doses simplified. 10. Soy allergies. 11. Soy politics. 12. SOS guidance. 13. Downloads. 14. Links. 15. Hot news. 16. Regulators. 17. Big Ugly Bull: Sanitation, FDA-CF-SCAN, Novagen, Abbott, Dr. Brian Strom, USDA, Unilever, NZ MOH (New Zealand Ministry of Health), ANZFA, Plunket, Israeli Officials, USB [United Soybean Board], Solae / DuPont / Bunge. 18. Testimonies. 19. Chicken roost.

A counter near the bottom of the Home Page states that this site has had 476,892 visitors since 27 April 1999. The information on this site cannot be printed unless you select the particular text you wish to print.

1012. *SoyaScan Notes.* 2004. Chronology of major soy-related events and trends during 2004 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan/Feb.–*Biodiesel* magazine starts publication in the USA.

Feb. The excellent European periodical *Soyafoods,* edited by Heather Paine of England, changes its title to Soy & Health, when the American Soybean Association stopped funding. Past and current issues can be downloaded from the Soy Conference website www.soyconference.com.

April–Yamasa Corporation purchases San-J International (Richmond, Virginia).

April–Pulmuone U.S.A. makes a significant financial investment in Wildwood Harvest Foods, Inc. In July the two companies announce their merger. Both tofu companies are based in California.

April–The Food and Drug Administration (FDA) confirms that it is in the process of reviewing a petition for a health claim that suggests the consumption of soy protein-based foods may reduce the risk of certain types of cancer, including breast, prostate, and colon cancer. The Solae Company submitted the petition.

June–"The Whole Soy Story: The Dark Side of America's Favorite Health Food," an article by Kaayla T. Daniel is published in *Mothering* magazine. Her unbalanced approach is to collect, often misinterpret, and publish in one place all the negative information she can find about soy.

July 20–Wildwood Natural Foods, Inc. and Pulmuone U.S.A. announce their merger.

July–Soyfoods Center "publishes" on its Internet website (www.soyfoodscenter.com) the entire (previously

unpublished) manuscript of its book *History of Soybeans and Soyfoods,* by William Shurtleff & Akiko Aoyagi (2,500 pages). It is now available worldwide for all to use free of charge. Research and writing of this book began in Oct. 1980.

Nov. 10–USDA's Animal and Plant Health Inspection Service [APHIS] confirms the presence of soybean rust on soybean leaf samples taken from two plots associated with a Louisiana State University research farm.

World Wildlife Fund establishes the Roundtable on Responsible Soy to address the impacts of soy production [as on the Amazon rainforest] and identify solutions.

Trends: (1) The low-carb diet continues its popularity and upward trend in the USA. Soy protein is being used to replace carbohydrates is a wide array of products from taco chips to bread, from healthy soft drinks (Snapple-A-Day) to vegetable juice (V8 Splash Smoothies). Consumption of meat, which is also low in carbohydrates, is now coming back into popularity. Few, if any, nutritionists, think that low-carb diets are healthful. (2) The anti-soy faction continues to have an active and one-sided web presence–and a negative effect on the growing interest in soyfoods. Leaders are Sally Fallon, Kaayla T. Daniel, Richard and Valerie James, and a few others. (3) Ten million more people were hungry in 2004 than in 2003, according to Bread for the World Institute's 2004 Hunger Report. At the same time the World Food Program announced that food aid has decreased every year since 1999. Hunger is a growing issue. Hunger and poverty are inextricably linked; if there are no resources, there is no food.

1013. IQPC, Food & Beverage Div. 2004. SoyFoods 2002: Take your product development and marketing strategies to the next level. Register by January 5, 2005 and save $300 (Brochure). Iselin, New Jersey: International Quality & Productivity Center. 8 p. 28 cm.

• ***Summary:*** This glossy brochure (green and yellow on white) states: "Food & Beverage is proud to present its 8th annual soyfoods conference. Two-day conference: March 1-2, 2005. Pre-conference workshops: February 28, 2005. Rasisson Hotel Miami, Miami, Florida. This brochure gives details on the conference agenda, with the names of the speakers, presenters or workshop leaders, the title of the presentation, and the date and time. Pre-conference workshops (Monday): (A) New strategies and techniques for product innovation, led by Mattson & Co. (B) Think big: Redefining the competition to expand your market, led by Garnet Pigden, The Solae Co. (Solae has come up with a campaign pitting soy products directly against the dairy industry). (C) Understanding your consumer–Soyfoods focus group workshop, led by Primary Insights.

Day 1 includes: "Understanding the soyfood trends of today and tomorrow," by: Tina Nelson of SunRich (the U.S. soyfoods market hit nearly $4 billion in 2003, up 7.2% over 2002). "Kraft's health and wellness initiatives: Evolving with today's consumers," by Kevin Scott, Boca Foods, a div; of Kraft Foods, Inc. "Out of the box: Designing the soy products of tomorrow," by Robert C. Jones, President and CEO of Vitasoy USA. "Partnering with the soy protein ingredient supplier to develop functional products for the future," by Deborah Schultz of Cargill Health and Food Technology. "The soymilk revolution: Marketing for mainstream appeal," by Mary Adams of White Wave. "Understanding the vegetarian, 'flexitarian' and omnivore market for soyfoods," Terry Gieseke of Nutriant, a Kerry Company (Flexitarians are people who usually eat vegetarian but occasionally dine out on meat). "Creating a winning soy snack food," by Tim Walter of Peanotz, Inc. Dominic Dyer, of Soya Protein Assoc., UK.

Day 2 includes: "Making sense of soy health research," by Mark Messina of Nutrition Matters. "Soy and menopause: A clinicians view," by Dr. Ari Babaknia, MD of DrSoy. "Can soyfoods play a role in reducing obesity?" by Barbara Klein of Illinois Center for Soy Foods. "Lessons learned from the US FDA cancer claim petition," by Garnet Pigden of Solae (cites 58 studies as evidence that soy reduces the risk of cancer of the breast, prostate, and colon). "Improving product flavoring to meet consumer preferences," by Mary T. Nash of TIAX LLC. "Research meets commerce: Using new Non-GMO technology to create highly marketable new products," by Daniel Facciotti of Davis Lab, Anawah (Tilling = Targeting Induced Local Lesions in Genomes, a new technology to manipulate gene traits and generate novel ingredients). "Lowering trans fat content with new low linolenic soybeans," by Prof. Walter Fehr of Iowa State Univ.

The price is very expensive: Gold package–$3,186 for the conference plus 3 workshops (save $300) or $1,899 for the conference only. Address: 555 Route 1 South, Iselin, New Jersey 08830. Phone: 1-800-882-8684.

1014. Herring, Sandy. 2005. The Solae Branded Products program (Interview). *SoyaScan Notes.* Jan. 5. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** For a product to become part of the Solae Branded Partners program, the manufacturer must agree to two things: (1) To put the Solae logo (of at least a minimum size) on the product. (2) To include a minimum amount of Solae brand isolated soy protein (ISP) in the product. Usually Solae's advertising program ("Protein in Unexpected Places") promotes some of the Branded Partners' products. The makers of some products that do contain Solae might decide not be part of the Branded Partners program because (for example), the package might be too small to include the logo, the amount of protein that gives the maximum acceptability and profitability might be less than Solae requires.

In the past, many products contained ISP for its functional properties, such as being a good binder or

emulsifier. The new program is designed to add value to consumer products by making Solae a "characterizing ingredient" and by advertising that the product contains Solae. Before Solae approaches a potential new customer about "a co-branding opportunity," they do a great deal of consumer research and market research about the concept of a product that contains Solae–its acceptability and how the new product or product concept "would resonate with their consumers." Solae presents their ideas of how the ad might look, the packaging might look, etc.

A media release (faxed by Sandy to Soyfoods Center) lists the following 16 branded products: 8th Continent Soymilk (www.8thcontinent.com), Snapple-A-Day Meal Replacement Beverages (www.snappleaday.com), V8 Splash Smoothies (www.v8juice.com), Gardenburger Meat Alternatives (www.gardenburger.com), Mori-Nu Tofu (www.morinu.com), Yves Veggie Cuisine (www.yvesveggie.com), NuGo Bars (www.nugonutrition.com), DelightFull Meal Replacement & Snack Bars (www.affinta.com), DelightFull Smart Snax (www.delight-full.com), Hormel Health Labs Great Shake & Great Shake Plus (www.hormelhealthlabs.com), Perky's 100% Natural Nutty Grains & Soy Cereal (www.pacgrain.com), Natural Harmony Foods SoyLean (www.soylean.com), So Good Soymilk (available in Canada) (www.so-good.com), Linda McCartney Spicy Peanut Pasta with Vegetarian Chicken (www.linda-mccartney.com), Body Choice Premium High Protein Cookies (www.bodychoicenutrition.com), El Burrito Meat Alternatives (www.elburrito.com).

Note: The Solae Company Logo and Solae* are trademarks or registered trademarks of Solae LLC. Address: The Solae Co., P.O. Box 88940, St. Louis, Missouri 63102. Phone: 314-982-2680.

1015. Richmond, Akasha. 2005. Update on soy and progress with her book (Interview). *SoyaScan Notes.* Feb. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Steve Demos mentioned last night at a meeting with Doug Greene that FDA may pass a new ruling that soy may reduce one's risk of cancer. Note: FDA announced in April 2004 that it was considering such a petition, submitted by The Solae Co. Address: Los Angeles, California.

1016. *Soy Daily* (*The*). 2005. The Solae Company unveils new corporate tagline. Feb. 12.
• ***Summary:*** "St. Louis–(Business Wire)–Feb. 8, 2005–'Better Ingredients for Better Living ™' was unveiled today as the new corporate tagline for The Solae Company, a global innovator in technology development and the research and application of soy protein and other characterizing ingredients in great-tasting, better-for-you foods and beverages.

"'Better Ingredients for Better Living™' concisely captures who we are and what we do,' said Garnet Pigden, global vice president of marketing and business development for The Solae Company. 'The statement accurately positions The Solae Company as a company that markets a wide variety of high quality products that bring value to the end-user by making foods and beverages that are healthier, more flavorful, more stable, more appealing and more affordable.'

"The Solae Company's portfolio of products includes soy protein, lecithin, fiber and polymer. Its Solae® soy protein brand is currently licensed by more than 40 companies worldwide and appears on more than 60 different products as a 'trust mark' of proven nutrition. Some co-branded products include 8th Continent soymilk and Gardenburger® Meatless Products.

"'Better Ingredients for Better Living™' is being launched globally today throughout The Solae Company's worldwide network. It will appear in all trade advertising and collateral materials including brochures, business cards, letterhead and presentations, as well as the company's website.

"The new tagline comes on the heels of the launch last year of the company's first-ever cable advertising campaign. Since the debut of the campaign, awareness of the Solae® brand has increased with one out of four women now recognizing the Solae® brand. In addition, 74 percent of Americans now believe that soy-based ingredients are healthy dietary choices.

"Given our consumer-led and customer-driven philosophy, combined with an outstanding portfolio of products that an ever-increasing share of consumers are demanding, we believe The Solae Company is positioned for unparalleled growth as we move into the second half of this decade and beyond," Pigden said.

"About The Solae Company: A global leader in technology development and the research and application of soy protein and other characterizing ingredients, The Solae Company, based in St. Louis, Missouri, serves food and beverage manufacturers, dietary supplement developers, retailers and consumers in 80 countries worldwide including the United States and Canada, Europe and the Middle East, Latin America and the Asia/Pacific region. The company was formed through an alliance between Bunge Limited (NYSE: BG) and DuPont (NYSE: DD). For more than 30 years, The Solae Company has invested in fundamental research to understand the health benefits of soy protein. Researchers at more than 180 leading universities and research institutions have used soy protein products produced by The Solae Company in hundreds of completed and ongoing soy studies. For more about the health benefits of soy protein, including additional research and resources, please visit www.thesolaecompany.com

Note: The "30 years" figure is misleading. The Solae brand first appeared in about Aug. 2001. DuPont purchased Protein Technologies International from Ralston Purina Co. on 3 Dec. 1997. DuPont was not involved with soy protein

before the latter date.

1017. Chajuss, Daniel. 2005. Brief biography and history of his work with soy in the USA and Israel. Part IV (Interview). *SoyaScan Notes.* Feb. 19. Followed by numerous e-mails. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1985–Hayes General Technology (HGT) Co. Ltd. is incorporated as a separate and independent company, still owned by the Chajuss family, especially to develop engineering, process know how and new technologies, mainly in the field of soy proteins.

1986–The Chajuss family sold the remainder of the shares in Hayes Ashdod Ltd. to Koor Foods Ltd. One of Koor's directors was Mrs. Shefi of Kibbutz Hatzor. She was the link connecting her kibbutz with Koor Foods and Hayes Ashdod Ltd.

1987 Feb. 18–Elijah Mathew Chajuss, Daniel's father and co-founder of Hayes Ashdod Ltd., passed away in Rehovot at age 84.

In March 1987 all the shares of Hayes Ashdod Ltd. were purchased from Koor Foods by Kibutz Hatzor. A few months later, in about Sept. 1987, the company name was changed from "Hayes Ashdod Ltd." to "Solbar Hatzor Ltd."

In 1988 Soya Mainz (of Mainz, Germany) bought from Hayes General Technology engineering designs to set up a soy protein concentrate plant in Germany. The plant was not built and instead in early 1991, Soya Mainz bought 25% of Solbar's shares.

In 1989 (a year later) Soya Mainz bought an additional 24% of the shares in Solbar, so that they now owned a total of 49% equity in Solbar Hatzor; Kibbutz Hatzor owned the remaining 51% equity of this joint venture between Israeli and German companies.

Note: The proprietary rights of Hayes Ashdod Ltd. know-how and technology remained, however, Chajuss' proprietary possession. Koor Foods ceased operations in about 1987.

Today HGT does mainly research engineering and designs systems, but it also manufactures special, nonstandardized equipment, and installs complete systems. HGT engineers, including Daniel when warranted, also work as field engineers and consultants on site when the systems they have designed are installed in other countries. They have done that since 1973-74 when their first system was installed outside in Aarhus, Denmark. Systems for manufacturing soy protein concentrates and soy molasses, designed and developed by HGT, have been installed in Israel, Denmark, The Netherlands, France, USA, China, and Brazil. All these plants include texturizing facilities, which although recommended by HGT are designed and made by firms such as Wenger, Extru-Tech, and Clextral. Today HGT is known and often referred to as 'Hayes Ltd.'. Hayes General Technology Company Ltd. is thus thinking about making 'Hayes Ltd.' its official company name. Also today (2005) this company is owned and managed by Daniel Chajuss.

Note: Hayes Ashdod Ltd., although it was sometimes referred to as "Hayes Ltd." was never officially named "Hayes Ltd."

In early 1991 the German soy processor, Soya Mainz GmbH and Co. bought a 25% equity interest in Solbar Hatzor Ltd. (formerly Hayes Ashdod Ltd.), soya protein manufacturers of Ashdod, Israel. The company has also contracted with Hayes General Technology Co. Ltd. of Israel to set up a soya protein concentrate production facility in Germany.

By 1999 Solbar had started a sister company or division named Solbar Plant Extracts to market its nutraceutical products (such as isoflavones) extracted from soy molasses.

Today (Feb. 2005) the makers of traditional type concentrate generally use the systems developed by Daniel Chajuss. These systems are purchased from Hayes General Technology and are presently used by all the leading makers of traditional and functional soy protein concentrates. Today over 95% of the soy protein concentrates manufactured worldwide are made using systems developed by Hayes. Included among Hayes General Technology clients for traditional or functional soy protein concentrates (SPC) have been: (1) Hayes Ashdod Ltd., Ashdod, Israel (later renamed Solbar Hatzor Ltd.), 1962 to 2005 (complete engineering designs and services). (2) Aarhus Oliefabrik A/S, Aarhus, Denmark (alter renamed Central and presently Solae), 1972 to 1974 and later periodically upon request. (3) Bunge Sogip, Bordeaux, France, 1988 to 1996 (later renamed Central Soya Aarhus and presently Solae). (4) Soya Mainz, Mainz, Germany, 1988 (now part of ADM group). (5) ADM, Decatur, Illinois, 1989-1999. Intended to be used for SPC in the Decatur plant. The knowledge was later also utilized by ADM in plants in the Netherlands (Europort) and China. (6) Finnsoypro Oy, Uusikaupunki, Finland, 1995. Textured soy protein concentrate plant. (7) Cargill, Minneapolis, Minnesota, 2000 to 2003. SPC technology licensing and transfer of know-how and engineering designs. Also consultations. (8) Shemen Industry–Soyprotec Advanced Protein Technology, Haifa, Israel, 1999 to present. SPC technological transfer and licensing agreement and consultation services. (9) China–In China HGT is involved directly and or through Wuhan Crown Friendship and provide Hayes know-how, licensing, engineering designs and services to manufacture SPC to firms such as Shandong Sanwei Oil Enterprise (Group) Co. Ltd., Linyin City, to Crown Proteins, to Gushen in Shandong province and to YiQing Group in Tianjin. (10) Brazil–The transfer of know-how and engineering designs is and was made to such firms as IMCOPA (2006) and others through Crown Iron Works, Cargill, Shemen Industries (Soyprotec), Shandong San Wei, etc.

Daniel has retired largely from the commercial side of

his business. But he still (2005) has a small company that makes isoflavone products; he likes very much to do research is this company's laboratories. "Business can be god or bad, profitable or not profitable, but when you do research, you may get good or bad results, but it's always interesting. That's what I like to do." From time to time Daniel goes to the Hebrew University of Jerusalem at Rehovot to do research; he still works occasionally with Dr. Yehudith Birk.

Daniel has become interested in a remarkable plant and its seed, pearl lupin (*Lupinus mutabilis*), a species of lupin that is grown in the Andes of South America for its edible bean. He has done research on the bitter compounds in this underutilized bean, and believes this seed has a very bright future, including as a human food (see separate record).

Daniel's wife is well (Dec. 2007) and works as information librarian in Tel Aviv University Faculty of Medicine.

The year 2007 marks the 45th anniversary of Daniel's pioneering work with soy products in Israel. Today Hayes makes about 450 to 500 metric tons per year. Address: Managing Director, Hayes General Technology Company Ltd., Misgav Dov 19, Mobile Post Emek Sorek, 76867 Israel. Phone: (972) 8 592925.

1018. *NSRL Bulletin* (*National Soybean Research Laboratory, Urbana, Illinois*). 2005. U of I scientists on the hunt for hypoallergenic soybean. 12(1):2-3. Feb.
• ***Summary:*** Scientists at the University of Illinois at Urbana have found a soybean that does not contain the P34 protein, which is responsible for allergic reactions in 6 to 8% of children. University researchers screened over 11,000 plant types from the USDA soybean germplasm collection in order to find one confirmed P34 null line and about 94 lines with significantly reduced levels of P34–according to Ted Hymowitz, a plant geneticist at the U of I. There are about 5,000 more plant types to be tested. The research is being led by Prof. Hymowitz and Eliot Herman at the Danforth Center. A photo shows Prof. Hymowitz with postdoctoral research associate Leina Mary Joseph, who is in charge of the tedious task of testing the seeds using immunological procedures. The Danforth lab uses a different technique to confirm that Joseph's results are accurate.

Note: Letter (e-mail) from Roger N. Beachy, president of the Danforth Foundation. 2008. Dec. 3. The Danforth Center was founded by Dr. William H. Danforth, M.D., former chancellor of Washington University–St. Louis [Missouri]; he is the son of the late Donald Danforth, who was responsible for the success of Ralston Purina. The Foundation was a key sponsor when the Center was established. Dr. Danforth was the founder of the Center, and remains Chairman of the Board of Trustees. Bill is the brother of (former) Sen. John C. "Jack" Danforth, who was also U.S. Ambassador to the United Nations (2004-2005).

1019. Messina, Mark J. 2005. Update on work with soy (Interview). *SoyaScan Notes.* March 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Mark has made presentations on soy and health in 33 countries and has been to Brussels 10-12 times, and once to China.

Second generation statins are truly remarkable in their ability to lower human cholesterol by 30-35%–much more than any short-term dietary change.

The French government is now advising no soy consumption before age 3, and the British government has two editorials on soy consumption in childhood.

Creation of a Soy Nutrition Institute has been under active discussion for the past two years. Three companies are potentially interested: Solae (the most interested), followed by ADM and Cargill. They would publish accurate, well-documented information about soy and nutrition. They have set two goals: Within 5 years to become like the Egg Association, and within 10 years to become like the Dairy Association. Mark is considering applying for the position of director if he can get a long-term contract and if the salary is adequate. When the media and others had questions about soy, nutrition and health, this is the first place they would think to contact.

The 6th International Symposium on the Role of Soy in Preventing and Treating Chronic Disease will be held in Chicago, Illinois, this summer.

Dr. James Anderson is doing a new meta-analysis on soy and heart health. There are many new studies since his first meta-analysis was published in Aug. 1995.

The earlier a young woman gets pregnant, the lower her risk of breast cancer later in life. One of the most exciting hypotheses in this field is that isoflavone intake (including soy isoflavones) during youth / adolescence significantly reduces breast cancer risk later in life.

A member of the anti-soy group is "Dr. Mercola." He is somehow associated with Sally Fallon and her Weston Price Foundation. Dr. Joseph Mercola is an osteopathic physician and director of the Optimal Wellness Center, his medical clinic outside Chicago. Trained in both alternative and traditional medicine, he has served as the chairman of the family medicine department at St. Alexius Medical Center for five years. Address: PhD, 439 Calhoun St., Port Townsend, Washington 98368. Phone: 360-379-9544.

1020. Soy Online Service (Website printout–part). 2005. www.soyonlineservice.co.nz Retrieved March 29.
• ***Summary:*** An anti-soy website. "When we [Richard and Valerie James] first questioned the safety of soy a representative of Protein Technologies told us that they: Had teams of lawyers to crush dissenters, could buy scientists to give evidence, owned television channels and newspapers, could divert medical schools and even influence governments."

"If you only knew the power of the dark side"–Darth Vader.

1021. Bunge Ltd. 2005. Partnering for the future: 2004 annual report. 50 Main St., White Plains, NY 10606. 90 p. May. 28 cm.
• ***Summary:*** Consolidated net sales for 2004 (year ended Dec. 31) were $25,168 million, up 13.5% from 2003 ($22,165 million). Net income in 2004 was $469 million, up 56.3% from 2003–not including a one-time gain of $111 million on sale of soy ingredients business in Brazil. Cash dividends per share in 2004 was $0.48, up from $0.42 in 2003.

"Last year, according to the USDA, the world consumed 130 million tons of soybean meal, up from 118 million in 2000. Future growth is forecast to top 4 percent per annum.

"Demand for vegetable oil should increase at a similar rate. Growth will be particularly strong in China and India. Last year global consumption reached 100 million tons, up from 89 million tons in 2000."

"South America is cementing its position as the world's leading agricultural producer. Both Brazil and Argentina produced large soybean crops 2004, and their output is expected to grow steadily in coming years."

"Vietnam is the fastest-growing market for soybean meal consumption in Southeast Asia, a region that has seen a 40 percent increase in demand for the product since 1999 and in which Bunge is the leading importer."

"In the U.S., we formed AGRI-Bunge, LLC, a joint venture with AGRI Industries [a cooperative]. The partnership links AGRI's crop origination network in Iowa with Bunge's global sales, marketing and logistics. The result is a new source of crops for Bunge and wider market access for AGRI and U.S. farmers.

"We also entered the value-added market for cholesterol-reducing phytosterol ingredients by creating a partnership with Procter & Gamble and Peter Cremer in North America."

