

# attend World Conference on Vegetable Food Proteins

Trade and general media representatives from The Netherlands, Germany, France, Great Britain, Switzerland, the Mideast, Canada and other nations attended the conference.

Fifty-four plenary session speakers covered all aspects of the use of vegetable food proteins from nutrition to marketing, including specific applications in food products. Abbreviated summaries of the talks follow.



Food Protein Council buffet highlighted Sunday exposition opening

## Session A – Protein Nutrition

Foods containing soy protein, the most widely used, commercial, vegetable food protein, provide high nutritive value toward meeting the protein and amino acid requirements for humans of all ages, Dr. Vernon Young, Massachusetts Institute of Technology, reported. Dr. Young and Dr. Nevin S. Scrimshaw, a colleague at MIT, prepared the report based on extensive, recent, human metabolic studies.

Dr. L.S. Satterlee, University of Nebraska, described progress in developing two new methods for measuring the protein quality of foods. Traditional methods are expensive and require four weeks to complete, Dr. Satterlee said. New, less-expensive methods could provide results within 72 hours. If either new test procedure proves successful, it would permit economic, accurate monitoring of protein quality of incoming ingredients as well as of finished products at food processing plants, Dr. Satterlee said.

Monitoring food protein nutritional quality has become important during the past ten years because of the increasing use of vegetable food proteins and the requirements for nutritional labeling of certain foods in the United States.

Dr. Irvin Liener, University of Minnesota, outlined the significance for humans of biologically active factors in soybeans and other legumes. "Most plants contain substances that exert adverse physiological effects in animals," Dr.

Liener said. "Traditional methods of preparation and present technology have served to minimize any harmful effects from such substances," he said. He described methods to determine whether such factors in plant proteins could pose a serious threat to health when incorporated in food products.

A large-scale experiment to assess physiological effects of substituting soy protein for conventional protein in the usual diet of 92 volunteers was described by Dr. P.G. van Stratum, Unilever Research Laboratory, Vlaardingen, The Netherlands. Of more than 100 parameters monitored by Dr. van Stratum and Dr. M. Rudrum, a colleague at Unilever, statistically significant reactions were found only in mineral metabolism and digestion, Dr. van Stratum said, added that these were within normal physiological ranges.

A new concept in feeding tests to evaluate new foods was advanced by Dr. Sanford A. Miller, head of the U.S. Bureau of Foods. Dr. Miller described a current study using such concepts at the Massachusetts Institute of Technology, where Dr. Miller had been a faculty member until taking leave of absence to head the Bureau of Foods. While traditional testing methods have been to feed a test substance "at extremely high, nonphysiological levels with the hope that this would reveal any toxic response, a better technique may be designed to explore the functional consequences of feeding the test analog over several generations, using stress as a modifier to increase sensitivity of the system," Dr. Miller said. Behavior and resistance to disease under such conditions also could be monitored, he said.

Data relating to vegetable protein and atherosclerosis are still sparse, Dr. David Kritchevsky, Wistar Institute, said in reviewing present knowledge of relationships between the two. He also described recent animal feeding tests.

## Session B – Economics of Vegetable Protein

Increasing the use of vegetable food proteins can provide a way to improve diets nutritionally using familiar food forms, former U.S. Secretary of Agriculture Clifford Hardin said. Dr. Hardin, vice chairman of the board of directors for Ralston Purina Co., stressed that the solution to worldwide malnutrition lies in developing nations' ability to produce more food for their populations.

Dr. V.F. Lischenko, Institute of U.S.A. and Canadian Studies, Moscow, spoke on "Protein Trends and Economics" as viewed from his nation. Dr. William W. Gallimore, U.S. Department of Agriculture, discussed prospects for increased use in institutional markets, ingredients market, and in products for direct use by consumers. Ole Kaae Hansen, Aarhus Oliefabrik A/S, Denmark, reported on vegetable food proteins used in Danish meat products. Dr. Percy Willner, AB Karlshamns Oljefabriker, Sweden, reported on economic factors in use of vegetable food proteins in Scandinavia. David Simpson, Inner London Education Authority, England, described how vegetable food proteins were introduced into daily school menus of some 230,000 students.

