

VOLUNTARY STANDARDS FOR
THE COMPOSITION AND LABELING OF SOYMILK
IN THE UNITED STATES

ACCEPTED BY
THE SOYFOODS ASSOCIATION OF AMERICA

March, 1996

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Table of Contents

I. Purpose of Voluntary Standards.....	2
II. History and Terminology of Soymilk	
A. History	3
B. Existing Standards in Other Countries	5
C. Terminology.....	7
III. Definition and Classification of Soymilk Products	
A. Soymilk Definition	10
B. Soymilk Classification	10
IV. Labeling of Soymilk Products	
A. General	12
B. Modifiers to the Statement of Identity.....	12
C. Use Date Labeling.....	13
D. Refrigeration Information Labeling	13
V. Microbiological Guidelines for Soymilk	14
VI. Standards Committee;	
Adoption and Amendment of Standards.....	15

I. PURPOSE OF VOLUNTARY STANDARDS

The purpose of voluntary industry standards for the composition and labeling of soymilk in the United States is to:

- Promote honesty and fair dealing in the interest of consumers.
- Help to ensure that the soymilk consumer receives a quality product.
- Establish consistency and fairness in labeling.
- Disseminate sound nutritional information.

The SOYFOODS ASSOCIATION OF AMERICA¹ recommends that all manufacturers and marketers of soymilk and soymilk products comply with the following standards for such products.

NOTE:

These standards are intended as a voluntary supplement to the requirements of federal and state law, including the Federal Food, Drug, and Cosmetic Act, Title 21, United States Code, section 301 et seq., as amended by the Nutrition Labeling and Education Act, and regulations of the United States Food and Drug Administration (FDA), Title 21, Code of Federal Regulations, part 1 et seq., applicable to foods. These voluntary standards are not intended to conflict in any way with any requirements of federal or state law. At certain locations, these voluntary standards refer to particular applicable requirements of federal or state laws; however, they are not intended to be a complete compilation of applicable laws. A company should consult with its own legal counsel or labeling adviser to be certain that it is in compliance with federal and state law before marketing any product.

¹ The Soyfoods Association of America is a trade association formed in 1979 to represent the soyfoods producers and marketers in the United States. For more information, contact: *Soyfoods Association of America at P.O. Box 3179 • Walnut Creek, CA 94598 • PH: 510.935.9764 • FAX: 510.935.9721.*

II. HISTORY AND TERMINOLOGY OF SOYMILK

A. HISTORY

Archaeological evidence (a Chinese mural incised on a stone slab) shows that soymilk and tofu were being made in Northern China during the Eastern/Later Han period (A.D. 25-220).² The earliest known written reference to soymilk appeared in about A.D. 1500 in China, in a poem by Su Ping.³

The earliest known European reference to soymilk was in 1665 by Domingo Fernández de Navarrete, who served as a Dominican missionary in China.⁴ Soymilk was also mentioned in 1790 by Juan de Loureiro, a Portuguese Jesuit missionary who lived in what is now Vietnam.⁵

Each of these and many other early references mentioned soymilk as part of the process for making tofu. The world's earliest known discussion of soymilk as a drink in its own right appeared in 1866, when the Frenchman Paul Champion, who had traveled in China, stated that the Chinese had taken their cups to tofu shops to get hot soymilk which they drank for breakfast.⁶

Soymilk was first referred to in the United States by Henry Trimble in 1896 in the *American Journal of Pharmacy*.⁷ In 1909, a U.S. pediatrician developed the first soy-based infant formulas and soymilk from full-fat soy flour. In 1910, Li Yu-ying, a Chinese citizen in Paris founded the world's first soy dairy and was granted the first British patent for soymilk production (No. 30,275. "Vegetable milk and its derivatives"). In 1913, Li Yu-ying was granted the first U.S. patent for soymilk (No. 1,064,841). By 1917, soymilk was being produced commercially in the U.S. by J.A. Chard Soy Products in New York City.⁸

² Chen, Wenhua, 1990. The origin of doufu - When was it first made? (abstract). Paper presented at the Sixth International Conference on the History of Science in China, held Aug. 1990 at Robinson College, Cambridge, England.