Eastern Europe has the "potential to regain its status as one of the world's breadbaskets." Grain exports from Black Sea nations could rise dramatically. In 2002 Bunge acquired Cereol.

In 2006 U.S. law will require labeling of trans fats. In response, Bunge and DuPont have developed Nutrim, which contains less than 3% linolenic acid, making it naturally stable and eliminating the need for partial hydrogenation when it is used as a frying oil. This partnership links DuPont's plant science with Bunge's agribusiness and oilseed processing operations. However, Nutrim is a trademark of Pioneer Hi-Bred International, Inc. A bar chart shows projected Nutrim production, reaching 1 billion pounds by 2009. A colored graph shows global agricultural trade. Trade of soybeans and soybean products, only 50 million metric tons (MMT) in 1985, passed both wheat and coarse grains in 2001 (at about 110 MMT) and is expected to reach 175 MMT by 2015, much more than wheat and coarse grains.

Accompanying the annual report is a "Notice of Annual General Meeting of Shareholders" (89 p.). Information is given about the amount of money paid to individual company officers. For example, Alberto Weisser (chairman and CEO) was paid a base salary of $1.2 million and a bonus of $3 million, plus securities underlying options awards (130,000 shares), long-term incentive payments (LTIP; $3.7 million), and all other compensation ($55,729). Address: White Plains, New York. Phone: 914-684-2800.

1022. Kingsbaker, C. Louis. 2005. Fires and explosions at soybean processing plants (Interview). *SoyaScan Notes.* Aug. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** There has long been an important relationship between the Safety Committee of the National Soybean Processors Association (NSPA, now named NOPA) and the National Fire Protection Association (NFPA); the latter organization has developed NFPA-36, which is the standard for Class 1B flammable liquids. The first NFPA-36 standard was written in 1957 and adopted by NFPA in 1959. It has been incorporated into the OSHA law / standards. When Lou joined the NFPA-36 committee in 1970, there were only two engineers (Lou and John Howeman) and no members of oilseed processing companies. Everyone else on the committee represented insurances; they were out to protect their own interests. "NFPA-36 pretty well eliminates soybean dust as a cause of explosions, because soybean dust is not an explosive due to its high oil content." Lou plans to give a speech in Buenos Aires, Argentina, in Nov. this year; his subject will be fires and explosions, and what changes have been made in NFPA-36 to prevent them from happening. The number of explosions has decreased as better safety practices have been implemented and enforced.

Lou has a list (not computerized) of more than 50 [59 to be exact] fires and explosions from 1948 on at oilseed processing plants worldwide; these are mostly soybean plants. He would be willing to share it with Soyfoods Center if we credit him as the source. He has been involved in 12 or 13 of these accidents, either while the fire was still burning or coming in afterwards to see what caused it.

In 1948 Lou started to work for Blaw-Knox and has been involved in starting up plants since 1949. In most of these cases, he was working for Blaw-Knox (which was later acquired by Dravo). Some of the explosions were in Blaw-Knox plants, some were not–but Blaw-Knox saw this as an opportunity for new business.

Lou was involved with the Louisville sewer explosion. In Friday, 13 Feb. 1981 Ralston Purina dumped about 25,000 gallons of hexane into the Louisville, Kentucky, sewage system, and blew up (and destroyed) about 20 miles of sewage pipes in the system. Miraculously, nobody was killed, and only one person was injured. Manhole covers

were blown into the air, and flames shot out of the manholes. Ralston Purina was trying to get rid of the hexane and they thought they could get away with it. This was Lou's first job as a consultant; he was hired by the Louisville municipal sewer system.

Lou presented a paper about the Louisville sewer explosion in Denver, Colorado, for the international oil millers superintendents association. "This was the first time anyone had talked about what happened in this explosion." Ralston Purina sent a lawyer. Lou said that as long as the lawyer was in the room, he wouldn't give his paper. The group asked the lawyer to please leave, which he did. George Willhite of AOCS attended the meeting mainly to hear Lou's paper.

Lou turned the paper into an article, then submitted it to George Willhite for publication. The higher-ups at AOCS wouldn't allow the article to be published; somebody from Cargill stopped it. AOCS may publish it in 2005 to mark the 25th anniversary of the disaster.

Dick Farmer is now checking to see if Cargill (which bought 7-8 of the Ralston Purina soybean crushing plants) will allow Lou to give the talk at an AOCS meeting next spring. Lou and Dick Farmer are good friends and have worked together since the 1960s.

Cargill bought most or all of the Ralston Purina plants after the explosion. The explosion was probably the main reason that Ralston Purina got out of the soybean processing business! They were very embarrassed by this incident. The deposition of Hal Dean and William Stiritz was taken in their board room. Lou has most of the newspaper articles and many photos about the explosion in his files. It was the biggest event in the history of the solvent extraction industry in the USA. One reason for the Louisville explosion was very bad management at Ralston's plant; there was an ongoing argument between the man running the plant and headquarters in St. Louis, Missouri. Lou walked and inspected the sewers, and took many photos. More than 100,000 people were without sewage for a very long time. Sewage could not flow through the old pipes until they were replaced. One hole in the street was 20 by 30 feet. Ralston took out a $100 million insurance policy with Lloyd's of London 1-2 days after the explosion; they were afraid of pestilence if there were rain. People could get ill and die. In the end, Lou thinks it cost the company about $80 to $90 million out of pocket. There was a federal trial in Louisville. Lou, who was on the side of the prosecution, was in the witness stand for 4 straight days. After the prosecution presented its case, Ralston caved in and settled–with the sewer district, the city of Louisville, the state, and all the merchants who had to shut down their businesses because they couldn't get sewage service.

He also has photos of Quincy Soybean Co. when they had an explosion in Sept. 1966. And of Oelmuehle Hamburg in Germany where there was a tremendous explosion in about 1983; he was hired by them as a consultant. Central Soya had an explosion in 1994 in Indianapolis, Indiana; they were not allowed to rebuild the plant. They were cited by OSHA and fined something like $600,000 to $700,000. The story made all the Indianapolis newspapers. If somebody gets killed or goes to the hospital, OSHA comes right in and it becomes an open book. At Union Oil Mill, a cottonseed processor in Jackson, Mississippi, two men were killed.

In Germany, there have been a lot of explosions related to solvent extraction. Oelmuehle Hamburg had 3 solvent plants; 2½ of them were blown apart. At one plant in Germany, Lou was there when it was on fire. Another was Fuji Oil Co. in Japan in about 1990, where about 8 people were killed. Then the Japanese government stepped in, shut down the company and wouldn't let them re-open the plant. Lou, who was a consultant by then, was hired by the Japanese Oilseed Processors Association to fly to Japan, meet with the company, and see if they could develop a program to get government approval.

Blaw-Knox replaced the German plants owned by ADM and by Glidden (Indianapolis). Blaw-Knox copied some of the German designs, but then they developed a completely new extractor (Rotocel), and desolventizer. Lou "cut his teeth" working with the Rotocel at Blaw-Knox. Address: Atlanta, Georgia. Phone: 770-396-1413.

1023. Farmer, Richard. 2005. History of work at soybean processing plants (Interview). *SoyaScan Notes.* Aug. 3. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dick served two stints on the NSPA / NOPA safety committee, one in the 1980s and one from 1994 to 2004. The committee created some early safety reports related to solvent extraction, but they were for in-house use by members of the Association. In addition, many companied developed their own reports.

Dick started in the soybean business in 1959 with Swift & Co. He is aware of the Monticello Co-operative Soybean Products Co. (Monticello, Piatt Co., Illinois). They were a small plant, still in operation in 1978, and he believes that they are still operating. At one point their name was Viobin, and they were extracting wheat germ oil from wheat germ for the health food trade. Note: A Web search shows that as of Aug. 2005 Viobin USA (A division of McShares, Inc.) was at 226 West Livingston, Monticello, Illinois 61856. Phone: 217-762-2561. Website: www.viobinusa.com. The company produces defatted wheat germ and wheat germ oil.

The sewer explosion in Louisville, Kentucky, was perhaps the major reason that Ralston Purina got out of the soybean crushing business, but there were other factors. All of their plants were fairly small and relatively old, and some early ones (such as the plant in Memphis, Tennessee) now had towns growing around them, so there was no room to expand.

Another important soybean explosion was the one at

Quincy Soybean, in Quincy, Illinois, and later related to Helena, Arkansas.

The original desolventizer, developed in Germany, was called a Schneckens. It used jacketed screw conveyors and condensed solvent that came off the meal–very inefficient. However it gave desolventized meal with a low PDI (protein dispersibility index, of about 60). Later, some Schneckens were made in the USA.

The first desolventizer-toaster was developed in the USA in the late 1940s or early 1950s by Central Soya Co. Dick thinks Norm Kruse has the process patent and French Oil Machinery Co. has the equipment patent. It, of course, gave meal with a low pdi.

The EMI developed the flash desolventizer, which used superheated solvent vapors to get rid of 95% of the hexane. It was designed to give meal with a high pdi, that could be used in foods. Another innovation was the vapor desolventizer.

Dick studied engineering as an undergraduate at the University of Illinois at Urbana, but he did not graduate. He also worked and was married. He went on to earn an MBA at the same university.

He worked for Bunge for many years before he retired last year. The last plant of which he was in charge was in Marks, Mississippi. Address: Chesterfield, Missouri (near St. Louis). Phone: 314-576-1794.

1024. Kingsbaker, C. Louis. 2005. Odds and ends concerning explosions and fires at solvent extraction plants (Interview). *SoyaScan Notes.* Aug. 4. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Lou was deeply involved in the Ralston Purina trial. He served as an expert witness and his name was mentioned many times in the court record.

With the talk was a chart that he made of time and temperatures of equipment, showing how many times Ralston Purina had tried to re-start the plant after the explosion.

Sergeant Bluff: Connection between Carl Parker, Jr. and Bunge. Was his father connected with Bunge. "I think he was plant manager at Eagle Grove." "When they went to put in this new plant at Sergeant Bluff, they sent Carl, Jr. up to assist in the work." Carl is still living.

On 8 March 1982, E.H. Gustafson (Cargill's general superintendent) sent Lou a letter with his list of fires and explosions. It was interesting that he did not list the fires at Cargill's plants in Chicago (Illinois), Minneapolis, or Savage (Minnesota). He said: "You will note Cargill incidents are not listed. I believe you know most of these." Address: Atlanta, Georgia. Phone: 770-396-1413.

1025. Soyfoods Association of North America. 2005. Soyfoods (Website printout–part). www.soyfoods.org 13 p. Retrieved Aug. 15.

• ***Summary:*** Home: About SANA. BookMart. Technical / Regulatory. Members only. Become a member. Photos. Contact us.

Consumer news and consumer info: News releases, policy statements, presentations, 25 ways to enjoy soyfoods, recipes, events. Sales and product info: Sales and trends, soy fact sheets, history of soy products (members' products only [ridiculous]). Soy and health: Soy and heart disease claim, soy and dietary guidelines, soy and cancer claim, soy and children, primer on soy, FAQs. Locating soy products: Retailers list, wholesalers list, company contacts, soyfood samples, food service. Special announcement: SANA booth at Natural Products Expo East. E-mail: info@soyfoods.org. Copyright 2005. Website sponsored by Vitasoy, Boca, Soy7, White Wave, Yves, Morningstar Farms. Revival, The Solae Company. The logo of each is shown.

About SANA: Goals. Objectives. History of SANA. Chronology of SANA's main accomplishments, 1985-2004. 2005 Board of Directors. Officers. Committee Chairs. Executive director: Nancy Chapman. Address: 1001 Connecticut Ave., NW, Suite 1120, Washington, DC 20036. Phone: 202-659-3520.

1026. Soyfoods Association of North America. 2005. New taste of soy: Annual reception September 15, 2005 (Card). Washington, DC. 1 p. Front and back. 13 x 18 cm.

• ***Summary:*** "The New Taste of Soy is a chance to sample a delightful array of soyfoods and talk with policy makers, Administration officials and leading representatives in the soyfoods industry, including manufacturers, growers and suppliers.

"Thursday, September, 2005. 5:00–7:00 pm. U.S. Capitol, Room HC-5*, Washington, DC.

"A special thank you to Congressman Collin Peterson from Minnesota for hosting this year's event. RSVP: members@soyfoods.org–by September 7, 2005.

"Sponsored by: Soyfoods Association of North America, Archer Daniels Midland, Cargill, Boca Foods, Hain-Celestial Group, Kellogg's / Worthington Foods, Monsanto, Natural Products Inc., Revival Soy, Solae, Sunrich, a Division of SunOpta, Vitasoy USA, White Wave Foods." Printed green and black on white. Address: 1101 Connecticut Ave. NW, Suite 1120, Washington, DC 20036. Phone: 202-659-3520.

1027. Boismenue, Clyde. 2005. Soy protein isolates–old and new (Interview). *SoyaScan Notes.* Sept. 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Cargill has fallen flat on their face with their isolate made by ultrafiltration. Soy protein clogs the filters. The product is very fluffy. And there are waste water disposal problems; they must dilute it and back-flush the filters. It is still made from hexane-extracted white flakes.

Almost all isolates are spray dried; this reduces their dispersibility. To solve the problem, the powder is agglomerated by spraying it with a fine mist of water. It is

still a free-flowing powder but now more expensive. Ideally you want an isolate that will "fall in," meaning it will disperse in water by itself, without stirring, when it is placed on the surface.

Clyde has spent much of the past year evaluating and developing soy protein isolates for food ingredient use. Supro 661 is still the best-selling isolate to the health and natural foods industries. Sand is very dispersible in water but not at all soluble.

Isolates have 3 main problems. 1. Flavor. 2. Those with a bland flavor are quite viscous, so they are not very soluble. 3. Color; many are tan, and can only be made white by bleaching.

Solae and ADM are the two biggest makers of isolates and Solae is about 5 times as big as ADM. ADM's branded products have a hard time because they are part of a commodity company, which thinks only in terms of price; they have no concept of sales or customer service. They treat their isolates like a commodity, and always ask: At what price could we sell it? That is the wrong question, the wrong approach. Some people won't buy it at any price. Customers of isolates need customer support and a product suited to their special needs.

A centipoise (pronounced SENT-uh-pwaz) is a unit of absolute or dynamic viscosity (1/100 of a poise) in the cgs system. Water is 7-10 centipoise. Slimfast in liquid is about 100 centipoise. The approximate viscosity, in centipoise, of various substances at room temperature is: Water 1, olive oil 100, Slimfast in liquid 100, a thin milk shake 700, motor oil 1000–2000, honey 2000–10,000, molasses 5,000–10,000, Heinz ketchup 50,000–70,000, peanut butter 250,000. Address: Basic Foods Co., P.O. Box 240070, Los Angeles, California 90024. Phone: 310-473-0719.

1028. Southern African Soyfood Association (SASFA). 2005. Home page and links (Website printout–part). www.soyfood.co.za Retrieved Sept. 22.

• ***Summary:*** Links: (1) Home page. (2) Executive. (3) Membership. (4) Constitution. (5) Quality mark. (6) Minutes of meetings. (7) Conferences. (8) Publications. (9) Weekly ASA report. (10) Recipes. (11) Useful information. (12) Useful links.

The 7th International Soyfood Conference will be held on 28 Sept. 2005 at Farm Inn, Pretoria, South Africa. A preliminary program and registration form are given. The program is sponsored by the American Soybean Association (ASA) and WISHH. Speakers from the USA include Peter Golbitz, Frank Daller, Paul Lang, Jim Hershey (Director, WISHH), Rep. of Solae Company.

Some papers from the 2002, 2003, and 2004 conferences are available on the site. Also "Minutes of executive committee meeting held by telephone conference on 18 Nov. 2003. "The web site has been upgraded with the financial support of the American Soybean Association... The recipe book was updated and expanded by 20 pages. A thousand copies were printed with the financial support of the ASA. 170 people attended the soy food conference on 17 July 2002.

The constitution of the SASFA, dated 28 Oct. 1999 (11 pages), is filed with the above materials.

1029. *Nutrition Business Journal* (*San Diego, California*). 2005. NBJ's leading U.S. supplement & functional food supply companies in 2004. Aug/Sept. p. 13.

• ***Summary:*** Soy-related companies are:

Solae (Dupont/Bunge) 150-200
ADM 100-150
Degussa (Lucas Meyer, Traco Labs) 50-100
Cargill 30-50.
Central Soya (Cereol S.A.) 20-30

1030. Shurtleff, William. 2005. Thoughts on the big picture with soy in the United States over the past ten years (Editorial). *SoyaScan Notes.* Oct. 10.

• ***Summary:*** 1. Significant interest in the health benefits of soy began in about 1995 with the original meta-analysis by Dr. James Anderson and colleagues published in the prestigious *New England Journal of Medicine.* The United Soybean Board and Protein Technologies International encouraged this study, and once it was published used it skillfully to bring about the first USDA health claim for soy protein. Three months later, the highly respected University of California, *Berkeley Wellness Letter* ran a prescient front-page story titled "Oy, soy: here comes the hype." A careful critique of Anderson's meta-analysis, it concluded that the health benefits of soy protein were not very impressive and applied to only a small group of high-risk people.

2. The conclusion of more than 1,000 scientific studies since 1995 on soy & health (the health benefits of soy) is that they are not that impressive or significant in all areas studied. Many soy advocates had hoped that soy would be a magic bullet that would help prevent heart disease, cancer, menopausal symptoms, and help promote bone health, renal function, etc. But it has not turned out that way.

Mark Messina and I have discussed this subject many times over the past 10 years and we generally agree. There are modest health benefits, but soy is not a magic bullet.

3. The popular media has engaged in much more hype concerning health benefits of soy than individual companies or the soyfoods industry. In America the media tends to sensationalize, with headlines such as "Soy stops hot flashes, cures cancer." I, personally, find this embarrassing.

4. The message of the anti-soy people is growing louder and reaching more people via the Web; they believe that non-fermented soyfoods (such as tofu and soymilk) and modern / refined soy ingredients are actually dangerous. This is leading some consumers to hesitate and rethink their devotion to soyfoods.

I wonder if we and the media didn't create these anti-soy people ourselves, by trying to suppress their message, by exaggerating the significance of the health benefits and concealing or "playing down" the inconclusive or "no significant benefit" studies.

I believe the soy industry has not been effective in responding to their claims and ideas in an organized, professional, scientific way (as on a website or media campaign) to show that many of the things they say are untrue, and in some cases preposterous.

5. One measure of the declining interest in soy among professionals is the decreasing attendance at conferences; the peak year for attendance at the international conference was 1999–six years ago.

6. Recent studies show that sales growth in many sectors of the soyfoods industry has slowed significantly, stopped, or in some cases has even declined.

7. For industrialized countries, the real health benefits of soy are seen when soyfoods are used as part of a healthy diet, such as the Portfolio Diet or a balanced vegetarian diet. Significant lowering of cholesterol levels and LDL has been found in the very short term (2-4 weeks).

8. As an industry we must start now to prepare for the "post-health benefits era"–which is where we were in about 1995. I believe, at the same time, we must also make a commitment to honesty, balance, and "full disclosure" as we communicate the results of future health studies.

9. Are there other benefits (besides health benefits) to consuming soyfoods and soy ingredients? Yes! Soy is the least expensive source of high-quality protein. This is extremely important for the vast majority of people in the world (especially in Third World countries) who have small to modest incomes and diets without sufficient protein–places like India, China, Africa. Soy is the #1 best alternative protein source for those who wish to avoid or reduce their consumption of meat and/or dairy products. Soy has many environmental benefits.

Perhaps most important, using traditional soyfoods in place of meat and dairy products can help to alleviate the vast pain and suffering and waste that is built into factory farming and eating animals. Address: Founder and owner, Soyfoods Center, Lafayette, California. Phone: 925-283-2991.

1031. Roberts, Jane. 2005. The soy of life–On World Food Day, Solae helps feed Africa beyond its next meal. *Commercial Appeal* (*Memphis, Tennessee*). Oct. 16.
• ***Summary:*** Today–which is World Food Day–350 employees at The Solae Co. in Memphis, Tennessee, are preparing to ship more than $100,000 of soy protein and know-how to Africa. Much of this soy protein is made right in Memphis, at a 40-acre plant at 4247 S. Mendenhall, the crown jewel of Solae's U.S. operations and one of the largest soy protein plants in the world. Solae has 28 plants around the world and annual sales exceed $1.1 billion.

In this plant, that once belonged to the Ralston Purina Co., Solae transforms soybean flakes into high-protein powders, such as isolated soy proteins, used to fortify foods and beverages such as infant formula, meat, energy bars, smoothies, etc. for clients such as Gardenburger, Campbell's Soup, 8th Continent, and Snapple.

Soy is a complete protein with all the amino acids necessary for human development. Solae is starting a new kind of philanthropy: helping developing fortify popular food staples–porridges, corn-based drinks and meats–with high-quality soy protein, and then working on the ground with local food producers to develop businesses, with local jobs, to make the project profitable and sustainable.

The project was initiated USAID, the arm of the U.S. Department of State that provides emergency food aid, and the World Initiative for Soy in Human Health (WISHH), funded in part by the American Soybean Association, including $5,000 from the Tennessee Soybean Promotion Board. Solae is the largest corporate partner in this $750,000 project, according to Jim Hershey, director of WISHH. Hershey says that, of WISHH's six private partners, Solae is the only one that actually has an office and personnel in South Africa; the will accelerate project's ability to find local solutions.

For people with a protein deficiency, the addition of soy protein to the diet can improve life dramatically. Hershey says that children are born healthier and learn better because soy enhances brain function, and AIDS patients live longer because protein increases the effectiveness of retroviral drugs. In southern African nations, where one in five are infected with AIDS in some places, and the life expectancy as a result has dropped from 57 to 33, the infusion of an inexpensive protein holds promise. In the Ivory Coast, WISHH has helped introduce textured soy protein into the school lunch program.

1032. **Product Name:** 8th Continent Premium Soymilk [Vanilla, Chocolate, Original].
Manufacturer's Name: 8th Continent, L.L.C. [General Mills] (Distributor).
Manufacturer's Address: Box 200, Minneapolis, MN 55440. Phone: 1-800-247-6458.
Date of Introduction: 2005.
Ingredients: Soymilk (water, soy protein [isolate], soybean oil, calcium phosphate), sugar, fructose, potassium citrate, sodium polyphosphate, dipotassium phosphate, soy lecithin, salt, natural and artificial flavor, xanthan gum, carrageenan, riboflavin (vitamin B-2), vitamin A (palmitate), vitamin D-2, vitamin B-12. Contains soy ingredients.
Wt/Vol., Packaging, Price: Half gallon (1.89 L) square plastic bottle with screw-on cap. Retails for $4.39 (2006/07, Lafayette, California).
How Stored: Refrigerated, 10 day shelf life after opening.