## Session C – Current Developments in Protein Food Regulation

Consumers must be certain that their diet is not being damaged by the increasing use of vegetable food proteins, Daphne H. Grose, head of the International Organization of Consumers, London, England, said.

“Consumers must be sure that they are not being conned, deceived or defrauded,” Ms. Grose told approximately 1,000 conference registrants. She urged that food processors provide full information to consumers and that all products be clearly labeled as to content.

Proposed comprehensive regulations on labeling and nutritional quality of vegetable food protein products in the United States were described in detail by Dr. J.E. Vanderveen, acting director for the Division of Nutrition in the U.S. Bureau of Foods. The regulations, published last summer, are scheduled to go into effect in 1979.

The divergent regulations of the nine EEC members and of Austria, Finland, Norway, Spain, Sweden and Switzerland were discussed by Anne Brincker, Danish Meat Products Laboratory, Copenhagen.

“In most of the European countries, no general approach on regulating the use of vegetable protein in meat products has yet been taken,” she said, but quite a few of the countries are in the process of formulating such a policy.

Another speaker, Anthony Kinch, administrator for the EEC in Brussels, told registrants that if common regulatory systems are to develop, there must be agreement among governments, consumers and industries. A plant food proteins committee is in the process of being established by Codex Alimentarius, a United Nations sponsored group that seeks agreement among nations on identity standards for foods traded in international commerce. J. Hutchinson of the Food and Agricultural Organization (FAO), Rome, described the status of that project.

Major issues in vegetable food protein regulations were discussed by Leonard Roberts, Ralston Purina Co., USA, and Prof. Alan G. Ward, University of Leeds, England. Ward outlined the various viewpoints, including those of officials who will enforce any regulations that must be considered in formulating regulations.

Dr. Vanderveen delivered a paper prepared by Dr. Howard Roberts, former deputy director of the U.S. Bureau of Foods. Dr. Roberts resigned his government post just before the conference and asked Dr. Vanderveen to deliver the paper.

## Session D – Characteristics of Protein Ingredients

Dr. Harold Wilcke, Ralston Purina Co., described the different textures that can be obtained by selective processing of soy protein to produce foods with textures and flavors that consumers will accept. Soy protein is the most widely used commercial vegetable food protein.

Dr. John Kinsella, Cornell University, emphasized the need to learn more about the individual proteins found in soy protein. Models of these individual proteins can yield valuable information on how soy protein will behave in foods, thus allowing researchers to produce attractive food-stuffs, Dr. Kinsella said.

Beany, grassy, bitter or other off-flavors can occur in soybean-based products. Joseph J. Rackis of the U.S. Department of Agriculture told how he and his colleagues have identified many specific chemical constituents in soybeans that contribute to these off-flavors, opening new avenues for removal of these undesirable characteristics. Experimental batches of soy protein flour with the blandness of wheat flour have been produced by a combination of chemical extraction and steaming, Rackis said.

In the search for proteins to use in modern foods, many sources besides the soybean are available to food scientists,

Dr. Wilda Martinez, also of the U.S. Department of Agriculture, said. Proteins from cottonseed, peanut, rapeseed and coconut have been investigated for possible nutritional contributions to foods as well as improvements in such characteristics as color, flavor, and texture. Dr. Martinez described such applications of nonsoy proteins.

Knowing what kind and how much vegetable protein may be mixed in a meat product is important to consumers and to quality control technologists. Dr. W.J. Olsman, Center Institute for Nutrition and Food Research, The Netherlands, described four traditional detection methods, then explained a promising new procedure that uses a computer to identify amino acid profiles within a food product. Since amino acids, the building blocks of protein, occur in specific proportions in each type of protein, a computer can be programmed to sift through possible profiles to match the pattern found in a test substance, Dr. Olsman explained.

