Introduction to Round-Table Discussion on Soy Protein in Dairy-type Foods, Beverages, Confections, Dietary, and Other Foods

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Despite the intensity of current interest in soy proteins for the extension of meat and for the fortification of cereal-grain foods, we must recognize that these vegetable protein products also are being used to manufacture diverse processed food products, as illustrated by the title of this round-table discussion. We can expect substantial growth in this particular area of soy protein utilization, if the current pace of technological development continues and economic factors remain favorable. Obviously, the economic interplay among the several available protein sources is a vital factor in their utilization for food production.

This session provides a forum for the discussion of the use of soy protein products in specific foods such as: infant formulations and baby foods; coffee whiteners; whip toppings; cheese-like foods; frozen and chilled desserts; margarine and other spread products; beverages, including dietary or nutritional beverages of the carbonated, still, or milk-like varieties; confections, including candies; imitation nut meats and nut butters; whipping agents; and dietary foods, including calorie-reduced foods.

With reference to the foods to be discussed in this round-table, both the functional and nutritional qualities of their protein ingredients are of much concern. In a number of instances, these are indivisible qualities, for there is need for adequate function with good nutrition. It should be understood that the term "function" includes both the flavor and texture contributions of the protein ingredient to the food product. These qualities dictate the suitability of a given protein ingredient for use in a specific food item. Functional value and nutritional quality have been the subjects of some controversy. We expect that these concerns will be voiced in these proceedings.

The panelists of this round-table have been requested to present summary statements regarding specific or general aspects of the foods of concern to this discussion. No effort has been made to prevent duplication in these remarks, since varying viewpoints have been solicited. A frank exchange of ideas and viewpoints is fundamental to achieving the objectives of this Conference.

Soy Products in Other Applications

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INTRODUCTION

In an attempt to stay within the short time allotted, I would like to discuss briefly the various aspects of the use of soy products in whip toppings, coffee whiteners, and beverages.

Of the three classes of soy products currently available, soy flours, soy concentrates, and soy protein isolates, my comments will be directed primarily to the use of soy protein isolates in the three product categories. The uses of soy flours with ca. 50% protein and soy concentrates at 60 or 70% protein undoubtedly have been studied in these three product categories; but, because the problems are so large and numerous, no attempt will be made here to discuss them at this time.

The functional properties of isolates are especially important and appear to be more critical for these product applications than their applications in meat and bakery products. In my opinion, the functional properties are several times greater in their effect than they are for meat or in bakery products.

The important functional properties of soy protein isolates for coffee whiteners, whip toppings, and nutritional beverages are as follows: wetability, dispersibility and solubility, flavor (taste and aroma), pH, ash content, viscosity, color, nutritional considerations, protein-protein interaction, protein-lipid interaction, emulsifying characteristics, particle size, and uniformity of product. They are not listed in order of importance, however. There may be other functional properties, but certainly this is an impressive list which must be considered to achieve good performance from soy protein isolates. I will discuss briefly some of the functional properties as they apply to each of these product categories.

COFFEE WHITENERS

To the best of my knowledge, it is essential that a modified soy protein isolate be used in dry nondairy coffee whiteners. This modification may be either chemical or enzymatic. So called native or normal protein isolates containing 90% protein or more do not function with satisfaction in dry coffee whiteners. In liquid type nondairy coffee whiteners, at low protein levels, native soy isolates can function satisfactorily. There is considerably more stress put upon the dry coffee whitener than a liquid coffee whitener prepared either as a refrigerated product or as a sterile product. The use of a dry coffee whitener when added to coffee involves factors such as wetability, reconstitutability, whitening characteristics, and a whole host of other factors which are not as greatly stressed as in a liquid type coffee whitener. A suitable chemically modified soy protein isolate can function satisfactorily in coffee whiteners. Flavor, color, and freedom from feathering or precipitation can be obtained. Some coffees currently on the market have a lower pH than other coffees; this low pH in coffees accentuates the problems that pertain to dry or liquid coffee whiteners. It is obvious that these factors, as well as many others, need careful study before they can be of good application of soy protein isolates in this area.

WHIP TOPPINGS

Whip toppings in the dried state can be formulated using small amounts of soy protein isolates with other protein sources; but to date the best whip toppings are made by