FOREWORD

Soy protein products for human consumption are now available in the European Community (EC) market in a wide and growing variety of products. Soybeans are the most efficient and least costly source of protein presently available. The demand for soy protein products seems to be growing rapidly mainly due to: (1) Increasing prices for animal proteins; (2) increased use of and demand for specialty foods and convenience items; and (3) the need to provide essential nutrients to a growing world population.

Basically, the processed soybean yields two chief products, soybean meal and soybean oil. First, the soybeans are cleaned, cracked, dehulled, and crushed into soy flakes. Soybean oil is removed from the flakes via solvent extractions. These oil-free flakes are the basis of edible soy protein products.

Additional information concerning international marketing of soy protein may be obtained from the Foreign Market Development Division for Oilseeds and Products. Inquiries regarding analysis, tariffs, or competition should be directed to the Foreign Commodity Analysis Division for Oilseeds and Products, Foreign Agricultural Service, U.S. Department of Agriculture.

The authors would like to thank U.S. Agricultural Attaches stationed in the European Community and their staffs for the assistance they provided in compiling information for this publication.

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UTILIZATION OF SOY PROTEIN IN THE EUROPEAN COMMUNITY

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SUMMARY

Availability of Soy Protein Products

The majority of the European Community (EC) countries now produce some type of soy protein, although in limited quantities with production generally confined to soy flour and grits. Denmark is the only exception with production also including soy concentrates and soy isolates. Consequently, the EC countries are largely dependent on imports to fulfill their needs. The United States is the major supplier, being supplemented by EC countries that are also producing soy protein such as the United Kingdom, the Netherlands, Denmark, and France.

It is not possible to quantify EC imports of soy protein since vegetable proteins are classified in a basket category. To reflect the supply situation in these countries, therefore, it is necessary to rely on the information supplied from the trade and U.S. Census data. Accordingly, U.S. exports to the EC have increased substantially from 320 metric tons in calendar 1970 to 12,032 metric tons in calendar 1975. Until 1975, West Germany was the largest importer of U.S. soy proteins. However, the Netherlands importing 8,886 metric tons of protein substances in calendar 1975 has exceeded total German imports for 1970-75. At the present time, EC imports of soy protein account for approximately 82 percent of the total world market for U.S. soy protein.

Government Position

The EC governments' level of awareness and degree of knowledge of soy protein varies widely among the members, depending on the availability of soy protein and frequency of use in these countries. Consequently, countries with limited availability results in less government awareness.

Generally, however, the majority of EC countries (Belgium, Denmark, France, Netherlands, and the United Kingdom) have a working knowledge of soy protein and are fairly open-minded toward future utilization. The major drawback appears to be the governments' hesitancy to encourage its use. Often this attitude appears to be in response to consumer groups, farmers organizations, and the meat industry.

Food Legislation

With the advent of new vegetable protein materials, the regulatory methods which have been used in the past must be adjusted to allow for the proper use of these new items.

Regulations devised to deal with the application of vegetable proteins in food vary from country to country within the EC. In most cases, the use of soy protein is commonly specified through general food legislation, and not regulations pertaining solely to protein substances. Therefore, precise uses of soy protein are not always explicit.

However, certain generalizations about EC regulations with regard to use of soy protein can be made.

- Total imitation products, products composed solely of vegetable protein are acceptable.
- Declaration of protein content must be declared on the package.

- Use of fanciful rather than generic names may be used as a method of incorporating vegetable protein.
- Most countries allow use of soy protein with food items not containing meat.
- Soy protein may be added to some meat products but with limitations.

Legal harmonization of the EC regulations would eliminate the confusion prevalent today concerning soy protein and its uses. In addition, both the interests of the consumer and industry would be protected.

Tariff Classification

Tariff classifications and corresponding duties are based on the Brussels Tariff Nomenclature system (BTN). As new members of the EC, Denmark, Ireland, and the United Kingdom are in the process of aligning their tariff schedules and duties with those of the other member countries. Historically, there has been some confusion as to the appropriate classification of soy proteins. However, heightened interest has been generated in the tariff classification scheme since the reclassification of soy protein concentrates in 1970. The United States is currently initiating bilateral discussions with the EC to secure trade concession benefits negotiated prior to the 1970 reclassification.

Soy Protein Uses

Although in varying quantities, the majority of the EC countries are using soy flour and grits, textured soy protein, soy concentrates, and soy isolates. The most frequent uses are in bakery goods, dietetic foods, baby foods, sauces, soups and in some instances sausage, ground beef, and other processed meats.

Retail, Institutional, Food Processing Industry

Three market outlets exist for soy protein products: Retail, institutional, and the food processing industry. The institutional and food processing areas are by far the most frequent users of these products, whereas use at the retail level is limited, and generally confined to inclusion in health, dietetic, and vegetarian foods.

Presently, the consumer, with minimal exposure to these soy protein products, has little awareness and knowledge of soy protein. With increased availability at the retail level, however, the problem of developing and maintaining favorable consumer image evolves. Consumers have specified their preferences for natural foods and are quite quality conscious.

In several instances, consumers have erroneously categorized soy protein as an imitation product. Furthermore the consumers' unfavorable attitude has been fueled by earlier, but unsuccessful, attempts to market soy protein to the retail sector. Initial efforts were not properly consumer oriented and the products were not palatable. Consequently, the industry has worked diligently to overcome the ill effects that resulted from the use of poor promotional techniques. Thus, success at the retail level will depend heavily on proper education of the consumer, emphasizing nutritional value and economics of use of soy protein products.

The institutional and food processing areas presently hold the greatest market potential for soy protein. Soy fortified products are being used to a substantial degree by these two areas in the EC countries. Products being served which incorporate soy protein are bakery products, soups, sauces, snack foods, hamburgers, and sausages used in mass feeding operations in schools and hospitals. Unlike the retail area, use of soy protein by the institutional and food processing markets is not directly influenced by consumer attitude, since proper processing and food preparation techniques camouflages its use. Consequently, the consumer who is the end user, generally has no knowledge of the presence of soy protein.

Growth potential exists for soy protein in the EC countries, but a few adjustments will need to be made to allow further increases in use. For instance, food regulations need to become more flexible, tariff barriers for soy protein must become more clearly defined, and the end user must be fully educated on product utilization to avoid misuse and unjustified prejudice. Two basic ideas should be the underlying theme for motivating increased use: the nutritional aspects of soy protein and the economics of use.

DEFINITION OF SOY PROTEIN PRODUCTS

Soy Flours and Grits

Soy flour and grits were the first soy products to be developed. The ground, screened, graded product obtained after extracting most of the oil from selected, sound, clean, dehulled soybeans; soy flour and grits are produced by grinding the defatted soy flakes. The protein content ranges from 40-60 percent. The difference between soy flour and soy grits is that the particle diameter of flour is less than 0.25 mm, while that of grits is greater than 0.25 mm. Soy flour is used in various baked goods and bakery products, and it is a key ingredient in protein-rich breads, diet foods, cereals, and infant foods. Soy grits are used mainly in the snack food industry.

Soy Protein Concentrate

These concentrates are produced from dehulled, defatted soybean flakes or flour by various washing processes which immobilize the protein and remove soluble sugars and minerals. The yield being some two-thirds of the raw material.[1] The resultant concentrate has a protein content of about 70 percent on a dry basis. It is very highly flavored, and is edible in its existing form. Concentrates are used in meat systems such as frankfurters and bologna for its emulsifying, binding, and nutritional properties, and in baked goods, breakfast cereals, infant foods, as well as dietary, geriatric, and hypoallergenic foods. These proteins are used in confections, processed, and frozen foods where improved appearance, less shrinkage, and high protein content are desirable. Concentrates also are used in the manufacture of textured products, as they are low in soy flavor, light in color, and available in a range of particle sizes from flour to grit form.

Isolated Soy Protein

This product may be prepared in one process by washing out the proteins from enzyme active dehulled, defatted soy flakes, then precipitating the protein out of the liquid solution with a mild alkali; and finally dried by a spray process. The yield is equivalent to only one-third of the raw material,[2] but the isolate obtained has a protein content of over 90 percent. Isolated soy protein is a cream-colored, spray-dried, nonaromatic, bland powder. It is used to increase protein content, reduce shrinkage, improve appearance, and provide necessary structure and form to processed foods.

Like the concentrates, isolates are used in sausage and canned meats as binding agents because of their moisture-holding and fat-dispersing qualities, particularly in products that are subject to stress of high-temperature processing. They predominate in dairy-type products such as coffee whiteners, whipped toppings, and frozen desserts, plus cheese-like spreads and dips. Here they function in a double role as emulsifier and stabilizer. If modified by enzymatic hydrolysis, isolates may act as a whipping agent. Isolates also are used as a drying aid for meat in convenience foods and for fruits such as bananas; and in confectionery items, beverages, and special products.

Textured Soy Proteins (Textured Vegetable Proteins[3])

Two basic types of textured soy protein products now available are extruded and spun. In addition, granular soy protein concentrate products have been developed with identifiable textures.

(a) Extruded soy protein products (mostly 50-52 percent protein) are made by a special extrusion-type processing of soy flour or concentrate which produces a high-protein material with definite shape and chewable texture that will be retained on rehydration in water. Sizes range from bite-size chunks to tiny bits. They are crunchy when dry; rehydrated, they become moist and chewy, closely resembling cooked beef, chicken, and other meats. They also can simulate other products including nutmeats, coconut chips, and fruits, and can be used to enrich existing foods without changing the color or taste.

(b) Spun soy protein products (90 percent protein and above) are produced by spinning the isolated soy protein into fibers. The fibers are processed by combining with flavors, fats, coloring, and are formed into simulated meat items. The resulting product is diced or dispersed in a moist condition and like the extruded products, they closely resemble

[1] Residues are used in animal feeding.

[2] Residues are used in animal feeding.

[3] Textured vegetable proteins also can come from the edible protein sources—cottonseed, peanut, sesame seed, and sunflowerseed—and should not be abbreviated "TVP" since this is the registered trademark for a U.S. firm's textured edible vegetable proteins.

cooked meat. Dry products are in small bits, chunks or granules while moistened products are either canned or frozen in granules, bits, chunks, slices or loaves. The canned and frozen forms have an advantage in that they may be used as purchased. Spun soy protein products are generally more expensive than extruded products, since they are based on isolated soy proteins.

(c) Textured soy protein concentrates (70 percent protein) are available in several different sizes and shapes and can be colored to simulate cooked meat. It is usually hydrated with more water than textured soy flour and usually has less flavor and better structural integrity. It is especially desirable for adding texture to canned retorted food products.