Dr. Anne-Marie Hermansson, Swedish Food Institute, Goteborg, stressed the need to properly design research projects on functional properties of vegetable proteins. “Functional characteristics of separate protein ingredients give information on their characteristic properties,” she said. “It does not, however, tell whether a protein will affect other food ingredients.”

## Session E – Vegetable Proteins in Cereals, Snacks and Bakery Products

Economic, technological and political considerations in fortifying bakery products with vegetable protein were discussed by Dr. William Hoover, American Institute of Baking. Peter Fitch, British Arkady Co. Ltd., England, explained how vegetable protein can be a valuable ingredient in snack foods.

Norman Wookey, Tenstar Products Ltd., England, described unique properties of wheat gluten. Gluten's elasticity gives bread its characteristic texture and also can be used to produce meat analogs with the texture of the original products, Wookey said.

## Session F – Vegetable Proteins in Meat and Fish Products

Ways to use vegetable protein to improve texture and appearance of meat products were described by Dr. Mogens Jul, Danish Meat Products Laboratory, Copenhagen. He also discussed its use as an extender in chopped meats and whole meat products.

Dr. William Brown, ABC Research, discussed how vegetable protein may be incorporated into fabricated foods, such as sausages. He concentrated on soy protein products currently available and approved by governmental agencies.

E.F. Sipos, Central Soya, described some novel fabricated foods of Japan – fishfurters, fishburgers, marine patties – in discussing how the Japanese are using vegetable food proteins in processed seafood products.

Dr. J.A. Nowacki, Central Soya International, Belgium, and Dr. V.V. Kadane, Central Soya, Germany, spoke on “Retorted Meat and Vegetable Protein Combinations” and “Vegetable Proteins in Cooked and Fermented Sausages,” respectively. Dr. Kadane noted that, according to one estimate, approximately 17,000 tons of various soy proteins were used during 1977 throughout Europe in heat-treated and fermented food products.

Dr. E.A. Desmyter, Purina Protein Europe, Belgium, described developments that have made it possible to incorporate soy protein into muscle tissue.

## Session G – Vegetable Proteins in Confectionary Products

Use of vegetable food protein in confectionary products was discussed by Dr. R.C. Gunther, Gunther Products,

USA, and J.W. Mansvelt, Lenderink & Co., The Netherlands. Dr. Gunther described how protein materials with unique whipping and foaming properties comparable to egg white can be produced by using an enzyme to treat a plant protein, such as soybean or wheat. Mansvelt described how protein whipping agents derived from soy or wheat can be used to aerate and improve the texture and consistency of a variety of products, including marshmallow, creams, and nougats.

#### Session H – Vegetable Proteins in Fermented Foods and Other Products

Tempeh, one of the world's oldest foods, also may be the first fast-food product.

Tempeh is a soybean-based fermented food product that has been part of the Indonesian diet for centuries. Tight, compact cakes of tempeh are deep fat fried for three to four minutes (or boiled for 10 minutes) just before serving, perhaps making it the world's first fast-food product, Dr. F.G. Winarno of the Bogor Agricultural University, Indonesia, explained.

Dr. Winarno described several traditional vegetable food proteins from Indonesia and the implications their use has for improving diets elsewhere. Indonesian studies have shown that fermented food products provide sizable amounts of Vitamin B-12, often deficient in other vegetarian diets, Dr. Winarno said. The fermentation process also partially inhibits formation of aflatoxins, poisonous substances sometimes present in crops such as peanuts, Dr. Winarno said.

The use of tempeh by millions of people on Java for centuries also provides considerable experience that can be used to evaluate the nutritional value of such foods, he said.

Fermented foods in Africa, mid-Asia, and the Middle East generally are similar to each other, but differ considerably from those developed in the Far East, Dr. Clifford Hesseltine, U.S. Department of Agriculture, said. Dr. Hesseltine has compiled files on more than 100 fermented food products from Africa, mid-Asia and the Middle East.

