Original Research Paper

Volume - 7 | Issue - 6 | June - 2017 | ISSN - 2249-555X | IF : 4.894 | IC Value : 79.96

Home Science

Soy fortification of traditional Indian foods like Sattu and Vermicelli for improving the nutritional status of low income group population.

Sarika Tyagi PhD Scholar, Department of Home Science, University of Delhi.

Shuchi Gupta Asst. Teacher, Arya Kanya Pathshala Roorkee.

ABSTRACT Undernutrition is the major nutritional problem of developing countries like India affecting millions of preschool children globally. To address the problem of undernutrition, two Indian food items namely Sattu and Vermicelli were fortified with soyabean. Standardization of recipes was done by changing the proportion of ingredients used in food products and the most acceptable proportion was finalized through sensory evaluation. Microbial analysis was done to check the shelf life of developed fortified food products. Soy fortified Sattu and vermicelli were found acceptable and were graded above good for sensory characteristics. Both the food products had increased macro and micro nutrient composition when compared with the original food products without major change in cost. Thus soy fortification can improve the nutritive value of traditional Indian foods. Nutrition interventions like food fortification with soyabean can proof a sustainable and cost effective method of improving the nutritional status of low income group population.

KEYWORDS : Undernutrition, Soyabean, fortification, Sattu, Vermicelli

Introduction: Nutrition is an integral component of health and well being of all individuals. Good nutrition enables one to lead a socially and economically active life. Undernutrition on the other hand adversely affects morbidity, life expectancy and mortality. The burden of undernutrition is enormous, especially for children. Globally, one quarter of children are stunted, meaning they are not getting enough nutrients to reach their full mental and physical potential. At any given time, around 52 million children are too thin for their height (known as wasting), resulting from rapid weight loss, often due to illness or a severe food insecurity. [1] Undernutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and contributes to delayed recovery. In addition, the interaction between undernutrition and infection can create a potentially lethal cycle of worsening illness and deteriorating nutritional status. [2]

Address the direct causes of undernutrition means ensuring i) the quality and quantity of food a person eats, and ii) their overall good health, and a healthy environment. [1] Nutrition interventions such as nutrient supplementation (a large dose of micronutrient as a medical supplement) is an effective short term strategy and can proof effective in providing immediate relief, but there is concern that this approach is not sustainable in long time. Food fortification is a more cost effective and sustainable solution which can plays a major role in improving diet and meeting the nutritional needs of the population. It does not need a change in dietary pattern of the population and can work on a continuous basis. The identified vehicle should be consumed throughout the year by the majority of the population. To meet the needs, ideal food supplements should be low in cost, capable of being produced in volume, easily transported and stored, capable of simple preparation and acceptable to taste. Protein cereal grains are ideal food supplements for various nutrition intervention programme. [3]

Soyabean is one of the nature's wonderful nutritional gift. It is one of the very few plants those provide a high quality protein with minimum saturated fat. Soy can added to cereals because it greatly improves their protein content and quality. Soy fortified foods have been formulated to resemble as much as possible the appearance and taste of similar unfortified foods. The fortified grain products carry an amino acid profile and utilizable protein content comparable to that of meat and milk and yet are priced at only a fraction of what the animal protein would cost in developing countries. The introduction of such fortified grain food products can brought a new dimension to supplementary feeding programmes. Hence the objective of this study is soy fortification of two Indian recepies (sattu and Vermicelli) and after standardization of recepies, to check the acceptability, nutrient content and shelf life of the developed fortified food products.

Methods: Fortified food products were developed at Food and nutrition laboratory of GDM PG college, Modinagar (U.P.). Ingredients used were brought from the local market of Modinagar. Method used for development of fortified food products is as follows:

Soy Fortification of Barley based Sattu

Ingredients: Whole grains of Barley- 100gm
Whole grains of Soybean- 100gm
Whole grain of Bengal gram- 100gm

Method:
Clean whole grains of soybean, Barley and Bengal gram.

Conditioning of each ingredients to 30% moisture level.

Sealed in a low density polythene (LDPE) bags and stored under refrigerated conditions for 48 hours.

Samples roasted in hot sand bath at 180^{0}C for 10-12 minutes.

Dehulling/ dehusking of each ingredient.

Dehulled samples mixed in selected proportion of soybean, Barley and Bengal gram respectively, 10: 20: 70

Samples prepared were ground and powdered to pass through sieve.