Nutrition: Per 8 fl oz.: Calories 100, calories from fat 25, total fat 3 gm (4% daily value; saturated fat 0 gm, trans fat 0 gm), cholesterol 0 mg, sodium 170 mg (7%), total carbohydrate 11 gm (dietary fiber 0 gm [3%], sugars 10 gm), protein 6 gm. Vitamin A 10%, vitamin C 0%, calcium 30%, iron 4%, vitamin D 25%, riboflavin 25%, vitamin B-12 15%. Percent daily values are based on a 2,000 calorie diet.
New Product–Documentation: Product with Label purchased in dairy case at Safeway supermarket in Lafayette, California. 2006. Oct. 31. White plastic bottle. Dated 2005. Text on wrap-around paper label in yellowish orange, white, light blue and red on dark blue. On the front panel: "New look. Same great taste. Vanilla–Naturally and artificially flavored. Helps lower cholesterol." Illustration of a glass overflowing with splashing, very white soymilk. Solae logo [DuPont]. Right panel: Nutrition facts. Ingredients. "Not for use as an infant formula. Lactose free. Please recycle. ME 5¢ DEP [deposit]." UPC. Back side: "Send the red dress for heart health. The Heart Truth is that heart disease is the #1 killer of American women. 1 in every 3 women dies of heart disease. Help us raise $200,000 for women with heart disease! $50,000 guaranteed donation plus $0.50 per red dress foil lid redeemed through January 2007 up to another $150,000." Left side: "8th Continent is where taste matters. www.8thcontinent.com. 8th Continent is the one-of-a-kind place that combines great taste with the heart health benefits of soymilk." Soyfoods Center taste test: Flavor–poor, artificial, much too sweet (like a soft drink). Color: Surprisingly tan for soymilk. Made from highly refined soy protein isolates (not revealed on the label) rather than from natural whole soybeans. The price per quart ($2.20) is almost *twice* as high as Trader Joe's delicious natural soymilk ($1.19) which is also free of sugar. The white plastic bottle with blue screw-on cap looks somewhat like a bottle of Clorox, but the paper label is attractive.

1033. **Product Name:** 8th Continent Light Soymilk.
Manufacturer's Name: 8th Continent, L.L.C. [General Mills] (Distributor).
Manufacturer's Address: Minneapolis, Minnesota 55440. Phone: 1-800-247-6458.
Date of Introduction: 2005.
Ingredients: Soymilk (water, soy protein [isolate], soybean oil, calcium phosphate), sugar, potassium citrate, sodium polyphosphate, dipotassium phosphate, soy lecithin, salt, carrageenan, xanthan gum, natural and artificial flavor, sucralose, riboflavin (vitamin B-2), vitamin A (palmitate), vitamin D-2, vitamin B-12. Contains soy ingredients.
Wt/Vol., Packaging, Price: Half gallon (1.89 L) square plastic bottle with screw-on cap. Retails for $1.99 (on sale) (2006/09, Berkeley, California).
How Stored: Refrigerated.
Nutrition: Per 1 cup (240 ml): Calories 50, calories from fat 20, total fat 2 gm (3% daily value; saturated fat 0 gm), saturated fat 0 gm, trans fat 0 gm, cholesterol 0 mg, sodium 160 mg (7%), total carbohydrate 2 gm (dietary fiber 0 gm, sugars 2 gm), protein 6 gm. Vitamin A 10%, calcium 30%, vitamin D 25%, vitamin C 0%, iron 4%, riboflavin 25%, vitamin B-12 15%. Percent daily values are based on a 2,000 calorie diet.
New Product–Documentation: Product with Label purchased by Martine Liguori in Oakland, California. 2006. June. 10 inches tall. Front panel: White, dark blue, yellow and red on light blue. Illustration of a stream of white soymilk streaming into a clear glass. "50% fewer calories than the leading original soymilk." Solae logo. Note: Light soymilks are generally made by mixing equal parts of regular soymilk and water.

1034. *Seed World.* 2006. Comings and goings. 144(1): 6. Jan.
• ***Summary:*** Alliances: On Oct. 3, the USDA's Agricultural Research Service (ARS) granted an exclusive license on the patented sunscreen technology SoyScreen, a biodegradable sunscreen derived from soybean oil, to iSoy Technology Corp.

Monsanto Co. and Solae Co. will team up to develop and market a new line of better tasting, more soluble soy proteins reported the *St. Louis Business Journal* (Oct. 27).

Companies: Arcadia Biosciences said (Nov. 2) that it had received a grant from the National Institutes of Health to develop soybeans with specific levels of soy isoflavones. The grant is for a little less than $100,000.

Delta King Seed Co. announced (Nov. 11) that it has continued promotion of SoyDiesel by investing in the Patriot BioFuels Plant in Stuttgart, Arkansas, which is scheduled to open in early 2006.

1035. Bell, David E.; Shelman, Mary. 2006. Bunge: Poised for growth. *Harvard Business School Case Study* N9-506-036. 36 p. Revised March 9, 2006. [9 endnotes]
• ***Summary:*** Original copyright: 2005. www.hbsp.harvard.edu. Contents: Introduction. The oilseed industry: Farm-to-consumer chain, soybean pricing, genetically modified soybeans, other feeds, other oils. Bunge Limited: Company background, building an oilseed giant. Bunge 2005: Agribusiness, fertilizer, food products. Bunge-DuPont alliance (2003): Technology access, production agriculture, The Solae Company (launched in April 2003, it is a soy ingredients company). The Bunge difference: Focused, efficient and global, integration unlocks value, commitment to partnering. The "Bunge Style." Managing change: Changes in demand and world trade, greater market volatility, greater traceability and integration (Nutrim Low Lin). Filling in the global mosaic.

Exhibits.

(1) World supply of major oilseeds, 2000/2001 to 2005/2006 (million metric tons). Soybean (by far the largest), rapeseed, cottonseed, peanut, sun seed, palm kernel,

copra.

(2a) Soybeans: World supply and distribution (thousand metric tons), 2000/01 to 2005/06.

(2b) Soybeans: Harvested area and yield by country, 1999-2005.

(3) Oilseed supply chain.

(4) Soybean pricing by major producing country, 1985-2005 (in US$ per metric ton).

(5a) Adoption of genetically modified soybeans in USA, Brazil, Argentina, 1997-2004. The USA has adopted the most and the fastest.

(5b) Graph: Global area of biotech crops, 1996 to 2004, by crop. Soybean, maize, cotton, canola.

(6) Pie chart (%): Share of global soymeal consumption by region, 1998 and 2005: The big change is in China, which has grown from 9% to 18%.

(7) World vegetable oil supply and distribution, 2000-2005 (million metric tons).

(8) Bunge stock price, Aug. 2001 to Nov. 2005. It has risen steadily and much faster than the S&P 500.

(9) Map of Bunge facilities in Eastern Europe.

(10) Map of trade flows and Bunge's global footprint. Soy products, corn, wheat. Shows each Bunge facility.

(11) Bunge Ltd. financial summary (in US$ million except share data).

(12a) Bunge operating segment information, 2002-2004–Agribusiness, fertilizer, edible oil products, milling products, other, unallocated.

(12b) Bunge net sales by geographical area, in US$ millions, 2002-2004. Net assets by geographical area.

(13) Graph: Growth of Bunge's Brazilian fertilizer business (8.6% a year). Bunge-DuPont biotech alliance. Treats DuPont/Pioneer as one company. "An effective development and delivery system for soy products."

(15) Comparison of Bunge, Cargill and ADM results, 2000-2005, Cargill has the largest revenue and no. of employees, followed by ADM, with Bunge last. But Bunge has grown the fastest.

(16) The Bunge operating model.

(17a) Projected population growth, 2004-2050 by world, high income, low income, Africa, Asia. Source: U.S. Bureau of Census.

(17b) Population growth and income growth, 1986-2010. "World food needs continue to grow." World population is growing at 1.35% per year average. World per capita income is growing at 1.4% per year adjusted for inflation: Source: World Bank.

(18) Graph: Areas with growing meat consumption. "Fastest growth in meat consumption occurs when income is less than $5,000 per year." Annual income per capita in 1995 US$.

(19) Projection of grain (corn and wheat) and soy consumption in principle markets, 2004/05 to 2010.

(20) Projection of grain and soy production in principle origin markets, 2004/05 to 2010.

(21) Production potential of agriculture in Brazil. Address: 1. Prof.; 2. Senior Researcher. Both: Agribusiness Program, Global Research Group [Cambridge, Massachusetts?].

1036. Companies join to invent, market new meatless sausages: Novel technology promises better texture and improved taste (News release). 2006. City of Industry, California.

• ***Summary:*** City of Industry, CA and St. Louis, MO, March 22, 2006 (Markey Wire)–Vegetarians and health-conscious shoppers, take note: El Burrito Foods today launched a new line of gourmet meatless sausages that promises to rival its counterparts with superior taste and a meat-like texture.

"The company also announced that the sausages, which are made using non-genetically modified Solae® brand soy protein, would be stocked at Whole Foods Market®, the world's leading natural and organic foods supermarket.

"El Burrito partnered with food scientists from The Solae Company to develop an improved meat-free sausage that would more closely resemble and taste like a traditional sausage. A proprietary soy protein invented by Solae was combined with El Burrito's well-reputed flavor expertise to produce four varieties of sausage: Kielbasa, Sun Dried Tomato & Basil, Chicken Chipotle and Apple Cranberry.

"Each 12 oz. Package includes four hearty, cholesterol-free links that are high in protein. Most varieties contain approximately 120 calories and 5 grams of fat, and carry a suggested retail price of $5.99." Address: California; Missouri.

1037. INTSOY. 2006. Processing and marketing soybeans: Meat, dairy and baking applications, May 1-5, 2006 (Leaflet). Urbana, Illinois. 4 panels each side. Each panel: 22 x 9 cm.

• ***Summary:*** This glossy leaflet (green and black on white) announces a 5-day course ($1,800) plus the course and an extended workshop schedule ($2,400). The program now has 15 corporate sponsors: The Solae Co., Staeta, Insta-Pro, Proviant, BAR, N.A., Inc., SOI, ADM, Assoy, Wenger, Microsoy Corporation, US Soy, Silk, Kikkoman, Cargill, and Buehler. Course schedule: Welcome, international soymilk processing, success stories, soymilk, and soy products, marketing, soy flour, soy and meat, hot topics (soy infant formula, soy and reduction of chronic disease, soy allergies, quality and stability of soybean oil, specialty soybean varieties, biotechnology of soybeans). A list of featured speakers are given; many are from the corporate sponsors!

Talk with INTSOY employee. 2005. The "short course" has been discontinued; it was established through a grant, has come to an end. The course is now under the aegis of NSRL. In the year 2000 the 4-day course attracted 28-30 people. Address: National Soybean Research Lab. (NSRL), 1101 W.

Peabody Dr., Urbana, Illinois 61801. Phone: (217) 244-1706.

1038. Messina, Mark J. 2006. Origin of the Soy Nutrition Institute (Interview). *SoyaScan Notes*. May 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The following companies have paid $10,000 to join the Institute: Revival, White Wave, ADM, Cargill, Solae, Monsanto, SANA, and the Soyfoods Council (Linda Funk, Iowa). The first meeting will be held on May 15 and 16 in (Monday and Tuesday) at the Sheridan-Clayton Hotel in St. Louis, Missouri. It could be the beginning of something important. Mark will be sending out official notes.

Mark has started to play the mandolin for fun. Also, he thinks that some of the recent not-so-exciting research findings on soy and human nutrition look bad because of the great expectations that so many people now have about soy. If we put things back into a more normal perspective, it still looks good, its just not going to make the food and ingredient manufacturing companies as rich as they hoped–except probably White Wave. Address: PhD, 439 Calhoun St., Port Townsend, Washington 98368. Phone: 360-379-9544.

1039. Soyatech. 2006. Soya Summit 2006: Food & Energy for the 21st Century (Leaflet). Bar Harbor, Maine. 1 p. Front and back. 28 cm.
• ***Summary:*** This conference will be held on 18-20 Sept. 2006 in St. Louis, Missouri, at the Chase Park Plaza Hotel. Sponsored by The Solae Company. There will be two parallel tracks. The soyfoods track speakers will include representatives from: The Solae Co., Monsanto, ADM, USDA, Kerry Foods, ProSoya, Tivall Corp., Natural Products Consulting, Soyatech, SunRich, and WISHH.

The energy track speakers will include representatives from: National Biodiesel Board, Toyota, DuPont, The ProExporter Network, Delta-T, New Energy Finance, Sigma Capital, Energy Management Institute, Rocky Mountain Biodiesel Consulting.

A third day of workshops on Sept. 20 will include: Taste of Soy: Beyond ingredients–Bring on the food! Address: Bar Harbor, Maine. Phone: 1-800-882-8684.

1040. 8th Continent L.L.C. 2006. 8th Continent (Website printout–part). www.8thcontinent.com Retrieved Sept. 6.
• ***Summary:*** Contents: A simple change. Healthy living: Healthy heart, healthy diet, healthy life. Our soymilk. Recipes. Contact us. About us. Media room. Site map. Privacy. Legal. En Espanol.

8th Continent now has 3 regular soymilks (original, vanilla, chocolate), 3 light soymilks (original, vanilla, chocolate), 2 fat-free soymilks (vanilla, original), and 2 refreshers (strawberry banana and orange pineapple banana). Address: P.O. Box 9452, Minneapolis, Minnesota 55440. Phone: 1-800-247-6458.

1041. WISHH (World Initiative for Soy in Human Health). 2006. Soy in Southern Africa.
• ***Summary:*** Below the title of this 1-page leaflet is printed: "Enhancing human well-being through soy."

"A meeting will be held on Friday, Oct. 6, 10:00 A.M. Room 316.

"Soy protein for people living with HIV

"Sustainable nutrition solutions through local businesses and products

"Nine countries–one association

"SISA Alliance: WhiteWave/Silk, Solae, Soyatech, Natural Products Inc, Hain Celestial, SANA, WISHH, the Services Group, USAID."

1042. Bloomberg News. 2006. DuPont to reduce pesticide output and cut 1,500 jobs. *New York Times.* Dec. 12. p. C2.
• ***Summary:*** "The DuPont Company will eliminate 1,500 agricultural jobs and cut output of herbicides and pesticides in a plan to increase spending on genetically modified [engineered] seeds, the company said yesterday."

Among the jobs to be reduced are those related to Solae, a joint venture with Bunge. "DuPont controls Solae, which makes liquid packaging [packaging for liquids] and soybean-derived ingredients for energy bars and other foods."

1043. *SoyaScan Notes.* 2006. Chronology of major soy-related events and trends during 2006 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 17–Soyatech (founded and owned by Peter Golbitz) is sold to HighQuest Partners, a management consulting firm headquartered in Boston, Massachusetts.

March 15-17–CERHR (Center for the Evaluation of Risks to Human Reproduction) expert panel meets in Virginia to discuss soy-based infant formula safety. They issue an important report.

May–The Soy Nutrition Institute is founded. Mark Messina is executive director. The founding members (each of whom paid $10,000 to join) are: ADM, Solae, Cargill, White Wave, Revival, Monsanto, SANA, and the Soyfoods Council (Linda Funk, Iowa).

June 23. Vandemoortele Group, a large oilseed crusher of Ghent and the parent company of Alpro, Belgium, acquires SoFine Foods, a subsidiary of Heuschen & Schrouff and the largest tofu manufacturer in Europe.

July 15–The National Nutritional Foods Association (NNFA) changes its name to the Natural Products Association (NPA); it hopes to attract more members from the natural foods industry which is not represented by a trade association.

Sept.–*The Soya and Oilseed Bluebook*, published by Soyatech, migrates to the Web. Some bound paper copies will still be published. For the first time in decades, copies are sent free of charge to qualified industry members.

Oct.–House Foods (which owns and operates America's

largest tofu plant in Garden Grove, California), opens a huge, brand new tofu manufacturing facility in Somerset, New Jersey. This enables them to deliver fresh, high quality, low cost tofu to the East Coast, Midwest, and Southeast markets.

Dec. 11–Hain Celestial Group (Melville, New York) acquires the assets of Haldane Foods Ltd. (Newport Pagnell, Bucks., UK) and its meat-free and non-dairy beverage business from Archer Daniels Midland Co. (ADM).

This year biofuels, including soy biodiesel, get new recognition for the important part that they can play in the U.S. energy economy.

1044. Orcutt, M.W.; McMindes, M.K.; Chu, H.; Mueller, I.N.; Bater, B.; Orcutt, A.L. 2006. Textured soy protein utilization in meat and meat analog products. In: Mian A. Riaz, ed. 2006. Soy Applications in Food. Boca Raton, Florida, London, New York: CRC Press (Taylor & Francis Group). [x] + 288 p. See p. 155-84. [11 ref]
• ***Summary:*** Contents: Introduction. Textured soy protein products. Soy grits. Textured soy flour. Textured soy protein concentrates. Textured isolated protein products. Textured vegetable protein blends. Meat coatings. Regulations governing the use and labeling of products containing textured vegetable protein products: United States, People's Republic of China, Canada, Japan, European Union. Meat product formulations containing textured soy protein ingredients: Preparation procedure for raw frozen beef patties, preparation procedure for precooked beef patties, preparation procedure for chicken patties, preparation procedure for beef meat loaf, preparation procedure for beef chili, preparation procedure for reduced-fat pepperoni. Meat analog food products: Meat analog product formulations (preparation procedure for vegetarian patty nugget, preparation procedure for vegetarian chili). Summary.

Tables: (1) Water-holding capacities and cooked texture of textured soy protein concentrate flake, crumble, and granule particles. (2) Texture comparison of different treatments. (3) Characteristics of textured soy protein products. (4) Characteristics of beef patty formulated to contain various levels of hydrated textured soy protein concentrate. (5) Minimum meat content requirements for selected meat and poultry products produced and sold in the United States. (6) Summary of use of textured vegetable protein meat products having a standard of identity. (7) Minimum meat requirements for selected Canadian standardized meat products. (8) Minimum meat requirements for Japanese agricultural standards. (9) Contents of raw frozen beef patties (U.S. formulation). (10) Contents of precooked beef patties (U.S. formulation). (11) Contents of chicken patties (U.S. premium formulation). (12) Contents of U.S. beef meat loaf. (13) Contents of beef chili. (14) Contents of reduced-fat pepperoni. (15) Contents of chicken-flavored vegetarian patty nugget. (16) Contents of vegetarian chili. Address: All: The Solae Company LLC, St. Louis, Missouri.

1045. Parkin, Katherine J. 2006. Food is love: Food advertising and gender roles in modern America. Philadelphia, Pennsylvania: University of Pennsylvania Press. 296 p. See p. 194. Illust. 24 cm. *
• ***Summary:*** "Early ads started out promoting their products' benefits to young children, as in a 1905 ad for Ralston Health Food. It offered a dense narrative, characteristic of the time, about 'How to Grow Strong Children' with the cereal."

1046. Paulson, Paul V.; Welsby, David; Huang, Xiaolin L. 2006. Ready-to-drink soy protein nutritional beverages. In: Mian A. Riaz, ed. 2006. Soy Applications in Food. Boca Raton, Florida, London, New York: CRC Press (Taylor & Francis Group). [x] + 288 p. See p. 199-226. [45 ref]
• ***Summary:*** Contents: Introduction: Markets for soy protein nutritional beverages, nutritional and functional demands, soy protein health benefits, categories of ready-to-drink soy protein nutritional beverages. Soy proteins: Soy protein classification, soy protein product manufacture and chemical composition (soy flour, soy protein concentrates, soy protein isolates), physical properties and functionality. Key factors for beverage quality: Dispersion and hydration of dry protein products, factors affecting hydration, recommended temperatures. Formulation and selection of ingredients: Protein attributes, effect of sugars on browning, hydrocolloid stabilizers, emulsifiers, selection of a buffering system, flavoring, colorants, fat sources. Processing: Beverage makeup, thermal treatment, handling (foaming). Beverage applications for soy protein: Ready-to-drink neutral pH (beverages containing dairy proteins, all-soy-protein nutritional beverages, high-fat beverages), ready-to-drink acid (stabilization, protein selection criteria, flavors and colors, thermal treatments, formulation). Parting comments.

Revenues from soymilk sales in the United States today are over $600 million, and soymilk products are sold in a wide variety of retail outlets.

Tables: (1) Human requirements for essential amino acids. (2) Composition of some commercial products derived from soybeans. (3) Relationships between physical properties of proteins and beverage attributes. (4) Examples of heat process conditions for beverages. (5) Formulas for ready-to-drink neutral beverages. (6) Formula for acidic beverage.

Figures: (1) Soybean processing pathways. (2) Nitrogen solubility index (%) of various soy protein isolates. (3) Physiochemical properties of protein hydration. (4) Maillard reaction of milk proteins or isolated soy proteins with fructose. (5) Process flow for typical RTD beverage. (6) pH/solubility curve for the main soy proteins. Address: The Solae Company LLC, St. Louis, Missouri.

1047. Taillie, Steven A. 2006. Food bars. In: Mian A. Riaz, ed. 2006. Soy Applications in Food. Boca Raton, Florida,

London, New York: CRC Press (Taylor & Francis Group). [x] + 288 p. See p. 185-98. [5 ref]

• ***Summary:*** Contents: Product marketing and positioning. Definition. Formulation types. Physical forms. Processing. Ingredients: Carbohydrates and polyols, protein sources, fats and oils, dietary fiber, minor ingredients. Impact of ingredients and other parameters on bar texture: Isolated soy protein, carbohydrates (corn syrups, sugar alcohols), pH, extruded soy nuggets as ingredients, dairy proteins, processing, shelf-life considerations. Conclusions.

Figures: (1) Evolution in bar categories with time. (2) Evolution of bar market size and composition in the United States from 1998 to 2004. (3) Bar outlets dominated by grocery stores in 2004. (4) Typical plant layout for a sheet and cut bar line. (5) Different soy proteins produce solutions of different viscosities. (6) Impact of pH on bar texture. (7) Impact of milk proteins on bar hardness.

Tables: (1) Types of bar formulations and typical compositions. (2) Classification of polyols. (4) Polyol properties. Address: The Solae Company LLC, St. Louis, Missouri.

1048. 7th international soy symposium: Role of soy in health and disease prevention. Program and abstracts. 2007. Singapore: Printed for Boon Yee Yeong. 100 p. Held 7-9 March 2007 at Shangri-La Hotel, Bangkok, Thailand. Illust. No index. 30 cm.

• ***Summary:*** See next two pages. This is the first time the International Symposium of the Role of Soy in Health and Disease Prevention is being held in Asia. It will take place in conjunction with the 5th Southeast Asia Soyfoods Seminar and Trade Show–Science to Market Opportunities in Asia, which will be held at the same location March 6-8. This document was compiled and organized by Boon Yee Yeong, who owns her own company in Singapore; her clients include ASA.

Contents: Scientific and organizing committee: Chair (Dr. Mark Messina), Panel of Advisors, Secretariat. About the organizers: Institute of Nutrition, Mahidol University (INMU, Thailand), ASA International Marketing (ASA IM; the overseas arm of the United States Soybean Export Council), The Soy Food Forum (SFF; a network of organizations in Asia with particular interest in soy).

Acknowledgements: Platinum and gold level sponsors: Otsuka Pharmaceutical Co., Ltd. (own SoyJoy brand), Tetra Pak Asia Pte Ld.–Soy Knowledge Centre. Silver and bronze level sponsors: The Solae Company, Solbar Plant Extracts Ltd., Green Spot Co. Ltd. (Thailand's pioneer and leading soymilk maker with over 45 years of experience. Produces a wide range of soymilk products under the Vitamilk, Vitamilk Champ, and V-soy trademarks). Media sponsor: Be Media Focus (Thailand) Co. Ltd. (Publisher of *Food Focus Thailand* a trade magazine). Exhibitors: 13 companies are listed, about half from the USA.

Symposium program. Post-Symposium seminar program. Speaker profiles. Symposium abstracts: Opening session: Soy and health–An overview. Session 1: Soy and cardiovascular diseases. Session 2: Soy and cancer prevention. Session 3: Soy and bone health. Session 4: Soy and menopause. Session 5: Soy and other health aspects.

Post-Symposium seminar abstracts: Soy complementary food & soy milk programs. Micronutrient fortification programs.

Poster presentation abstracts.

1049. Golbitz, Peter. 2007. Color photos of the soymilk processing short course held 22 May 2007 at the SoyCow Training Center in Bergville, KwaZulu-Natal, South Africa. Bar Harbor, Maine.