Hydrolyzed Soy Proteins

Soybean proteins are partially hydrolyzed by a number of agents such as enzymes, acids, alkalis, steam, or yeasts, molds, and bacteria. Hydrolysis of soy proteins reduces the molecular weight from 50,000 to about 2,000 and makes hydrolysates soluble in water over the entire pH scale. The products of partial hydrolysis of soy protein have found applications in foods (soy sauce and other flavoring), foaming agents, and whipping agents (confections).

EC TARIFF CLASSIFICATIONS

Tariff classifications and corresponding duties are based on the Brussels Tariff Nomenclature system (BTN) which varies in many respects from the Tariff Schedules of the United States (TSUS). Initially, reflecting the general absence of uniform descriptions and the low level of trade, many soy protein items were grouped under such headings as food preparations, protein substances and others. As technology advanced, definitions became somewhat more precise and new tariff headings and subheadings were introduced.

During the Kennedy Round negotiations of 1966 and 1967, the United States recognized the potential for expanded trade in soy proteins, particularly isolates and concentrates and negotiated for tariff reductions in BTN 35.04. The EC-6 offered a reduction from 10 to 5 percent on BTN 35.04, subject to U.S. Congressional removal of the American Selling Price (ASP) system. In the absence of the removal of ASP, the duty was bound at 8 percent, which remains the current applicable rate.

Denmark, not an EC member at the time of the negotiations, agreed to bind BTN 12.02 (flours and meals of oilseeds) and BTN 23.02 (oilcake and other residues resulting from the extraction of vegetable oils) at zero–duty free.

On April 24, 1970, the 24th session of the Nomenclature Committee of the Customs Cooperation Council approved a revision of the Brussels Tariff Nomenclature Explanatory Notes to clarify the scope of certain protein items including hydrolysates, concentrates, and others. The revision relocated soy protein concentrates under BTN 21.07 rather than BTN 35.04 under which they had been imported with an 8 percent Kennedy round binding. The duty for the proteins now falling in 21.07 is 20 percent.

EC TRADE SITUATION

The situation for soy protein products or substances in each of the EC member countries includes a discussion on imports, tariff classification, legislation, and general consumer awareness and uses.

Belgium

Belgium is a net importer of soy protein products. With the exception of limited production soy flour, there are no indications of the prospects of domestic production of other soy protein products; however, at least two soybean crushing facilities are located in Belgium and represent over 94 percent of total oilseed crush in this country. The presence of these facilities could be an indication in the long term that Belgium could eventually start production of these products.

Imports: No serious impediments to imports exist at present but quantities cannot be determined from data available since vegetable proteins are classified in basket categories. It has been determined, however, that imports come from France, the Netherlands, the United Kingdom, and the United States. Although trade data are incomplete, U.S. Census data indicate that exports of vegetable proteins to Belgium have increased rapidly in the last several years. Exports in 1970-72 were about 15.6 metric tons. The large

EC TARIFF CATEGORIES FOR SOY PROTEIN

Tariff No.	Description	Rate of Duty	
		Autonomous percent of levy (L)	Conventional (percent)
12.02	Flours or meals of oil seeds or oleaginous fruit, non-defatted, (excluding mustard flour): A. Of soya beans	10[1]	8
19.02	Preparations of flour, meal, starch, or malt extract of a kind used as infant food or for dietetic or culinary purposes, containing less than 50% by weight of cocoa:		
	B. Other 1. Containing no milkfats or containing less than 1.5% by weight of such fats:		
	a. Containing less than 14% by weight of starch		
	1. Containing no sucrose or containing less than 5% by weight of sucrose (including invert sugar expressed as sucrose)	19.6 plus VC[2]	11 plus VC[2]
21.07	Food preparations not elsewhere specified or included:		
	B. Other 1. Containing no milkfats or containing less than 1.5% by weight of such fats:		
	a. Containing no sucrose or containing less than 5% by weight of sucrose (including invert sugar expressed as sucrose)		
	1. Containing no starch or less than 5% by weight of starch	25	20
23.04	Oilcake and other residues (except dregs) resulting from the extraction of vegetable oils:		
	B. Other	Free	Free
35.04	Peptones and other protein substances and their derivatives; hide powder, whether or not chromed	12	8

[1] In certain conditions, the collection of a compensatory amount is provided for in addition to the customs duty.
[2] VC - Variable Charge.

Source: Official Journal of the European Communities, Vol. 17, No. L295, 1 Nov. 1974.

upsurge in exports occurred in 1973 when U.S. exports jumped to 182.8 metric tons. A slight decline followed in 1974 when exports amounted to only 126 metric tons. U.S. exports showed in increase to 205 metric tons in 1975.

Tariff Classification: Belgium-Luxembourg adheres to the Brussels Tariff Nomenclature regulations, which classify soy proteins in five distinct categories. Tariff numbers and rates as disclosed in the official Journal of European Communities, Vol. 17, No. L295, 1 Nov. 1974, are shown in the table above.

Government Position: Health ministry officials concerned with foodstuffs appear to have extensive knowledge of soy protein. The application of food regulations, permitting the use of soy protein, especially as a meat extender, indicates that the Government is fairly open-minded regarding soy protein. Generally, however, the Government has not formulated an opinion for or against this product, and thus has not encouraged its use.

Food Legislation: Belgian legislation governing the use of nonmeat substances in meat products permits the unlimited use of soy protein in meat products. However, only color additives and trace substances shown on the officially approved list are authorized to be used in certain foods. Therefore,

product additives, such as Titanium dioxide (TiO_2), used in connection with soy proteins marketed in Belgium, should be cleared with the Belgian Ministry of Public Health.

• Belgian labeling requirements do not inhibit imports of vegetable proteins. However, the label must indicate that soy proteins are contained in the finished product, either canned or packaged. On the other hand, there are no packaging requirements for food items sold in Belgium.

Product Use: Consumption of soy protein at the retail level is limited generally to inclusion in ground beef. However, food processors and institutions are substantial users, including soy protein in ground beef, sausages, processed meat, prepared dishes, soups, and sauces.

Consumer Market: Although soy protein is consumed, few Belgians are aware of its use in food. Many, however, realize the vital role it plays in the feed industry. Generally, the consumer is eating soy fortified products such as steak tartare, sausage, and processed meats about twice a week. The Belgian consumer generally is quality conscious and conservative in respect to meat products with considerable preference for so-called natural food products. This does not apply to some dietetic food in which soy protein is a vital ingredient. This attitude may be a barrier to increasing the use of soy protein in the retail market.

Institutional and Food Processing Users: The majority of soy protein utilized in Belgium is by meat processors and institutional users of ground meat. Textured soy protein is manufactured from soy flour and incorporated into meat products with a total usage level of 20 percent in processed meat, or about 8 percent of the product. These percentages are projected to rise 25 percent and 10 percent, respectively. Presently, there are no barriers to using soy protein, and this will most likely be the case as long as products are not noticeably altered in texture and taste when soy protein is added.

The greatest potential uses in these sectors are in mass feeding operations and in the meat processing industry. Specifically, the meat processing industry is facing a 20 percent rise in cattle prices over the previous year, making it too expensive for industry to use 100 percent animal protein in manufactured meat preparations. In general, the meat industry is not as concerned with the comparability of vegetable protein to meat protein but rather the consumer's reaction toward the use of soy protein. Consequently, the meat processing industry attempts to maintain taste, color, and/or texture of the products containing vegetable protein.

There are fewer problems involved in marketing soy protein via these two routes than in retail marketing. Although Belgian labeling requirements must be met for both types of users, the consumer eating outside of his home would in most cases not be aware of the presence of soy protein.

The Belgian institutional buyers are cost conscious and attempt to buy less expensive food items as long as quality is maintained. Another factor favoring the institutional market is the mass feeding operation that serves more ground meat and processed meat products, whereas, the consumer is attracted by meat cuts, which lessens the potential use for soy protein.

Denmark

Denmark is both an importer and producer of soy protein products and soy protein foods. Since Danish import statistics do not indicate the amount of soy protein imported, total supply data are not available. Therefore, assumptions on the supply situation for soy protein are based on U.S. export data and information gathered from the trade.

Denmark has three soy protein producers manufacturing soy flour and grits, concentrates, isolates, and textured soy protein, but data are not available on quantities produced. One Danish soybean crusher started commercial production of soy concentrates in 1974.

Currently, sales of this soy concentrate have recently moved into the retail and institutional market with use as a meat extender and for use in other food products. In addition, this crusher is reportedly seeking export markets for the soy concentrates, mainly in the EC countries. Another company that supplies soy protein to the meat industry, produces limited quantities of concentrates by mixing soy isolates (imported from the United States) with soy flour (imported from Europe) thereby taking full advantage of the low tariff rate classification for isolates. There is also one plant in Denmark producing synthetic meats and "health foods" for specialty vegetarian stores. Production is based on imported U.S. spun soy fibers and soy proteins.

The majority of finished soy fortified food products are manufactured by an agent of a licensed U.S. company located in Denmark.

Imports: Soy protein products are in basket categories and import statistics, therefore, give only a small indication of the actual situation, particularly with regards to 21.07. However, by far the largest supplier is the United States, with minor quantities from Israel, the United Kingdom, and Japan. West Germany also supplies the lower percentage of soybean protein. This has been the case for the past 2 to 3 years and no change is expected.

U.S. exports to Denmark have fluctuated somewhat since 1971. In 1970, no U.S. soy protein was exported to Denmark. Then in 1971, the U.S. exported 234.8 metric tons. A low for the 3 years.

1971-74, came in 1972 when Denmark imported only 143 metric tons. In 1973 the total was 300.9 metric tons, slipping back to 166 metric tons in 1974. Presently the United States has little competition in this market; however, the United Kingdom is expected to have both types of soy protein products available in the foreseeable future.

Belgium also exports soy flour to Denmark. Denmark also imports small quantities of soy fortified food products such as meat analogs, soups, and sauces from the United States and the Netherlands.

Tariff Classification: Denmark is in the process of a gradual alignment with the EC tariff rates, to be achieved by 1978. Denmark utilized the BTN prior to EC membership and, in line with the 1970 Brussels Nomenclature Committee decision, officially moved soy protein concentrates (50-70 percent protein) from BTN 35.04 (with zero tariff) to 21.07, "food preparations, n.e.s." (with tariff of 10 ore/kg).[1] Soy protein isolates of 90 percent or more protein were left in 35.04.

Officially, the soy protein isolates under 35.04 are listed as "soy proteins," and concentrates under 21.07 are listed as "soy protein concentrates." Membership in the EC has led to higher tariff rates on categories BTN 35.04, 12.02, and 21.07.

