Utilization and Quality Standards of Vegetable Proteins for Foods in Japan

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ABSTRACT

Approximately 50,000 metric tons of vegetable proteins were produced from soyabeans and wheat in Japan in 1978. Soyabean and wheat proteins have mainly been used for meat and fish paste products in similar supplemented rates. The Japan Vegetable Protein Food Association, established in 1975, has promoted development of vegetable proteins in cooperation with the Japanese government. Most of the vegetable protein producers participate in this association. Quality standards have been established for vegetable proteins to permit their use in various processed foods guaranteed by the government under the Japan Agricultural Standards (JAS) program. The current state of vegetable protein uses and the quality control system operated in cooperation between the producers and the Japanese government will be discussed.

INTRODUCTION

Soybeans have had an important part in the Japanese diet as a protein source for several hundred years. Soya sauce, natto and tofu are some traditional processed foods made from soybeans. At present, Japan imports more than 3,500,000 tons of soybeans, most of which are crushed for oil and meal.

Since about 1960, soybean protein has attracted much attention as a less expensive protein source than meat and fish. Processed meat products, fish paste products and minced meat products have been produced, making the best use of the functional properties of soybean protein.

With this background, producers of vegetable proteins, with the assistance of the Ministry of Agriculture, Forestry and Fishery, founded in 1975 the Japan Vegetable Protein Food Association. The Association has promoted general use of vegetable proteins by the united efforts of government and producers. As a result, ca. 40,000 tons of vegetable protein are used annually in processed foods.

In line with wide use of vegetable protein, efforts have been made to ensure acceptable quality for consumers of these products. Quality standards (JAS) of such proteins have been established through cooperation of government and producers.

Utilization of Vegetable Proteins in Japan

Vegetable proteins that are popular in Japan are mainly soybean protein and wheat protein. They are further grouped by their forms into textured, structured, paste and powdered types. Total production of these products reached ca. 40,000 tons, according to the survey compiled in 1979 by the Japan Vegetable Protein Food Association. Table I shows production by grouping in forms.

As the data show, textured and powdered types occupy the greater part of vegetable protein consumption in Japan. The amounts of soybean and wheat protein are approximately the same. The greater part of wheat protein, however, is produced as the wet type, and if it were converted to a dry basis, the production of soybean protein would almost double that of wheat protein. In view of this, it is forecast that the production of soybean protein will continue to grow faster. Current consumption of these vegetable protein products is shown by types of processed foods in Table II.

Soybean protein is mainly used for the production of ham, sausage and minced meat products, whereas wheat protein is primarily used for fish sausage and fish-paste products. Regarding minced meat products, which use the most vegetable protein, textured soybean protein is usually the meat extender. For hams and sausages, powdered soybean protein is utilized as binder and for the purpose of quality improvement.

In Japan, more than 300,000 tons of processed meat

TABLE I

Vegetable Protein Production in Japan

		Estimated for 1979 (MT)
Soybean protein	Powdered	12,106
	Textured & structured	
	dry	8,045
	wet	1,057
Wheat protein	Powdered	8,930
	Textured & structured	
	dry	119
	wet	5,482
	Wheat gluten paste	
	wet	6,814
Total		42,553

TABLE II

Utilization of Vegetable Proteins for Processed Foods in Japan

		Estimated for 1979 (MT)
Hams & sausages	Soya protein	5,013 (4,888)[a]
	Wheat protein	4,715 (2,675)
Fish hams & sausages	Soya protein	765 (765)
	Wheat protein	5,648 (3,199)
Fish-paste products	Soya protein	1,275 (1,275)
	Wheat protein	3,660 (2,708)
Minced meat products	Soya protein	11,164 (10,642)
Frozen dishes	Wheat protein	4,885 (1,817)
Canned dishes		
Chinese dishes		
Others		
Processed wheat products	Soya protein	2,158 (2,158)
(Bread, pre-mix, others)	Wheat protein	1,839 (1,839)
Minced meat & others	Soya protein	830 (772)
	Wheat protein	598 (598)
Total	Soya protein	21,205 (20,500)
	Wheat protein	21,345 (12,836)

[a]Parentheses indicate dry basis.

products represented by hams and sausages are produced annually. Minced meat products such as hamburger steaks and Chinese dishes include over 150,000 tons, and fish-paste products such as kamaboko (boiled fish paste), over 120,000 tons. In addition, soybean protein recently has been used not only for quality improvements by its functional properties such as water-holding, gel formation, foaming and emulsification, but also in health foods that do not contain cholesterol, such as soyamilk, coffee whitener, whipped cream, corned-beef-like food and vegetable mayonnaise, which makes the most of the emulsification characteristics of purified soybean protein, is produced without eggs and has been in demand among consumers. Such a product would seem to increase use of soybean protein in the future.

Quality Standards of Vegetable Protein in Japan

In Japan in 1950, the law was enacted to standardize quality of agricultural and forestry products. Since around 1960, processed foods have registered remarkable popularity and the government has coped with the situation by standardizing the quality of these products and requiring labels for their contents, so that consumers may buy them without trouble. These foods are monitored by periodical inspection and only those approved by the Minister of Agriculture, Forestry and Fishery are permitted to be labeled with the JAS mark.

Currently, 323 processed foods are covered by the Japan Agricultural Standard.

Regarding vegetable protein foods, since the Japan Vegetable Protein Foods Association was founded, thorough discussions have been made to establish the JAS, enabling it to provide users with assured quality for vegetable protein. That is, it is stipulated that vegetable protein to be used for JAS-labeled processed foods should satisfy conditions of the JAS.

In Japan, vegetable protein is classified into textured-, structured-, paste-, and powdered-types as shown in Table III. There are also provisions for food additives and ingredients for vegetable protein products: proteins using additives and ingredients other than those stipulated by the Standard are not allowed to use the JAS label.

