

ENERGY FOOD

(NEW FORMULATION)

1. Introduction:

The problem of malnutrition, with all its implications to public health and natural development is probably the greatest challenge for planners, scientists and administrators of India. Any attempt to meet this challenge must be based on scientific foundations and on a clear appreciation of the realities and constraints in the existing situations.

The pre-school years of a child are critical for growth and development with more rapid and frequent transitions occurring in dietary patterns than in other age groups. The prominent nutritional problem in the country that currently accounts for significant impairment of the country's human resources is Protein-Energy Malnutrition, which leads to physical and mental retardation and under development of children. The solution to this problem could be achieved through proper use of inexpensive traditional cereal-legume-based diets within the economic reach of poor families and within the country's resources. A hurdle in feeding cereal-legume based diets to very young children starts from the low calorie density of these diets. This could be alleviated by the reduction of viscosity of cooked cereal foods. The calorie density could be increased by the addition of malted cereals as they provide the pre-digestive enzymes such as amylase, protease and lipase.

India's rural population is subject to three common forms of nutritional deprivation:

1. Inadequacy of food intake among the poorer segment leading to calorie deficiency
2. The extra nutritional need of infants and preschool children
3. Deficiency of specific micronutrients such as Vitamin A and iron

Although cereal-legume blends would provide the requirement of both proteins and calorie to preschool children, they pose a number of hurdles, in large-scale programmes, which include raw material ingredients that have to be cooked to be acceptable, the distribution centers should be equipped with hygienic kitchens. The processing and preparation times are high. Keeping these factors in view CFTRI has developed 'Energy Food' which is ready to eat and does not need cooking at the point of distribution. The major ingredients of the energy food contain the pre-gelatinized starch; the food absorbs a large quantity of water and increases its bulk. This 'High Bulk' limits the nutrient content of the food per unit feed and is a major constraint for intake of the requisite quantity of energy and protein by the younger children and toddlers. This is more so in the case of 'second' and 'third degree' malnourished children, who require about 600 calories and 200 g protein per day in the form of food supplements. Hence it was felt desirable to reduce the 'Dietary Bulk' of the energy food by textural modifications and to improve its 'Nutrient Density' by simple methods, without involving, additional processing and which may eventually result in improving the nutritional quality of the product. Amylase-rich energy food containing malted cereals is a supplementary food in this direction. The supplementary food is based on cereal (wheat), legumes (Bengal gram dhal) and defatted protein-rich oilseed meals. The product formulated is found to be useful as a ready to use weaning/nutrition food for children and pregnant women.

The raw materials are precleaned, roasted, cooled, ground to a powder and mixed with sugar. The mixture is fortified with vitamins and minerals. The Energy food shall provide 15g of protein and 360 kcal of energy per 100 g serving. Energy food is a ready-to-eat formulation and is distributed to the beneficiaries in powder form. The beneficiaries, namely mothers and

children, are advised to mix the food in water and consume the same in the form of gruel or laddu.

The 'Energy Food' is an almost ready to eat food and does not need extensive cooking at the point of distribution and consumption. Production of 'Energy Food', which is primarily designed of the purpose of supplementation or nutritional needs of the undernourished or malnourished children, is also popularized as a consumer item.

2. Raw material:

Wheat, Bengal gram dhal, defatted soy flour, sugar, vitamins, minerals and malted cereals.

All the above items are easily available from local market.

3. Plant and machinery:

Principal equipments: Single trunk elevator, grain grader cum seed cleaner, fluidized bed roaster, cooler, impact pulveriser, storage bins, gram toaster, and ribbon mixture.

a. Land and land development	4000 Sq. M
b. Building and civil construction	
c. Plant and machinery	55,00,000

4. Production capacity:

Installed capacity:	4 MT / shift /day
Working:	300 days in 2 shifts
Optimum capacity utilization:	90%
Annual production envisaged:	2160 MT

5. Technology /Manufacturing process – Availability

The process consists mainly of pre-cleaning all the raw materials, roasting under optimal conditions, powdering them to the required mesh size, mixing of all ingredients and packing.