• ***Summary:*** Peter Golbitz took these color photos and wrote the captions. For background see interview with Peter Golbitz on 22 Jan. 2009. The short course workshop on 22 May 2007 took place at the training center located on property owned by Henry Davies adjacent to his Eden Manufacturing plant. This workshop (including the travel and other expenses of the African participants) was paid for mostly by WISHH; other contributors were USAID, Solae, Silk, Soyatech, and others.

(1) Peter Golbitz leading a strategic planning discussion at a meeting of the Soy Southern Africa association, held in Bergville on May 22.

(2) Ratan Sharma from the American Soybean Association's office in New Delhi, explaining the equipment and processing steps for the SoyCow system. These SoyCows are made in India using the ProSoya process developed and patented by Raj Gupta (Ottawa, Canada).

(3) Henry Davies of Eden Manufacturing and the Eden Social Development Foundation demonstrating the VitaGoat soymilk processor. At this stage, the soymilk and pulp have been pressure cooked with steam and the mixture is being strained before manual pressing to separate the okara from the fresh soymilk.

(4) A participant grinding soaked soybeans on a pedal-powered VitaGoat grinder while a helper feeds fresh beans into the grinder hopper.

(5) Ratan Sharma explaining how to make soymilk yogurt from fresh soymilk produced with the VitaGoat or the SoyCow.

(6) Ratan Sharma demonstrating how to make tofu using freshly produced soymilk curds from the VitaGoat. See two pages after next.

(7) Ratan Sharma cutting freshly pressed tofu for participants at the short course. Onlookers include Henry Davies (right) and Mrs. Mchunu (center in blue), a member of the South African National Government, Inkatha Party, also known as "Mama Soya" for her long time and personal support of the expanded use of soy in Southern Africa.

(8) Participants at the short course taste and evaluate

PROGRAM & ABSTRACTS

7TH INTERNATIONAL SOY SYMPOSIUM

Role of Soy in Health and Disease Prevention

MARCH 7-9, 2007
SHANGRI-LA HOTEL, BANGKOK, THAILAND

Jointly organized by:

SoyFoodForum

ASA International Marketing™

Scientific and Organizing Committee

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Mr John Lindblom, *ASA International Marketing, Singapore*
Mr Timothy Loh, *ASA International Marketing, Singapore*
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Ms Claudia Loh, *ASA International Marketing, Singapore*
Ms Curlyn Tan, *ASA International Marketing, Singapore*

different soymilk and soymilk yogurt formulations using different flavors and levels of sweeteners. Address: Director of International Business Development, SunOpta Grains and Food Group.

1050. Solae Co. (The). 2007. Solae acquires isolated soy protein line from Cargill (News release). July 11.
• ***Summary:*** "St. Louis, Missouri. July 11, 2007–Solae, a joint venture between DuPont (NYSE: DD) and Bunge Limited (NYSE: BG) and the leading supplier of soy protein for food-based products, announced today that it has completed the acquisition of Cargill's isolated soy protein (ISP) Prolisse product line including the patented membrane technology for processing ISP. Financial terms were not disclosed.

"'The combination of Solae's ISP business and Cargill's Prolisse product line is a perfect fit,' says Solae President and CEO Tony Arnold. 'We are committed to the soy ingredient industry and this investment will enable us to continue serving customers with quality and reliability.' Solae will transition Cargill's products and technology into an existing plant, thus ensuring reliability of supply. Both Solae and Cargill are committed to a smooth transition. Both companies will make every effort to ensure that all customers will continue to be serviced with the current level of commitment without any interruption.

"'At Solae, we are excited to be a global partner in delivering innovation that improves our customers' products,' says Arnold. 'With this purchase, we gain new technology that will enhance our ability to take new products to market and will allow us to offer more solutions for our customers.' Adding Cargill's membrane-based technology and patents to Solae's existing portfolio will enable Solae to offer a wider range of products and innovation, he said.

"About Solae: The Solae Company is a food innovation and ingredient manufacturing organization, providing meat, food and beverage manufacturers across the world with Better Ingredients for Better Living™. Headquartered in St. Louis, Missouri, USA, with annual revenue exceeding $1 billion, the company was formed through an alliance between Bunge Limited (NYSE: BG) and DuPont (NYSE: DD). For more information, visit www.solae.com" Address: The Solae Company LLC, St. Louis, Missouri.

1051. *St. Louis Business Journal* (*Missouri*). 2007. Solae acquires Cargill product line. July 11.
• ***Summary:*** Solae announced today that it has completed its purchase of Cargill's Prolisse line of isolated soy proteins (ISP), including the patented membrane technology for processing ISP. Financial terms of the deal were not revealed.

Solae's news release dated July 11 stated: "'The combination of Solae's ISP business and Cargill's Prolisse?

product line is a perfect fit,' says Solae President and CEO Tony Arnold. 'We are committed to the soy ingredient industry and this investment will enable us to continue serving customers with quality and reliability.'

"Solae will transition Cargill's products and technology into an existing plant, thus ensuring reliability of supply. Both Solae and Cargill are committed to a smooth transition. Both companies will make every effort to ensure that all customers will continue to be serviced with the current level of commitment without any interruption."

In May 2006 Solae told the *Business Journal* that it had more than 50% of the world market for ISP used as a food ingredient.

Talk with Bill Limpert of Cargill (Protein). 2008. June 2. Solae bought Prolisse then shut it down; Solae never made any Prolisse and apparently did not use the patented membrane technology. They promised in negotiations and in their news release (but not in their contract) to continue serving Cargill's former customers. Cargill began to sense that something was wrong when no Solae engineers showed up at Cargill's plant (a large pilot plant). So guess who got all the criticism from former Cargill customers–Cargill.

1052. *SoyaScan Notes.* 2007. Chronology of major soy-related events and trends during 2007 (Overview). Dec. 31. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** Jan. 1–Soyfoods Center changes its name to Soyinfo Center.

Feb.–The Soy Connection for the Food Industry (Vol. 1, No. 1) starts to be published by United Soybean Board as a free e-newsletter. The subject of the first issue is Qualisoy soy oil.

March 6-8 International Soy Utilization conference held in Bangkok, Thailand. It is organized by: The Institute of Nutrition, Mahidol University (INMU), ASA International Marketing (ASA IM), and the Soy Food Forum Southeast Asia (SFF).

April 4–Organizations listed in the Soya & Oilseed Bluebook are invited and enabled to update their own listings online. The update listing will appear as soon as the Bluebook editors review it and in the print edition in the fall. The Bluebook will continue to be printed as a bound book. Preferred customers will receive a free copy. Qualified people or organizations in the industry who request a copy pay shipping and handling. Those outside the industry must pay for shipping and handling plus a $95 fee.

June 11–The Hain Celestial Group completes its acquisition of the tofu and meat-alternatives business of WhiteWave Foods Co., a subsidiary of Dean Foods. The product line includes grilled and baked tofu, seitan, tempeh, etc. These products are expected to complement Hain Celestial's existing meat alternatives under the Yves brand in Canada and the United States. The White Wave tofu business generated sales of approximately $8 million in the last financial year. Dean Foods keeps Silk soymilk.

July 11–Solae announces that it has completed its purchase of Cargill's Prolisse line of isolated soy proteins (ISP; soy protein isolates), including the patented membrane technology for processing ISP.

Aug. 7–SunOpta (incl. SunRich), headquartered in Canada, announces that it has acquired a soymilk plant in Heuvelton, New York, from ProSoya Corporation (Ottawa, Ontario). Allan Routh is president of the SunOpta Grains and Foods Group.

Aug. 16–CPM (Waterloo, Iowa) acquires Crown Iron Works (Minneapolis, Minnesota). CPM is owned by Golbert Global, a private equity group. The acquisition doubles the size of CPM.

Sept. 11–Hain Celestial Group announces it will delay filing its annual report with the U.S. Securities and Exchange Commission (SEC) pending a review of its practices in granting stock options. Thus, the annual report was received by shareholders in April 2008, rather than the typical Nov. 2007.

Nov. 5–Symington's, a major U.K. food manufacturer, has acquired the dry-mix products from Hain Celestial (formerly known as Haldane Foods) for an undisclosed sum. In the purchase of Hain Celestial's dry mix operation, Symington will take over the Barrow based production centre from Hain Celestial and will enable the company to increase its stake in the growing health food and vegetarian sector. Main products in the acquisition are couscous, sport nutrition, snack pots and vegetarian meals. Brands acquired include Granose, Realeat, Direct Foods, Organic and Amazing Grains. Granose was owned by Haldane Foods which also owned Direct Foods and Realeat. So you will also find Sosmix and Burgamix have disappeared as well–but they have returned under the Granose brand. We now have the Granose Sausage Mix, Burger Mix and others that have replaced the Realeat and Direct Foods Sosmix and Banger Mix as well as the Burgamix. Popular products like Nut Roast, Cashew Nut Roast and Chicken Style Bake were discontinued following the sale of the Realeat, Granose and Direct Foods brands.

1053. **Product Name:** 8th Continent Soymilk Smoothie [Chocolate Strawberry Banana].
Manufacturer's Name: 8th Continent, L.L.C. [General Mills] (Distributor).
Manufacturer's Address: Minneapolis, Minnesota 55440. Phone: 1-800-247-6458.
Date of Introduction: 2007.
Ingredients: Soymilk (water, soy protein [isolate], soybean oil, calcium phosphate), sugar, fructose, modified corn starch, cocoa processed with alkali, strawberry puree, banana puree, potassium citrate, dipotassium phosphate, natural and artificial flavor, salt, carrageenan, tricalcium phosphate, soy lecithin, sucralose, xanthan gum, sodium

benzoate (preservative), riboflavin (vitamin B-2), vitamin A (palmitate), vitamin D-2, vitamin B-12. Contains soy ingredients.
Wt/Vol., Packaging, Price: 1.5 qt (1.41 L) square plastic bottle with screw-on cap. Retails for $1.99 (on sale) (2007/02, Berkeley, California).
How Stored: Refrigerated.
Nutrition: Per 8 fl oz (236 ml): Calories 100, calories from fat 10, total fat 1 gm (2% daily value; saturated fat 0 gm, trans fat 0 gm), cholesterol 0 mg, sodium 180 mg (8%), total carbohydrate 18 gm (dietary fiber <1 gm [3%], sugars 10 gm), protein 6 gm. Vitamin A 10%, vitamin C 0%, calcium 30%, iron 8%, vitamin D 25%, riboflavin 25%, vitamin B-12 15%. Percent daily values are based on a 2,000 calorie diet.
New Product–Documentation: Product with Label purchased by Martine Liguori in Berkeley, California. 2007. Feb. Private labeled as "Official soymilk of Bob Greene's Best Life Diet. Approved Bestlife the bestlife.com. Limited edition." 10 inches tall. Front panel: Chocolate brown, tan, blue, red, white yellow on light green. Illustration of a strawberry and a scoop of vanilla soymilk floating in a wavy sea of chocolate. Solae logo. Side panel: The Best Life Diet is a new book authored by Oprah's trainer Bob Greene. Forward by Oprah Winfrey. Martine's taste test: Nice thick shake. Good chocolate, banana, strawberry flavor. Low in calories.

1054. *St. Louis Post-Dispatch* (*St. Louis, Missouri*). 2008. Solae: Rhenman is named CEO. Feb. 28. p. D2.
• ***Summary:*** "Solae Co., a seller of soy ingredients [isolated soy proteins] for baked goods, beverages, nutrition bars and meats, named Torkel Rhenman chief executive.

"Craig Binetti, who led St. Louis-based Solae as interim CEO since August 2007, will continue as chairman of the board of Solae and president of DuPont Nutrition & Health."

1055. Garden Protein International. 2008. Lifestyle (Website printout–part). www.gardenprotein.com 7 p. Retrieved May 28.
• ***Summary:*** Tabs (across the top): Product info (Garden Beef or Garden Chicken). Product usage. Availability. Formats & flavors. Nutrient info. Contact us. "Gardein™–the new vegetable protein. More than an ingredient, its a foundation." E-mail: wow@gardenprotein.com.

Talk with Seth Tibbott, founder and president of Turtle Island Foods, Inc. 2008. May 27. Yves Potvin has started a new company (after selling his original company to the Hain Celestial Group in June 2001) named Garden Protein International. He probably had to wait until his "noncompete agreement" had expired. He has worked with Solae and soy protein isolates to develop a new generation of extruded meat alternatives, with an excellent texture and flavor. Yves also has a second and newer website with the latest info on its products: www.gardein.com.

Note: As of Nov. 2012, the name of the company is still Garden Protein International. Address: 12751 Bathgate Way, Vancouver (Richmond), BC, Canada V6V 1V5. Phone: 604-278-7300.

1056. 8th international soy symposium on the role of soy in health promotion and chronic disease prevention and treatment: Program. 2008. Champaign, Illinois: American Oil Chemists' Society. 36 p. Held 9-12 Nov. 2008 at Hilton Tokyo Hotel, Tokyo, Japan. No index. 28 cm. [Eng; jap]
• ***Summary:*** See next 3 pages. This program was given (free of charge) to attendees when they registered.

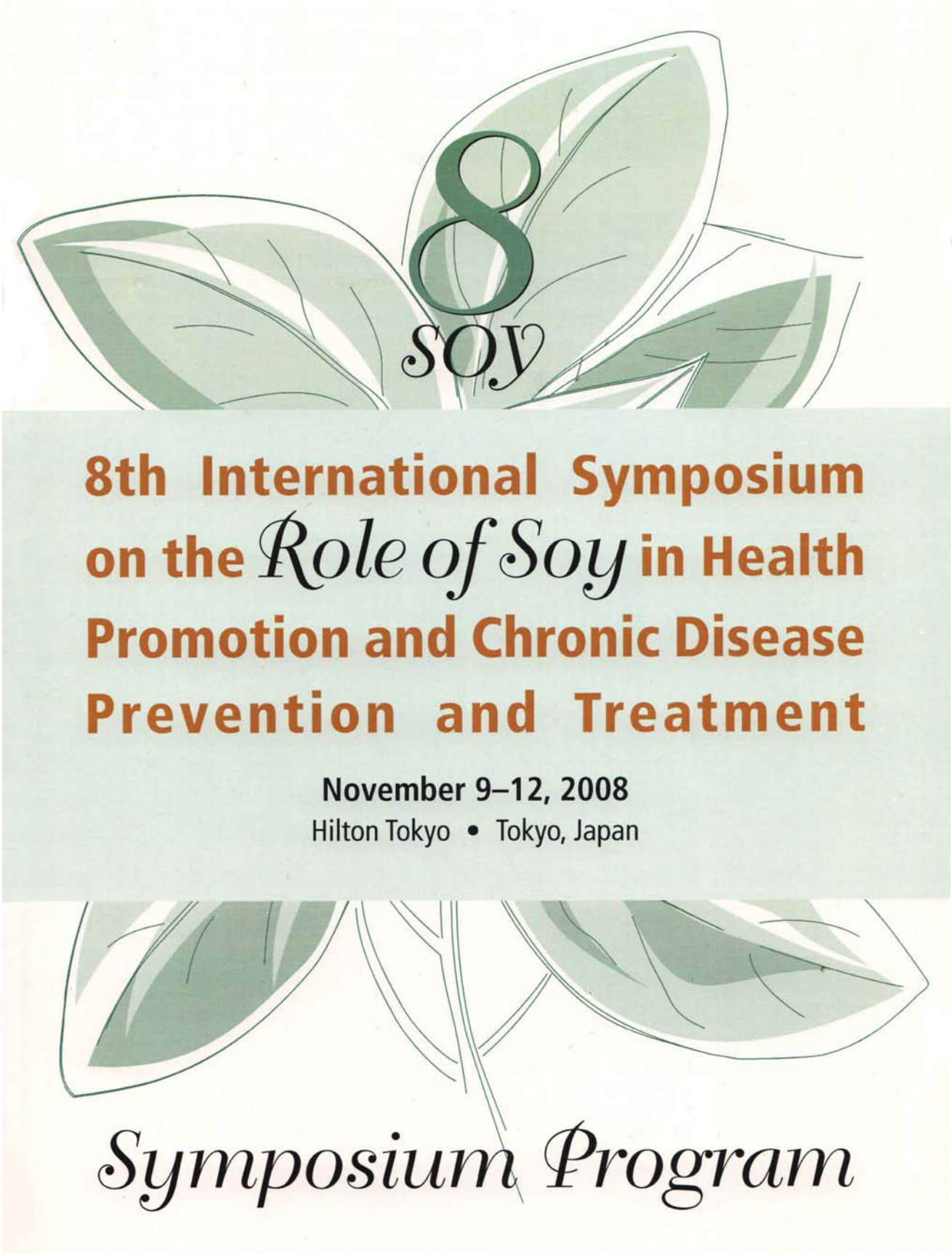
Contents: Welcome! Chairpersons. General information. Award winners. Oral presentation abstracts. Poster presentation abstracts. Poster presentations. Program schedule. Sponsor showcase schedule. Symposium sponsors: Diamond level–Otsuka Pharmaceutical Co., Ltd. (own SoyJoy brand). Platinum level: ASA International Marketing, Japan office, Fuji Oil Co. Gold level: Silk (soymilk), Solae, Soy Nutrition Institute Japan (SNIJ). Soy Nutrition Institute, Inc. (c/o SmithBucklin, St. Louis, Missouri). Silver level sponsors: Fujicco Co. Ltd. (Kobe, Japan), Nichimo Biotics Co. Ltd. (Tokyo, Japan), Solbar Industries, Ltd. (Ashdod, Israel). Note: All sponsors also have a ½-page ad in the program.

Program schedule: Sunday, Nov. 9: Opening remarks. Hormones, menopause, and mood. Obesity / satiety. Mon. Nov. 10: Equol session. Tues. Nov. 11. Cancer session. Bone / cardiovascular disease. Wed. Nov. 12. Emerging areas research. General topics.

On the inside front cover is a special section with a beige background titled: "The Origin of Soybeans" which states: "According to research conducted by the Yamanashi Prefectural Museum, there is evidence that soybeans were already being propagated in Japan during the Jomon Era, some 5,000 years ago (reported from the Sakenomiba site, Hokuto City, Yamanashi Prefecture)."

Letter (e-mail) from Mark Messina. 2008. Nov. 18. "Total attendance: 250, about 210 paid. Fewer Japanese attended than we hoped but still a success in terms of attendance and information presented. Lots of enthusiasm for holding another meeting. People were thinking of Italy because it is such a nice venue and so much soy work is underway there. But if we have it there it would be 7 years between symposia in the US so I suspect we will have it in the US in 2010."

1057. Schneider, Michael. 2008. Major sources, composition and processing. In: Frank D. Gunstone, ed. 2008. Phospholipid Technology and Applications. Bridgwater, England: The Oily Press. xii + 201 p. See p. 21-40, Chap. 2. Illust. 24 cm. Series: Volume 22 in The Oily Press Lipid Library. [38 ref]
• ***Summary:*** Contents: Introduction. Occurrence:



大豆の起原

大豆は野生のツルマメ（ノマメ）が改良されたもの。栽培の起原は中国の東北部あるいは華南とされています。司馬遷の『史記』（前漢の紀元前 91 年ころ成立）によれば、中国古代の伝説上皇帝“黄帝”が植えた五穀に大豆が含まれていたとされ、これが正しければ紀元前 5000 年以上前に栽培されていたことになります。

山梨県立博物館の研究では、日本にもすでに 5000 年ほど前の縄文時代に伝播していた痕跡があると言われています。（北杜市の酒呑場遺跡）

大豆の食べ方は、枝豆のように未熟豆をゆでて食べるほか、完熟豆を煮豆にしたり煎った豆をお菓子に使う以外は原形をとどめることなく加工され、納豆、豆乳、豆腐、湯葉、油揚げといった食品や、味噌・醤油などの調味料、さらには大豆を絞った油など、様々に用いられています。

Various ways of preparing soybeans

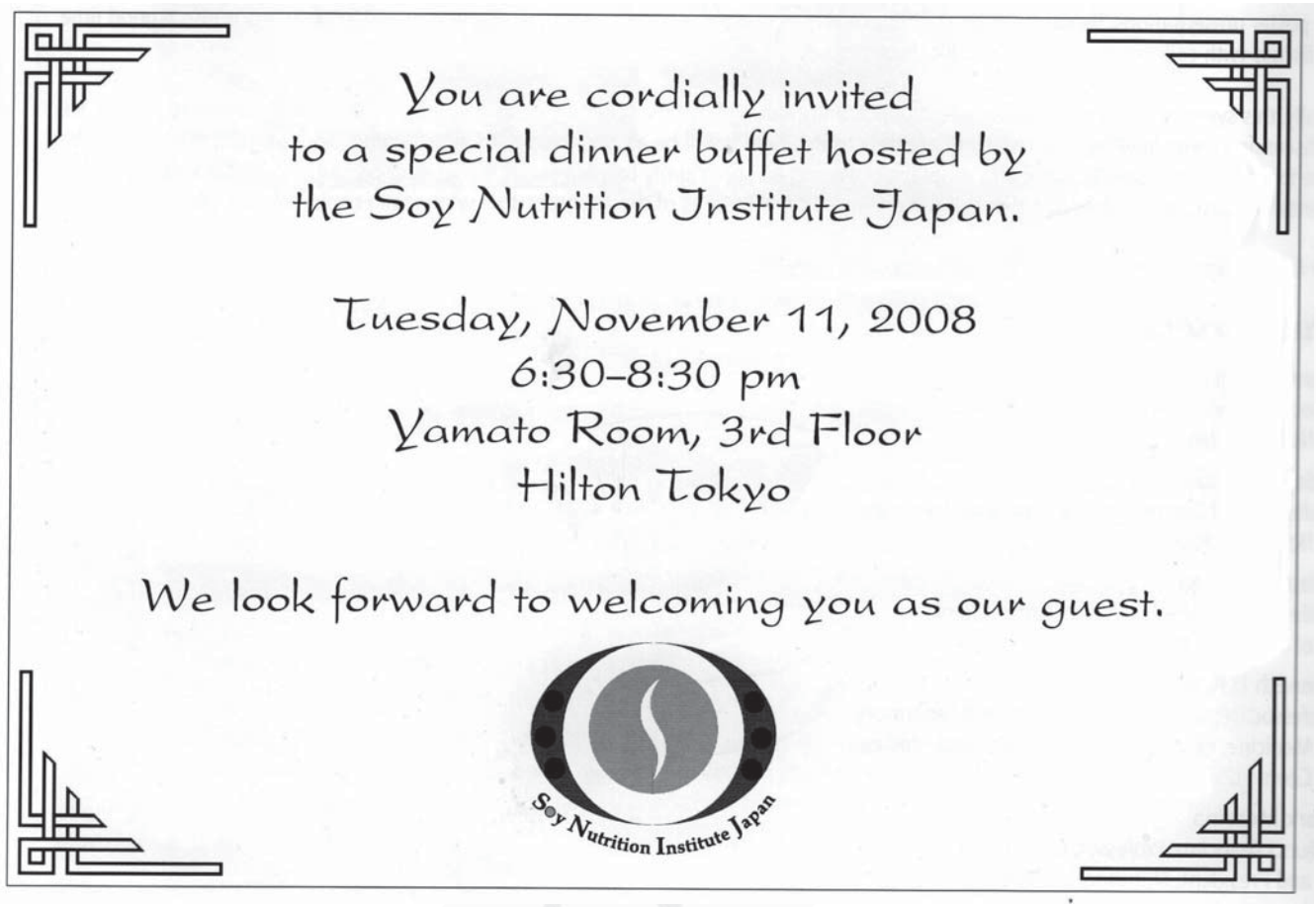
大豆の様々な調理法

The Origins of Soybeans

The progenitor of the modern soybean was a wild, vine-like plant called Glycine soja. It is generally believed that soybeans were originally cultivated in northeastern China or the Huanan region. According to the Records of the Grand Historian, the magnum opus of Sima Quan written from 109 BC to 91 BC, soybeans were one of the five grains cultivated by the legendary Chinese sovereign, the Yellow Emperor, which, if true, means that this crop has been being produced for more than 7,000 years.