Dr. Danji Fukushima, Kikkoman Foods Inc., USA, described how modern fermentation technology and engineering are being adapted to produce shoyu and miso, foods originally developed more than 2,500 years ago in the Far East.

Hydrolyzed vegetable proteins (HVP) are produced primarily by major food processors to flavor their bouillons, soups, sauces, processed meats, fish and poultry products, Dr. H. Olsman, Unilever Research Laboratory, Vlaardingen, The Netherlands, told registrants during his talk on HVP.

#### Session I – Vegetable Proteins in Dairy Products

Dr. C.V. Morr, Clemson University, said technology must be improved if vegetable proteins are to become practical as ingredients in dairy products. One key will be producing vegetable proteins with characteristics compatible with those of traditional dairy products, Dr. Morr said.

Dr. W.A.B. Thomson of Ross Laboratories, USA, covered the use of soy protein to produce nutritional formulas for infants who are allergic to cow's milk. The session on dairy products will conclude Friday, the final day of the week-long conference.

In the dairy products area, Dr. C.W. Kolar, Ralston Purina Co., USA, said specially prepared soy proteins can replace milk protein in liquid and frozen coffee whiteners as well as in liquid and frozen whipped toppings for desserts.

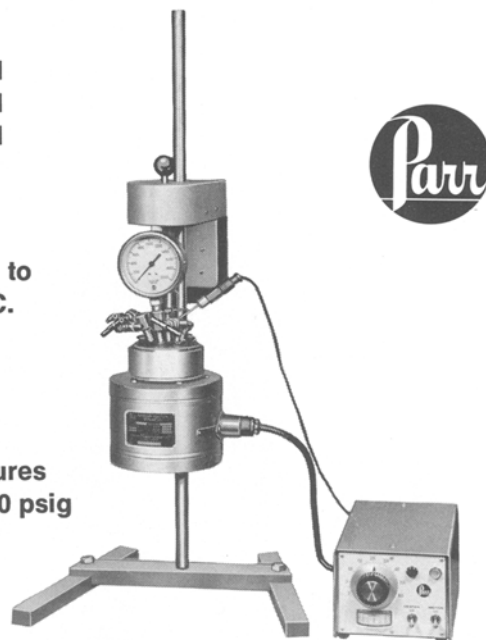
Dr. Dean Wilding, Kraft Inc., USA, reviewed soy protein use as a low-cost milk replacer and discussed how it has been used to replace up to half the dairy protein in ice cream with acceptance by consumers.

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#### Session J – Marketing Requirements and Experiences

In the marketing session, J.F. Casey, Central Soya International, Belgium, stressed the need to design products that will match consumers' needs and desires. W.A. Cummings, Cadbury Typhoo Ltd., England, outlined how to introduce a new product successfully. Dr. Thomas L. Welsh, Miles Laboratories Inc., described meat and dairy analogs that can be produced from soy protein to offer "the world's population a virtually untapped resource for its burgeoning food requirements."

B.J. McAuley, McAuley Edwards Ltd., England, emphasized the importance of technical understanding of these new foods to avoid marketing problems. John J. Anton, Ralston Purina Co., USA, discussed factors in worldwide marketing of vegetable protein products. Anton is president of the Food Protein Council, an American association of firms producing soy protein.

#### Session K – Advances in New Vegetable Proteins

Use of nonsoy vegetable food proteins also was reviewed in the concluding general session. James J. Spadaro, U.S. Department of Agriculture, USA, said cottonseed protein is used in bakery products and as an ingredient of "Incaparina," a product used to combat malnutrition in Latin America. Dr. E.W. Lusas, Texas A&M University, USA, said peanut protein has a relatively bland flavor compared to other vegetable protein sources, making it easier to incorporate in many foods. Dr. Ragnar Ohlson, AB Karlshamns Oljefabriker, Sweden, described work with rapeseed protein, a topic particularly important in Europe where rapeseed is a major oilseed crop. Dr. F. Sosulski, University of Saskatchewan, Canada, said the outlook for sunflower protein depends on the development of suitable varieties of sunflower and necessary technology. ●