



## History of Edible Soy Protein

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As Chairman of the Food Protein Council, I thank you for attending this seminar. Our council, in conjunction with the Foreign Agricultural Service of the Department of Agriculture and the American Soybean Association, is pleased to have this opportunity to talk with you about edible soy products. The purpose of the Food Protein Council is "to promote the interests of vegetable-based food protein and to provide information concerning the utilization and benefits of these products and to assist in the development of laws, regulations, and policies relative to vegetable-based protein products."

The companies holding regular memberships in the Food Protein Council are all producers of vegetable protein food products. In 1975 our member companies produced and sold approximately 240,000 metric tons of edible soy proteins. The sales trend for 1976 is up. Associate member companies are food processing firms who have a strong interest in vegetable proteins but are not basic producers of such proteins. The council has been active since 1967 and similar organizations have been formed in Canada and in Europe as the interest in vegetable proteins expands.

Much of the work of the council is centered on increasing the public's awareness and knowledge of vegetable protein foods. Our industry is relatively new and small in comparison to the total food industry and we are busy "getting our story" to the consumer.

We are also active in developing new regulations for the new food products made with, or from, our proteins. The production of analog products and meat extenders naturally presents problems of nomenclature, nutritional equivalency, and composition. Any time a product of different origin is made to simulate a known food product it is necessary to consider not only the consumer but also the established market position of the original product. We never realized how many friends the barnyard hogs had until our industry came out with imitation bacon and ham products. In such an instance, the people concerned with raising and processing the pork products envisioned an economic upheaval within their industry. In addition we encountered a large degree of emotionalism from people and groups who are more interested in maintaining the status quo than in opening new avenues of food product development that will produce new high quality food products at a price the consumer can readily afford.

The Food Protein Council believes that the consumer should be the final judge of the food products offered in the marketplace. In many cases, the use of our protein products allows a substantial savings to the consumer. In

alternative to established protein sources with certain nutritional advantages, such as reduced cholesterol content. There is no doubt in our minds that as the world's population continues to grow, the accompanying increasing demand for quality protein foods will put extreme pressure on the animal protein sources now preferred by the developed nations. Most of us here today have taste preferences for meat and poultry products. Given the collection of economic factors now in existence on a worldwide basis, it is easy to see that even to maintain existing levels of meat and poultry production will mean a future of steadily increasing costs. To enlarge this production to meet the growing demand from our growing world population will put further upward pressure on production costs.

The Food Protein Council feels strongly that government officials responsible for regulating the food industries in all parts of the world should begin now to develop sensible regulations concerning meat analogs and meat extenders. The consumer deserves the opportunity to purchase quality alternative food products, especially when these alternative products can be offered at a lower price.

During this two-day seminar, speakers from our member companies and from the academic community will explain in detail the nutritional, functional, and economic aspects of the wide variety of edible protein products produced at this time. I am certain that reference will be made to additional products currently under development. Specific reference will be made to the applications of these proteins and I think you will find these talks especially interesting as we have learned that there are many "tricks of the trade" regarding the applications of these proteins as foods and food ingredients. The last speaker is the executive vice president of the Food Protein Council and he will present a "wrap up" as well as discuss the future of edible vegetable proteins as seen by the council. All speeches have been translated and printed copies are available.

I have been talking about the edible vegetable protein industry. At this point, I should point out that soy proteins are far and away the most widely used vegetable protein in our industry. There are increasing uses of wheat gluten in the food industry, and some cottonseed proteins are being developed. There appears to be increased interest in peanut protein at this time but as of now there is no vegetable protein product that can match soy proteins in both availability and low cost, so from here on I shall refer specifically to soy proteins.

I would like to give you a brief history of the edible soy protein industry as it developed in the United States. The

other instances, their use offers the consumer a viable nutritional and economic values of soy protein have long been recognized. For years soy proteins, in the form of soybean meal, have been the most widely used protein source for the U.S. livestock and poultry feeding industry. Even today, over 95% of the protein fraction of the soybean goes into the animal feeding industry.