Government Position: The Government of Denmark is very knowledgeable about soy protein and other vegetable proteins, and recognizes the need for increased world utilization. Although research on soy protein is being carried out by state, municipal and private sectors, the Danish Government has not taken direct steps to encourage its use. In fact, it is doubtful that the Government would take such direct action because of the country's large surplus in livestock production, two-thirds of which has to be exported. Other countries with similar situations have found that vegetable proteins do not threaten animal product markets, but that domestic use permits bigger exports of meats. Nevertheless, there is a need to provide more educational information to all sectors on soy protein, especially aimed at nutritionists, dieticians, and other large users.

Food Legislation: Soy proteins are now classified as foodstuffs, contrary to earlier practice when they were regarded as additives. Their use as meat extenders in exported products is limited under Ministry of Agriculture regulations. However, packing plants authorized to export meat must apply to the Ministry of Agriculture to use soy protein in their products, and the content is limited to 3 percent of the finished product. The meat processors are, in practice, adding 2-3 percent soy protein as extender both for export and for home market sales in such items as luncheon meat or loaf and sausages.

There are no restrictions regarding the adding of soy protein or soy flour in any quantity to processed meat for sale on the home market, provided the content is declared on the label.

- Titanium dioxide (color tracer) must be added to soy protein isolates for use in processed meats only when the latter are intended for export to the United States to comply with U.S. regulations. The tolerance level for titanium dioxide in soy proteins is 1 gram per kilogram, for both exported and domestically sold products.
- The EC color directive permits the use of titanium dioxide up to December 31, 1977. Surface coloring (such as sausage skins) with this additive will still be permitted after the date but not internal coloring. However, dispensation will be possible in cases where the importing country, such as the United States, requires the addition of this tracer to isolates to be used in meat products. No other additives are permitted in soy proteins.
- The Ministry of Agriculture prohibits the use of any preservatives in meat products for export sale other than saltpeter, sugar, nitrates (limited to use in salted meats not heated/cured to temperatures above 60 degrees and with a tolerance level of 50 mg/kg calculated as KNO_3), nitrates (maximum tolerance 100 mg/kg calculated as $NaNO_2$ and only in form of nitrite salt), and ascorbic acid and sorbates (only in liver pate and salami—tolerance 1 gram/kg). These provisions also apply to domestically marketed products, which are under the jurisdiction of the National Food Institute. Permissible additives are allowable in exported products only to the extent that they are approved by the importing country. It should be noted that no additives may be used in fresh, chilled or frozen meat, and edible offal and ground/chopped meat of such origin.
- When adding soy protein to foods, the percentage content must be declared on the label. The soy protein itself must also be approved by the Ministry of Agriculture, by supplying the Veterinary Directorate's Hygiene-Bacteriological Laboratory with a sample. After approval, the package labels must indicate that the product is approved by the Ministry.

Product Use: There are a variety of soy protein products in the Danish market; however, isolates and concentrates are used most extensively as meat extenders in the meat processing industry. Due to escalating meat prices, use of both these products is expanding. Unlike other countries in the EC, textured soy proteins are not used in the Danish meat industry, but are used to a small extent by one health food plant. This company produces about 20 different types of soy based foods such as synthetic meat,

[1] In 1972, 10 ore/kilogram equaled $0.0143 per kilogram. 100 ore equals one Danish Krone (DKr). 6.98 DKr equals US $1.

soups, and sauces from imported U.S. soy protein products.

Consumer Market: With the exception of vegetarians and health food users, the Danish consumer, in general, has limited knowledge of soy protein. However, considerable publicity has recently been generated on the worldwide needs for vegetable protein as a result of the World Food Conference in November 1974. In response to consumer inquiries and interest in this area, several women's periodicals have featured articles on soy flour and the nutritional properties of the soybean, including a few recipes and general instructions for enriching food with soy flour.

Progress has been slow in gaining consumer acceptance of soy enriched food products. Enjoying an abundance of animal and fish protein, consumers believe vegetable protein is for developing countries lacking animal and fish products in their diet. Consequently, the most frequent users of soy flour and the processed products are the health food and vegetarian groups. Although Denmark has a liberal attitude towards vegetable protein consumption, it will be difficult to change the Danes' traditional diet of animal and fish protein by attempting to introduce vegetable protein as a substitute.

On the other hand, the economic situation can play a significant role in changing this attitude. Continued inflation and other economic factors can create a need for cost-saving food that also is nutritional. In addition, the consumer is becoming more conscious of nutrition. These factors present some opportunities for increasing retail use of soy protein.

Institutional Uses: With the exception of three vegetarian sanitariums, institutions are not using soy protein to enrich the food. It appears, however, that there is a potential for soy protein products in the institutional sector, especially in homes for the aged and hospitals. Use could be encouraged on the basis of nutrition and economy. A major obstacle in penetrating this market is the lack of central organization in the institutional food sector. Each institution works independently, relying on its own dietitian for meal planning and purchasing, which creates the problem of coordinating such a large and diversified group.

The retail area has been more progressive in soy protein use than the institutional. Two chain store groups have actually attempted to market chopped beef with 6-8 percent soy flour extender, appealing to the consumer on the basis of economy. One of the chain stores was forced to drop the product because of consumer disinterest and an unresolved quality problem. The other, a consumer cooperative, is continuing to retail soy fortified chipped beef without encountering any problems.

Use of soy protein at the retail level seems to be limited to these two cases. Large supermarkets and specialty food stores, however, carry soy flour and grits including a variety of soy protein foods. Three different brands of soy flour are available; one is sold in the original packs imported from Belgium and two are sold under Danish brand names.

France

France imports most of its soy protein from the United States and Europe, with domestic production limited to an estimated 2,000 tons of soy flour a year. When 50 percent protein flour was introduced on the market, it was first used for feed, then food. Ste. Industrielle des Oleagineaux (SIO), the major producer, began crushing operations in 1960 and now crushes about 50,000 tons of soybeans a year.

Based on information now available, it appears likely that France will continue in the foreseeable future to rely upon the United States and other European countries for soy protein to meet their demands.

Imports: Since statistical data are not available on France's imports, assumptions on the supply of soy proteins are based on U.S. export statistics, and interviews with members of the French trade.

U.S. exports to France have fluctuated widely in the past several years from a high in 1972 of 356 metric tons to a low of 77 tons in 1974. This downturn is partially attributed to decreased use of textured soy protein, unresolved changes in food regulations, and the changing economic situation in France. In Calendar 1975, U.S. exports rose to 261 metric tons, which is partially attributable to the passage in August 1975 of the French vegetable protein regulation.

Tariff Classification: France employs the tariff classifications decided upon by the Brussels Authorities (see page 5). An application to import must be submitted to the French Customs Office, which will decide the appropriate tariff number depending upon the ingredient involved.

Government Position: France's food regulations and research on soy protein indicate that the Government is quite knowledgeable about soy protein. Government interest and concern was evident in the delayed implementation of the vegetable protein regulations approved in August 1975 by the Administration. The delay represented an attempt to learn of legislation in other countries and to allow sufficient time for interested individuals and groups to share their views.

The Government has cooperated with the National Institute for Agronomic Research to carry out scientific and technical research on protein. Although soy protein is a primary concern, efforts also have been made to develop France's own source of vegetable protein for both animal feeding and human consumption, especially since there is sensitivity to France's

dependence on other countries for its protein supply. Other research efforts have focused on sunflower and, to a limited extent on extracting protein from horsebeans and rapeseed.

The French Government is also sensitive to the reaction of consumer and farmer organizations toward the use of soy protein. Although farmer organizations have not officially reacted against soy protein, their objective is to encourage and defend French agricultural production. Consequently, this group has a particular interest in the development of French protein sources. However, there has been official objection to soy protein raised by the Technical Center for Charcuterie based on its close ties to French pork producers.

Food Legislation: The Ministry of Agriculture through the "Service de la Repression des Fraudes et du Controle de la Qualite" recently issued a circular specifying definitions and uses of vegetable proteins in food products, enforceable by law. The circular is the result of a series of discussions among French Government officials, distributors of vegetable protein products, and French consumer organizations. According to this circular, vegetable proteins may be added to any meat food product not precisely defined by law, regulation, or tradition, but labels must indicate that the product contains vegetable protein. Their proportion of use as a binding, emulsifying, or gelling agent is generally from 1-1.5 percent.

- For cold meat products, vegetable protein can partially or totally substitute for starch, based on the equivalent of 1.5 grams of proteins for 5 grams of starch. Consequently, vegetable protein can account for up to 3 percent of "terrines," "gallantines," and "boudin blanc." Usual water content cannot be increased, nor the usual protein content decreased.
- Textured product use with meat is allowed in products free from legal, regulatory, or use definitions. The name must be different from the traditional product, and the list of ingredients must include vegetable proteins. Their maximum incorporation is 30 percent. Products having a composition similar to traditional animal products or products of animal origin must comply with sanitary and qualitative regulations applicable to the imitated products. The label must state the percentage of vegetable proteins, dry product basis, as follows: "Vegetable proteins, X percent."
- When foods other than meats contain vegetable proteins, they cannot use names of food products defined by regulation or tradition. Hence, soy flour may not be used in bread production.
- It is relatively easy to apply the general regulation on food to new products when there is no problem of confusion with traditional food products. In France, however, dairy products and products having a protected denomination (products with "appellation d'origine" or with "label") cannot be imitated. For dietetic products, a May 15, 1972 regulation requires that a product "rich in protein" have twice as much protein as the usual product. Protein calories must be more than 20 percent of the total caloric value. Recipe denominations are required for products with vegetable protein offered for consumption in the institutional sector. Thus, it is possible to use either the traditional denomination immediately followed by a statement indicating the presence of vegetable proteins, or to use a purely fanciful name that makes no reference to a traditional product defined by regulation or custom.
- Color additives, minerals, and vitamins cannot be added to fresh or frozen meat (except in certain dietetic foods). Color and flavor additives, but not minerals and vitamins, may be added to meat products such as pates, saucissons (dry sausage), and sausages; however, additives used must be specifics of the final product. The Service de la Repression des Fraudes is aware that some changes may be necessary to coordinate the use of flavoring and color additives for processed products when used in conjunction with soy protein.
- Labeling and packaging requirements generally do not prohibit imports of these protein products.

Product Use: Although soy flour, textured soy protein, and soy isolates are available in the French market, greater interest and present utilization are in textured soy protein.

Soy flour is presently used in the bakery, pastry, and the delicatessen food industries. However, France's current food and drug regulations restrain increased use. For example, a potential outlet exists for soy flour in bread production, but regulations only allow the use of 1 percent horsebean flour and exclude the use of soy flour. If the food regulations were changed to favor the use of soy flour, the market potential could be significant, since the French eat approximately 3.5 million tons of bread annually.

Until 1974, France prohibited use of soy isolates as a binder for food. These restrictions were eased in February 1974, followed by introduction of soy isolates on the market in September 1974 and subsequent sales of some 100 tons. Indications are that further sales have been made.