According to research conducted by the Yamanashi Prefectural Museum, there is evidence that soybeans were already being propagated in Japan during the Jomon Era, some 5,000 years ago (reported from the Sakenomiba site Hokuto City, Yamanashi Prefecture).

There are many ways to eat soybeans, ranging from boiling immature beans, as in edamame, making boiled bean dishes, and roasting mature beans to produce a snack food, to processing them in ways that go beyond the original form of the bean, including food products such as natto, soy milk, tofu, yuba, and aburaage, seasonings such as miso and soy sauce, and soybean oil.



Glycerophospholipids, sphingophospholipids. Phospholipid processing: Vegetable phospholipids (fluid {crude} lecithins, solvent technologies {membrane degumming, membrane de-oiling, acetone de-oiling, carbon dioxide de-oiling, alcohol fractionation, chromatographic purification}), animal phospholipids (egg phospholipids, milk phospholipids, marine phospholipids, brain phospholipids). Modification of phospholipids: Chemical modification (chemical hydrolysis, acetylation, hydroxylation, hydrogenation). Commercial uses (summarized in tables 2.10 and 2.11).

Figures: 2.1. Model of a biological membrane (from *Scientific American*).

2.2 Structure of diacylglycerophospholipids; X is residue from choline (PC), ethanolamine (PE), inositol (PI), glycerol (PG), water (PA).

2.3 Structure of sphingomyelin.

2.4 Vegetable lecithin processing (including crude soya lecithin, standard lecithin, modification (hydroxylation), acetylation, hydrolysis), fractionation (with acetone, or ethanol), and compounding (using emulsifiers, carriers, or fats and oils).

2.5 Egg yolk phospholipid processing principles (in order to get various products, such as egg yolk powder or yolk lipids).

2.6 Milk fat globule membrane (remarkable complex).

Tables: 2.1 Phospholipid content of biological materials (% of dry matter; soybeans 0.5, sunflower seeds 0.2, rice bran 1, egg yolk 17, salmon roe 8, milk 0.1).

2.2 Main phospholipid classes of commercial interest and their abbreviations: The two main classes are (a) glycerophospholipids and (b) sphingophospholipids. In class (a) are: phosphatidylcholine (PC), phosphatidylethanolamine (PE), phosphatidylserine (PS), phosphatidylinositol (PI), phosphatidylglycerol (PG), diphosphatidylglycerol (DPG). phosphatidic acid (PA), N-Acyl-phosphatidylethanolamine (NAPE). In class (b) are: ceramide phosphocholine (sphingomyelin).

2.3 Phospholipid composition in oil-free polar lipid extracts for commercial raw materials (%). Gives values for soya [soybeans], rapeseed, sunflowerseed, corn, egg, milk, salmon roe. For example, egg is the richest source of PC (74%) whereas soya has the lowest content of PC (22%).

2.4 Main fatty acid composition of phospholipid mixtures (%). Gives values for soya, rapeseed, sunflowerseed, corn, egg, milk, and salmon roe. For example, egg is the richest source of 16:0 (30%) compares with only 20% for soya.

2.5 Composition of commercial fluid soya lecithin (%). It contains 52% of 6 phospholipids, 6% glycolipids, 4% carbohydrates, 38% neutral lipids, and five fatty acids

(palmitic acid 18%, stearic acid 5%, oleic acid 11%, linoleic acid 59%, and linolenic acid 7%).

2.6 Typical composition of a commercial de-oiled soybean lecithin (%). It contains 81% phospholipids, 10 glycolipids, etc.

2.7 Alcohol fractionation of soybean lecithin.

2.8 Chromatic systems for phospholipid fractionation / purification.

2.9 Lipid composition of commercial marine phospholipid products (%). Gives values for krill, fish processing by-products, and salmon eggs.

2.10 Commercial phospholipid products and their predominant use. 18 commercial products are listed. The uses are: Food, animal feed, industrial, cosmetics, pharma [pharmaceutical], and dietetics. For example: The main uses / applications of fluid soybean lecithin (oil containing) are animal feed, food, industrial, cosmetics, pharma. and dietetics. By contrast, de-oiled soybean lecithin fractions (PC 50-80%) are food, cosmetics, pharma, and dietetics.

2.11 Major companies employing a range of phospholipid preparations. The companies are: ADM (US), Solae (US), Cargill (Germany), Lipoid (Germany), Phospholipoid (Germany), Chemi (Italy), Lecico (Germany), Tsuji Oil Mill (Japan), Fresenius-Kabi (Sweden), Doosan (Korea), Nippon Oils and Fats (Japan), Biofer (Italy), Avanti Polar (USA), Belvo (Italy), Enzymotec (Israel), Lipogen (Israel), and Neptune (Canada). For each company is given: Website, country, and which of 13 commercial phospholipid products it sells. Address: Lecithos–Functional Lipid Innovation and Consulting, Freinsheim, Germany.

1058. WISHH. 2009. WISHH–World Initiative for Soy in Human Health (Website printout–part). www.wishh.org Retrieved Jan. 29.

• ***Summary:*** Contents: Home. About WISHH: Mission and vision, WISHH Committee, Our supporters / partners, Staff. Global outreach: WISHH has activities in the following countries, listed alphabetically and highlighted in green: Afghanistan, Bangladesh, Botswana, Burkina Faso, Cambodia, Ivory Coast, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Kenya, Mozambique, Pakistan, Senegal, South Africa, Uganda, Vietnam, Zimbabwe. These countries are shown on a map of the world and each program is described in considerable detail if you click on the name of that country below the map. Another group of countries in the same list, whose names are written in black, are those where WISHH presently has projects but (being very busy and active) has not yet had time to describe that project and add a color photo. They are: Angola, Democratic Republic of the Congo (DRC), Ethiopia, Malawi, Nicaragua, Nigeria, Tajikistan, Tanzania.

Media communications: Press releases, Newsletters, Annual reports, Photo gallery (very interesting). Workshops / Training: International workshops, Washington, DC, workshops, Midwest workshops, Other training. Nutrition library: Nutrition HIV/AIDS overview, WISHH presentations, WISHH papers / publications, WISHH HIV/AIDS activities, HIV/AIDS resources, SoyCow & VitaGoat, Economics of soy. Resources / Links: Soybean organizations and agencies (33), U.S. government and international organizations (13). About soy: Soy products, composition of soy, US soy production, Supplier list. Contact us: The WISHH office is co-located with the American Soybean Association office near St. Louis, Missouri.

"Global outreach: WISHH works with multiple private voluntary organizations and commercial companies in more than 28 different developing countries in Africa, Asia and Central America. Many of these groups are using U.S. high-protein soy to improve diets and health as well as encourage growth of food industries in developing countries."

Supplier list–Suppliers of soy and soy products: ADM, Bunge Milling, Cargill, Inc., CHS (Cenex Harvest States), Soya Kenya (agent for CHS in Kenya), Louis Dreyfus Corp., Nedan Oil Mills (Pty) Ltd. (Afgri Products) (Republic of South Africa), North American Millers' Association, Rab Processors Ltd. (Malawi). Seba Foods (Malawi), The Solae Co., Soy Afric (Kenya), SunOpta Food Group LLC (USA), Zeeland Farm Soya (USA).

SoyCow & VitaGoat: Both are manufactured and supplied by Malnutrition Matters (Frank Daller), 498 Rivershore Crescent, Ottawa, ON, Canada K1J 7Y7. www.malnutrition.org. Details about each low-tech machine are given.

Color photos show: (1) Jim Hershey, executive director of WISHH, with Africans interested in soyfoods in Cote d'Ivoire. (2) Ditto. (3) Handsome boy with soy in Mozambique. (4) Jim Hershey drinking soymilk in Malawi. Address: 12125 Woodcrest Executive Dr., Suite 100, St. Louis, Missouri 63141. Phone: (314) 576-1770.

1059. American Soybean Association. 2010. History of the American Soybean Association, 1998-1999 (Website printout–part). www.soygrowers.com/history/default.htm Retrieved April 22.

• ***Summary:*** "1998: ASA opened a new chapter for soybean producers this year when Congress enacted legislation that allows vehicle fleets regulated under the Energy Policy Act of 1992 to earn credits toward meeting EPACT requirements by operating on B-20. This legislation is significant because it provides credits for the use of biodiesel fuel that can be made from soybean oil, and it provides biodiesel blends that offer consumers the economics necessary to make B-20 the "low cost leader" in the EPACT market. Biodiesel has been one of ASA's top priorities for several years.

"+ ASA issued Grower Advisories pertaining to import clearances for soybeans grown from genetically modified seedstock in major export markets.

"+ A $6 billion ag assistance package was enacted

that included $2.575 billion in total funding to address crop disaster losses, and another $3.15 billion in market loss payments to producers eligible for Freedom to Farm contracts. Also, ASA successfully urged Congress to approve income averaging, increased deductibility of health insurance for farmers, and a 5-year carryback for operating losses. The approved tax cuts are estimated to save producers more than $1 billion over the next five years.

"+ ASA worked diligently to ensure that Ag appropriators approved funding for the Foreign Market Development Cooperator Program at the current operating level of $32 million and $90 million for the Market Access Program. ASA utilizes funding from the FMD and MAP, along with producer checkoff dollars, to promote U.S. soybean exports in more than 80 counties.

"+ Funding was secured for the International Monetary Fund at $17.9 billion. IMF funding is vital to ensuring stability in U.S. Soybean export markets in both the short and long-term. ASA also succeeded in convincing USDA to include half a million tons of soy in a Russian Food Aid Program and another $61 million of soybeans and soy products in other P.L. 480 Title 1 programs.

"+ Early this year, ASA participated in the White House Rose Garden ceremony, during which President Bill Clinton signed into law the Agricultural Research, Extension, and Education Reform Act. This legislation was one of ASA's top priorities because it approved funding for increased agricultural research funds, as well as crop insurance. Agricultural research is slated to receive $600 million over five years, and it authorized $485 million over five years to pay insurance agents and companies for expenses to write crop insurance policies.

"+ On Nov. 10, the Food and Drug Administration gave initial approval to allow health claim labels on products containing soybean protein based on data contained in a petition presented by Protein Technologies International, Inc., and a follow-up petition filed by ASA in October. Approval by FDA of evidence that including soy protein in a healthy diet reduces serum cholesterol and may reduce the chance of heart disease will have consumers around the world seeking foods labeled to contain soy protein. A final rule was expected in 1999.

"+ In November, ASA formally opened its 14th international marketing office in Istanbul, Turkey, to increase demand for U.S. soybeans and products in the Middle East.

"+ ASA took the lead in working with biotechnology and seed companies to ensure that U.S. growers didn't lose $9 billion of U.S. Soybean export markets due to the presence of unapproved biotechnology-derived soybean varieties.

"+ To help maintain U.S. soy exports despite Asia's economic crisis, ASA worked to obtain and increase credit guarantees from USDA for the purchase of soybeans and soy products. In part due to ASA's aggressive initiative, USDA approved additional GSM-102 export credit guarantees for Asia including increases from $250 million to $400 million for Indonesia, $100 million to $300 million for Thailand, and zero to $100 million for Malaysia. In addition, Korea

received an estimated $1.1 billion, an increase from $154 million from the previous year.

"+ The Loan Deficiency Payment (LDP) rate was increased by 34 cents as result of ASA's policy efforts during the 1996 Farm Bill process. LDPs were based on a $5.26 per bushel loan rate.

"+ ASA increased its membership for the fourth consecutive year, ending the year at 31,737 members. Even more was added to the value of an ASA membership with the launch of the first issue of the Washington Insider Report [ashington, DC]. This new publication, distributed quarterly to all ASA members, focuses on key policy issues facing soybean farmers. To help ensure continuation of the national soybean checkoff, ASA created a special Vote YES committee to develop funding and prepare for the possibility of a producer referendum.

"+ There was a record attendance of producers and exhibitors at Commodity Classic in Long Beach [California], making the third annual event a huge success. Show attendance reached 3,676 and more than 500 trade show booths were sold. More than $23,000 was raised for safety education through the 1998 Stephen M. Yoder Foundation Auction and from associated raffles."

"1999: The American Soybean Association applauded approval by the U.S. Food and Drug Administration (FDA) of a new soy health claim based on a petition filed by ASA in 1998. FDA published its final rule on October 25, that soy protein included in a diet low in saturated fat and cholesterol may reduce the risk of coronary heart disease by lowering blood cholesterol levels. As a result, food labels may now contain messages, such as "25 grams of soy protein a day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease." Research funded by the soybean checkoff shows that the use of soybeans in food products will increase at a rate of 10% a year for the next five years, up from about 37 million bushels to more than 60 million bushels.

"+ Biodiesel implementation moved a big step forward with the release of the Department of Energy's interim final rule to allow public vehicle fleets to earn EPACT credits. ASA also was pleased with USDA's August 13, announcement that the agency planned to purchase an unprecedented level of 20,000 gallons of biodiesel during the year, and with pro-biodiesel legislation that was introduced in the Senate on November 17. That legislation, entitled the "Biofuels Air Quality Act" would allow biodiesel to compete for funds in the Congestion Mitigation Air Quality Improvement (CMAQ) program. Similar legislation was introduced in the House on August 6. The Senate and House bills expand the CMAQ program's authority to allow funding of alternative fuel projects that include purchases of biodiesel, which is a proven cleaner-burning fuel made from natural, renewable sources, such as soybean oil. ASA also asked that the government introduce biodiesel-blended fuels in at least 50% of the government's diesel-powered vehicles by 2002.

"+ While drought and flood conditions in several areas of the country prevented another record-breaking U.S. soybean harvest, producers continued to face the lowest prices paid for their soybeans since the early 1970s. Three ideal growing seasons, one right after the other, in the majority of soybean production areas in both the United States and in South America, caused soybean stocks to grow, while at the same time, export growth stalled as a result of depressed economies in key Asian markets. These factors were primarily responsible for drifting soybean prices paid to farmer down from an average per bushel price of $7.35 in 1996, to $4.35 in 1999.

"+ Fortunately, ASA's soybean safety net policy work during the 1996 Farm Bill process helped see many producers through a tough year. ASA's success in raising the soybean loan rate $.34 would provide growers with nearly $1 billion of additional farm revenue from the loan deficiency payment program.

"+ Even with ASA's earlier policy efforts and successes, it was clear that stronger and more comprehensive efforts would be needed to improve the outlook for soybean producers. In February, ASA farmer leaders made public a comprehensive list of farm income and market demand policy initiatives for the Administration and Congress to act upon. ASA's proposal included economic loss assistance, farm income protection, food assistance and export initiatives, biodiesel, and trade policy initiatives. Also included were key domestic policy initiatives concerning the Food Quality Protection Act implementation, the environment and conservation, research, transportation and tax initiatives. ASA also outlined major issues for changes in Federal crop insurance programs.

"+ ASA urged Congress to provide economic loss payments to producers, similar to payments provided to farmers in 1998, and also advanced with congressional leaders inclusion of soybean-specific payments and provisions in any farm aid package. Subsequently, Congress did approve an $8.7 billion emergency farm spending plan that also included an authorization of $475 million in direct payments to oilseed producers to help partially offset low prices. It was estimated that this oilseed payment would provide producers with 15 additional cents per bushel of soybeans.

"+ In April, ASA and the National Oilseed Processors Association (NOPA) provided Secretary of Agriculture Dan Glickman with a comprehensive list of recipient countries, quantities, and products for a proposed $1 billion concessional sale and donation program for soybeans, soybean meal, soybean oil, and soy protein products. Secretary Glickman requested this list during a March 16 meeting with ASA leaders in Washington when ASA urged him to utilize Commodity Credit Corporation (CCC) funds

for a purchase and donation program that could help alleviate a disastrous decline in prices and soybean producer income.

"+ ASA also initiated, for the first time, discussions with a group of international food aid groups who were interested in programming soy into their USDA requests. These private voluntary organizations (PVOs) provided concrete proposals to USDA for the implementation of food aid. This combination of ASA's "pushing" and the PVOs "pulling" helped convince USDA of the merits of assisting people in the most needy countries in the world while bolstering demand and improving prices paid to farmers.

"+ To urge further action on ASA's request for a $1 billion soy donation, 72 House members cosigned a letter to Secretary of Agriculture Dan Glickman in November, calling for USDA to move quickly to mitigate the downward pressure on soybean prices during harvest. ASA also met with several Senators and Representatives to urge them to place calls to the White House, Agriculture Department, and Office of Management and Budget to "dislodge" this and other food aid programs which have been held up pending reviews.

"+ At year's end, ASA was still waiting for a major food aid announcement, which was being delayed by bureaucratic red tape. Meanwhile, some significant amounts of soy were already being included in major food aid programs, such as the purchase by Russia of an additional 117,000 metric tons of soymeal under the P.L. 480, Title I program for shipment December 17, 1999 to January 7, 2000.

"+ On November 15, U.S. and Chinese negotiators completed bilateral talks on China's accession to the World Trade Organization (WTO). The agreement that U.S. trade negotiators reached with China included significant opportunities to expand market access that ASA has worked toward for years. According to U.S. government sources, the ongoing WTO accession negotiations include assurances that will formalize access to the Chinese market–the largest growth market for soy in the 21st century–and includes commitments to expand access over the next few years.

"+ Based on the announced WTO Accession Terms for Agriculture, there will be no tariff rate quota (TRQ) for soybeans, and the duty is bound at the current applied level of 3%. The agreement stated that soybean oil will be subject to a 9% duty and the TRQ quantity will be based on average 1995-97 calendar year imports calculated on the basis of data from Oil World. Soybean oil also will be designated a "most-favored-oil"–meaning that any permanent or temporary duty reduction provided to other oils also will be extended to soy oil. ASA also began an extension policy effort in 1999 to promote approval of Permanent Normal Trade Relations (PNTR) with China, which the U.S. Congress was scheduled to debate in 2000.

"+ ASA counted among its accomplishments the lifting of sanctions on the sale of U.S. food to Iran, Sudan and Libya. ASA continued to work to expand sanctions relief to Iraq, North Korea, and Cuba to help improve soybean producer profitability.

"+ Confusion about the marketability of biotech-derived crops was at the forefront of many producers' thoughts. During these challenging times, ASA called upon all of its resources to actively communicate with growers, customers and other stakeholders about the safety of biotech soybeans to minimize the negative effects of activities and efforts to undermine public confidence in agricultural biotechnology.

"+ In November and December, ASA implemented a series of "Planting Decision 2000" Town Hall meetings around the country to help producers make well-informed planting decisions for 2000. ASA also produced "Planting Decision Guide" that provided producers accurate information on the factors affecting the demand for both biotech and non-biotech soybeans. ASA distributed the Planting Decision Guide to more than a quarter million soybean producers." Address: 12125 Woodcrest Executive Drive, Suite 100, St. Louis, Missouri.

1060. 9th international soy symposium on the role of soy in health promotion and chronic disease prevention and treatment: Program. 2010. Champaign, Illinois: American Oil Chemists' Society. 28 p. Held 16-19 Oct. 2010 in Washington, DC. No index. 28 cm. [Eng]

• ***Summary:*** This program was given (free of charge) to attendees when they registered.

Contents: Welcome! Co-Chairpersons. Scientific advisory board. General informal. Sponsors. Program schedule: Sat. Oct. 16. Keynote presentations. Award presentations. Sunday Oct. 17. Soy and the breast cancer patient. Mon. Oct. 18. Nonalcoholic fatty liver disease. Cardiovascular disease. Bone health. Hot flashes. Sports nutrition. Thyroid function. Tues. Oct. 19. Equol. New research areas. Poster presentations. Symposium sponsors. Oral presentation abstracts. Poster presentation abstracts. Schedule-at-a-glance.

Note: E-mail from Mark Messina. 2017 Sept. 29. "Bill, Here is the program including abstracts for the 9th symposium which was held in DC in 2010. That was the last one.

"I believe there might have been 160 in attendance but only about 40 or so were paid admissions. The rest were speakers and representatives of companies that were sponsors. The information presented was top notch but it was clear this conference was no longer economically viable. The first one in 1994 had 300 attendees and the third one in 1999 had 600.

"There were lots of reasons for the demise of the conference. One is that soy had lost much of its luster in the opinion of the food industry. Non-soy food companies were no longer interested in coming out with soy products. Another was that travel budgets really tightened so academics had to be very judicious in the way they used

their funds. If you could only go to one or two meetings a year and you were doing work on soy and cancer, you would end up going to a cancer meeting not to the soy meeting. Remember that the meeting might have only one session on cancer so if your focus was cancer most of the meeting was irrelevant to your interests..."

1061. Hughes, Glenna J.; Ryan, D.J.; Mukherjea, R.; Schasteen, C.S. 2011. Protein digestibility-corrected amino acid scores (PDCAAS) for soy protein isolates and concentrate: criteria for evaluation. *J. of Agricultural and Food Chemistry* 59(23):12707-712. Dec. [22 ref]
• ***Summary:*** "Protein quality, as determined by the PDCAAS method, is a measure of a protein's ability to provide adequate levels of essential amino acids for human needs. PDCAAS is calculated using an amino acid profile and true digestibility of a food protein." Three different isolated soy proteins (ISP) and one soy protein concentrate (SPC) were compared. The reasons for the small difference in scores is discussed. All are approximately equal in quality for humans compared to animal protein. Address: Solae, LLC, 4300 Duncan Avenue, St. Louis, Missouri 63110.

1062. INTSOY. 2012. 2012 INTSOY Processing and marketing soybeans for meat, dairy, baking and snack applications, June 3-8: A unique opportunity to gain hands-on experience & practical knowledge about soybeans (Leaflet). Urbana, Illinois. 9 panels. Each panel: 28. Single sided. Black and white.
• ***Summary:*** This printout of an e-mail announces a 5-day course ($1,500 for 1 attendee). The program now has 26 corporate sponsors (listed alphabetically with the logo of each): ADM, Clarkson Grain, Clextral Group, Crown, Devansoy, French [Oil Mill Machinery Co.], General Mills, Harvest Innovations, House Foods America Corporation, Illinois Soybean Association, Insta-Pro, NEI–Natural Enrichment Industries, NPI–Natural Products, Inc. ProSoya. SavInd (formerly Bar N.A.). Silk, The Solae Co., Soyatech, Soyfoods Association of North America. Soyjoy. SunOpta. United Soybean Board. USSEC. Wenger. WISHH. World Soy Foundation.

Course highlights. Who should attend? Course schedule (preliminary agenda). Sponsors. Address: National Soybean Research Lab. (NSRL), 1101 W. Peabody Dr., Urbana, Illinois 61801. Phone: (217) 244-1706.

1063. DuPont. 2012. DuPont acquires full ownership of Solae: Soy-based ingredients leader will help feed a growing population (News release). Wilmington, Delaware: 1 p. May 1.
• ***Summary:*** "Wilmington, Delaware–DuPont today announced that the company has acquired from Bunge full ownership of the Solae, LLC joint venture, a soy-based ingredients leader. DuPont previously owned 72 percent of the joint venture while Bunge owned the remaining 28 percent.

"'DuPont is committed to nutrition and health. This investment in Solae, along with the acquisition of Danisco last year, has significantly added to our leadership position in food ingredients,' said DuPont Executive Vice President James C. Borel. 'Solae's scientific expertise and market leadership in soy is a critical element in our plans to enhance the quality and quantity of food for a growing global population.'"