³ Su Ping. 1500. Ode to tofu. Quoted by Wai, 1964, p. 91-92.

⁴ Navarrete, Domingo Fernández de. 1665. A Collection of Voyages and Travels. Published by the author, London. See p. 251-52, Chap. 13.

⁵ Loureiro, Juan de. 1790. The Flora of Cochin China, Vol. 2, Lisbon, Portugal. See p. 441-42.

⁶ Champion, Paul. 1866. On the production of tofu in China and Japan. *Bulletin de al Societe d'Acclimation* 13(6):562-65. June.

⁷ Trimble, Henry. 1896. Recent literature on the soja bean. *American J. of Pharmacy* 68:309-13. June.

⁸ Piper, C.V.; Morse, W.J. 1916. The soy bean with special reference to its utilization for oil, cake and other products. *U.S.D.A. Bulletin* No. 439. Dec. 22. p. 9; Horvath, A.A. 1927. The soybean as human food. Chinese Government Bureau of Economic Information, Booklet Series, No. 3. p. 47.

By the 1950's, soymilk began to enter the "modern era" largely due to work done by K.S. Lo of Vitasoy in Hong Kong and Yeo Hiap Seng in Singapore, which resulted in soymilk being marketed in bottles like soft drinks.

In 1966, scientists at Cornell University discovered that the enzyme lipoxygenase was responsible for creating the "beany" flavor in soymilk and developed a process which could be used to help eliminate this flavor.

Another major breakthrough in soymilk technology came in 1967 in Singapore when soymilk began to be packaged aseptically in Tetra Pak cartons. This allowed soymilk to be sold without refrigeration for six months or more.

During the 1970's and 1980's, soymilk became a popular beverage throughout Asia and its popularity spread to Europe, Australia and the United States.

In the early 1980's, both Eden Foods of Clinton, Michigan, and Vitasoy (USA) Inc. of Brisbane, California, began importing soymilk drinks from Japan and Hong Kong, respectively. As a result, consumers in North America were introduced to modern, bland tasting soymilk, in a long-life package.

The first comprehensive study of the soymilk market in the United States was published in February, 1984. It estimated that total consumption in the U.S. in 1983 (not including soy-based infant formulas) was 2.68 million gallons.

By 1991 there were at least 35 processors or marketers of soymilk in the U.S. Production increased to approximately 9.8 million gallons of soymilk, and consumption was estimated to be growing at between 15 and 20% per year since 1984.⁹

By 1993, more than 200 scientific journal articles about soymilk had been published in English and at least 80 English-language patents on soymilk had been issued between 1912 and 1993.¹⁰

According to a market study published in 1995, an estimated \$108 million of soymilk was sold in the U.S. in 1994. This equates to approximately 13.5 million gallons of soymilk. By 1995, sales were projected to rise to over \$130 million, or approximately 16.3 million gallons.¹¹

⁹ Golbitz, Peter; Soyatech, Inc., 1991; estimates based on industry survey conducted in 1991.

¹⁰ The early history of soymilk, as described above, is documented in: Shurtleff, William; Aoyagi, Akiko. 1984. *Soy milk Industry and Market*. Lafayette, Calif.: Soyfoods Center. p. 10-11, 24. It is updated for these soymilk standards in a letter from William Shurtleff to Peter Golbitz dated 3 October 1993.

¹¹ The Meat and Dairy Alternatives Market, May 1995; Packaged Facts, New York. 1995. p.37, 138.

B. EXISTING STANDARDS IN OTHER COUNTRIES

As sales and consumption of soymilk have steadily increased around the world, standards for its composition and labeling have been adopted in Japan, Taiwan, Singapore, France, Thailand and Korea.