Textured soy protein, the most widely used soy protein product in France, was introduced on the French market in 1968. At that time, a joint U.S.-French venture began importing U.S. textured soy protein in the extruded form for sale at about 6 francs (US $1.20) per kilogram to food industries and 10 francs (US $2) to institutional users. The volume of textured soy protein marketed that year was an insignificant 0.3 metric tons, but by 1973 it

had risen to 1,000-1,500 tons. Sales in 1974, however, dropped to 500-1,000 tons as new Government regulations and other constraints retarded sales.

Previously, some textured soy protein had been incorporated into corned beef as a meat replacer without being identified. Since newly proposed draft regulations forbade such a practice, several food processors reduced purchases of textured soy protein to aline themselves with the proposed regulations. In addition, as the French economy began to slow down in 1974, meat prices also headed downward, depressing demand for textured soy protein as a meat replacer. Furthermore, prices were more attractive for textured soy protein sellers in the preceding 5 years when there were fewer dealers in the market. Now, there are many dealers resulting in stiff competition and reduced prices and margins.

The food processing industry today uses 85 percent of the textured soy protein, while the remaining 15 percent is used by institutions. The food industry is marketing such textured soy protein as "steket," "val-steck," and "saucette" which are forms of hamburger and sausage. Identification of these products is in accordance with French food and drug regulations prohibiting use of traditional names for imitation products.

Consumer Market: French consumer awareness and knowledge of soy protein is limited in part because of the market's lack of soy protein foods and information about the products. Considering the French tendency to cling to traditional eating habits, rapid consumer acceptance of soy protein is not anticipated.

The word "protein" in the consumer's mind is generally synonymous with chemical and artificial products. Yet tests conducted by the National Office for Medical Research show that reactions are good when consumers are not aware of the presence of soy protein in a food product. In 1970, H. Gounelle and M. Astier Dumas published the results of their acceptability tests on textured soy protein. Ten days of testing 100 individuals revealed that consumer acceptability was excellent when textured soy protein was mixed with traditional or dietetic foods.

Research on textured soy protein has been favorable to increased usage. Because of the French reluctance to change eating habits, introduction of soy protein on the retail market must be preceded by reeducation of the consumer. Even then, breakthroughs in the market will probably be slow in coming. A consumer program might include media coverage, advertisements, and articles in local magazines and newspapers. Increased consumption at the institutional level also would stimulate expanded use of soy protein.

One potential drawback to French use of U.S. soy protein is the country's stress on developing its own sources of vegetable protein. Toward this end, the country has launched a domestic soybean industry, but progress so far has been limited.

Institutional and Food Processing Users: Although slowly, lifestyles in France are moving away from traditional habits and customs toward more modern styles of living. Growing numbers of housewives now are working outside the home, spurring demand for ready-to-prepare foods and quick and easy food preparation techniques. In addition, the institutional market is catering to a larger and more demanding market. Both the institutional and food processing sectors are responding to this need.

For instance, the number of dishes served by institutions has doubled in the past 10 years and the institutional market's share of total dishes served annually has risen to 7.1 percent with a projection of 8.3 percent by 1980. Soy protein was first introduced to the institutional market around 1970. Of the total textured soy protein available in the market, 15 percent is used by the institutional sector at a cost of approximately 8-10 French francs per kilo (US $2.00-2.50).

"Fansteco" is a soy protein product recently introduced on the institutional market by a French company. This product contains soy protein, spices, aromates, and glucides and is sold in 5 kilogram bags at 15 French francs per kilogram. To date, 1 million dishes have been served incorporating this product, while a number of recipes demonstrating uses of "Fansteco" have been developed and distributed to aid in marketing the product.

The trade indicates that the institutional market is one of the best outlets for increased use of soy protein. However, the large number of institutions, estimated at 70,000, impedes penetration of this complex and diverse market.

France's institutional market is made up of schools and universities, 32 percent; government and company restaurants, 27 percent; hospitals, 22 percent; army, 5 percent; and other, 14 percent.

Marketing soy protein via catering companies could provide a means of overcoming this barrier, since there is a trend toward catering companies assuming the management of institutional food preparation. In fact, 23 catering companies served 197 million dishes to the institutional market in 1974.

Soy proteins were first introduced to the French market via the food industry, a sector that currently utilizes 85 percent of the textured soy protein consumed in France. Most of the food processors in France are familiar with soy protein and have attempted to incorporate textured soy protein in meat products or to develop new products containing textured soy protein.

Although the food industry is the major outlet for soy protein, the quantity used is still low. Usually,

soy protein is used as a meat replacer in meat products, such as corned beef or charcuterie, with cost running 3-5 French francs per kilogram.

A major limitation is the reluctance of the food industry to launch products on the French market containing large shares of textured soy protein because of the accompanying obligation to indicate the contents on the label. In addition, processors often fear that competitors will take advantage by publicizing adverse comments on soy protein.

In spite of these problems, the food product market should continue to develop as more and more new food products incorporate soy protein. Several companies are currently developing such products to be placed on the market in the near future.

Competition for Soy Protein: In the long run, vegetable soy protein may encounter competition from the single-cell protein (animal protein based on yeast produced on oil). The French are aware of their protein deficit and, through research, are attempting to develop their own sources of protein.

For several years, a company in southern France has been manufacturing single-cell proteins. This plant is producing 20,000 tons annually of a product identified as "Toprina" for use in animal feeding.

Investigations also have been made into the possibility of developing a single-cell protein for human consumption. Before introducing the product, tests are required to study the effects of the single-cell protein on the human body. Consequently, use for human consumption will not come about as soon as originally anticipated. In the future, however, this type of product could be in direct competition with vegetable protein and, more specifically, with soy protein.

Ireland

Producing no soy protein, Ireland is completely dependent on imports. Since trade data does not adequately reflect that country's supply situation for these products, it is necessary to rely on information gathered from the trade.

Imports: Apart from levies and duties, no specific impediments exist to imports. Trade sources estimate 300-500 tons annually of soy proteins and byproducts now are imported for human consumption with the bulk coming from the United Kingdom. In 1975, for the first time, U.S. statistics indicate direct shipments of soy protein to Ireland. Prior to that, U.S. shipments were made indirectly via the United Kingdom and Canada.

Tariff Classification: As a new member of the EC, Ireland is progressing toward the EC rates. At the present time, soy protein enters Ireland under three tariff classifications.

Government Position: The Government of Ireland has shown little interest in soy protein. So far, the Government has taken no position on soy protein nor has it encouraged its use. Generally, those individuals with knowledge of soy protein do not believe it will become a significant food product in Ireland in the near future.

Food Legislation: Ireland has quite strict legislation on the inclusion of additives in food. However, these do not hamper the use of soy proteins as meat extenders. Labeling and packaging regulations have not caused significant problems for Ireland's soy protein importers.

Product Use: The majority of soy protein available in Ireland is used by the food processing industry and the institutional sector, and its use is influenced to a great extent by the prevailing price of these products. This in itself can limit increased use. In fact, Irish distributors have voiced complaints that prices of soy protein are in some cases higher than meat prices because of the costs attributed to middlemen and franchise holders. Also, Ireland is a substantial exporter of meat and sees little need for vegetable meat extenders at this time. However, spiraling meat prices could stimulate interest in this area.

Soy flour, isolates, concentrates, and textured soy protein are all available in this market; however, the isolates appear to have a greater appeal as a meat extender in hamburger and sausage. The isolate raises the protein content and allows higher usage levels of fat and cereal extenders. In fact, the main use of all soy protein products in Ireland is as a meat extender. This practice is in accordance with Irish food regulations, and manufacturers have indicated that up to 10 percent is included in most sausage and hamburgers, although hamburger consumption is relatively low.

Consumer Market: For the most part, the consumer's knowledge about soy protein and its uses is limited, although it is included in several food products. Those who are aware of its presence generally maintain that the vegetable protein is not as good as meat protein, indicating a prejudice against these products. This attitude is a result of lack of exposure and limited availability of soy fortified foods at the retail level. Consequently, increased sales will involve an education program on the utilization of soy protein.

Although soy protein products are not sold in the retail market, soy proteins are included in some snack and carryout foods.

One possible market opportunity for soy protein in the retail sector is high-quality health foods utilizing soy protein. These foods provide an opportunity to introduce soy as a superior health food.

Aside from lack of knowledge and limited availability the market potential for soy protein is not hampered by any particular barrier at the retail level.

BTN	Description	Rate		
		Full	Other EC	UK
2107-130	Food preparations not elsewhere specified or included: F. Other I. Containing no milk fats or containing less than 1.5% by weight of such fats: a. Containing no sucrose or containing less than 5% by weight of sucrose (including invert sugar expressed as sucrose): 1. Containing no starch or less than 5 percent by weight of starch Other: Made from or containing wheat or any product of wheat Other	16%	0%	0%
2107-152+	b. Containing 5% or more but less than 15% by weight of sucrose (including invert sugar expressed as sucrose): 2. Containing by weight of starch aa.) 5% or more but less than 32%	19.4% + VC[1]	9% + CA[2]	0% + CA
3504-000	Peptones and other protein substances and their derivatives; hide powder, whether or not chromed	6.4%	0	0

[1] VC - Variable component.
[2] CA - Compensatory amount.

Source: Customs and Excise Tariff of Ireland, In operation on the 1st January 1976.

Institutional and Food Processing Users: Considerable potential exists for institutional use of soy protein, especially in hospitals and schools. Until there is greater acceptance of the product, it appears more advantageous initially to encourage use by this sector and the food processing industry, especially considering the accepted practice of using soy as a meat extender. In addition, food processors are eager to keep prices reasonable while sustaining an acceptable level of quality, and increasingly recognize soy proteins as useful in this respect.

Reportedly, the greatest potential in the institutional and food processing industry is the use of isolates and concentrates in hamburgers, sausages, and pies. Possibilities exist to increase the portion of soy presently included in meat products in view of the low quality meat such as hog heads, skins, offal, and cereal fillers presently incorporated into some brands of sausage.

There does not appear to be a substantial market for textured soy protein as a meat replacer, because of conservative Irish food tastes and preference for high-quality fresh meat, currently in sufficient supply. However, some expansion in institutional use appears possible.

Italy

Italy's success in processing soybean cake and meal for use in animal feed has limited interest in local production of vegetable protein or flour. As a result, Italy relies totally on imports, mainly supplied by the United States, the United Kingdom, and the Netherlands.

Imports: Italian import data do not adequately reflect the supply situation. Therefore, assumptions are made on the basis of U.S. export figures and information gathered from the trade. According to U.S. Census data, U.S. exports of soy protein to Italy have fluctuated between a low of 1.3 metric tons to a high of 23.5 metric tons during 1970-73 period.