1064. Natoli, Cori Anne. 2012. DuPont gets full stake in soy business: Solae started as joint venture in 2003. *News Journal* (*The*) (*Wilmington, Delaware*). May 2. p. A10, A12.
• ***Summary:*** DuPont has acquired the remaining 28% of Solae from its partner Bunge Ltd. DuPont "is keeping a keen focus on Danisco and Solae, which are tied to its global mission to address megatrends in food production and health,..." DuPont's investment in these two companies has significantly added to its leadership in food ingredients. Address: The News Journal staff.

1065. *SoyaScan Notes.* 2012. Chronology of major soy-related events and trends during 2012 (Overview). Dec. 31. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** May 1–DuPont, which previously owned 72% of Solae, acquires full ownership of Solae by purchasing Bunge's portion for $440 million.

Sept. 1–Keith Spackler replaces Marty Reagan as the new CEO and general manager (GM) of AGP (Ag Processing Inc a cooperative).

Dec. 31–During 2012 Soyinfo Center published ten major digital books, mostly about fermented soyfoods, on Google Books. Each one contains many color photos and is free of charge.

1066. *Iowa Soybean Review* (*Iowa Soybean Association, Ankeny, Iowa*). 2012. WISHH: Helping people and building markets. 24(3):12. Dec.
• ***Summary:*** The group learned from DuPont / Solae officials that "close to 4,000 metric tons of soy isolates (ISP) were imported to South Africa in 2011."

In Uganda and Ghana, WISHH cooperators are processing "textured soy protein into snacks, as well as blends for meals and flour for baking." The products are well accepted. Jim Hershey, Executive Director of WISHH, says "We've forged important linkages throughout the soy value chain, both in the U.S. and overseas. For example, our strategic partners in Africa are now repeat customers for U.S. soy..." This work is "funded by the U.S. government, soybean checkoff and industry.

"WISHH work in Afghanistan: In 2010, the USDA announced that the WISHH program and three partnering organizations would receive a cooperative agreement for

work in Afghanistan.

"Through USDA's Food for Progress Program, WISHH and its partners have established Afghanistan's first commercial soybean value chain as part of the Soybeans in Agricultural Renewal of Afghanistan Initiative (SARAI). As a result, Iowa-made processing equipment from Insta-Pro now has soybeans from Afghanistan as well as Ohio, Michigan and other states flowing through it. An Afghan company provided the land and the building as well as employs the staff.

"People and livestock benefit from the high-protein soy flour, soy meal and the crude soybean oil produced at the Mazar-e-Sharif manufacturing facility. An Afghan dairy, Kefayat Farms, made the first purchase of 10 metric tons of soybean meal for its herd of 140 Holstein cows. Farmhands soon noted the cows producing two to three additional liters of milk a day, and the milk quality was noticeably improved so customers were willing to pay more.

"A solid supply of soybeans is key to the processing plant serving as a reliable source to its customers. Throughout the three-year project, more than 200,000 bushels of U.S. soybeans will augment local production processed in the plant. Perdue Grain and Oilseed's 2011 sale exemplifies how U.S. soybeans contribute to the processing plant being a steady supplier of soy products in Afghanistan.

"In 2011, the project also assisted 891 Afghan farmers, including 91 women, in producing the country's first commercial crop of soybeans on a total of approximately 450 acres. This year, 3,325 Afghan farmers, including 300 women, are planting soybeans through SARAI."

1067. INTSOY. 2013. 2013 INTSOY Short Course: Processing and marketing soybeans for meat, dairy, baking and snack applications, June 2-7: A unique opportunity to gain hands-on experience & practical knowledge about soybeans (Leaflet). Urbana, Illinois. 8 panels + 1 panel insert Each panel: 23 x 15.1 cm. Front and back. Glossy color.
• ***Summary:*** Announces a 5-day course ($1,500 for 1 attendee). The program now has 24 corporate sponsors (listed alphabetically with the logo of each): ADM, Clarkson Grain, Clextral Group, Crown, Devansoy, French [Oil Mill Machinery Co.], Harvest Innovations, House Foods America Corporation, Illinois Soybean Association, Insta-Pro, Kays Naturals, NEI–Natural Enrichment Industries, NPI–Natural Products, Inc. ProSoya. SavInd (formerly Bar N.A.). The Solae Co., Soyatech, Soyfoods Association of North America. SunOpta. United Soybean Board. USSEC. Wenger. WISHH. World Soy Foundation.

Course highlights. Who should attend? Course schedule (preliminary agenda). Sponsors. Address: National Soybean Research Lab. (NSRL), 1101 W. Peabody Dr., Urbana, Illinois 61801. Phone: (217) 244-1706.

1068. Li, Hujing; Zhu, K.; Zhou, H.; Peng, W.; Guo, X. 2013. Comparative study about some physical properties, in *vitro* digestibility and immunoreactivity of soybean protein isolate for infant formula. *Plant Foods for Human Nutrition* 68(2):124-30. June. [30 ref]
• ***Summary:*** "Abstract: The objective of this study was to determine molecular weight subunit distributions of soy protein isolate (SPI) by SDS-PAGE and gel size exclusion chromatography, and further to investigate the differences of thixotropy, viscosity, in vitro digestibility and immunoreactivity of SPI for infant formula produced in Chinese domestic companies and world famous SPI manufacturers such as Dupont and Fuji. The molecular subunit distributions were analyzed by SDS-PAGE and gel size exclusion chromatography, indicating that Solae and Fuji were hydrolyzed by proteolytic enzymes. The thixotropy of Fuji and Solae significantly reduced around by 95%, compared with those of Mantianxue and Dupont Zhengzhou. The allergen contents of Fuji and Solae strikingly decreased by 60 and 84% respectively, in contrast to that of Mantianxue. The in vitro protein digestibility of Solae at the end of pepsin and trypsin digestion markedly increased by 11.7 and 11.3%, respectively, in comparison to those of Mantianxue. Suitable enzymatic hydrolyzed SPIs showed lower thixotropy, viscosity, immunoreactivity and higher in vitro protein digestibility than those from the other SPIs. The lower thixotropy indicates low difficulty or shear stress in swallowing for infants. The lower immunoreactivity will improve the safety of SPI for cow milk allergic babies." Address: State Key Lab. of Food Science and Technology, School of Food Science and Technology, Jiangnan Univ., Wuxi, China.

1069. Nordquist, Ted. 2014. Re: Thoughts about the Soyfoods Association of North American (SANA). Letter (e-mail) to William Shurtleff at Soyinfo Center, July 30. 1 p.
• ***Summary:*** Devansoy and I tried for many years to design and implement a Non-GMO Organic category at SANA. As President for a few years and on the Technical Committee throughout our membership, I really pushed this. The result was somewhat of a confrontation with the big donors/members (Dean Foods, Dupont/Solae, United Soybean Board, etc.) regarding hexane solvent based soyfoods vs. organic soyfoods. In the end both Devansoy and WholeSoy left SANA because we felt membership actually hurt our reputation/integrity rather than helping. Cornucopia published information about hexane related issues with soyfoods, and we wanted to distance ourselves from these companies/products. "That is the story today. We want our money to go to labeling GMOs in food and supporting organic agriculture, not supporting the perpetrators of commercial mono-agriculture and GE food. Nancy Chapman always pushed for 'soyfood' is good for everybody. I do not support that belief. I believe biotechnology is probably the highest risk for human pain and suffering as well as

destroying the 'balance' in nature. Since GE soybeans contribute so much to the pain and suffering at 94% of US agriculture and United Soybean Board, Monsanto and WISHH succeeded in making South Africa 100% GE soybeans, I want no part of it!" Address: TAN Industries, Inc., 353 Sacramento St., Suite 1120, San Francisco, California 94111.

1070. Schroeder, Eric. 2014. Matthias Heinzel to head DuPont Nutrition & Health (Web article). *Food Business News* Dec. 5.
• ***Summary:*** "Wilmington, Delaware–Matthias Heinzel has been named president of DuPont Nutrition & Health, effective Jan. 1, 2015. He will succeed Craig F. Binetti, who is retiring following 38 years of service to the company.

"'Matthias brings global business experience with a proven success record in building competitive advantage, setting strategy and direction and creating profitable growth,' said James C. Borel, executive vice-president. 'He will help drive the Nutrition & Health business as a leading food ingredients and food safety solutions provider to the food and beverages industries worldwide.'"

1071. List, Gary R. 2014. Giants of the past: Hermann Bollmann (1880-1934), Bruno Rewald (1882-1947), Heinrich Buer (1875-1962), Stroud Jordan (1885-1947), Percy Julian (1899-1975), Joseph Eichberg (1906-1997). http://lipidlibrary.aocs.org/History/content.cfm?ItemNumber=41089. 4 p.
• ***Summary:*** "Lecithin is the most important by product of the oilseed processing industry. In the US alone nearly 100 million kilograms annually are used in a host of foods and non-food applications.

"The origins and development of the modern lecithin and pharmaceutical industries can be traced back to the work of three German technologists beginning over a hundred years ago. Bollmann and Rewald developed the extraction technology while Buer brought lecithin to the pharmaceutical arena. Not only did the industries thrive in Europe but eventually in the United States as well. Although many US chemists and technologists contributed to the growth of the lecithin industry, three stand out from the 1930-1945 era. (Jordan, Julian, Eichberg).

"Hermann Bollmann was born in Hamburg Germany in 1880. Bollmann's parents were wealthy and he was sent to a private school where he was told to leave school at age 17 because he had learned everything being taught.

"From about 1910 until his death in 1934, his contributions to the fats and oils industry are well documented. There is no doubt that Bollmann and Bruno Rewald were the fathers of the modern lecithin industry. Although soybeans had been grown for thousands of years in China, their entrance into Europe and North America did not occur until about 1910 when Bollmann imported beans from Manchuria. Bollmann immediately recognized the potential of soybean oil and by 1911 had (presumably with his father's help) constructed the plant Die Hansa Muhle (The Hansa Mill) in Hamburg.

"Bollmann was not the first to look into lecithin. Heinrich Buer (1875-1962) began to search for replacements for egg yolk as a lecithin source and began research on soybeans in 1909 and received a US Patent in 1912. The Buer process consisted of boiling leguminous seeds with alcohol to recover lecithin. However, his interest was not to commercialize lecithin for mass production but rather to promote its therapeutic benefits. Prior to 1910 some 15 medicinal lecithin preparations were marketed in Europe. Lecithin sources included egg yolks, brains and bone marrow. (Wendel, Inform, 2000) Many of the products contained other ingredients as well (hemoglobin, albumin, cod liver oil, wine). Buer and his son, Carl received 20 patents (3 US) and introduced pure lecithin in 1930. The product was made from commercial de-oiled soy lecithin. Buer was convinced of the health benefits of lecithin and published a book on the subject. By the end of World War 2 Buer introduced additional products still known today as Buer Lecithin. The Buer company was taken over by Pfizer and ultimately by Roland Lipoid KG. Although others entered the lecithin pharmaceutical field Buer can claim to be the father of that industry.

"Bollmann received a number of US and German patents on the recovery of lecithin from soybean and other seed oils (US 1 464 557, 1923; 1 667 767, 1928). The experimental work was carried out in the laboratory with a solvent system containing alcohol, benzene and petroleum ether. Whereas hexane alone will remove about 50% of the soybean phosphatides, Bollmann's reagent give nearly complete extraction. Knowing that his solvent system could never be adopted commercially, Bollmann designed and patented a solvent extraction system based on soybean flakes moving continuously through a solvent bed while contained in baskets. Although the US Patent 1 414 154 'Extraction of fat and oil from raw materials' was issued in 1922, Bollmann filed applications in Germany (1916, 1918), Belgium (1919), Norway (1919), the Netherlands, (1919), Austria (1919), Sweden (1919), Switzerland and Czechoslovakia (1919). In total, Bollmann held 17 US Patents. Bollmann extraction plants were very popular in the US during the 1930-1950 era. Coconut, peanut, rapeseed, linseed, sunflower, and soybeans could be processed (100 tons/day) with a residual oil of 1% or less. In the mid 1930's a 400 ton/day Bollmann plant was constructed to process soybeans by solvent extraction. Material balance data demonstrated excellent extraction efficiency and solvent recovery (see Kruse et al., Ind. Eng. Chem. 40 (1948) 186). This plant was the first to process lecithin from soybeans extracted with hexane. After the removal of the solvent the crude oil was treated with water and steam followed by separation of the coagulated lecithin

by centrifugation. The process produced lecithin free of bitter taste. A patent was issued to Sorensen and Beal (US 2 024 398, 1935) with the rights assigned to ALC.

"Bollmann played a major role in the development of the American lecithin industry. About 1928, Joseph Eichberg (1906-1997) learned of the Hansa Mill and a few years later visited the mill and proposed to Bollmann that he would represent Hansa in the US. In 1928 Hansa and Rewald visited the US to discuss the patents held by Hansa. By 1930 The American Lecithin Company (ALC) was formed with rights to distribute lecithin in the United States. Prior to 1934 all imported lecithin came from Hansa and was distributed by ALC and Ross and Rowe. In that year ADM and Glidden constructed plants to produce lecithin and by then Hansa had gone bankrupt and changed hands. Apparently the US producers formed a patent holding licensing agreement with stock in ALC which was eventually terminated by mutual consent in 1946.

"Hansa was deeply affected by the great depression of 1929 and the entrance of other companies into the lecithin market. Hansa declared bankruptcy and was acquired by another company (GmbH). As a result Bollmann was demoted from his position as director and left the Company. Bollmann attempted to start over but his patents were owned by others. Ironically Bollmann died in 1934 while visiting the patent office in Berlin.

"Bruno Rewald (1882-1947) played a major role in the lecithin industry as an assistant to Bollmann at Hansa and had worked to form the ALC with Eichberg. Rewald had promoted the growing of soybeans in the Balkans with little success. Nonetheless he recognized the potential of soybean lecithin in non-food applications. Born in Germany Rewald moved to England in 1933 where he helped build a lecithin plant. Rewald visited the US a number of times (1928, 1946 and 1947) as a consultant to the industry and to promote soybeans and lecithin as food ingredients. Rewald died in Minneapolis on his final trip to the US. It is safe to say that Rewald had a hand in every known use for lecithin during his lifetime. As early as 1925, Bollmann found that lecithin improved the solubility of cocoa powder. By the end of the 1920s Rewald showed that lecithin could reduce the amount of cocoa butter used in chocolates. ALC commercialized the product 'Alcolec' in 1929. It was advertised 'Alcolec saves cocoa butter, time, and power, lowers costs, improves working properties and quality, stabilizes viscosity, and extends shelf life.' Addition of lecithin to chocolate became state of the art and remains so today. An excellent review of lecithin in the chocolate industry is found in INFORM. (A. Wendel, Vol. 12 pp. 821-823, 2001).

"Rewald held a number of US patents on lecithin uses in a variety of industrial products including textiles, leather, rubber, meat, insecticides, egg yolk substitutes, stable emulsions, and nutritional foods.

"Stroud Jordan (1885-1947) was an early worker in the lecithin applications arena. Jordan held a number of positions including chief chemist for a large candy manufacturer, as managing director of the Applied Sugar Laboratory and established the Stroud Jordan Laboratories in New York City. Jordan finished his career (1938-1947) as director of research for the American Sugar Refining Laboratory. Jordan recognized the potential of lecithin in candy. Between 1932 and 1942 he received a number of US patents on water dispersible lecithin, viscosity lowering preparations, lecithin-based flavoring, and bakery products based on lecithin. Early in his career Jordan worked on tobacco and received a patent for toasting which was used to produce 'Lucky Strike' cigarettes. The American Candy Technologists presents an Achievement Award in his name.

"A considerable amount of lecithin research was conducted by Percy Julian (1899-1975, a Fellow of the National Academy of Sciences) a chemist and director of research at the Glidden Co. (1936-1954). Julian held a number of lecithin patents including the function of lecithin in chocolate as a viscosity modifier. Other discoveries included granular de-oiled and alcohol-fractionated lecithins. (Davis and Iveson, US 2 910 362, 1959) Julian left Glidden in 1954 and a few years later Central Soya leased the Glidden Chemurgy Division and purchased it outright in 1961. Alcohol fractionated products were discontinued but the de-oiled product remained on the market trademarked as 'Centrolex.' Eventually Central Soya became Solae and the de-oiled lecithin became Solec™ and remains on the market.

"Joseph Eichberg along with Bollmann and Rewald played a central role in bringing the lecithin industry to the US through the formation of the American Lecithin Company (ALC) in 1930. ALC became the distributor of lecithin in the US. However, by 1935, several lecithin plants were operational under a patent licensing agreement between ALC, Hansa, ADM and Glidden. The Glidden plant was destroyed by a fire and explosion from a hexane leak in October 1935 but was quickly rebuilt. Eichberg held about a dozen patents most of which were directed at industrial uses of lecithin including corrosion inhibitors, metal oxides in paints, coating compounds, pigment modification and turpentine. Eichberg patented a unique method for increasing the hydrophilic properties of commercial lecithin by treatment with yeast. These products showed improved emulsification and anti-spattering properties in margarine (US 2 893 612).

"Notes and further reading: Much of the information given here is credited to Armin Wendel who published a comprehensive history of the lecithin industries (INFORM 11 (2000) 885-897 and INFORM 12 (2001) 821-823) Wendel is the managing director of Nattermann Phospholipids GmbH, Cologne, Germany.

"The patents of Bollmann, Rewald and Buer are matters of public record and were examined by the author. The number of patents (US and Foreign) issued to Bollmann,

Rewald, and Buer number about 65.

"Percy Julian was the first black American chemist to earn a doctorate in chemistry albeit in Vienna, Austria. He was the first to synthesize the alkaloid physostigmine which is considered a classic research accomplishment. Julian pioneered work leading to the synthesis of sex hormones. His life story was documented in the ACS sponsored program 'Percy Julian the forgotten genius.' The program was aired on the Nova Series on public television [on 6 Feb. 2007]. Dr. James Kenar wrote an article on Julian's remarkable career (See Giants of the Past INFORM, 19 pp. 411-414). A detailed biography of Julian can be found on the NAS Website (B. Witkop, Percy Lavon Julian 1899-1975, Biographical Memoirs National Academy of Sciences, Vol. 52 pp. 223-266, 1980)

"An account of the History of lecithin is given by Shurtleff and Aoyagi (http://www.soyinfocenter.com).

"A biography of Stroud Jordan can be found on http://www.ncpedia.org/biography/JordanStroud (William S. Powell, 1988)." Address: Formerly of–National Center for Agricultural Utilization Research, ARS, U.S. Dep. of Agriculture, Peoria, Illinois USA.

1072. Rutherfurd, Shane M.; Fanning, A.C.; Miller, B.J.; Moughan, P.J. 2015. Protein digestibility-corrected amino acid scores and digestible indispensable amino acid scores differentially describe protein quality in growing male rats. *J. of Nutrition* 145(2):372-79. Feb. [28 ref]

• ***Summary:*** "Background: The FAO has recommended replacing the protein digestibility-corrected amino acid score (PDCAAS) with the digestible indispensable amino acid score (DIAAS).

"Objective: The objective of this study was to compare aspects underlying the calculation of the DIAAS and PDCAAS, including (1) fecal digestibility vs. ileal digestibility, (2) using a single nitrogen digestibility value for all amino acids, and (3) the effect of truncation. Truncated PDCAAS and untruncated DIAAS values calculated as formally defined were also compared and DIAAS data presented for 14 dietary protein sources.

"Results: True fecal nitrogen digestibility was different ($P < 0.05$; 10% difference on average) from true ileal nitrogen digestibility for 11 of the 14 protein sources. True ileal nitrogen digestibility was different ($P < 0.05$) from true ileal amino acid digestibility for almost half of the indispensable and conditionally indispensable amino acids (differences ranged from 0.9% to 400%). DIAAS values ranged from 0.01 for a corn-based cereal to 1.18 for milk protein concentrate.

"Conclusion: Untruncated PDCAAS values were generally higher than a DIAAS values, especially for the poorer quality proteins; therefore, the reported differences in the scores are of potential practical importance for populations in which dietary protein intake may be marginal."

Note: In Table 1 (p. 373), SPI A = soy protein isolate A (Supro XF; Solae); SPI B = soy protein isolate B (Supro 670; Solae). Address: 1. Riddet Institute, Massey Univ., Palmerston North, New Zealand.

1073. Zigmont, Randy. 2015. How Central Soya became part of DuPont Nutrition and Health (Interview). *SoyaScan Notes.* June 17. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** In 2002 Bunge bought Cereol, SA, which owned two oilseed processors in North America: Central Soya in the United States and CanAmera Foods in Canada. In about 2005 Bunge and DuPont created a new company named Solae. DuPont owned Protein Technologies Inc. which became their main contribution to the new group. Bunge contributed Central Soya. In about 2013 DuPont acquired a big emulsifier company. At that time they separated from Bunge and DuPont created DuPont Nutrition and Health. Address: Lipoid LLC. Phone: 203-751-5368.

1074. *Gibson City Courier* (*Gibson City, Illinois*). 2015. DuPont Gibson City celebrating 75th anniversary. July 8. p. A1, A2.

• ***Summary:*** "The Central Soya corporate name was changed to Solae in 2003, when its operation became part of the Bunge-DuPont joint venture. In 2012 DuPont purchased Bunge's interest in Solae. The plant is now a part of DuPont Nutrition & Health (N&H), a world leader in the food industry,..."

Today, DuPont N&H has more than 7,000 employees, 50 manufacturing sites and 20 research and innovation centers worldwide.

1075. Wendel, Armin. 2015. Re: The largest soybean crushers in Europe who sell their own lecithin. Letter (e-mail) to William Shurtleff at Soyinfo Center, Sept. 13–in reply to questions. 1 p.

• ***Summary:*** In the European market, soy lecithin is no longer as popular as it was because of GMO [genetically engineered soybeans] and allergy to soy.

The main oilseed crushers in Europe are ADM, Bunge and Cargill.

The food industry in Europe now prefers rape- and sunflower lecithin. Therefore the big oil mills (ADM, Bunge and Cargill) are crushing non-GMO soybeans (mostly coming from South America or India), rapeseeds and sunflower seeds (from Eastern Europe).

Companies modifying or fractionating lecithin are mostly importing lecithin from USA, South America and India.

ADM sells lecithin under the trademarks Yelkin®, Beakin®, Performix™, Thermolec®, Ultralec®, and Adlec™.

ADM sells deoiled lecithin under the trademark

Ultralec®.

Bunge sells their lecithin mostly through DuPont (Danisco, Solae, former Central Soya) under the trademark Solec® (liquid and deoiled lecithin).

To explain: Cereol bought Central Soya (CSY) many years ago.

In July 2002 Bunge bought Cereol of France.

In 2003 Bunge, together with DuPont, integrated the business of Cereol into the new company, Solae.

DuPont bought Danisco and integrated the Solae business into Danisco.

Cargill (which purchased Lucas Meyer, Degussa) (fluid lecithin, deoiled lecithin, lecithin fractions): Topcithin, Lecigran, Epikuron, Metarin, Emulfluid, Emulpur, Emultop, Chocotop, Lecisoy, Lecimulthin.

To explain: In July 1999 Lucas Meyer (which sold mostly lecithin) was acquired by the nature products division of SKW Trostberg (a specialty chemical company). In 1998 Lucas Meyer has almost 250 employees, 140 of them in Germany, and generated sales of DM160 million ($83.5 million). The business was then integrated into Degussa–a large German company with a long history. Degussa sold the business to Cargill. Cargill bought the lecithin business from Riceland.

Monsanto, with their introduction of GMO soybeans, has had a very negative influence in the lecithin business and industry. Address: Germany.