Figure 1. below summarizes the various categories and compositional characteristics for soymilk for the countries shown. These are meant to serve as summaries only and do not constitute the entire standards for any of the countries listed.

Figure 1.

Soymilk Standards for Various Countries

minimum requirements

Country	Product	Protein	Fat	Soybean solids
Japan	Soymilk	3.8%	—	8.0%
	Blended soymilk	3.0%	—	6.0%-8.0%
	Soymilk beverage	1.8%	—	4.0%-6.0%
	Soy protein beverage	1.8%*		
Taiwan†	Soymilk	2.6%	0.5%	
	Formulated soymilk	2.0%	0.5%	
	Soy drink	1.4%	0.5%	
Singapore	Soymilk	2.0%		
	Soy drink	>2.0%		
France	Soymilk (tonyu)	>3.6%	>1.5%	>7.3%
	Fortified soymilk (extra tonyu)	>3.8%		
Thailand	Soymilk	2.0%	1.0%	

*0.9% if in beverages with 5%-10% fruit juice added.

†Revised June, 1993 to lower taxes and allow for low fat varieties.

Sources: Steve Chen, ASA Taiwan; Japanese Ministry of Agriculture, Forestry and Fisheries; SOJINAL, France; China National Standards; as compiled by Soyatech, Inc.

Japanese standards were first established in 1981, but were later revised in 1985 to allow for beverages to be made from soy proteins as well as whole soybeans, if they contain at least 1.8% protein from soybeans.¹²

The China National Standards (CNS) were established in 1984, but were just recently revised by lowering the minimum protein level in their "soymilk" from 3.4% to 2.6% in order to avoid a commodity tax. In addition, minimum fat levels were revised downward from 1.0% and 2.0% to 0.5% to allow low fat soymilks to be marketed.¹³

¹² Japan Agricultural Standards (JAS) for Soymilk Products, November 16, 1981, Ministry of Agriculture, Forestry and Fisheries, Notification No. 1800; June 1, 1984, Notification No. 1281; October 5, 1985, Notification No. 1482.

¹³ Letter from Steve Chen, Country Director/Taiwan, American Soybean Association, November 9, 1993.

C. TERMINOLOGY

The SOYFOODS ASSOCIATION OF AMERICA recognizes that there is a need to standardize terminology for the wide variety of soymilk and soymilk drink products sold in the United States today.

The present American-English terms “soymilk,” “soy milk,” and “soybean milk” have all been used to describe the liquid food derived from the cooking and processing of whole soybeans with water.

The earliest known use of the present word “soymilk,” spelled as one word, was by Dr. Harry W. Miller and Dr. C. Jean Wen in 1936. It appeared in a scientific journal article titled *Experimental Nutrition Studies of Soymilk in Human Nutrition*.¹⁴

In 1947, the American Soybean Association (ASA), then located in Hudson, Iowa, published the first edition of its *Soybean Blue Book*. This directory of soy products and processors listed five companies in the U.S. as “manufacturers and handlers” under the category of “soy milk.”¹⁵ Later, beginning in 1980, the ASA’s *Soya Bluebook* (updated title) described soymilk manufacturers’ products as “soymilk,” in one word, under the broader category heading of “soy beverages.”¹⁶

The United States Department of Agriculture (USDA) in the 1963 edition of its *Agriculture Handbook No. 8* (approved for reprinting in 1975), provided compositional characteristics of “soybean milk,” in both fluid and powder form. The fluid “soybean milk” listed contained 3.4% protein, 1.5% fat, 2.2% carbohydrates and 0.5% ash.¹⁷

The USDA in its *Home and Garden Bulletin* No. 208, printed in 1977, listed the nutritive value of various soyfood products including “soy milk.”