Tariff Classification: In accordance with the European Community tariff regulations, soy protein is classified in five distinct categories. A table of tariff numbers and rates as disclosed in the Official Journal of the European Community, Vol. 17, no. L295, 1 Nov. 1974, is on page 5.

Government Position: Government officials are generally unfamiliar with soy protein. Since utilization of vegetable protein is limited, Italian legislators tend to almost disregard the subject. Furthermore,

the Government has not been stimulated or motivated to consider strongly the pros and cons of using soy protein for human consumption. Instead, the Government tends to take the position that the genuineness of food should be maintained, thus, does not encourage use of vegetable protein. Some progress is taking place, in view of the pending decree on use of vegetable protein in meat products. The Government also readily recognizes the effect of meat imports of $1.9 billion last year on their balance of payments, and consequently, is showing a little more interest in soy protein as a meat extender. However, the Meat Importers Association opposes the use of vegetable proteins as meat extenders and replacers.

A newly founded soy protein group that has representatives from various Italian firms has organized efforts on soy protein and is implementing a program that will acquaint Italian legislators, Government officials, and industry and institutional users on the utilization of soy protein. A specific program will be developed to educate potential users, but initially efforts will be directed toward the Italian Government in an attempt to get adequate legislation on soy protein.

Food Legislation: Legislation restricts the widespread use of soy protein in Italy.

- Article 55 of the decree of December 20, 1928, prohibits the addition to meat of colors or other substances that would alter its normal composition.
- Article 10 of July 4, 1967, Law No. 580 prohibits the addition of foreign substances into cereal flour and semola (except for a restricted list according to the law of April 30, 1962).
- In many cases, the use of vegetable proteins is illegal because of the lack of positive legislation permitting its use (in Italy, that which is not on a list of permissible additives is considered prohibited). However, the Ministry of Health, which is responsible for authorizing production of baby and dietetic food, has granted petitions in several cases to use vegetable proteins in the production of baby food, some of which contain meat.
- A new food decree is being studied that would allow the retail sale of textured protein products with hamburgers, "ragu," etc., but not in "insaccati" with the possible exception of "mortadella." This directive is being reviewed by the Italian Ministero della Sanita and will require the final approval of the Department of Commerce, Agriculture, and the Consiglio Superiore per L'Alimentazione. A decision is expected to be reached in the next 2 to 6 months.

Product Use: Several types of soy protein are available in this market. Users are confined to the institutional and food processing sectors. Although soy protein products as such are not available at the retail level, these ingredients are incorporated in such retail products as dietetic foods, baby food, and bakery products.

Soy isolates. Supply estimates show approximately 300 metric tons of isolates available in this market, most of which are presently being used in the food processing sector.

Soy concentrates. The food processing sector is the main user of soy concentrates. Approximately 80-100 metric tons are used in this market.

Textured soy protein. The greatest use of textured soy protein is in the institutional sector, for which approximately 40-50 metric tons are imported.

Consumer Market: Generally, the consumer has little knowledge of soy protein. Due to minimal quantities of soy protein available at the retail level, use by the consumer in daily meal planning is limited. Consumption is limited mainly to baby foods. The Italian consumer is suspicious of processed food and the same attitude applies to vegetable protein. This attitude has been fueled by a hot debate in the Italian press on petroleum-derived proteins and the possible related dangers resulting from their use, leaving the consumer confused and/or disinterested.

Increased use of soy protein at the retail level also is hampered by legal restriction, which is especially true in the prohibition of vegetable protein in meat products, reportedly an area of potential demand. According to the trade, legislation will be changed reflecting a more favorable attitude toward the use of vegetable protein as a meat extender, or as a meat replacer.

No attempts have been made to promote soy protein at the retail level, but there has been some technical assistance between distribution firms and processing firms demonstrating the use of soy protein in lunches. Most likely positive steps will be taken to alleviate the consumer's lack of information in view of the pending changes in the Italian food regulations and the recent establishment of a soy protein group in Italy.

Institutional and Food Processing Users: Textured and spun protein are most frequently used by the institutional market. Increased use of soy protein by this sector is hampered, however, by restrictive food regulations, and lack of familiarity and product availability. Furthermore, the use of textured vegetable protein and other meat simulators by other countries has caused apprehension in agricultural circles, that feel the introduction of vegetable protein will cause a decline in demand for animal proteins. So much publicity was given these apprehensions that a decree was enacted a few years ago temporarily making sales of vegetable protein illegal. This decree is no longer in force, but some degree of sensitivity remains. Meat importers' associations are expected to continue to oppose increased use of vegetable protein as meat extenders or replacers.

Providing these barriers can be partially or totally removed, there is a significant potential for soy protein in the institutional and food processing

sectors, especially in the case of sausages, bologna, and other preparations where vegetable protein could be used for functional properties (binding) as meat extenders. For example, sausage consumption is relatively high, therefore, provides a ready market for soy protein. Ready-to-cook products, especially for institutional use, also have potential because of their functional properties and low prices. Cereal flours and baking products also provide an opportunity, particularly in view of the low protein content of Italian wheat. Another area is the Italian ice cream industry, which is well organized and concentrated in a few international firms. This industry employs skilled personnel who adapt readily to improved techniques. Protein isolates could be emphasized here.

Providing the greatest outlets for expanded use of soy protein in the immediate future are the institutional and food processing sectors, where it is not necessary to contend directly with the negative consumer attitudes towards processed foods.

Competition for Soy Protein: Generally speaking, the fluctuation of meat and dairy product prices poses a considerable threat to the competitiveness of soy proteins. However, since prices for both beef and pork have risen about 25 percent within the last 2 years and are now among the highest in Europe, prospects for increasing the use of soy protein in Italy could be improving.

Netherlands

The Netherlands is quite active in the soy protein area, being both a producer and importer. Trade and production data are scarce, but some assessments of the soy protein supply situation can be made based on information gathered from the trade.

Beginning in 1974, several large international firms began planning to establish soy protein production facilities in the Netherlands to be built adjacent to existing soybean extraction plants. One company has begun production with several others scheduled to be in operation by 1977. Annual production capacity of the currently operating firm is estimated at 50,000 tons with no indications for future expansion at this time.

Imports: Imports cannot be determined from data available since vegetable proteins are classified in basket categories, however, the United States is reportedly one of the main sources of supply.

According to U.S. Census data and in comparison with that of other West European countries, the U.S. exports substantial amounts of soy protein to the Netherlands, averaging 372 metric tons a year between 1972 to 1974. In 1975, however, exports increased to 8,886 metric tons. Some of this increase is attributable to the fact that construction of local soy protein production facilities has fallen behind schedule.

Tariff Classifications: Soy protein is presently classified in five distinct categories, according to the EC tariff regulations. These classifications include such items as soy flour (nondefatted) and grits, soy concentrates, textured vegetable protein, and soy isolates. As of July 1974, there was no national interpretation of tariff classifications that would bar, directly or indirectly, the import of soy proteins. On page 5 is a table of tariff numbers and rates as disclosed in the Official Journal of the European Communities, Vol. 17, no. L295, 1 Nov. 1974.

Government Position: Government knowledge and interest in soy protein is rapidly growing as a result of changes requested by the industry in Dutch food regulations. The Government is becoming more involved because of the increasing exchanges between local manufacturers, importers, nutritionists, and Government officials on soy protein. In general, the Government is not opposed to soy protein but is loth to interfere with local food interests.

Food Legislation: Food legislation in the Netherlands, particularly the Meat and Meat Products Decree, is explicit as to what can be added to meat and specified meat products. Generally, the decree does not allow the addition of soy proteins to meat as extenders, binders, or emulsifiers.

- Food legislation forbids the use of color additives or trace substances in food products in general and especially in meat. This may cause a problem with those U.S. exports containing titanium dioxide (color tracer).
- However, certain exceptions exist. For instance, the decree does not include certain catering products and snacks containing meat such as "fricadellen" (beef/pork rolls), "croquettes," "nassi-ballen" (fried rice balls with meat and spices), "pate," etc., which are usually sold in automats. Consequently, soy protein products can and sometimes are used in the preparation of certain products.
- The use of fantasy rather than generic names such as soy burgers vs. hamburger is an accepted means of incorporating soy proteins into meats in the preparation of food products.
- Soy proteins also can be used in canned or dry soups as long as the name of the soup on the label does not indicate that meat is included and the label specifies the contents.
- Up to 3 percent of soy flour may be used in bread flour.
- The Netherlands is a major exporter of meat products to countries permitting the use of soy protein concentrates as product components.
- In general, there are no labeling or packaging requirements inhibiting imports of vegetable proteins. Vegetable proteins are normally imported in bags.

The Netherlands has no specific packaging requirements for bags but labels must state the name of the product and weight in kilograms.

Product Use: All four types of soy protein products are available in this market both from imports and local production. Information available, however, is limited to soy flour and textured vegetable protein.

Annual consumption of soy flour is estimated at 8,000 tons, 20 percent for human consumption and the balance for animal feed. In the area of human consumption, soy flour is incorporated into bakery breads and biscuits and used as egg white replacer by the institutional sector and food processing industry. At this time, this is a low volume market due to restrictive food regulations. By far the largest use of soy flour is in animal feed for the production of pet foods and calf milk replacer, and in the short term, is a particularly promising area for market expansion. Soy protein is also used for pharmaceutical industry fermentation but in very limited quantities. According to domestic soy protein producers, the best prospects for sales are soy flour and grits via the outlets of the "snack" industry and other institutional sectors.

Annual consumption of textured vegetable protein is estimated at 400-500 tons. This product is used almost exclusively for pet foods and institutional foods. Isolates and concentrates are used by meat packers but mostly for meat products destined for export. The Netherlands, being a major meat product exporter, ships to destinations that allow the use of soy protein in meat products.

In addition to soy protein products, soy protein foods are also available in this market as a result of the food processing industry's efforts. The most popular uses are bakery breads and breading for frying meat and fish products. Oriental dishes such as egg rolls, bami, and nassiballs also contain soy protein. These products, without ingredient identifications, are available in cafeterias and snack bars and are used frequently by caterers and restaurants.

Consumer Market: As in other West European countries, the consumer has limited awareness of soy protein due largely to lack of availability or of knowledge that soy protein is an ingredient of the food product. Furthermore, there is no general acceptance in the Netherlands that vegetable protein is a suitable substitute for meat protein, especially when soy proteins are advertised as a meat replacer. To some extent, this prejudice is a result of a marketing venture 4 or 5 years ago which attempted to introduce textured vegetable protein to the Dutch consumer. This product was marketed unsuccessfully as a meat replacer in three different flavors—ham, pork, and beef. This unfavorable consumer reaction has carried over to the snack food industry and producers of canned and frozen ready-made meats, who are reluctant to use textured vegetable protein. Generally, however, the consumer has not had a good opportunity to formulate an impression of soy protein.