1076. Bunge Ltd. 2015. Experience the next level of lecithins! BungeMaxx (Internet resource). Weena 320, 3012 NJ Rotterdam, The Netherlands. 8 p. Dec. 15. www.bunge.com.

• ***Summary:*** Page 2: Top half is a bowl of granular lecithin. Bottom half: "Starting a new era of lecithins: BungeMaxx is a globally standardized product line, made from soya, rapeseeds, and sunflower seeds. "Individual products in the assortment of BungeMaxx can be offered in higher purity as 'Transparent and Clear.' Additional filtration ensures that these products are amongst the best available on the market today." Get to know more about the next generation quality lecithins–made by Bunge, the world's largest manufacturer of lecithin."

Page 3: Bunge lecithins at a glance: Sustainable raw materials (no mention of genetic engineering). Bunge is working with The Nature Conservancy in Brazil to improve the sustainability of production agriculture, and with Srijan in India to help smallholders increase their soybean yields and improve their businesses. State of the art processing. BungeMaxx–Specialty lecithins for food applications.

Page 4: Product range. The crude oil "is heated and mixed with water. The water binds to the phospholipids and forms a sludge which is then separated in high-speed centrifuges. The lecithin is subsequently refined and standardised. Filtration steps in this process can help determine the final quality of the lecithin."

Page 5: Manufacturing process: "BungeMaxx lecithins are manufactured using a multitude of processes which may include filtration, standardisation, chemical or enzymatic modification and de-oiling. The molecular structure of lecithins can be changed by either enzymatic or chemical means." A large photo shows a woman about to eat a chocolate bar.

Page 6: Application overview: Chocolate, bakery products, margarine and fats, chewing gum, instant products, nutritional supplements.

Page 7: Table of 15 BungeMaxx lecithin products (8 soy, 4 sunflower, 3 rapeseed) with the product number and applications for each.

Page 8: Koninklikje Bunge B.V. (Rotterdam, Netherlands), Bunge Agribusiness (Singapore), Bunge Argentina S.A. (Buenos Aires).

Note 1. Although Bunge is a global company, its headquarters in White Plains, New York, USA is not mentioned in this promotional report.

2. Letter (e-mail) from Armin Wendel, lecithin expert from Germany. Shurtleff asked Wendel: Is Bunge really "the world's largest manufacturer of lecithin"–as they say? Wendel replies:

"Bunge has the most soy processing plants and therefore the possibility to produce the most lecithin.

"But they never where big in selling lecithin by themselves.

"In the past they sold their lecithin to Central Soya (CSY)–later they bought CSY.

"Then they formed an alliance with DuPont, creating Solae. But when DuPont bought Danisco [in May 2011, of Copenhagen, Denmark] they tried to integrate the lecithin business into Danisco.

"Bunge was never happy with this relationship; that is the reason why they now build their lecithin business under BungeMaxx (only outside the US; in the US they are still bound to DuPont)

"See attachments–that may help you to understand the history."

Armin attaches 6 documents. Address: The Netherlands. Phone: +31 (0) 10 217 66 58.

1077. Dow Chemical Co. 2017. DowDuPont merger successfully completed (Web article). https://corporate.dow.com/en-us/news/press-releases/dowdupont-merger-successfully-completed.html#:~:text=%2D%20September%2001%2C%202017%20%2D%20DowDuPont,31%2C%202017 2 p. Retrieved 9 Sept. 2020.

• ***Summary:*** DowDupont today announced the successful completion of a merger of equals between The Dow Chemical Company ("Dow") and E.I. du Pont de Nemours & Company ("DuPont"), effective Aug. 31, 2017. The combined company is operating as a holding company under

the name 'DowDuPont™' with three divisions–Agriculture, Materials Science and Specialty Products.

1078. Seibert, Jeanne. 2019. Re: Founding and early history of NSPA. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 17. 1 p.

• ***Summary:*** "Here is the information that I was able to find:

"Sometime in early 1930, several soy bean crusher manufacturers met in Chicago to discuss the first rules to govern the purchase and sale of soy bean oil.

"In May 1930 at the first general meeting of the group the term "soybean" (one word not two) was adopted. At this same meeting, Code of Ethics and Constitution and By-Laws were presented by the Chairman of the Organization Committee, Otto Eisenschiml (Scientific Oil Compounding Co.) and adopted. Trading Rules were presented by Trading Rules Committee Chairman, Harry Haze of Harry Haze, Inc. and adopted.

"The Articles of Incorporation were granted from the State of Illinois in May of 1936.

"I have attached the list of representatives and their respective companies to this email. Some of the names may be misspelled because I had to create them from the individual's handwriting. I cannot provide any copies because what we have in archive are very thin 'onion skin' carbon copies and the high resolution copiers of today cannot read them. All you get is a dark shadow on the page.

"Unfortunately, I was unable to find any information prior to 1930 nor was I able to find the publication on soy flour.

"I did find a very interesting article on Gene A.E. Stanley from *American Magazine* dated June 1926, which I have attached too. This is a photocopy of a copy, which is why parts are cut off. I do not have the original clipping.

"Good luck with your research and book."

Attachment 1:

"May 21, 1930

"Underwriting of original By-Laws, Code of Ethics, and Trading Rules are established. Firms followed by company attendee are listed below.

"Archer-Daniels-Midland Company
"By: W.H. Eastman
"Allied Mills Inc.
"By: H.G. Atwood
"Staley Sales Corporation
"By: H.T. Morris
"Funk Bros. Seed Co.
"By: I.C. Bradley
"Scientific Oil Company Co.
"By: Otto Eisenschiml
"Spencer Kellogg & Sons Sales Corp.
"By: Robt. G. Bennet
"Shellabarger Grain Products Co.
"By: W.L. Shellabarger
"Evans Milling Co.
"By: Edw. D. Evans
"Lafayette Milling Co.
"By: B.C. Williams
"Armstrong Paint & Varnish Works.
"By: R.G. Dahlberg
"Falk & Co.
"By: D. Lewis
"Central States Chemical Co.
"By: Walter C. Flumerfelt
"List of Witness Signatures:
"Ralston Purina Co.–E.F. Johnson
"Standard Soybean Mills–H.R. Schultz
"Central Soya Co., Inc.–H.D. Egly
"Spencer Kellogg & Sons Sales Corp.–J. Johnson
"Iowa Millings Co.–Joe Sinaiko
"Illinois Soy Products -
"The Larrowe Milling Co.–F.W. Thomas
"National Mills Inc.–J.H. Ball
"Plymouth Processing Mills -
"Buckeye Cotton Oil Co.–M. Knapp
"J.B.D. Hauler–Allied Mills Inc.
"Funk Bros. Seed Co.–E.D. Funk Jr.
"A.E. Staley Manufacturing Co.–E.K. Scheiter
"Archer Daniels Midland Company–Whitney Eastman
"Shellabarger Grain Products Co.–John
"National Soybean Processors Association
"Members:
"Allied Mills, Inc. J.B. DeHaven Board of Trade Bldg., Chicago
"American Soya Products Corp. H.O. McCutchan Evansville, Ind.
"Archer-Daniels-Midland Co. W.H. Eastman Box 603, Milwaukee, Wis.
"Buckeye Cotton Oil Co. W. Youtsey Cincinnati, Ohio
"Cairo Meal & Cake Co. A.T. Madra Cairo, Illinois
"Central Soya Co., Inc. H.D. Egly Ft. Wayne, Ind.
"Funk Bros. Seed Co. E.D. Funk Jr. Bloomington, Ill.
"The Glidden Co. W.G. Dickinson 2670 Elston Ave., Chicago
"Illinois Soy Products Co. I.D. Sinaiko Springfield, Ill.
"Iowa Milling Co. Joe Sinaiko Cedar Rapids, Iowa
"Larrowe Milling Co. F.W. Thomas Detroit, Mich., Box 68, N. End. Station
"I.F. Laucks, Inc. H.F. Armstrong Portsmouth, Va.
"National Mills, Inc. J.H. Ball Quincy, Ill.
"Norris Grain Co. E.M. Gallup Board of Trade Bldg., Chicago
"Old Fort Mills, Inc. G.A. Holland Marion, Ohio
"Plymouth Processing Mills C.J. Simmons Ft. Dodge, Iowa
"Ralston–Purina Co. J.H. Caldwell St. Louis, Missouri
"Shellabarger Grain Prod. Co. W.L. Shellabarger Decatur, Ill.

"Soy Bean Processing Co. W.E. Flumerfelt Waterloo, Iowa

"Spencer-Kellogg & Sons Sales J.E. Johnson 105 W. Adams St, Chicago, Ill.

"A.E. Staley Mfg. Co. E.K. Scheiter Decatur, Ill.

"Standard Soybean Mills H.R. Schultz Centerville, Iowa

"Ralph Wells & Co. Ralph Wells Monmouth, Ill.

"Clinton Company E.W. Myers Clinton, Iowa

"Associate Members:

"Barlett Frazier Co. 111 W. Jackson Blvd.

"Chicago, Ill.

"Cummings & McAlister 30 E. Broad Street Columbus, Ohio

"Harry Haze, Inc. 435 N. Michigan Ave. Chicago, Ill.

"Procter & Johnson 520 N. Michigan Ave. Chicago, Ill.

"H.L. Raclin, Inc. 135 S. LaSalle St. Chicago, Ill.

"Roesling, Monroe & Co. 327 S. LaSalle St. Chicago, Ill.

"Scientific Oil Compounding Co. 1637 S. Kilbourn Ave. Chicago, Ill. [Scientific Oil Compounding Co.]

"Snow Brokerage Co. 221 N. LaSalle St. Chicago, Ill.

"Soy Bean Products Co. 4900 W. Flournoy St. Chicago, Ill.

"Stein, Hall Mfg. Co. 2841 S. Ashland Ave. Chicago, Ill.

"Sterne & Sons Co. 332 S. LaSalle St. Chicago, Ill.

"Wilbur-Ellis, Inc. 141 W. Jackson Blvd. Chicago, Ill.

"Zimmerman-Alderson-Carr Co. 105 W. Adams St. Chicago, Ill.

"Special Associate Members:

"Dr. Roger Adams University of Illinois Urbana, Ill.

"Dr. H.E. Barnard Farm Chemurgic Council Dearborn, Michigan.

"K.E. Beeson Purdue Experiment Station W. Lafayette, Indiana.

"Dr. W.L. Burlison University of Illinois, Urbana, Illinois.

"Dr. A.A. Horvath, P.O. Box 385 Newark, Delaware.

"H.W. Irwin Swift & Co., Union Stock Yards, Chicago, Illinois.

"Dr. H.R. Kraybill Purdue University Lafayette, Ind.

"Glen H. Pickard United Chemical & 4100 S. Ashland Ave.

"L.M. Tolman Organic Products Co. Chicago, Ill." Address: Secretary, National Oilseed Processors Assoc., 1300 L Street, NW #1020, Washington, DC 20006. Phone: 202-864-4365.

1079. *St. Louis Post-Dispatch* (*St. Louis, Missouri*). 2019. IFF to buy DuPont's nutrition unit. Dec. 17. p. A7.

• ***Summary:*** "New York-based International Flavors and Fragrances Inc. said it will buy DuPont Inc.'s nutrition & biosciences unit for $26.2 billion in a deal that will create a new combined company."

In 2012 Solae LLC, a major soy ingredients company, had "about 370 employees in St. Louis and 2,400 globally."

1080. Dawson, Wayne. 2020. Re: Genealogy: The pedigree of William H. Danforth–founder of Ralston Purina Co. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 30. 2 p.

• ***Summary:*** For a genealogy of this family, please see the next 3 pages.

"William H. Danforth (the subject of your book)

"was the son of

"Albert Hampton Danforth

"was the son of

"Leander Foster Danforth and his wife, Jane Woodfork Jones, the people in the item I sent you.

Note: As part of this record is a page of birth scanned from a Bible.

Also this note by Dorothy Renaud. "William Danforth, founder of Ralston Purina Co. and my grandmother, Byrd Danforth were 1st cousins. Byrd's father, Levi Danforth, and William's father, Albert Hampton Danforth, were brothers. Levi and Albert were sons of Leander and Jane Jones Danforth. The Danforths came to Mississippi County, Missouri, from Henderson County, Kentucky, in the 1850s. Leander was in the marble business and both he and Jane are buried here in Mississippi County." Address: Genealogist, Tucson, Arizona.

1081. Wikipedia, the free encyclopedia. 2020. Ralston Purina (Web article). https://en.wikipedia.org/wiki/Ralston_Purina 2 p. Retrieved Sept. 1.

• ***Summary:*** "For the Ralston portion of the now defunct Ralston Purina Company, see Ralcorp.

"Ralston Purina Company was a St. Louis, Missouri-based American animal feed, food and pet food company. On December 12, 2001, it merged with Swiss food-giant Nestlé's Friskies division to form Nestlé Purina PetCare Company. [1]

"History: Ralston Purina (originally Ralston-Purina) traces its roots to 1894, when founder William H. Danforth established the animal feed company Purina Mills. Danforth, formed a partnership with George Robinson; William Andrews, entered the business of feeding farm animals by founding the Robinson-Danforth Commission Company. Its predominant brand for each animal was generally referred to as "Chow"; hence "Purina Horse Chow", "Purina Dog Chow", "Purina Cat Chow", "Purina Rabbit Chow", "Purina

Family in which Albert Hampton Danforth was a Child

Husband:		Leander Foster Danforth
	Birth:	3 October 1809 in New York
	Marriage:	7 July 1836 in Henderson Co. Kentucky
	Death:	22 September 1877
	Burial:	Charleston, Mississippi Co., Missouri; Oak Grove Cemetery
	Father:	William Newberry Danforth
	Mother:	
Wife:		Jane Woodfork Jones
	Birth:	23 August 1815 in Henderson, Kentucky, USA
	Death:	3 January 1900 in Charleston, Mississippi County, Missouri, USA
	Burial:	Charleston, Mississippi Co., Missouri; Oak Grove Cemetery
	Father:	Hampton Jones
	Mother:	Matilda Crowder
Children:		
1	Name:	Lewis W. Danforth
M	Birth:	10 June 1837 in Kentucky
	Death:	30 January 1917 in Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; IOOF Cemetery
	Spouse:	Mary Jane Yates
2	Name:	Albert Hampton Danforth
M	Birth:	12 September 1842 in Henderson, Henderson Co., Kentucky
	Marriage:	7 November 1867 in Mississippi Co., Missouri
	Death:	24 December 1900 in Charleston, Mississippi Co., Missouri
	Burial:	Charleston, Mississippi Co., Missouri; IOOF Cemetery
	Spouse:	Rebecca Hannah Lynn
3	Name:	Charles W. Danforth
M	Birth:	Abt. 1848 in Kentucky
	Marriage:	26 March 1889 in Clark Co., Missouri
	Spouse:	Elizabeth Williams
4	Name:	Eliza J. Danforth
F	Birth:	Abt. April 1850 in Kentucky
	Marriage:	13 June 1869 in Mississippi Co., Missouri
	Spouse:	Thomas J. Weatherby
5	Name:	Levy Danforth
M	Birth:	1852 in Kenetucky
	Death:	1921
	Burial:	Charleston, Mississippi Co., Missouri; IOOF Cemetery
	Spouse:	Margaret Cocke
6	Name:	Robert G. Danforth
M	Birth:	1854 in Kentucky
	Death:	1909
	Burial:	Charleston, Mississippi Co., Missouri; IOOF Cemetery
7	Name:	Leander H. Danforth
M	Birth:	16 August 1857 in Kentucky
	Death:	22 November 1872
	Burial:	Charleston, Mississippi Co., Missouri; Oak Grove Cemetery

8	Name:	Mary Danforth
F	Birth:	Abt. 1860 in Missouri
	Marriage:	4 September 1889 in Charleston, Mississippi Co., Missouri
	Death:	17 December 1928 in St. Louis City, Missouri
	Burial:	Charleston, Mississippi Co., Missouri; Oak Grove Cemetery
	Spouse:	Samuel Alsbrook

Notes:

Leander Foster Danforth

On 7 July 1836, Leander F. Danforth married Jane W. Hawkins. Source: Kentucky, County Marriage Records, 1783-1965.

In 1850, Leander and his family lived in District 1, Henderson County, Kentucky, where he was a farmer with $1,600 of real estate. Four children were in the family. Source: 1850 United States Censs of District 1, Henderson County, Kentucky, taken on 5 Sept 1850 by William P. Smith, Page 9 via Ancestry.com.

In 1860, Leander had moved his family to Tywappity, Mississippi Co., Missouri. He was a farmer with $3,000 in real estate and $3,000 in personal property. They had added 3 more children before they left Kentucky. From the ages of the children and where they were born, the family moved from Kentucky to Missouri between 1856 and 1860. Source: 1860 United States Census of Tywappity Township, Mississippi Co., Missouri. The census was taken on 4 June 1860 by James H. Budyo(?), Page 11.

In 1870, Leander and his family was living in Tywappity, Mississippi Co., Missouri. Jane was shown with $1,500 of real estate. Leander was shown with $400 personal estate. Only Jane, Robert, L. H., and Mary were in the family. Source: 1870 Census of Tywappity, Mississippi Co., Missouri,
Post Office: Charleston, Mississippi Co., Missouri. Census taken 3 August 1870 by C. T. Jenkins, Page 349.

Jane Woodfork Jones

Name Source: Familysearch.org search for Jane Woodfork Jones.

From the marriage record of Jane and Leander L. Danforth, Jane's name may have been Hawkins when she married Leader F. Danforth. Hawkins may have been the name of her first husband or her maiden name. No records have been found on a marriage of Jane W. Jones and Leander F. Danforth.

Lewis W. Danforth

In 1870, Lewis Danforth had married and was living in Charleston, Mississippi Co., Missouri. He had 3 children and was a Dry Goods Merchant. Source: 1870 Census of Tywappity, Mississippi Co., Missouri, Census taken 3 August 1870 by C. T. Jenkins, Page 358.

Albert Hampton Danforth

Parents Names, Birth, Death, Burial Source: Findagrave.com Memorial #158344419 for William H. Danforth.

Birth Place, Children, Spouse Name, Parents Source: Harrison-Ivie Family Tree via Ancestry.com.

In 1900 when the 1900 United States Census was taken, A. H. Danforth was a landlord, owned their own home which was a house, not a farm. Source: 1900 United States Census of Mississippi County, Missouri, Tywappity Township, Charleston City, Supervisor's District 12, Enumeration District 71, Sheet 19A, was taken on 22 June 1900 by Henry A. Danforth.

When Albert H. Danforth registered for the Civil War on 1 July 1864, he was 20 years old, had been born in Kentucky, and was living in Long Prairie, Mississippi County, Missouri. He had 14 months of prior military service. Source: US, Civil War Draft Registration Records, 1863-1865 via Ancestry.com.

On 7 November 1867, Albert H. Danforth married Rebecca H. Lynn in Charleston, Mississippi Co., Missouri. Source: Missouri, Marriage Records, 1805-2002 via Ancestry.com.

A. H. Danforth signed his will on 1 June 1900. It was filed for probate on 2 January 1901 in the Probate Court of Mississippi County, Missouri. In his will, he left 40 acres to his son, William H. Danforth, namely the SE of the NW quarter and SW of the SE quarter in Section 33, Township 27. Range 16 in Mississippi

Notes: (cont.)

County, Missouri. In addition, he bequeathed his $25,000 and all the stock he owned in the Robinson-Danforth Milling Company of St. Louis, if he desired to take it at par value. If he took the stock, the value was to be deducted from the $25,000. In addition, he bequeathed to his son A. H. Danforth, Jr., 40 acres of land, namely the SE of the SW quarter in Section 2, Township 26, Range 15, and 80 acres, the East half of the NW quarter of Section 11, Township 26, Range 15, all in Mississippi County, and 20 acres N half of the NE of the SW quarter of Section 11, Township 26, Range 15, all in Mississippi County, He also bequeathed A. H. Danforth, Jr., $25,000. Any remaining property and stock, he bequeathed to his wife Rebecca, requesting her to keep the stock, bonds, etc. in the same form as they were in at the time of his death, believing that they were profitable. She was to used the income for her support. At her death, all of her inheritance would be divided between his legal heirs. Source: Missouri, Wills and Probate Records, 1766-1988, Volume 3, Page 135, via Ancestry.com.

Charles W. Danforth

In 1870, Charles W. Danforth was a horse trader living with Livi (or Levy?) in Charleston, Mississippi Co., Missouri. Post Office: Charleston, Mississippi Co., Missouri. Source: 1870 Census of Tywappity, Mississippi Co., Missouri, Census taken 3 August 1870 by C. T. Jenkins, Page 349.

Mariage Source: Missouri, Marriage Records, 1805-2002 for Charles W. Danforth via Ancestry.com

Eliza J. Danforth

Eliza married Thomas J. Weatherby on 13 June 1869 in Mississippi Co., Missouri. Source: Missouri, Marriage Records, 1805-2002 via Ancestry.com.

Levy Danforth

In 1870, Livi or Levy Danforth was a store clerk living with his brother, Charles W., in Charleston, Mississippi Co., Missouri. Post Office: Charleston, Mississippi Co., Missouri. Source: 1870 Census of Tywappity, Mississippi Co., Missouri, Census taken 3 August 1870 by C. T. Jenkins, Page 349.

Robert G. Danforth

Birth and Death Source: Findagrave.com Memorial #130865307 for Robert G. Danforth.

Leander H. Danforth

Birth, Death and Burial Source: Findagrave.com Memorial #112952360 for Leander H. Danforth.

Mary Danforth

Birth Source: 1870 United States Census, Tywippity Township, Mississippi Co., Missouri. Mary Danforth, age 10, in the family of L. F. and Jane Danforth. Census taken on 3 August 1870 by C. T. Jenkins, Page 17.

Death Source: Missouri, Death Certificates, Mollie Alsbrook, #43448, Registered #12765. Daughter of L. Danforth and Minnie Jones.

Pig Chow", and "Purina Monkey Chow".

"Later, the company began producing cereal, which received endorsement by Webster Edgerly, founder of Ralstonism, to market Ralston breakfast cereals. Edgerly was at the time promoting the consumption of whole-grain cereal. These cereals became so successful that the name of the enterprise was changed in 1902 to the Ralston-Purina Company. [2] [3]

"In 1986, Ralston Purina sold Purina Mills, its US animal feed business, to British Petroleum. Purina Mills is now owned by Land O'Lakes. In 1994, the Ralston "human food" operations of the Ralston Purina Company were spun off into a new company called Ralcorp Holdings. In 1998, Ralston Purina spun off its international animal feed business as Agribrands, which was acquired by Cargill in 2001. [4] The animal feed businesses continue to use the Purina and Chow brands, which Purina Mills and Cargill license for use in the US and internationally, respectively.

"Merger with Nestlé: Ralston Purina became the subject of an acquisition bid by Swiss-based Nestlé, whose Friskies brand was the other leading US brand of pet food. Nestlé S.A. and Ralston Purina announced in January 2001 a definitive merger agreement. [5] Under the agreement, Nestlé acquired all of Ralston Purina's (NYSE: RAL) outstanding shares for US$33.50 per share in cash. The offer represented a premium of 36% over the closing price on Friday, January 12, 2001. The transaction had an enterprise value of US$10.3 billion ($10.0 billion equity plus $1.2 billion of net debt, minus $0.9 billion of financial investments).

"Both corporations saw this major strategic transaction as the ideal way to benefit from their combined know-how, complementary strengths, and international presence in the growing pet-care market. [citation needed] Several brands of pet food (e.g., "Meow Mix") had to be divested separately to meet antitrust concerns. Purina brands are now made and marketed by a division of Nestlé (Nestlé Purina PetCare) which is still headquartered in St. Louis.

