

## Summary of Discussions on Session A

### Vegetable Protein Nutrition

J.C. COWAN, Recorder, Bradley University, PO Box 3442, Peoria,  
IL 61604 USA

The primary concerns exemplified by questions and comments on Protein Nutrition involved safety, benefit, and their measurement. Procedures for measuring protein quality and particular methods that should be used for official purposes appear to be in considerable doubt. For adult humans, for example, soybean protein seems to be rated considerably higher than when tested for rats. For some, the pig, not the rat, appears to be the ideal animal for measuring protein quality. Most of these PER methods require days or weeks and are much too elaborate and time-consuming for processing control. Even Incap's use of a "rapid" assay for PER & N-Balance with dogs requires 7-14 days. The use of *tetrahymena* and chemical score sometimes called CPER appears promising, but it is beset with difficulties in amino acid analysis. In a collaborative study using five laboratories and sodium caseinate and durum wheat flour as samples, checks on digestibility were good, but difficulties were encountered in amino acid analysis for tryptophane, sulfur amino acids, and lysine. They varied enough to need more investigation. Additional information is being obtained, and some of it is being processed for publication. Below CPER of 0.6, with egg protein as reference, the method is not sensitive enough. Much more remains to be done.

One observer suggested that the testing of new combinations of old foods or food ingredients of established value might be desirable for a developed country, but not for a developing country. He considered it parachocical, or narrow minded. Consensus suggests that new fabricated products have to be tested adequately and to obtain better data than we have now. For example, use of methionine to fortify food for adults is not needed. Indeed, less soy protein is needed for humans in the final nutritious product than thought necessary. Safety tests need to be conducted with older people, stressed humans; and better correlations must be made between rats and human needs. Routine tests for destruction of hemagglutinins, or trypsin inhibitor do not appear necessary for soy flour, but they are definitely needed for some other sources of vegetable protein. Clinical tests in developing countries show that flatulence is too variable in infants to set limits on soy products for infants.

Investigations of a spun protein product show that no lysinoalanine was present. Supplementation of zinc in small amounts might be desirable according to some observers but not others. Supplementation with zinc and iron does

not appear to be necessary with soy flour. Both metals are shown to be available in properly treated flour. The phytic acid component can be reacted with calcium and other minerals so that they do become unavailable, but this condition is not easy to achieve except outside the soybean product or fabricated food. More research is needed to establish beyond any reasonable doubt that the minerals are still as available as they appear to be in the soybean products.

One nutritionist commented as follows: "After having listened to the many aspects of vegetable proteins dealt with until now, I see some trends developing in application and legislation that will prevent improvement of our diet for present and future needs.

"Novel proteins offer new possibilities for improving our current diet. Nutritionists should be able to make use of these possibilities to provide a *better* diet, now and in the future. I fear that many of the trends I see developing will result in *preservation* of the current dietary situation with all its negative aspects.

"All of us have learned to think of nutrition in terms of fulfilling minimal needs of nutrients. Now that we have learned to provide for ourselves — in the Western World — with all the food we need to fulfill these minima, we have discovered that this does not give optimum conditions for health and longevity. More and more advisory committees have published guidelines for modifications in our food pattern in order to avoid diseases of affluence such as atherosclerosis, diabetes, and obesity.

"What struck me, especially in the topics of this morning, was a tendency to *preserve* certain existing situations. The same governments whose health authorities on the one hand ask for changes in our foods, on the other hand tend to maintain existing norms for nutrient levels and composition of foods in their legislation on the use of novel protein sources.

"We expect from legislative authorities not only that they protect us from deterioration of the existing situation, but also that they support developments that *improve* the nutritional status of our populations.

"The consumer is becoming more and more aware of his nutritional needs, and is competent enough to decide for himself which products he requires to fulfill these needs. He therefore should have more freedom of choice, backed by legislation that allows for future developments."