Lack of availability of soy protein, its poor image, and present Dutch food regulations are the three major obstacles limiting increased use of it at the retail level.

Institutional/Food Processing Market: The greatest potential for soy protein lies with the institutional sector and the food processing industry. In the institutional sector, soy flour now is used at an estimated annual rate of 1,300-1,500 tons and textured vegetable protein at 150-200 tons.

The main type of products containing soy protein currently being marketed is "Fricadellen," croquettes, nassi-ballen, pate, soups, and bakery products.

United Kingdom

The United Kingdom is both a producer and importer of soy protein products, but it is difficult to quantify use since a mechanism does not exist within the industry to collect and disseminate industry-wide data. Consequently, the supply situation is based upon U.S. Census data and information gathered from the trade. Reportedly, 10 U.S. companies, either directly or through arrangements with U.K. companies, are engaged in the U.K. soy protein market, and about half of these are joint ventures with U.K. manufacturers. Local production is limited to soy flour (full fat and defatted), grits, bread improvers, and textured soy protein. However, one U.K. company has an annual production of 1,500 tons of soy concentrates with a projected capacity of 3,000 tons per year. Generally, however the isolates and concentrates are imported from the United States or Europe.

Imports: Because the United Kingdom does not keep separate statistics on soy protein imports, quantity cannot be determined accurately. In addition, shipments from Canada and the Netherlands may contain transshipments of soy protein from the United States. As far as U.K. statistics are concerned, the country from which the item is consigned is the country of origin.

According to U.S. Census data, U.S. exports of soy protein to the United Kingdom have steadily risen from 44.2 metric tons in 1970 to 497.6 metric tons in 1973. In 1974, U.S. exports were reduced to 410 metric tons, probably due to increased British production of soy proteins. In addition, American companies located in Western Europe supply processed soy to the United Kingdom. Consequently, the bulk of soy protein requirements is currently imported, and predictions are that present dependence

on imported ready-processed soy is likely to continue for many years, especially for isolates and concentrates, despite the fact that these products are produced locally.

Tariff Classification: At the present time, the United Kingdom is in the transitional stages of alining tariff rates to coincide with those of the EC. Reportedly, there are some serious problems in the tariff structure for the importation of processed soy products. There are 12 customs areas and there is no uniformity as to BTN categories under which this material is imported from customs area to customs area. The industry reports that most trade is conducted under 21.07 or 23.04.

Government Position: Although the United Kingdom has a good level of awareness and knowledge of soy protein products, the industry wishes to encourage the Government's awareness of the newer and potential developments. The Government appears to have an open-minded approach to soy protein and, in fact, appears to be receptive to the report and recommendations made by the Food Standards Committee on Novel Protein Foods. Consequently, the U.K. trade feels encouraged by the Government's position. However, a powerful agricultural lobby has tended to make the Government move forward very cautiously on soy protein.

Although no legislation inhibits market development of soy protein, the Government's overall reaction is one of caution. However, it is possible that legislation will follow the Food Standards Committee Report in reinforcing the obligations of catering and the labeling of products.

Food Legislation: Use of color additives and trace substances is limited but not barred. The addition of nonmeat substances such as soy protein to meat products is not barred, but is limited by food legislation. The main pieces of legislation applicable are: The Canned Meat Products Regulation 1967 with amendment, the Sausage and Other Meat Product Regulations 1967 with amendments, the Fish and Meat Spreadable Products Regulations 1968, and the Labeling of Food Regulations 1970 and 1972.

Basically, the "meat content" should include 60 percent lean meat, except for sausages (including salami) when the lean meat should be 50 percent of the total meat content. These standards do not apply to sales to caterers, but do apply to retail sales of catering packs, and to subsequent retail sales, including canteen meals. Furthermore, products described as "X with meat/type of meat" or "X containing meat/type of meat" or "X in meat/type of meat" are not required to comply with standards for minimum meat content.

- There are no significant labeling or packaging requirements that inhibit imports, as long as the material contains at least 50 percent or more crude protein and the following information is included on the label: Process to give texture; origin of material; protein; food or product.

Examples: "Spun Soya protein food" or "Textured groundnut protein product." For products containing less than 50 percent protein, the description should be as above with the word "protein" omitted. For nontextured products, descriptive terms such as soy flour and casein are acceptable.

Product Use: All four types of soy protein products are widely available in this market, either from local production or foreign imports. Marketing these products via the institutional catering market is currently and potentially more significant than for commercial catering and retail sales. Traditionally, these soy protein products are incorporated as an ingredient in sausages, pork pies, dairy products, and baking products and are used to some extent by all sectors.

Although in limited amounts, most of the soy protein at the retail level is consumed in the form of processed products such as canned meat products, breads, and confectionery. Since institutional use of soy protein is far greater, the product line is much larger and varied including such soy fortified products as: Unflavored and beef flavored mince; ham and beef flavored chunks; curry, casserole, and savoury mixes; bolognese sauce; and unflavored crumbles.

In an attempt to quantify consumption of soy protein products in the United Kingdom, estimates were gathered from the industry, but there was no general agreement on likely consumption.

Product	*Quantity (in tons)*
Meal/Grits	4,000
Full fat and defatted flours	10,000 - 15,000
Concentrates	1,500 - 2,500[1]
Textured/Spun	5,000 - 8,000[2]
Isolates	2,500

[1] Several estimated total consumption for isolates and concentrates as close to 4,000 tons.

[2] Other estimates put total human consumption for textured spun in the range of 4,500 - 5,500 tons.

Consumer Market: Media education has led to greater levels of awareness than actual knowledge of soy protein, and much of this exposure can be traced to local press reports on use of soy protein in schools. Although most consumer consumption of soy protein is in processed foods, its presence is not generally recognized. Limited availability of soy enriched foods also results in negligible use by the consumer.

However, several manufacturers are in the process of testing retail soy protein products, and this possibly will be announced in coming months.

Many manufacturing/processing companies are anxiously watching the progress of "Mince Savour," a 1-ounce sachet for addition to mince dishes as an extender. This is the first and only soy protein product marketed at the retail level. Research figures indicate 12 percent of the housewives in London and the South of England actually have tried Mince Savour. According to the manufacturers, however, it will be many years before the United Kingdom reaches the same level of acceptance for soy products as now exists in the United States. On the other hand, the present economic situation and the media's concentration on rising food prices is likely, in the short term, to stimulate interest.

In consumer terms, soy protein is at an early stage in its development, and many consumers probably have not been consciously aware of soy-based products. Some attitudes that do exist are confused most likely by conflicting claims of "meat replacement," cheap alternative to meat, "meat extender," and the "plastic meat."

Increased use of soy protein at the retail level is hampered in several ways. First, the limited range of products available to the consumer results in minimal exposure and the consumer gains no indepth knowledge on these products and their uses. Also, supermarkets are relatively reluctant to sell soy protein products during the initial stages of marketing. Therefore, limited availability, along with the poor publicity often generated when schools or hospital groups use soy as part of their catering programs, are obstacles to marketing soy protein.

In addition, the price of meat affects the atmosphere for marketing soy. Low meat prices diminish the demand for meat extenders; increasing meat prices encourage use. Possible legislation covering "novel protein foods" will affect usage levels significantly.

Although numerous, many of these barriers are not insurmountable and can be minimized through proper education of the consumer. Even with the actual introduction of a soy protein product such as "Mince Savour," there has been little media expenditure put behind consumer education and sales. The minimal amounts of advertising now used concentrate on the price/meat extender approach. By comparison, promotion by the catering industry is better developed and more indepth.

Institutional Market: The U.K. institutional market currently uses an estimated $2.3 million annually in schools, hospitals, and other institutional catering establishments. It is a good example of the use of a variety of soy protein products.

According to the U.K. Food Standards Committee's proposals, the recommended level of substitution is up to 10 percent of total meat content and as the report on Novel Protein Foods states, "We recognize this as a conservative approach to substitution which is justifiable where the consumer has little or no choice." There are a wide range of products available in the institutional sector, and a U.K. journal carried details of some 40 basic catering products from 10 different manufacturers/marketers including such products as flours, textured and spun soy, as well as isolates and concentrates.

The greatest potential for soy protein is in the catering field, which has four main categories: Hospitals, schools, retail catering, and industrial catering. Despite all the activity in this sector and related publicity, the development of the catering market as a whole is currently slow. The greatest success to date is in schools and the industrial catering area. According to the Novel Protein Foods Report, the potential is there and greater substitution of meat and fish is expected in this sector than in the retail consumer sector, especially in such institutions as old people's homes, residential schools, hospitals, and prisons.

Since there is a 10 percent replacement guideline, the major limitation is likely to be attitude, which cannot always be attributed to insufficient knowledge and education on the product. One of the greatest stimulants to using soy protein, of course, is the cost-saving factor. Of the numerous individuals interviewed, one indicated that soy protein "is a lot cheaper than fresh meat, and it has plenty of protein." Consequently, rising food prices remain a significant impetus to soy expansion, especially in hospitals, schools, prisons, and old people's homes.

West Germany

West Germany is both a minimal producer and importer of vegetable proteins. Local production of soy protein is limited to defatted soy flour, 50 percent protein and full fat soy flour (toasted and untoasted), however, data are not available on present production or plant capacity. Because of prohibitive investment costs and current tight market conditions at this time, there is little interest in local production of concentrates and isolates.

Imports: Since vegetable proteins are classified in basket categories, imports cannot be readily determined from available data.

According to U.S. Census data, exports to West Germany of soy protein range from a low of 62.9 metric tons in 1971 to a high of 1,945 metric tons in 1974. U.S. exports have remained rather steady, fluctuating only slightly until the noticeable increase in 1974, which was followed by a 50 percent decline in 1975. The following products are imported both from the United States and several West European countries: Soy flour from France; soy concentrates from Denmark; soy isolates from the United States; and textured soy protein (TSP) from the United States, United Kingdom, and Sweden.

Tariff Classification: As do the other six original EC countries, West Germany also classifies soy protein in five distinct categories. Tariff numbers and rates as delineated in the Official Journal of the European Communities, Vol. 17, No. L295, Nov. 1, 1974, are on page 5.

Government Position: The German Government's awareness and knowledge of soy protein are very limited. Government officials regard soy protein as a meat and grain substitute rather than as a food. Consequently, the Government has taken no action to encourage the use of soy protein. Their position is rather one of "wait and see."

Food Legislation: The use of soy flour and soy protein in foods is restricted severely by German food law, which forbids many of the most popular uses of vegetable proteins in human foods. It does permit the production of totally imitation meat products as long as consumers are informed accordingly. That is, in foods that do not contain meat, the use of vegetable protein poses no problem.