TABLE III

Japan Agricultural Standards on Vegetable Proteins

			Textured		Structured	
	Powder	Paste	Dry	Frozen	Dry	Frozen
Moisture	<10%	<80%	<10%	<80%	<10%	<80%
Crude protein (dry)	>60%	<70%	>52%		>60%	
Particle size	>95%, through 350 μ mesh		<10%, through 350 μ mesh			
	Additives permitted for vegetable protein production					
Food ingredients	Vegetable oils, salt, starch, lecithin	Vegetable oils, salt, starch, lecithin	Vegetable oils, salt, starch, lecithin, tocopherol, color, sucrose, HVP, spices		Same as textured	
Food additives	Polyphosphate, L-ascorbic acid, emulsifier,[a] acetic acid, citric acid, Na-phosphate, Na-bisulfite	Polyphosphate, citric acid, Na-phosphate, Na-bisulfite	L-ascorbic acid, mono- & di-glyceride, Ca-sulfate, Ca-chloride, flavor, seasonings[b]		L-ascorbic acid, Ca-sulfate, Ca-chloride, flavor, seasonings[b]	

[a]Sugar ester, sorbitan ester.

[b]Mono-Na-glutamate, 5'-Na-inosinate, 5'-Na-guanylate, 5'-Na-ribonucleotide.

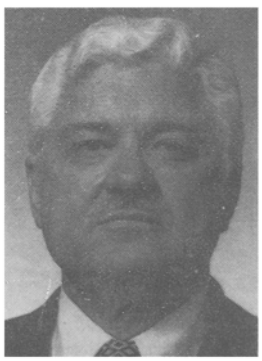
Table IV shows a part of the standards applied when vegetable protein is used for the production of JAS labeled processed foods.

The JAS has been established for newly developed corned-beef-like food. With further developments of products such as soybean milk and vegetable mayonnaise in the future, the JAS will be established. Thus, the creation of new, problem-free food products to be used by consumers will be achieved by common efforts of the government and producers.

TABLE IV

Permitted Levels of Use of Vegetable Proteins for Standardized Processed Foods in Japan

	Level
Pressed hams	<3∿5% as binder
Sausages	<5∿10%
Fish sausages	<20%
Kamaboko	<8%
Minced meat products	<20∿40% as meat extender



What's Holding up the Introduction of Soya into the Human Diet in Latin America?

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ABSTRACT

The introduction of soya into the human diet in Latin American countries suffers the same problem as foods with similar characteristics. The private industry soon finds that it is much easier to put "fun foods" into the market than it is to try to enrich a product and advertise the fact. Getting involved with the "heavy" subject of nutrition means having difficulties with the health authorities. There seems to be no national nutrition program working in Latin America that is truly effective in alleviating malnutrition. Causes for failure of programs are: substantial funding is spent in research, scientists work hard to solve malnutrition, then someone or something actively opposes introducing new soya technologies or there is an effective argument that a national program cannot be based on imported products. With a world population of 4,000 million and growing at a daily rate of 200,000, food and nutrition must have top priority in national planning.

"A certain important dairyman in the Bajío (México) area ordered his cowboys to give away milk generously to all the homes of the farmers on the ranch. One day he visited some of the homes, unannounced, and found the children drinking bottled soft drinks, while the give-away milk was used to fatten the hogs." The author, Carlos Loret de Mola, writing for *Excelsior* in April 1980, goes on to say: "to change the nutritional habits is to work for very patient giants. Yes, this requires the sum total strength of educators . . ." This editorial on the S.A.M. states that 20 million Mexicans go hungry every day.

Each of us has heard similar anecdotes in our own countries. Pedro Bleyer, from Santa Cruz, Bolivia, recently informed me that his excellent cereal product, "Maisoy," continues to struggle against the other major, and less nutritional, cereals which advertise everywhere from Disneyland to nationwide television. Children literally force their parents to purchase "X-Munchies" because they have fancy packages or contain prizes inside. In spite of the competition, Pedro continues to manufacture his nutritive product and slowly is carving out his share of the cereal market in Bolivia, much to the benefit of Bolivian children. Perhaps if Pedro would hire a team of Madison Avenue advertising geniuses and pay them a small fortune, he could increase his share of the market, but would it be worth it? I doubt it.

Before any new product is put on the market, it is test-marketed for months or years and the real advertising money only goes to the sure winner. The consuming public seldom buys a product because it is nutritional or helps produce healthy bodies. In Mexico, a large-scale manufacturer of snack items has a formula for an excellent high protein snack food but he does not want to get involved in the "heavy" subject of nutrition. He informed us: "We make fun foods that people like because they taste good." The advertising always stresses the "crunch" or the flavor, or that they have such a good chile that you go "oop!" when you taste it. They make no claims for nutrition and therefore never have trouble with the health authorities.

Why do the FDA or "Sanidad" people place such strict controls on nutritional claims for food products? They insist on months or even years of testing products on rats to prove that "Super Protina" actually furnishes the nutritive value claimed, even though it is now generally accepted that what is good for fast-growing, hairy rats, is not necessarily required by human beings. We do know that any amount of extra protein that is given to a growing child will be beneficial. So why place difficulties in the path of those who enrich their product and wish to advertise the fact? Why can't they use the term "instant breakfast" and advertise the fact that their product is a better one instead of losing sales to the "junk" foods? Our friends in the health departments say they must protect the consuming public against false claims. Moral: if you want to sell in any market with a minimum of problems and maximum profits, manufacture "fun" foods, make no health claims and aim your advertising at the most vulnerable sector of the market, the children. They can be counted on to spend their lunch money