Packaging of sattu in LDPE bags.

Soy Fortification of Vermicelli

Ingredients:

Soybean flour - 10gm
Refined Wheat Flour- 90gm

Method:

Mix soy flour to refined wheat flourin selected proportion.

Knead the flour by adding little water, it should be hard.

Put the dough in the extrusion machine and move the handle.

Vermicelli comes out of the machine.

Take Vermicelli and put in sun to dry.

Packaging of Vermicelli in LDPE bags.

Standardization of recipes: The recipes of fortified food products was standardized by doing 3 trials changing the proportion of each ingredient. For Sattu the proportion of Soybean, Barley and Bengal gram was used as 30:10:60, 10: 20:60 and 25:35:40 respectively. Vermicelli was prepared using the proportion of Soyabean and Refined wheat flour as 5:95, 10:90 and 30:70 respectively.

Microbial analysis of food products: To check the shelf life of developed food products, microbial analysis was done using the spread plate method on samples kept under appropriate storing conditions.

Sensory evaluation of food products: Developed food products were evaluated for sensory characteristics such as taste, flavor, texture and appearance using hedonic scale method. Evaluation was done by college teachers and preschool children.

Nutritive value of fortified food products was calculated by calculating the nutritive value of raw ingredients used in food products using the handbook, "Nutritive value of Indian Foods" NIN ICMR and compared with the nutritive value of original food products**.**

Cost analysis of fortified food products as done and compared with the cost of original food products. Labeling of fortified food products was done according the labeling laws and all the required information such as net amount of ingredients used, nutritional information per 100gm, date of manufacturing etc. Packaging of food products was done using low density poly ethylene packages.

Results : Sattu prepared with the proportion of soyabean, barley and Bengal gram as 10: 20:70 and vermicelli prepared with the proportion of Soyabean and Refined wheat flour as 30:70 respectively were found most acceptable. Sensory evaluation revealed that fortified food

products were graded above good for all four characteristics (taste, flavour, texture and appearance). Analysis of nutritive value showed the increment of 9.6 Kcal, 3.16 gm protein, 1.77gm fat, 41.6 µg vitamin A and 80 mg calcium/ 100 gm of fortified Sattu and 21.2 Kcal, 11.96 gm protein, 6.44 gm fat, 145 µg vitamin A, 66.1 mg calcium and 3 mg iron/ 100 gm of fortified vermicelli when compared with the original food product. Cost analysis of fortified food products showed very minimum difference when compared with the original food products. For testing the shelf life of products through microbial analysis, sattu was tested for 2 months and vermicelli for 1 month and no microbial growth was observed in food products during the testing period.

Thus the addition of soy flour improves the protein content without altering the taste of food products. Fortified food products contain not only the increased amount of macronutrient but also micronutrients such as iron, zinc and vitamins.[4] Food fortification with soyabean can proof one of the most effective method to improve health and prevent nutritional deficiencies among low income group population.

References:

1. Nutrition specific Programming; World Food Programme https://www.wfp.org/nutrition/direct-causes retrived on April 25, 2017.
2. Undernutrition contributes to nearly half of all deaths in children under 5 and is widespread in Asia and Africa; UNICEF Data: Monitoring the Situation of Children and Women; https://data.unicef.org/topic/nutrition/malnutrition/# retrived on April 15, 2017.
3. Shaughnessy DE; Nutrition intervention with protein foods. Proceedings of the world congress on vegetable protein utilization in human.
4. Soy-fortified cornmeal commodity fact sheet; https://www.usaid.gov/what-we-do/agriculture-and-food-security/food-assistance/resources/soy-fortified-cornmeal-commodity
5. Ghatge NS; Impact of soy ladoo supplementation on nutritional status of malnourished preschool children; Food Science Research Journal; Volume 3 | Issue 1 | April, 2012| 47-51
6. Kumar V, Rani A, Chauhan GS; Nutritional value of Soyabean; The Soybean: Botany, Production and Uses; https://books.google.co.in/books?id=EAhJUyAtsMoC&pg=PA370&lpg=PA370&dq retried on April 20, 2017
7. Rakashi K; Nutritional and health benefits of soybeans and micro - enterprise opportunities; http://www.mercosoja2011.com.ar/site/wp-content/imagenes/RAKASI-Kavita.pdf retrived on April 25, 2017
8. "Nutritive value of Indian Foods" National Institute of nutrition, ICMR; 2004