• A brochure entitled, "Assessment of Addition of Certain Soy Products to some Foodstuffs According to the German Food Laws," provides a systematic and detailed study of the provisions applicable to the numerous food preparations. According to this publication, the addition of soy products to meat products and to products to which meat products have been added generally is not permitted. Addition of non-meat proteins is limited to products "in air-tight packages or containers having been submitted to thermic operations in view of conservation." In all these cases, mention must be made on the label of the presence of these additives.

• Unfortunately, the term "meat products" has been defined neither in the Meat Regulation, December 19, 1959, nor by other legislation. The fact that not all foods containing meat—even if the amount is considerable—are "meat products" is apparent from the wording of the Meat Regulation. The meaning of the Regulation justifies the following classification:

"Meat products" are all those foods whose character are determined by meat and bacon.

"Products to which meat products have been added" are all those foods to which meat products have been added and which, apart from these products, also have another component which determines their characters.

• However, there is one exception. Soy flour or proteins are allowable for use as emulsifiers in "ready-to-serve dishes" containing meat if necessary in the manufacture of such products. It is not permissible to add soy products in amounts greater than that technically necessary, i.e. binders, or necessary for efficient manufacture. The significance of this is that labeling or marking is not necessary because the permissible addition of soy products is not considered adulteration.

• With regard to the meat products containing emulsifiers, such as meatballs and hamburgers, there are two interpretations of the paragraph of the law concerning the use of starches, bread crumbs, and flours because the word "flour" may be interpreted to include soy flour.

• The meat regulation does not provide a definition for "ready-to-serve dishes." However, there are plenty of examples that are referred to explicitly as "ready-to-serve dishes" such as: Goulash, fricassee, meat pies, corned beef, and others. "Ready-to-serve dishes" are, by virtue of these examples, all those dishes normally made in the kitchen, even if these dishes are sold as preserved products or deep-frozen foods. "Ready-to-serve dishes" do not include raw sausages, cooked sausages, raw ham, scalded sausages, "binder" meat, and similar meat products.

Product Use: There are three basic market outlets for soy protein products in Germany: Retail, institutional, and food processing industry. Of the three, the retail area is the most limited, and presently confined to full fat soy flour, which is produced in Germany and sold in local health stores. On the other hand, a variety of food items containing soy protein products are used by the institutional and food processing sectors. For instance, soy flour is used in premixes for institutional use in combination with wheat starch, lactose, milk powder, bakery goods, biscuits, crackers, and pet foods.

Food processors are also incorporating textured soy protein in dietetic, health and vegetarian foods, baby foods, and pet foods. In addition, soy concentrates and soy isolates are being used in burgers, patties, pies, and other preparations containing meat, but meat that does not characterize the product. Concentrates and isolates like textured soy protein are used in dietetic, health and baby foods, and pet foods. Isolates are also used in soft drinks. The use of concentrates or isolates in bakery products, however, is considered expensive.

Consumer Market: A general survey of consumers indicates limited knowledge and awareness of soy protein. Exceptions are health food consumers who have a keen interest in organically grown foods. Reportedly, this lack of knowledge is attributed partially to the fact that the soybean is not a native crop to West Germany. Consequently, the use of soy protein is very limited.

In general, those individuals with some awareness of soy protein have a rather negative attitude towards the product. This attitude is the result of traditional food preferencea and previous experience with soy protein. German consumers prefer fresh foods, and if the fresh product is not available, they tend to buy canned foods. Last in order of preference is frozen

food. It appears that the average German consumer has categorized soy protein as an artificial or unnatural food item, thus hurting its image.

In addition, soy protein's reputation was badly damaged as far back as the postwar years when people consumed relatively large amounts of nondefatted soy flour. This attitude was reinforced by an attempt to market textured vegetable protein as a meat replacer at the retail level several years ago. Failure of the effort resulted from marketing a product that did not appeal to the average household consumer and, furthermore, was more suitable to the food processing industry. Lack of sensitivity to consumer needs and desires was apparent since the soy protein product was packaged similarly to that of pet food.

Increased use of soy protein at the retail level is hampered in two ways. First, poor marketing procedures in the past have resulted in a negative consumer image, an attitude that is difficult to remove. Secondly, the severely restrictive food laws on the use of soy flour and soy protein in food products impedes increased use, such as use of concentrates as a binder in luncheon meats, sausages, and other meat products. Importers and distributors recognize this, and are stressing the need to remove this barrier. Market promotion could then concentrate on overcoming other obstacles.

Institutional and Food Processing Users: It is estimated that the institutional market in Germany utilizes approximately 50 metric tons annually of structured products, concentrates, and isolates. Concentrates, isolates, and soy flour are easily adapted to the institutional area, and are used in premixes, burgers, patties, and other preparations containing meat. These are the type of products that appeal to company-owned cafeterias, hospitals, and restaurants.

Reportedly, the institutional sector has greater potential than the retail area, although here, too restrictive food regulations hampers use by the institutional sector, especially in meat products. In addition, there is a lack of awareness of soy protein by the institutional user; however, there is not the image problem that is encountered at the retail level.

A survey of the trade indicates a marked expansion in the requirements for textured defatted flour, isolates, and textured vegetable protein by the food processors during the next several years. This is especially true for large food companies for use in soup, convenience foods, frozen foods, baby foods, and dietary preparations.

U.S. EXPORTS OF SOY PROTEIN SUBSTANCES TO EC

Tables 1 and 2 entitled, U.S. exports, protein substances to the EC by quantity and value indicate the metric ton quantity and dollar value of exports to the EC countries from 1970-75.

The basket category 5995855 was recently divided into two more well-defined categories (see footnotes tables 1 and 2). Category 5995860 contains the vegetable proteins of interest, namely soy proteins. In 1975, soy proteins (Category 5995860) accounted for 98.9 percent of all protein substances exported to the EC.

Exports of protein substances have increased substantially since 1970. The largest increase occurred recently when exports jumped from a moderate 3,054 metric tons to a substantially larger 10,032 metric tons between calendars 1974 and 1975. With an increased focus on the importance of protein in the daily human diet, total exports to the EC have risen steadily from 320 metric tons in 1970 to 12,032 metric tons in 1975.

Until 1975, West Germany was the largest importer of U.S. soy proteins. However, the Netherlands, importing 8,886 metric tons of protein substances in calendar 1975, has exceeded total German imports for 1970-75. German imports for 1975 were reduced 50 percent from those of the previous year. Ireland has just recently begun to import protein substances directly from the United States.

At the present time, EC imports of soy protein (Category 5995860) account for approximately 82 percent of the total world market for U.S. soy proteins.

Additionally, in calendar 1975 the EC imported roughly 83,000 metric tons of soybean flour. Historical data indicate West Germany is the principal importer of U.S. soybean flour, averaging approximately 1,700 metric tons per year over the last 3 years. While U.S. exports of protein substances have increased substantially in recent years, the opposite holds true for soybean flour exports. This decrease has resulted in part from the domestic production of soy flour by Denmark, France, the United Kingdom, and West Germany.

TABLE 1.–U.S. EXPORTS OF PROTEIN SUBSTANCES TO EUROPEAN COMMUNITY BY QUANTITY AND VALUE CLASSIFIED UNDER SCHEDULE B 5995855[1], 1970-73

Country	1970		1971		1972		1973	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
EC:								
	Metric tons	*Dollars*	*Metric tons*	*Dollars*	*Metric tons*	*Dollars*	*Metric tons*	*Dollars*
Belgium-Luxembourg	16.8	58,700	14.9	40,404	15.6	29,361	182.8	173,000
Denmark	–	–	234.8	141,514	143	88,009	200.9	195,000
France	167.8	320,660	206.8	253,652	355.9	336,258	122.4	206,000
Ireland	–	–	–	–	–	–	–	–
Italy	12.3	10,042	1.3	1,466	1.4	1,694	23.5	29,000
Netherlands	7.7	23,010	120.7	71,063	125.3	87,514	678.5	499,000
United Kingdom	44.2	103,108	53	93,786	130.3	176,315	497.6	465,000
West Germany	70.9	44,559	62.9	53,940	1,281.9	886,200	1,256.9	865,000
Total EC	319.7	560,079	694.4	655,825	2,053.4	1,605,351	2,962.6	2,432,000

[1] 5995855 - Protein substances including inedible gelatin, n.e.c. (formerly part of 5995850); Drigel; Gelatin for photographic use; Gelatin for sizing hats; Hide powders; Isinglass; Soybean protein; Unhardened soybean protein.

Source: U.S. Census Data

TABLE 2.–U.S. EXPORTS OF PROTEIN SUBSTANCES TO EUROPEAN COMMUNITY BY QUANTITY AND VALUE CLASSIFIED UNDER SCHEDULE B 5995860 and 5995870

Country	1974[1]		1974[2]		1975[1]		1975[2]	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
EC:	*Metric tons*	*Dollars*	*Metric tons*	*Dollars*	*Metric tons*	*Dollars*	*Metric tons*	*Dollars*
Belgium-Luxembourg	102.5	75,000	23.5	127,000	205.0	336,000	([3])	1,000
Denmark	127.0	100,000	39.0	30,000	253.6	248,000	.45	1,000
France	55.7	67,000	20.8	143,000	185.5	196,000	75.3	124,000
Ireland	–	–	–	–	142.9	156,000	–	–
Italy	19.0	22,000	1.3	1,000	4.1	16,000	([3])	2,000
Netherlands	55.7	57,000	255.3	174,000	8,878.3	1,626,000	7.7	26,000
United Kingdom	242.2	275,000	167.8	450,000	1,246.0	1,404,000	44.9	313,000
West Germany	1,823.0	1,623,000	121.5	104,000	988.4	1,047,000	–	–
Total EC	2,425.1	2,228,000	629.2	1,029,000	11,903.8	5,029,000	128.4	467,000

[1] 5995860 - Vegetable Protein (formerly part of 5995855); Hydrolyzed vegetable protein; Soy Protein concentrates; Soy Protein isolates; Soybean Protein.
[2] 5995870 - Protein Substances including inedible gelatin n.e.c. (formerly part of 5995855); Drigel; Gelatin for photographic use; Gelatin for sizing hats; Hide powders; Isinglass.
[3] Less than 500 pounds, or 0.23 metric tons.

Source: U.S. Census Data.

