

three agencies of the USDA—the Northern Utilization Research and Development Division, the Agricultural Research Service, the Foreign Agricultural Service—and the United Nations Children's Fund and the Soybean Council of America. This document deals authoritatively with these topics:

- (1) "Nutritional Deficiency Problems in Developing Areas of the World."
- (2) "World Marketing of Soybeans and Soybean Products."
- (3) "Research and Development on Soybean Foods."
- (4) "Nutritional and Biological Studies."
- (5) "Processing and Feeding Value of Fluid and Dry Soy Milks."
- (6) "Problems Involved in Increasing Worldwide Use of Soybean Products as Foods."

While the report is devoted mainly to soybean products in human foods, it deals also with other high-protein foods. It brings to date the latest findings with regard to processes and nutritional values.

The prospective world supply of important protein foods may be put, according to Dr. Sebrell, of Columbia University, into five classes of products: (1) animal, (2) marine, (3) cereal grains, (4) oilseed press cakes, and (5) legumes.

The following comments on current developments relating to animal products, marine products, and cereal grains are taken from Dr. Sebrell's paper on "World Aspects of Protein Malnutrition."

*"Animal versus vegetable protein.*—For many years, nutritionists tried to meet the intricacies of the problem by specifying not only a total amount of protein for an individual but also by saying that a certain proportion should be from animal sources. However, it is well known that a completely adequate protein supply can be obtained solely from vegetable sources if the supply of essential amino acids is carefully looked after.

*"Marine products, fish flour.*—The greatest possibility in this area lies in the production of a suitable fish flour which could be stored without refrigeration and with little odor and taste so that it would be suitable for mixing with other foods. The natural tendency of the industry is to try to convert the present fish fertilizers or animal food products to human use with a minimum change. Preliminary results in this direction have not been very successful in that the final product is of variable quality and may be of low biological value. The problems here appear to be largely economic and technical.

"A suitable product can be made, and has been made, that will meet the requirements for biological value, taste, color, and odor. Whether it can be produced at a price which will make it economically feasible is the question that remains to be solved. The chances appear to be good.

*"Cereal grains, incaparina and other low-cost, high-protein mixtures.*—The three cereal grains, rice, wheat, and corn, really constitute the foundation of the food supply of most of the world. Unfortunately the protein of these three cereal grains is deficient in one or more of the essential amino acids. Animal and marine protein foods cannot be made available in amounts sufficient to meet the need and at suitable prices. The most logical solution is a mixture of foods of vegetable sources or a mixture with a small amount of added animal protein. A large group of foodstuffs of relatively high protein value now largely wasted as human food immediately comes to mind. The