In 1986, USDA, as part of its stated program to replace *Agriculture Handbook No. 8*, published the *Agriculture Handbook Number 8-16, Composition of Foods: Legumes and Legume Products*. In this publication’s introduction, the authors acknowledge that “soy milk” is produced commercially in the United States.¹⁸ A page of nutritional information under the title “SOY

¹⁴ SoyaScan, a computerized bibliographic database, Soyfoods Center, Lafayette, Ca.

¹⁵ Soybean Blue Book, 1947. American Soybean Association, Hudson, IA p.72.

¹⁶ Soya Bluebook, 1980. American Soybean Association, St. Louis, MO p.50-51.

¹⁷ Agricultural Handbook No. 8 — Composition of Foods, Raw, Processed, Prepared. Revised 1963, approved for reprinting October 1975. U.S.D.A., Washington D.C.

¹⁸ Agricultural Handbook No. 8-16 — Composition of Foods: Legumes and Legume Products. Revised December 1986. U.S.D.A., Washington D.C. p. 9.

MILK, Fluid" is provided. The product contains 2.75% protein, 1.91% fat, 1.81% carbohydrates and 0.27% ash.¹⁹

Although no compositional standard for soymilk currently exists in Canada, a March 21, 1984 memorandum from the Government of Canada to its regional food specialists stated:

At a recent meeting with Agriculture Canada, it was agreed that the term "soymilk" would be the acceptable designation for the aqueous extraction of soybeans used in the manufacturing of TOFU. This decision was based on a review of the research literature where the term "soymilk" has been in use for 60 years or more. It can therefore be argued, as in the case of coconut milk, that the common name "soymilk" is well established within this particular trade, thus barring any objection from the dairy industry.

The document, after showing a brief flow chart of a soymilk processing method, added:

Please be advised that we will be recommending the use of this name and of its French equivalent "jus de soya" (MAPAQ) for labelling purposes. For the sake of uniformity, we would appreciate your doing likewise.²⁰

The memorandum was signed by Johanne B. Robert-Stolow from the Manufactured Food Division, Consumer Products Branch, Hull, Quebec, Canada.

According to data searches in *SoyaScan*, a computerized bibliographic database on soybean products and research maintained by the Soyfoods Center in Lafayette, California, the word "soymilk" was used in the title of English-language periodicals, conference papers, or book chapters, at least nine times during the 1970's; and at least 84 times during the 1980's. In 1983, "soymilk" appeared for the first time in the title of a U.S. Patent (No. 4,409,256, titled "Soymilk Process").²¹

The SOYFOODS ASSOCIATION OF AMERICA believes that the word "soymilk," written as one word, should be the term used to identify the products described hereafter in these standards.

¹⁹ Agricultural Handbook No. 8-16 — Composition of Foods: Legumes and Legume Products. Revised December 1986. U.S.D.A., Washington D.C. p. 141.

²⁰ G7138-1, March 21, 1984, Memorandum to Regional Food Specialists from Johanne B. Robert-Stolow, Manufactured Food Division, Consumer Products Branch, Hull, Quebec (CANADA).

²¹ *SoyaScan*, a computerized bibliographic database, Soyfoods Center, Lafayette, Ca.

Current food labeling regulations in the U.S. recognize that “a common or usual name... may be established by common usage...”, and the SOYFOODS ASSOCIATION OF AMERICA believes that, through common usage, the term “soymilk” has become the correct common or usual name for these products.²²

²² 21 C.F.R. §102.5(a), (d) 1993. Soymilk manufacturers and distributors in the U.S. sometimes have been restricted in the past by the U.S. Food and Drug Administration (FDA) to using the term “soy beverage” or “soy drink” (for which no standard or definition exists) on their packaging or promotional materials. The Soyfoods Association of America believes that these generic terms are not consistent with the historical precedents set by the more than 50 years of usage of the term “soymilk.”

III. DEFINITION AND CLASSIFICATION OF SOYMILK PRODUCTS

A. SOYMILK DEFINITION

A.1 SOYMILK

A liquid food obtained as a result of combining: (1) aqueous-extracted whole soybean solids and water; or, (2) other edible-quality soy protein solids, soybean oil, and water; to provide the basic compositional levels recommended in Section B. below.