TABLE 3.–U.S. EXPORTS OF PROTEIN SUBSTANCES TO EC AND WORLD, 1970-75

Year and quantity	Total EC	World total	EC as percent of total
1970[1]			
Metric tons	319.7	1,174.3	27.2
Dollar value	560,079	2,420,117	
1971[1]			
Metric tons	694.4	1,762.4	39.4
Dollar value	655,825	3,096,594	
1972[1]			
Metric tons	2,053.4	4,673.4	43.9
Dollar value	1,605,351	4,886,676	
1973[1]			
Metric tons	2,962.6	7,043.7	42
Dollar value	2,432,000	7,878,363	
1974[2]			
Metric tons	2,425.1	5,960.2	40.6
Dollar value	2,228,000	5,474,000	
1974[3]			
Metric tons	629.2	1,510.9	41.6
Dollar value	1,029,000	3,791,000	
1975[2]			
Metric tons	11,903.8	14,534.2	81.9
Dollar value	5,029,000	7,779,000	
1975[3]			
Metric tons	128.4	583.8	21.9
Dollar value	467,000	2,966,000	

[1] 5995855 - Protein Substances. Beginning in January 1974 the U.S. separated protein exports into two distinct Schedule B categories.
[2] 5995860 - Vegetable Protein (formerly part of 5995855) Hydrolyzed Vegetable Protein; Soy Protein Concentrates; Soybean Protein; Soy Protein Isolates.
[3] 5995870 - Protein Substances including inedible gelatin n.e.c. (formerly part of 5995855) Drigel; Gelatin for photographic use; Gelatin for sizing hats; Hide powders; Isinglass.

Source: U.S. Census Data

TABLE 4.–U.S. EXPORTS OF SOYBEAN FLOUR AND MEAL[1] TO EC BY QUANTITY AND VALUE, 1973-75

Country	1973		1974		1975	
	Quantity	Value	Quantity	Value	Quantity	Value
	Metric tons	*Dollars*	*Metric tons*	*Dollars*	*Metric tons*	*Dollars*
Belgium/Luxembourg	28.1	117,000	38.1	24,000	36.3	8,000
Denmark	49.4	26,000	30.0	14,000	54.9	27,000
France	108.9	32,000	82.1	46,000	11.3	2,000
Ireland	4,540.5	546,000	–	–	–	–
Italy	42.6	23,000	34.5	30,000	172.4	193,000
Netherlands	1,282.7	360,000	266.7	174,000	18.1	6,000
United Kingdom	424.6	149,000	574.2	197,000	513.5	145,000
West Germany	1,012.0	183,000	3,953.6	842,000	34.5	14,000
Total EC[2]	7,488.8	1,436,000	4,979.2	1,327,000	841.0	395,000
All Other	127,160.2	32,936,000	127,396.3	28,971,000	82,248.0	20,368,000
World Total[3]	134,649.0	34,372,000	132,375.5	30,298,000	83,089.0	20,763,000

[1] Schedule B 221.9010 (BTN 12.02A) soybean flour and meal, nondefatted.
[2] Average unit cost: 1973–$191.8, 1974–$266.5, 1975–$469.7.
[3] Average unit cost: 1973–$255.3, 1974–$228.9, 1975–$249.9.

Source: U.S. Census Data.

TABLE 5.–COMPARISON OF PROTEIN CONTENT OF VARIOUS FOOD ITEMS TO PROTEIN CONTENT OF SOY PROTEIN

[In percent]

	Crude protein content	NPU value[1]
Food item		
Beef, cooked	24.2	75.5
Cheese, cheddar	25.0	69.8
Eggs, medium size	12.8	93.5
Fish, cooked	19.6	83.9
Milk, whole, fluid	3.5	81.6
Peanut butter	26.9	42.7
Soy protein products[2] (heat treatment)	**Crude protein content**	**NPU value**
Soy flour, defatted (light)	40-60	58.9
Soy flour, defatted (toasted)	40-60	62.5
Soy flour, full fat (moderate)	40-60	52.7
Soy flour, full fat (toasted)	40-60	59.2
Concentrate (unheated)	70	44.5
Concentrate (heated)	70	58.8
Isolates (unheated)	90	47.6
Isolates (heated)	90	48.3

[1] Net protein utilization (NPU) value is proportion of nitrogen intake which is retained in the body.
[2] Data derived from NPU = 21.52 + 17.126 Protein Efficiency Ratio (PER), PER figures from "Soy Products in Bakery Goods," Robert H. Cotton, Proceedings: World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973, p. 118A.

Source: "Plant Proteins in USDA Feeding Programs," K. Bird, Head, Nutrition Programs Group, Nutrition and Technical Services Staff, Food and Nutrition Service, U.S. Dep. Agr. 1973.

TABLE 6.–PRODUCTION OF SOY PROTEIN IN EC BY PRODUCT

Country	Soy flour, & grits	Soy concentrate	Soy isolate
Belgium-Luxembourg	X	–	–
Denmark	X	X	X
France	X	–	–
Ireland	–	–	–
Italy	–	–	–
Netherlands[1]	–	–	–
United Kingdom	X	X	–
West Germany	X	–	–

[1] Netherlands produces soy protein, but breakdown of specific products not available.

TABLE 7.–FOOD USES OF SOY PROTEINS

Protein form	Uses
Flours and grits	Bakery products: Bread, rolls, and buns Doughnuts Sweet goods Cakes and cake mixes Pancake and waffle mixes Specialty crackers and cookies Meat products: Sausages Luncheon loaves Patties Canned meats in sauces Breakfast cereals Infant and junior foods Confectionery items Dietary foods
Textured flours	Ground meat extenders Meat analogs (bacon-like bits, etc.)
Concentrates	Bakery products: Bread, biscuits, and buns Cakes and cake mixes Meat products: Sausages Luncheon loaves Poultry rolls Patties Meat loaves Canned meats in sauces Breakfast cereals Infant foods Dietary foods
Isolates	Meat products: Sausages Luncheon loaves Poultry rolls Dairy-type foods: Whipped toppings Coffee whiteners Frozen desserts Beverage powders Infant foods Dietary foods
Spun isolates	Meat analogs: Bacon-like bits Simulated sausages Simulated ham chunks Simulated chicken chunks Simulated bacon slices Meat extenders

GLOSSARY

American Selling Price (ASP)–A valuation procedure of the United States under which the U.S. wholesale price of certain products, notably chemicals, is used instead of the foreign price, in arriving at the customs duty to be assessed.

Autonomous Rate–May also be referred to as a "general" rate, usually is a "statutory" rate that is established purely by law.

Binding–Also called a "bound duty." It is in effect a guarantee by the importing country that the duty rate negotiated in the GATT will not be raised without consultation and/or compensation to other GATT members. Since a rate or duty that is not bound can be raised without consultation and compensation it may be worthwhile in a negotiation to request a binding on an item that is not bound and is either duty free or has a low duty that the importing country will not reduce.

Brussels Tariff Nomenclature (BTN)–A uniform method of classifying commodities for tariff purposes. The BTN groups the goods handled in international trade in sections, chapters, and subchapters, which have been given titles relative to the types of products they cover. The BTN–officially known as the Nomenclature for the classification of Goods in Customs Tariff–was developed at Brussels in 1955 by the Customs Cooperation Council.

Convention Rate–Rate established through negotiating "rounds" or "conventions" carried on by two or more countries. Conventional tariffs, which embody the "most-favored nation" principle, call for rates of duty lower than rates covered in the "general" schedules. If the complete tariff system of a country embodies a general or statutory schedule together with an MFN schedule arrived at through negotiations, such as the BTN, the country is said to have a "general and conventional" tariff system, though it is usually referred to as a "two-column" or "two-schedule" system.

Customs Cooperation Council–See Brussels Tariff Nomenclature (BTN)

Duties

"Ad valorem"–A duty assessed in proportion to the value of the imported item–example 10 percent, etc.

"Specific"–A duty levied on some basis other than value–example, per pound, per gallon, etc.

"Compound" or "Mixed Duty"–A combination of ad valorem and specific.

Food Processing Industry–Food processing is essentially the changing of a food product from its raw state to a refined product. Example, incorporating soy protein into sausages, soups, sauces, etc. These soy fortified products can either be sold to the retail market or institutional market.

General Agreement on Tariffs and Trade (GATT)–A multilateral agreement, negotiated in 1947 among 23 countries, including the United States, to increase international trade by reducing tariffs and other trade barriers. Today 102 countries participate in the GATT, including 83 contracting parties and 19 others with partial participation rights.

General Rate–The duty established by law. It may be referred to as the "autonomous" rate.

Institutional Market–The institutional food market may be defined to include all eating done away from home. The institutional market can be divided into three main categories: (1) Commercial feeding institutions, including hotels and restaurants of all kinds; (2) semicommercial feeding, including schools, clubs, etc.; and (3) other feeding institutional homes, prisons, convents, etc. Example of use, incorporating soy protein products into food items served in a school lunch program.

Kennedy Round–General tariff conferences. Also called "tariff negotiation sessions" or "rounds" held under GATT auspices. Through these tariff bargaining conferences, customs and duties on products traded across the borders of member countries have been reduced. The sixth round of negotiations under GATT is also referred to as the "Kennedy Round," which began in May 1964 and ended in 1967.

Levy–The noun "levy" is synonymous with "duty;" "to levy" means to assess or impose a duty.

MFN Rate–Most Favored Nation rate. This is the duty established by negotiations in the GATT. It is usually lower than the general rate since it is the general rate that initially is reduced in negotiations. If there has been no negotiation on a specific item, then the general rate for that commodity is also the MFN rate. Negotiations are usually based upon the MFN rates. In a rare case, such as cottonseed oil in Japan, the general rate will be lower than the MFN rate. In such cases, the general rate probably was reduced unilaterally subsequent to the negotiation of the MFN rate. The duty applicable to imports is the lower of the general or MFN rate, assuming no temporary rate is in effect.

MT–Metric ton.

Net Protein Utilization (NPU)–The NPU (standardized) is that proportion of nitrogen intake that is retained when protein is fed at or below maintenance levels.

n.e.c.–Abbreviation for not elsewhere contained, used in reference to basket tariff categories containing miscellaneous items not included in any other category.

n.e.s.–Abbreviation for not elsewhere specified, (see n.e.c.).

Non-Tariff Barriers (NTB)–Regulations employed by governments to restrict imports from entering their respective countries usually to protect domestic producers.

Protein Efficiency Ratio (PER)–PER is the relationship of the weight gain of a growing experimental animal per unit of protein intake. A PER of 2 means that the average weight gain was 2 grams for every gram of protein consumed. The standard, which is used for comparison purposes, is casein with a PER of 2.5.

Retail Market (Consumer Market)–The sale of food goods to the ultimate consumer, usually in small quantities. Example, soy flour sold to the consumer in a grocery store.

Tariff Schedule of the United States (TSUS)–The U.S. tariff schedule lists foreign-produced items on which the United States levies duties and specifies the duty to be assessed against each item.

Titanium Dioxide–An oxide (TiO_2) of titanium found especially in rutile or ilmenite and used especially as a pigment, in particular, it is used as a tracer in meat products to detect the presence of soy protein products.

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