

# SUSTAIN Notes

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## JeeVee Food Industries will produce Infant and Children's Food in India

by Venkatesha Iyengar, DSc, Ph.D.

Even in the satisfactorily breast-fed infants, there is a need for supplemental foods after the third month to meet growth and related development requirements. Similarly, young children deprived of reasonably adequate and balanced nutritious foods during the critical years of growth, may never regain some of their physical and mental potentials. This problem is especially acute in low to middle income families in many developing countries.

Solving problems of the kind alluded to in the preceding paragraph is by no means easy. Yet, given a sustainable practical approach, it should be possible to resolve. With this as background, the author of this article, an Indian native and presently a U.S. resident, is in the process of launching a project named JeeVee Food Industries to produce infant and children's food. The goal of the program is to produce nutritious foods that will be affordable for low to middle income families.

It is proposed to start this project purely as a private initiative and as a commercially viable institution. The purpose of this model project is to address the problem of child nutrition in a developing country through modification and fortification of locally produced cereals and legumes. The target groups are infants (4 to 12 months old) and young children (1 to 4 years old) of low to middle income groups.

The primary focus is on adequately supplementing the product with vitamins and biominerals and making the product palatable to the children. Use of ingredients familiar to the local community is helpful in addressing the cultural eating habits (societal factor) which are important considerations in countries such as India.

Moreover, this approach is helpful in reducing the cost of the final products, presently estimated to cost approximately one-half that of other popular brands.

Mysore, a modest city situated in Karnataka State in South India has been chosen as the location. Geographically, Mysore is readily accessible to an entire belt of rural communities and over 10 million people live within a radius of 200 km around this area. This city is also the home town of the project initiator, which has helped to overcome societal factors such as language and related cultural parameters.

The equipment required is rather simple and obtainable from Indian sources. Similarly, the raw materials for processing are obtainable in and around Mysore itself. Un-

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## WEANING FOODS: AN INCAP PERSPECTIVE

by Dr. Luiz G. Elias, Ph.D.

There are at least two technological approaches to improving nutritional status. One is based on food fortification, enrichment, and restoration technologies (for cereal, leguminous foods, tubers, fruits) to meet specific nutrient deficiencies in the diet. The other is related to the development of highly nutritious food products that contain as many as possible of the nutrients needed to fulfill specific needs. The latter approach may be applied if the food product is a weaning food, whereas the purpose of the former is to provide a variety of improved nutritious food products that pay more attention to the nutrients lacking in the basic diet. This article will specifically consider the development of weaning foods.

In developing countries, weaning foods were developed as a source of nutrients for infants, mainly protein and calories, for infant feeding for families who could not afford to have milk in their diets. The first low-cost vegetable protein mixture used as a weaning food was developed and introduced by INCAP thirty years ago and was named "INCAPARINA" (INCAP. flour). Later, several INCAPARINA-type products were introduced in Latin America, India, Africa, and other parts of the world.

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SUSTAIN provides technical assistance to food companies in developing countries. U.S. food companies provide information, short-term consultants, and training. Information is given at no charge. If a consultant is sent, the requesting company only pays in-country expenses. International travel and the consultant's salary are paid by SUSTAIN and the U.S. company responding to the request. SUSTAIN is managed by the National Cooperative Business Association (NCBA) under a cooperative agreement with the U.S. Agency for International Development (USAID).

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Companies represented on the Steering Committee include McCormick & Co. (Chair); African Agriculture Systems, Inc.; Beatrice Co.; Campbell Soup Co.; General Mills, Inc.; Gerber Products Co.; H.J. Heinz Co.; Hershey Food Corp.; Kraft, Inc.; Pepsico, Inc.; JFW Enterprises; Results Technology (LOL).

Other organizations include USAID, American Association of Cereal Chemists, Carol James Communications, NCBA, TCR Services.

The views expressed in SUSTAIN NOTES are not necessarily those of SUSTAIN or USAID.

Editor: Elizabeth Turner

### SUSTAIN's ROLE

A major component of SUSTAIN is providing technical assistance to help build and improve weaning and fortified food projects in the developing world. Over the past year, SUSTAIN sent consultants to Sri Lanka and India to provide technical advice on weaning foods technologies and plant design. Preliminary assessments have also been completed in Guatemala and Cape Verde. Because weaning and fortified foods are so important to the health and nutrition of children in the developing world, they will remain a key focus of the program.



## INCAP Perspective

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Nutritionally improved weaning foods can be prepared both at home and industrially. However, the priority must be the target population in most need, and the socioeconomic and educational characteristics of the target population must be taken into consideration. These characteristics are related to the events occurring in the food chain, from production to consumption. Dietary habits, food preparation and consumption at home, general education, national industrial capacity in food processing, marketing systems, and socioeconomic capacity must also be taken into account.

