

## Introduction to Round-Table Papers

*Four simultaneous Round-Table discussions on the third day of the Conference provided a time and place for questions and answers and the presentation of short papers or "statements." Although full transcripts of these Round-Table discussions are not included in these Proceedings, several of the short papers are presented within the next few pages. The discussions were all vigorous, spirited, and instructive. Major points covered in the four sessions are discussed in the summary paper of the Proceedings.*

## Soy Products in Composite Flours and Protein-Rich Foods

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Two aspects of my Institute's work are particularly relevant to today's discussion, and I will outline them briefly.

For some years we have been studying the uses of composite flour, i.e. blends of cereal, root, and oilseed flours which can be used partially or totally to replace wheat in products, such as bread. Our research has led us to conclude that soy flour is the most suitable oilseed flour which can be used as a protein supplement in a composite. Motivation for this work is that imports of wheat and flour into developing countries have risen by 10% a year for the past 15 years. The urban population similarly has increased, and bread is becoming an important food for townspeople. An overseas project is underway in Sri Lanka, which I reported at last year's Bogota meeting of ICC Study Group 32.

We also have studied the use of protein-rich foods for the relief of malnutrition in developing countries. In a Tropical Products Institute's paper (TPI:G73) on this, prepared for the Protein Advisory Group, United Nations, we show that, of 50 products studied in 36 countries, 24 had soy protein as the principal source of protein. Of the 17 that have ceased production or were irregular, only six

had soy, whereas of the 33 that had achieved some success, there were 18.

The reasons given for the failures are interesting: non-acceptance, bad publicity, high cost, poor local raw material, or competition with a donated food.

Though use of soy protein, rather than other protein supplements, may lead to a more acceptable product, whether bread or weaning food, few developing countries yet grow soybeans in worthwhile quantities, and few process the beans to an acceptable quality flour. In some developing countries with foreign exchange earnings from commodities, such as petroleum, it is possibly more worthwhile to spend the easily come-by foreign exchange importing a high grade soy flour than endeavoring to set up a soybean agroindustry. In most cases, however, it would be worthwhile for governments to stimulate soybean production. The economics must be studied carefully, giving consideration particularly to the value placed upon foreign exchange—this, after all, is the principal reason for having composite flour programs. If soybeans cannot yet be grown and foreign exchange is scarce, other sources of protein that can be grown should be studied, rather than continuing to import soy products indefinitely.

## Use of Soy Flours in Bakery Products

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### INTRODUCTION

I would like to discuss two aspects of the use of soy flour in bakery and pastry products: the use of soy flour as a source of protein and the use of soy flour as an additive.

There are two types of soy flour: the crude soy flour in which the natural enzymatic system has not been inactivated and the toasted soy flour in which the enzymatic system has been destroyed to improve the nutritional value. Each of these types can be produced as either full fat or defatted flour.

We also must differentiate between two types of doughs in which these soy flours can be used: leavened doughs and sweetened doughs.

### ENZYME ACTIVE AND INACTIVE SOY FLOURS

For the production of bread, for example, we advise the use of the enzyme active flours. These flours contain, among other enzymes, the lipooxygenase which enables the oxidation of the lipid-protein linkage and causes hydrolyzation, leading to a superior dough development.