Heat treatment is applied to soymilk to inactivate possible antinutritional factors, such as trypsin inhibitors, and to ensure safety by adequate pasteurization.

Vegetable oils, sweeteners, salt, seasonings and/or other functional or flavoring ingredients may be added to soymilk. Resulting products should have a soy protein and fat content in accordance with the criteria stipulated for the specified classification.

B. SOYMILK CLASSIFICATION

Soymilk products are classified according to composition (concentration of soybean-derived nutrients and total soybean solids) as follows:

B.1 SOYMILK

“Soymilk” shall contain no less than 3.0% soy protein, no less than 1.0% soybean fat and no less than 7.0% total solids. (See Figure 2.)

B.2 SOYMILK DRINK

“Soymilk Drink” is a beverage that does not qualify as “soymilk” but that contains no less than 1.5% soy protein, no less than 0.5% soybean fat and no less than 3.9% total solids. (See Figure 2.)

B.3 SOYMILK POWDER

“Soymilk Powder” is the product obtained by removal of water from liquid soymilk, or by the blending of edible-quality soy protein and soybean oil powders. Soymilk powder shall contain no less than 38.0% soy protein, no less than 13.0% soy fat and no less than 90% total solids. (See Figure 2.)

B.4 SOYMILK CONCENTRATE

“Soy milk Concentrate” is the product obtained by modifying the level of water in soy milk so that the product shall contain no less than 6.0% soy protein, no less than 2.0% soy fat, and no less than 14.0% total solids. (See Figure 2.)

Figure 2.

Soy milk Composition

Classification	percent of component		
	soy protein	soy oil (fat)(1)	minimum total solids (2)
Soy milk	≥3.0	≥1.0	≥7.0
Soy milk Drink	1.5-2.9	≥0.5	≥3.9
Soy milk Powder	≥38.0	≥13.0	≥90.0
Soy milk Concentrate	≥6.0	≥2.0	≥14.0

(1) Fat may be removed or reduced if the finished product is labeled in accordance with FDA regulations for “reduced fat,” “low fat,” or other modified fat products as noted in 21 C.F.R. §§ 101.13, 101.62.

(2) May include solids other than soy protein and oil.

IV. LABELING OF SOYMILK PRODUCTS

A. GENERAL

The SOYFOODS ASSOCIATION OF AMERICA believes that soymilk products should be identified by the terms listed above in these voluntary standards which describe their composition by classification as noted in Section III. B.

All soymilk products shall be labeled in compliance with the requirements of federal and state law applicable to food, including the Federal Food, Drug, and Cosmetic Act, Title 21, United States Code, section 301 et seq., as amended by the Nutrition Labeling and Education Act, and regulations of the United States Food and Drug Administration (FDA), Title 21, Code of Federal Regulations, part 1 et seq.

B. MODIFIERS TO THE STATEMENT OF IDENTITY

A soymilk product may be labeled as “made from...” or “made with...” in relation to the primary soy protein source used in its manufacture as follows:

(1) If the soymilk is made from whole soybeans which have not been subjected to processing to separate the protein and fat components prior to manufacturing the soymilk, the following terms may be used as descriptors:

- made from whole soybeans
- made with whole soybeans

(2) If the soymilk is made from soybean protein and soybean oil ingredients, other than whole soybeans, the following terms may be used as descriptors:

- made from isolated soy proteins
- made with isolated soy proteins
 - made with soy protein
- made from soy protein
- Other acceptable protein descriptors may be used in place of the terms “isolated soy proteins” or “soy protein” as is applicable. Examples are: soy protein concentrate, concentrated soy protein, or defatted soy flour.