But an ever growing amount of the soybean's protein is being upgraded by the processors into an expanding variety of edible products. Edible soy proteins are not new; they have been available commercially since the late 1930s. Frankly speaking, the early edible soy proteins were not of the highest quality, and the early soy flours were often not much more than cleaned soybean meal. And the economics of the food industry were such that "traditional" foods were available in reasonable quantities at reasonable prices, so there was little incentive for the food processor to research the use of these new proteins.

World War II brought about new food requirements, and soy proteins were used as nutritional supplements and as extenders to scarce or costly foods. Most of these applications disappeared when the war ended and traditional food supplies caught up with demand. But the soybean processors had seen that edible proteins had a place in the food industry and, in cooperation with government regional research laboratories, they set out to improve the quality of the existing soy proteins and to develop new products. One important product developed at this time was the hypoallergenic infant formula based on soy protein. It has recently been estimated that almost three of every ten babies have an allergic reaction to cows milk and the importance of soy protein-based foods for this market has continued to grow since the early 1940s. The postwar 1940s and early 1950s were periods of improved soy flours and soy grits (basic 50% protein products) and the time when quality soy protein concentrates (approximately 70% protein content) and isolated soy proteins (approximately 90% protein content) were developed. By the end of the 1950s small quantities of soy flours were being used by the baking industry and smaller quantities of concentrates and isolates by other food processors.

Soybean processors recognized that the economics of the food industry was changing; food ingredients such as dried milk powders were becoming more expensive. Long-range economic forecasts showed that meats would increase in price. So the decade of the 1960s found the soybean processors building additional facilities for the production of soy flours and grits, soy protein concentrates, isolated soy proteins and textured soy proteins. It was also at this time that much research was being done on both extruded and spun textured products from various materials.

The textured soy proteins, or textured vegetable proteins, added a quality to the known nutrition and economics of the usual soy proteins. The American consumer had become accustomed to buying meat for a protein food and the introduction of a meat-like texture to soy protein meant that this new textured soy protein could be offered as a meat analog or be incorporated into processed meat

products. As meat prices continued to rise, the economics of using textured soy proteins improved and in 1971 the U.S. Department of Agriculture approved the use of textured vegetable proteins as a partial meat replacement in the school lunch program. Since that time, much progress has been made in adapting soy proteins to additional retail, fast-food and institutional food products.

Soy protein products can be sold to the food industry only when three product characteristics are present: economic justification, product functionality, and acceptable nutritional levels. Each speaker will go into greater detail regarding the economics, function, and nutrition of the various soy protein products.

Each of the soy proteins has its own economics and functionality, and, to some degree, different soy protein products have different nutritional values. The soy flour products are the lowest in cost per unit of protein value but offer somewhat limited functionality. The soy protein concentrate products are higher in price per unit of protein but have different functional properties from the soy flour products. There are applications where the functional characteristics of the concentrate justify its additional cost. Isolated soy protein products are more expensive per unit of protein than either the flour or concentrate products. Yet the soy protein isolates have distinctive functional properties that make them "the best buy" for certain applications. The spun analogs have yet another combination of price and value. It is important to have the right product for a specific application and this seminar will provide the information necessary to determine which soy protein fits into specific applications.

There are other very important foods besides meats which utilize our soy proteins. Soy proteins have been used in a variety of baked goods for many years. There is a growing market for their use in nondairy or imitation dairy foods. One benefit of soy protein is that it is versatile and can work in a multitude of food systems. Soy proteins can be used by themselves or they can be combined with meat or cereal flours or they can be used to extend dairy products. Soy proteins can be cooked or baked or fried. They can be canned or frozen. The research departments of our member companies are continually working to improve existing products and to develop products with new functionalities and improved characteristics. We welcome inquiries regarding the development of new proteins for new markets or for the adaptation of existing proteins to new applications.

I briefly mentioned the economic advantages of soy protein products. There is no other edible protein available in commercial quantities at comparable prices. The economics of soybean production and soy protein processing are such that this economic advantage over conventional animal proteins cannot help but be maintained or even increased. As it becomes more necessary for the nations of this world to better utilize their agricultural resources, we will see more emphasis on the use of soy proteins for edible purposes. ●