### NUTRITIONAL AND TECHNOLOGICAL PROPERTIES

In general, a higher nutrient density is recommended for weaning foods since they are consumed in small amounts and are intended for use as a supplemental or, at times, only source of food. Although there is no specific standard for weaning foods, milk has been proposed as a model. Protein content may vary from 16 to 26 percent with a high biological quality and must have an adequate caloric content. The addition of minerals and vitamins to guarantee that these micronutrients are present in the normal diet is recommended.

Nutritional formulation of the product is usually carried out by using protein complementation technology, which consists of combining two or more protein sources in different proportions. The different biological responses depend on the amino acid content of each of the components. The most adequate response from the nutritional point of view will occur when the mixture shows a higher protein value than each of the individual components. In general, weaning foods in developing countries are based on cereal grains, initially, followed by legumes and small amounts of animal products and green vegetables. These are important considerations in the formulation of these products. Cereal grains and their by-products, oil seeds, and legume foods are the raw materials used in the formulation. Most important is the possibility of including small amounts of animal products, such as milk, as an ingredient to add more flavor and nutrition.

The weaning food must also fulfill certain technological requirements. It must also be formulated according to the dietary habits of the target group and the raw material used must be locally available as much

as possible. Processing technology should also be carefully selected, depending on the industrial capacity of the country in which it will be produced. This can vary from a simple mixing operation of the ingredients to other sophisticated processing technology such as spray drying, drum-drying, or extrusion cooking. Physical characteristics in terms of texture, flavor, and different forms of preparation and consumption must also be taken into consideration.

Storage ability studies are very important because of tropical conditions prevailing in these countries. Furthermore, the addition of antioxidants and the use of adequate packaging materials are necessary to keep the product in good condition. As in any other industrial food processing activity, nutritional evaluation and acceptability tests, food safety, and quality control are very important. In the case of weaning food acceptability, it is important to consider the influence of the mother in the final decision. Of course, adequate sanitary conditions are mandatory.

### MARKETING

On the commercial side, the product should not be advertised as food for the poor. An image of prestige should be created for the product among other similar products. Yet, the product must be economically competitive and affordable for the target population. In this respect, different strategies to reach the population most in need have been used. In some cases, the government produces or buys the product from a private industry for distribution in their social programs. In other instances, the products are manufactured and commercialized by private industry. Experience has shown that this last approach seems to be the most appropriate if the product is going to remain in the market.

Finally, the development of nutritional agro-industries may help improve food and nutritional security, generate income to improve the socioeconomic situation, and stimulate a better utilization of indigenous food resources. It also will help develop food and agricultural technologies and strengthen the relationship between agriculture and food industry. It is, however, important to pay more attention to nutritional education programs, adequate marketing strategies, and competitive prices if the products are to succeed.

### FUTURE CHALLENGES

Future challenges to this area are the following: development of technologies

for local products, availability of raw materials through local agricultural production, establishment of systems of food safety and quality control including the final products, improvement of local food industry capacity, and ensuring food product affordability for the intended target groups.

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### JeeVee Food Industries

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til now, with the exception of the vitamin and mineral mix (courtesy of Hoffman-La Roche, Nutley, NJ), the remaining ingredients were purchased locally. Further, the Central Food Technology Research Institute (CFTRI) is located in Mysore and has made its expertise on developing weaning foods available to the project. The products are in the form of dry powders and are essentially pre-cooked. They simply need to be stirred in boiling water for a minute or two to prepare the slurry for feeding. Presently, two dry cereal-products have been developed; a rice and milk powder based combination (for the 4 to 12 months old) and a mixed cereal-milk powder-legume preparation (for 1 to 4 year olds). The products have been developed with strict attention to cost, government regulations, and nutrition by adequately supplementing with vitamins and biominerals. Production (100 kg trial batches) has been tested with the help of CFTRI using the institute's facilities. Most of the plant design work has been completed and the construction work is scheduled to start in Fall 1991.

SUSTAIN was requested by JeeVee Foods to send a technical consultant for an overall review of the technical soundness of the project. In response, Mr. Don Maxwell (Food Technologies, Inc. in Minnetonka, MN), an expert in food processing technology, volunteered his services to the project. SUSTAIN coordinated Mr. Maxwell's visit and covered the costs of international travel. He met with scientific and technical staff members of JeeVee Foods, held extensive discussions on processing technology and design features, examined test batches, and also contributed to cost analysis.

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