Soymilk products which have been modified in any way, including, but not limited to: (1) addition of flavorings or sweeteners; and (2) nutritional modifications; shall be labeled in compliance with the requirements of federal and state law applicable to food, including the Federal Food, Drug, and Cosmetic Act, Title 21, United States Code, section 301 et seq., as

amended by the Nutrition Labeling and Education Act, and regulations of the United States Food and Drug Administration (FDA), Title 21, Code of Federal Regulations, part 1 et seq.

Products labeled as “organic” must additionally conform to applicable provisions of the Organic Foods Production Act of 1990.

C. USE DATE LABELING

Each package of soymilk should bear a prominent statement of the date by which the product should be used, for example, “Use by [month/day/year]” or “Best before [month/day/year]”.

Each manufacturer shall determine the shelf life of its products by conducting tests that approximate conditions of handling and storage reasonably expected to be experienced by the products, in a reasonable attempt to ensure that no sour or spoiled soymilk reaches the consumer.

D. REFRIGERATION INFORMATION LABELING

Refrigeration information should be provided prominently together with the use date labeling established by Part C. above, e.g., “Perishable, Refrigerate below 40°F (4.4°C),” except for those products which are either canned or aseptically processed and packaged and do not require refrigeration.

V. MICROBIOLOGICAL GUIDELINES FOR SOYMILK

The SOYFOODS ASSOCIATION OF AMERICA recommends that all soymilk products be adequately heat treated prior to sale to ensure that consumers receive a good tasting product with no threat to public health.

Good manufacturing practices include, but are not limited to: thorough cooking of the soybean and water slurry; processing of the soymilk with sanitary equipment; adequate heat treatment for proper pasteurization or sterilization; rapid chilling of the finished product to below 40°F (4.4°C); and, packaging in sanitary containers. Pasteurized products should be stored, transported, and displayed for sale at temperatures at or below 40°F (4.4°C.).

Soy milk products may be heat processed by a number of methods, including, but not limited to: batch pasteurization, high-temperature short-time (HTST) pasteurization, ultra-pasteurization or ultra-high temperature (UHT) pasteurization or sterilization.

The SOYFOODS ASSOCIATION OF AMERICA Standards Committee intends to conduct tests to determine precise recommended processing times and procedures as well as microbiological and shelf life guidelines for soymilk products manufactured or sold in the United States.

Until these tests are completed, the SOYFOODS ASSOCIATION OF AMERICA endorses the following guidelines:

Microbiological Guidelines for Soymilk Products

1. None of the following bacteria should be present: *Staphylococcus aureus*, *Salmonella*, *enteropathogenic Esherichia coli*, *Vibrio parahemolyticus*, *Listeria monocytogenes*, *Campylobacter jejuni*.
2. No *Yersinia enterocolitica* should be present.
3. Final SPC should not exceed 20,000 CFU/g
4. Coliform should be absent in 1.0 ml samples.

Standard plate counts are defined by American Public Health Association (APHA) guidelines.

It is the responsibility of all processors who sell soymilk products in the United States, or who make soymilk products available for sale in the United States, to perform regular microbiological tests on their products, to maintain proper records of such testing, and to ensure the safety of their products from the date of manufacture through the labeled date by which the product should be used. Hazard Analysis Critical Control Point (HAACP) procedures should be considered by all manufacturers.

VI. STANDARDS COMMITTEE; ADOPTION AND AMENDMENT OF STANDARDS

The Standards Committee of the SOYFOODS ASSOCIATION OF AMERICA shall consist of seven members, one of whom will be the Chair and at least five of whom will be manufacturers and/or marketers of soyfoods products.

Initial adoption of these standards requires a two-thirds vote of approval by both the Standards Committee and the Board of Directors of the SOYFOODS ASSOCIATION OF AMERICA. Thereafter, any person may, at any time, in writing, recommend changes to these standards to the Chair of the Standards Committee. The Soymilk Standards, and any requests for changes, will be reviewed at least once a year. Changes to the Standards may be made by a two-thirds vote of approval by both the Standards Committee and the Board of Directors of the SOYFOODS ASSOCIATION OF AMERICA.