"While primarily a pet-food company, Ralston Purina also made some other pet-related products, such as Tidy Cats brand and Yesterday's News cat litter, which is made from recycled newspaper, purchased from Edward Lowe Industries in 1990. Also, Purina has honoured several Canadian animals every year since 1968 in their *Animal Hall of Fame*. The latest inductees included a police service dog which "rushed and subdued an armed robber".

"Acquisitions and diversifications: In 1977, Ralston Purina acquired Missouri Arena Corporation and the St. Louis Blues National Hockey League franchise. During the company's ownership of the team, they changed the name of the St. Louis Arena to the Checkerdome, reflecting the Ralston Purina logo. The franchise was sold to Harry Ornest on July 27, 1983.

"Ralston Purina purchased the Eveready Battery Company in 1986, owner of the Eveready and Energizer brands. The company was spun off in 2000.

"Ralston Purina purchased Continental Baking Company, makers of Wonder bread and Hostess cakes, from ITT in 1984. Ralston spun off Continental Baking Company, subsequently bought by Interstate Brands Corporation (IBC) of Irving, Texas.

"Ralston Purina opened test market pizza stores called Checkerboard Pizza in 1986. The format was similar to Domino's and Little Caesars. They opened the stores in markets such as Moorhead, Minnesota, to test how the Midwestern market would accept the concept. They did well, but Ralston Purina decided not to enter the pizza franchise business and closed all pilots by late 1987.

"Ralston Purina owned and further developed the Keystone ski resort in Colorado. "Checkerboard Flats" for kids and beginners at Keystone [6] still bears their logo. In 1993, Ralston Purina also bought Breckenridge ski area for an undisclosed amount, from Victoria U.S.A. Inc, a Japanese sporting goods retailer. [7]. However, both ski resorts were sold in 1997 to Vail Resorts for $331 million. [8]

"Ralston Purina also owned Jack in the Box fast food restaurants from 1968 to 1985, [9] along with several high-end restaurants. [10] [11]

"Ralston Purina owned Van Camp Sea Food Company from 1963 to 1988, a tuna cannery with Chicken of the Sea as its main product. [12]

"Ralston Purina owned an animal pharmaceutical company in the 1970s and 1980s.

"Logo: Ralston Purina's 'checkerboard' trademark was introduced in 1902. [13] [14] [15] It was inspired by William Danforth's childhood memory of a family dressed in clothing made from the same bolt of checkerboard cloth. [16] The company's headquarters was called Checkerboard Square. Danforth used the design as the visualization of a concept put forth in his book I Dare You, in which he proposed that four key components in life ('Physical', 'Mental', 'Social', and 'Religious') need to be in balance, and one area was not to develop at the expense of the others. [17] In 1921, the design inspired the design of feed that was pressed in cubes, called 'checkers'. [18]

See also:

"Louisville sewer explosions

"Ralcorp

"Purina Mills

"References:" There are 18 references.

"External Links:" There are 8

1082. Wikipedia, the free encyclopedia. 2020. Ralcorp (Web article). https://en.wikipedia.org/wiki/Ralcorp 2 p. Retrieved Sept. 1.

• ***Summary:*** "Ralcorp Holdings is a manufacturer of various food products, including breakfast cereal, cookies, crackers, chocolate, snack foods, mayonnaise, pasta, and peanut butter. The company is based in St. Louis, Missouri. The majority

of the items Ralcorp makes are private-label, store-brand products. It has over 9,000 employees. [1] Ralcorp has its headquarters in the Bank of America Plaza in downtown St. Louis. [2]

"Native name: TreeHouse Private Brands, Inc.

"Type: Subsidiary of TreeHouse Foods

"Industry: Food production

"Founded 1994; 26 years ago in St. Louis, Missouri (spun off from Ralston Purina).

"History and description: Originally part of Ralston Purina, the Ralston name was more associated with food for humans; soda crackers and a farina cereal, among other products, were marketed under this name. Ralcorp can trace its ancestry to 1898 when William H. Danforth of Purina Mills, which made animal feeds, began making breakfast cereal. He sought and received the endorsement of Webster Edgerly (Dr. Ralston) who founded the Ralstonism social movement. [3] Ralston cereal became so successful that Purina Mills was renamed Ralston Purina in 1902. [4] Ralston Purina also for many years produced the familiar line of Chex and Cookie Crisp cold breakfast cereals. The animal and human food businesses were seemingly only tenuously related. In 1994, the human food business was spun off to Ralcorp Holdings, operating as Ralston Foods,

which then sold its branded breakfast cereal lineup to General Mills and its Continental Baking division (Wonder Bread and Twinkies) to Interstate Bakeries. The Purina part of the company is now split. The pet-food company sold to Nestlé is now called Nestlé Purina PetCare. The livestock-feed company is called Purina Mills, LLC, and is a unit of Land O'Lakes. Ralcorp manufactures many store-brand foods that are sold in grocery outlets across the United States under the retailers' private labels. In late 2007, Ralcorp signed an agreement with Kraft Foods to acquire the Post Cereals brands, thus returning to the major-branded cereal business. The acquisition was completed August 4, 2008. [5] Another brand name product Ralcorp makes and markets is Ry-Krisp crisp bread.

"Purchase by ConAgra: In 2011, Ralcorp received an offer for the company from ConAgra Foods. Ralcorp resisted the attempt. Ralcorp also announced it was spinning off its Post Foods unit. [6] The spinoff was completed in 2012. [7] On November 27, 2012, ConAgra officials announced they were purchasing Ralcorp, pending Ralcorp shareholder approval, for about $4.95 billion. Stockholders of Ralcorp Holdings Inc. would receive $90 per share. The acquisition was completed in January 2013. [8] As a result, ConAgra is the largest private-label packaged food business in the United States. [9]

"Purchase by TreeHouse Foods, Inc: Feb. 1, 2016 TreeHouse Foods announced that it completed the acquisition of ConAgra Foods' private brands operations. "TreeHouse paid $2.7 billion in cash plus transaction expenses for the business and financed the transaction through the closing of its previously announced offerings of $775 million in aggregate principal senior notes due 2024 with a 6.0% annual interest rate and common stock issuance of 13.3 million shares at a price of $65 per share (which includes the exercise, in full, of the overallotment option), aggregating $862.5 million in gross proceeds. The remainder of the purchase price was financed under the Company's revolving credit facility." [10] The rumor of the deal was first broke in October 2015. According to a FoodProcessing.com article from 10/23/2015: "TreeHouse Foods is rumored to be in advanced talks to purchase the Ralcorp business from ConAgra Foods in a deal valued at $2.5 to $2.7 billion, according to a report from Reuters." This was a huge loss from the $5.1 Billion ConAgra paid for Ralcorp two years earlier. [11]"

Subsidiaries: Many. References: 23.

1083. Purina through the years (Website printout). 2020. https://www.purina.com/about-purina 2 p. Retrieved 1 Sept. 2020.
• ***Summary:*** 1894: William H. Danforth, partnering with George Robinson and William Andrews, enters the business of feeding farm animals by founding the Robinson-Danforth Commission Company. The name is changed to Ralston Purina in 1902.

"1926: Purina establishes the first pet [sic, farm animal] nutrition and care center at Purina Farms near Gray Summit, Missouri, to confirm the palatability and nutrition of its pet [sic] foods. It has since evolved into the Nestle Purina Pet Care Center in Northwest Missouri.

"1933: On a recommendation from Massachusetts General Hospital, the dogs on Admiral Richard E. Byrd's Antarctic expedition eat Purina Dog Chow Checkers, and thrive in the harsh conditions."

"1986: Ralston sells the Purina Mills animal feed business...

"2001 Dec. 12: Nestle acquires Ralston Purina, helping to expand the availability of Purina products to pets and pet owners all over the world."

1084. Spots at front of book: History of modern soy protein ingredients. 2020.
• ***Summary:*** (a) A container of GNC isolated soy protein. (b) The Solae logo. (c) Granular textured soy protein. (d) A soybean crushing plant with many tall silos for storing soybeans. (e-f) Textured soy protein. (g) TVP brand textured soy flour. (h) Eighth-Continent soymilk made with Solae® isolated soy protein.

1085. Spots at front of book: Ralston Purina and the Danforth family. 3000.
• ***Summary:*** Family in which William Henry Danforth was a child (a-d). Family in which William Henry Danforth was a parent (e-g). Family in which Donald E. Danforth was a parent (h-j). Solae logo and company (k-l). Family in which Senator John Claggett Danforth was a parent. Portrait of William Henry Danforth during World War I from Purina website (1880-1971) (m). Ralston Purina letterhead in March 1991 (n). Ralston Purina letterhead in March 1996 (o).

1086. *SoyaScan Notes.* 2020. Soyfoods big ventures wish list (Overview). Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** The Soyfoods Association should team up with other interested parties (such as Protein Technologies International) and petition the FDA to outlaw the use of the term "non-dairy" on the label of (or otherwise in connection with) products which contain sodium caseinate or any other product derived from cow's milk. This would open the way to many new soy-based dairylike products.

A joint venture with a Japanese company such as Sendai Miso Shoyu to brew Japanese-style shoyu in America in the traditional way. Large amounts are now imported from Japan.

1087. *SoyaScan Notes.* 2020. The visionary work of Henry Ford and his researchers with soyfoods–then and now: Pioneered soy protein isolates (Overview). Compiled by

William Shurtleff of Soyinfo Center.
• ***Summary:*** Robert Boyer and Bob Smith did extensive, pioneering work on developing soy protein isolates at the Ford Motor Co. Both started research in 1938. Boyer used his isolates to make industrial products, such as spun soy protein fibers and water-based paints. The soy fibers were produced in a pilot-plant with a capacity of 1,000 pounds per day of soybean "wool" and soon a fabric containing 25% soybean wool and 75% sheep's wool was used in the sidewall upholstery of many Ford cars. Bob Smith used his isolates to make a good-tasting soymilk, that was served in Ford cafeterias and schools, and at the Henry Ford Hospital, and was also used as the base for most of the early commercial soy-based whipped toppings–starting with Delsoy. In Nov. 1943 The Drackett Co. bought Ford's soybean fiber spinning operations; Boyer, Francis (Frank) Calvert, and William Atkinson went to Drackett from Ford as part of the deal. Drackett made and sold their fibers, Soybean Azlon, spun from soy protein isolates, from 2 Dec. 1943 to 1949. They were used mainly in felt hats by the American Hat Corporation. Drackett also commercialized other industrial soy proteins, such as Protein 110, 112, and 220, Ortho Protein, and plastic molding compounds. Boyer left Drackett in 1949 when they shut down their Azlon fiber spinning plant; he focused all his energy on developing food uses of edible products made from spun soy isolates. In mid-1957 ADM (Archer Daniels Midland Co.) purchased Drackett's soy protein business. Bob Boyer began to work as a full-time consultant for Ralston Purina in the field of soy proteins starting in early 1960. Since 13 June 1959 Ralston Purina had been manufacturing industrial soy protein isolates (for use in paper coatings) at a plant in Louisville, Kentucky, which they purchased from Procter & Gamble in December 1958. In 1960, after starting consultation with Boyer, Ralston Purina began its first work with edible soy proteins by establishing a research and pilot plant at company headquarters in St. Louis, Missouri. In about September 1962 Boyer was named technical director of protein products sales in the soybean division of the Ralston Purina Co.; he worked for Ralston until his retirement in 1971. Frank Calvert, Boyer's coworker from the Ford Motor Co. was hired in November 1962 to head up Ralston Purina's R&D work on food-grade isolated soy protein in St. Louis. In 1965 Calvert was named director of soybean research, and in 1967 director of research of the Protein Division. In 1969 Calvert was promoted to director of research, New Venture Management, and finally in 1971 vice president and research director, New Venture Management. During these years, Calvert developed new soy protein isolation processes, 70 percent soy protein concentrate products, and modified soy protein coating compositions for industrial use. Calvert is considered a visionary in soy protein research and the accomplishments of his career were honored in 1973 when the Ralston Purina plant at Memphis, Tennessee, was dedicated to him in recognition of his years of service and dedication to protein technology.

In Oct. 1962 Ralston Purina began to introduce a line of edible soy protein isolate products made at their plant in Louisville: The first three were Edi-Pro A and Edi-Pro N (spray-dried isoelectric and neutral isolated soy proteins respectively) and Textured Edi Pro (an edible spun soy protein fiber). Supro 610 was launched in October 1966. As sales of these products increased, Ralston Purina soon found itself a leader in this new field–along with the pioneer, Central Soya, which had launched Promine in Oct. 1959. Ralston Purina expanded food grade isolate capacity with new facilities at Memphis, Tennessee, beginning production on April 10, 1973; Pryor, Oklahoma, beginning production on December 1, 1976. By late 1975 the company was making about 75 million pounds per year of isolates from its three plants, and was starting to advertise its isolates in a big way, with full-page color ads. This expansion easily vaulted Ralston Purina into the position of world leader in food-grade isolated soy proteins by 1976. On 21 August 1979 the company began producing soy protein isolates at its first plant located outside the Unites States, in Ieper, Belgium. On 1 July 1987 Ralston Purina established Protein Technologies International (PTI) as a wholly owned subsidiary focused on manufacturing soy protein and fiber products. In 1993 PTI was by far the world's leading producer of soy protein isolates, controlling about 60% of the U.S. market. PTI's sales of consumer soy protein products rose from $221.6 million in 1989 to a record $288.1 million in 1992.

1088. *SoyaScan Notes.* 2020. The visionary work of Henry Ford and his researchers with soyfoods–then and now: Pioneered textured soy flour and TVP (Overview). Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** The world's most popular textured soy protein product among consumers is TVP; the name is a registered trademark of ADM, The Archer Daniels Midland Co. of Decatur, Illinois. One of the two main developers of textured soy flour was William Atkinson, a researcher at the Ford Motor Co. since 1935. After doing early work on industrial soy protein fibers, he went to The Drackett Co., then to ADM when Drackett sold their agricultural operations to ADM in 1957. "TVP Textured Vegetable Protein" was launched commercially in April 1966, and Atkinson was issued a key patent on the product in Jan. 1970 (No. 3,488,770). The product described in this patent has probably had "the greatest impact in bringing the low-cost, textured vegetable products into commercialization." A major breakthrough came on 22 Feb. 1971 when USDA's Food and Nutrition Service authorized the use of textured vegetable proteins (which, in practice meant TVP) as an extender for meat, poultry, or fish in National School Lunch Programs and Special Food Service Programs for children. Up to 30% on a hydrated basis could be used. By 1975 some 75 to

100 million pounds were being used in these programs alone. Starting in March 1973 TVP became a popular retail item as an extender for ground beef–whose price had skyrocketed. By 1976 approximately 60% of the soy flour and grit texturizing capacity in the U.S. was licensed under this Atkinson patent. It dominated the industry from 1970 to 1976 when it, in turn, came to be dominated by the Flier patent assigned to Ralston Purina Co. Wolf (1984) estimated that in 1982 approximately 95 million lb of textured soy flour, worth about $13.8 million at the wholesale level, were produced in the USA. It continues to be widely used in foods for both people and pets.

1089. *SoyaScan Notes.* 2020. The visionary work of Henry Ford and his researchers with soyfoods–then and now: Invented meat alternatives based on spun soy protein fibers (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** One day in 1942 at the Ford plant, Robert Boyer, while sampling fibers of his "soybean wool," realized that these same soy protein fibers, if made tender by omitting the protein denaturation, hardening, and insolubilization, could be used as a basic ingredient in making meatlike textured soy protein foods. He had already developed an analog for the protein fibers that grow on the *outside* of a sheep (wool), why not develop an analog for those on the *inside*, a meatless meat or meat analog? In 1949 Boyer left his job at The Drackett Co.

He devoted all his energy to developing food uses of edible products made from spun soy isolates. His first patent for edible soy fibers was applied for in 1949; It was rewritten and applied for in May 1952 and issued in June 1954 (No. 2,682,466). In 1956 Worthington Foods purchased a license from Boyer and began to develop the world's first meatlike meatless products based on these soy protein fibers. In Oct. 1962 Ralston Purina Co. began to produce the world's first food-grade spun soy protein fibers–named Textured Edi Pro–at its plant in Louisville, Kentucky. Worthington Foods purchased these fibers and used them as key ingredients in a new generation of meatlike products. The first of these were on the market by 1963, with names like Worthington Soyameat–Fried Chicken Style, Chicken Style Roll, Prosage (like pork sausage), White-Chik, Soya Meat–Beef Like; The Soyameat–Fried Chicken style was canned whereas the other products were frozen. The flavor and texture were better than any meatlike product ever made in America. Initially these products were sold in health food stores but in late 1965 they started to be sold in supermarkets. In 1966 Worthington started to spin its own soy fibers, and the next year Ralston Purina stopped spinning.

Other companies also licensed the rights to spin soy protein fibers from Robert Boyer. In December 1965 General Mills introduced its Bontrae line of spun soy protein fiber products, starting with Bac-O*s (imitation bacon bits). By May 1966 General Mills was making analogs for ground beef, diced ham, and diced poultry–all from spun soy protein fibers. So successful were these products (they also won several prizes) that in June 1969 General Mills broke ground for a multi-million dollar state-of-the-art fiber spinning plant at Cedar Rapids, Iowa. It began making Bontrae products in later 1970. By 1975 Cortaulds in England had launched Kesp, based on spun soy protein.

Today about 15-20% of Worthington's meat alternatives contain spun soy protein fibers. These products have a retail value of about $8.8 million. Worthington's Morningstar Farms line of meat alternatives, some of which contain spun soy protein fibers, is sold in the frozen foods section of about 95% of all supermarkets and grocery stores in America.

1090. *SoyaScan Notes.* 2020. Definition of the three types of soy fiber: Okara, soy bran, and soy cotyledon fiber (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** There are three basic types of soy fiber: Okara (soymilk pulp), soy bran (pulverized or ground soybean hulls / seed coats), and soy cotyledon fiber (soy polysaccharides). All of these products are sources of high-quality, inexpensive dietary fiber.

Okara: In the process of making soymilk or tofu, the liquid soymilk is separated by filtration from the insoluble fiber. This nutritious by-product, called okara (in both Japanese and English) or soy pulp, has the consistency and appearance of wet sawdust. It has been used for centuries as a source of food, feed, and fertilizer, and is generally available free of charge from most tofu and soymilk manufacturers. The quality of the protein in okara is higher than that in tofu, soymilk, or whole soybeans. Therefore adding okara to recipes and dishes (such as baked goods) is an excellent way to add both fiber and high-quality, low cost protein.

Soy bran: Soybean hulls, a by-product of the process of crushing soybeans to make oil and meal, can be ground to a light-colored, high-fiber flour generally known as "soy bran."

Soy cotyledon fiber: In the process of isolating the protein from defatted soybeans (i.e., of making isolated soy protein), the fiber is removed by filtration. We call this fine white powder "soy cotyledon fiber"; it differs from okara in five ways: (1) It does not contain soybean hulls; (2) It has been defatted and thus is lower in fat; (3) It has been treated during processing with mild alkali; (4) It has a much finer texture than okara; and (5) It is almost always sold in dry form, whereas okara is rarely dried. One well known brand, *Fibrim* (made by Protein Technologies International) has been used in many clinical trials. Address: Soyinfo Center.

1091. *SoyaScan Notes.* 2020. Chronology of early isolated soy protein (soy protein isolate) developed for food use. 5 June 2011. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1911–Beltzer develops isolated soy protein (ISP) for food use in France.

1921–Satow develops isolated soy proteids for food use in Japan.

1935–First U.S. patent for soy protein issued to Burruss & Ruth.

1932–The Glidden Co. (Chicago) first develops soy protein for food use in the USA but did not yet make a commercial product.

1939–Albusoy, made by The Glidden Co. in Chicago, is launched. It takes the place of egg albumen (egg whites) in a wide variety of products, especially confections.

1942–Central Soya Co. launches a similar whipping compound named Soy Whip–also meant to replace an animal product–egg whites.

1945–Rich Products Corp. (Buffalo, New York), during World War II when whipping cream is unavailable, launches Whip Topping, made from "Soy Cream," based on soy protein.

1946–Borden Co., Whitson Products Div., launches Soyco–a "soy albumen whipping agent."

1947–Vegetable Products Corp. (Saline, Michigan) launches Wonder Whip–a soy-based non-dairy whip topping.

1948–Rich Products Corp. launches Whip Topping, based on isolated soy protein, in a pressurized aerosol metal can. It is a smash success.

1950–Presto Food Products (of Industry, California) launches Mocha-Mix Coffee Creamer (later renamed Mocha Mix Non-Dairy Creamer)–based on soy protein.

1951–Rich Products Corp. launches Chil-Zert, the first non-dairy frozen dessert (ice cream)–based on soy protein.

1951–Hoffman Products (York, Pennsylvania), Subsidiary of York Barbell Co., launches Bob Hoffman's Hi-Proteen (powder)–based on soy protein.

1952–Rich Products Corp. launches Sundi Whip, a non-dairy fountain topping in a pressurized can, based on soy protein.

1952–Rich Products Corp. launches Rich's Chocolate Eclairs (non-dairy and frozen), filled with Rich's Whip Topping.

1959–Central Soya Co. (Chicago, Illinois) launches Promine–food-grade soy protein in two types; D is dispersible, R is regular.

1962–Ralston Purina launches Edi-Pro–spray-dried soy protein.

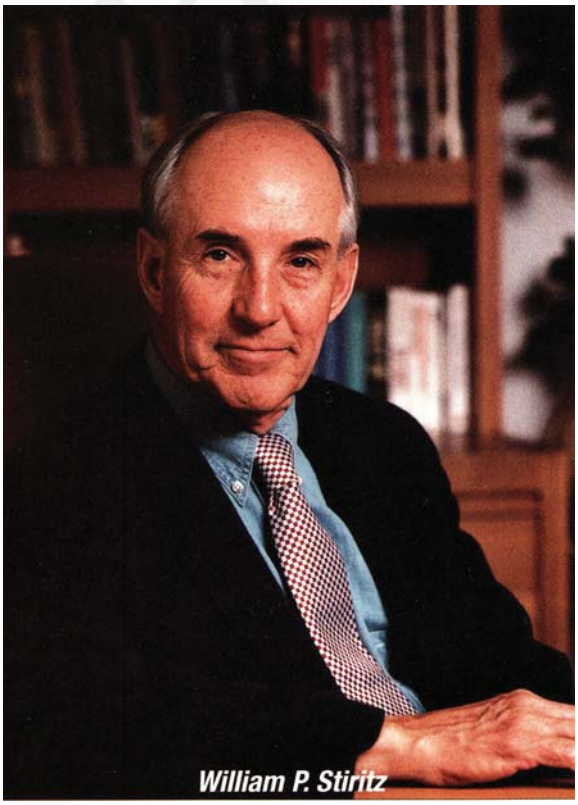
Observations:

1. Using plant proteins to replace animal proteins is generally a good thing for many reasons, and is definitely a long term green trend.

2. Many people who are unable (allergies, lactose intolerance, heart condition, etc.) or unwilling (vegan, kosher) to use dairy products are extremely grateful for non-dairy alternatives made from soy protein.

3. One of the Buddhist precepts is not to find fault with others... which may be interpreted to include other things. There is a place for just about everything if it is used wisely. The few groups criticizing isolated soy proteins are those promoting animal products (meat, dairy and eggs); they are therefore criticizing the competition–soyfoods and edible soy products.

An asterisk (*) at the end of the record means that SOYINFO CENTER does not own that document. A plus after eng (eng+) means that SOYINFO 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.



SUBJECT/GEOGRAPHICAL INDEX BY RECORD NUMBERS