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Pratistha Srivastava
Department of Food Technology, ITM, University, Gwalior, Madhya Pradesh, India

Pratistha Srivastava
Ehelind College of home science, Sam Higginbottom University of Agriculture Technology and Science, Allahabad, Uttar Pradesh, India

Pratistha Srivastava
Department of Food Technology, ITM, University, Gwalior, Madhya Pradesh, India

Correspondence
Pratistha Srivastava
Department of Food Technology, ITM, University, Gwalior, Madhya Pradesh, India

Development the nutrimix powder and its quality analysis

Pratistha Srivastava, Shipra Singh and Hradesh Rajput

Abstract
Nutri–mix is an instant food type that can be a good supplement of essential vitamins and minerals that contribute to recommended daily intake. Ragi and oats are commonly found in almost all areas in India, and they can be used as good replacements for traditional ingredients in nutri–mix, without altering their nutritional content. Under nutrition in children is a widespread health problem in our country. ICDS that addresses the problem of malnutrition has been unsuccessful even after three decades of implementation. Nutrimix - a nutritious supplementary food given for malnourished children is not utilized due to monotony in its preparation. Hence an attempt was made to formulate nutrimix. The nutrimix was prepared using soy,chia seeds, jeggary, and different levels of oats i.e., 30%,35%,40%, and 45% respectively and four different levels of soyabean i.e., 30%,25%,20%, and 15% respectively. There are four treatment combinations used in the study i.e. T1,T2,T3,T4 were replicate three times. The chemical composition observed as carbohydrates content ranges from 63.71, protein 16.66, fat 13.13, fiber 11.70, and moisture 6.99 respectively. Therefore, treatment 1 was selected as the best ingredient combination for nutri-mix as it showed significantly higher sensory and chemical attributes among others.

Keywords: Nutrimix powder, nutrional quality

Introduction
Appetite is a worldwide proportion of sustenance hardship, while ailing health is the physiological result of yearning. The nutrimix planned, is wealthy in fiber and phytochemicals. Fiber is only nourishment gotten from plant cells which is impervious to hydrolysis or assimilation by people. It is a kind of starch which helps detoxifying the body. High fibre diet is highly recommended for diabetes as it gives feeling of satiety even when low amount of food is consumed. This is due to decreased gastric emptying and there is a decrease in glucose absorption and the level of blood sugar does not increase rapidly. Fibre is equally effective in controlling lipid levels when it combines with cholesterol and prevents it from being absorbed. Fibre binds to bile acid and cholesterol and help in lowering fat levels [1].
Nutrimix powder is formulated as a food supplement for adults, children. Nutrimix is a complete mineral,vitamin and fibre rich supplement that can properly balance the mineral and vitamin levels of plain grains or can be used to provide supplemental levels of minerals, fibres and vitamins to an already balanced a 100% for age diet. It contains organic minerals and unique vitamin sources that provide a mineral and vitamin balance helping to support normal blood composition, immune function and overall performance. The Nutrimix powder which has been formulated comprises of Oats, Soybean, Ragi, Chia seeds, Jaggery.
According to International Baby Food Action Network (IBFAN) Asia **"**Lentils and beans are of various kinds – lentil, mung bean, chickpea, bengal gram, pigeon pea, cow pea, soya bean, kidney beans, etc. Though they are not as easily absorbed by the body, they form an essential source of proteins and nutrients, particularly for vegetarians. Some beans may need to be soaked for some time, and then washed before using. The green beans of lentils, especially bean varieties, are used as vegetables. In many cases, the leaves can also be used for cooking. is used to make a milk substitute which can be curdled to give tofu, or set as yoghurt. It forms a very important part of East and Southeast Asian food culture. Many baby food manufacturers promote soya milk as a substitute for infant formula. It is important to remember that the only milk a child under two years needs is breast milk."
Ragi (*Eleusine coracana*), commonly known as finger millet, is widely cultivated millet in the world. It is the 6th grown cereal in India and used as staple food across the country along with central and eastern Africa.1 In recent decades, ragi has been in focus due to its nutritional strength and high amount of dietary fiber (e.g. Water soluble fibers like arabinoxylans while

water insoluble fibers like lignin, cellulose, hemi-cellulose) and minerals (calcium, phosphorous and iron), essential amino acids and polyphenols content. 1, 2 High fiber compounds have various characteristics which affect the foods functional and physiological properties. Fibers from a variety of plant sources have been previously incorporated in processed food products to enhance the color, texture and aroma with reduced calories of the prepared product. Due to those properties, ragi is used in the development and preparation of infant, geriatric and health foods.4 It is widely consumed in the various forms like puddings, porridges, flours and rotis. [5]

Nutritionally, its importance is well recognized because of its high content of calcium (0.38%), dietary fiber (18%) and phenolic compounds (0.3– 3%). The iodine content is said to be highest among all the food grains. Ragi has best quality protein along with the presence of essential amino acids, vitamin A, vitamin B and phosphorus [2]. Thus ragi is a good source of diet for growing children, expecting women's, old age people and patients. Ragi is considered to be ideal food for diabetic individuals also due to its low sugar content and slow release of glucose/sugar in the body [3, 4].

Oats are a rich source of fiber, both soluble and insoluble, which helps in regulating bowel movements and hence prevents constipation. The antioxidants present in oats are beneficial for heart disease and the dietary fibers help lower the bad cholesterol (LDL) without affecting the good cholesterol (HDL).

Soybeans have a wealth of benefits, including their ability to improve the metabolism, help in healthy weight gain, protect heart health, defend against cancer, and reduce the effects of menopause. They improve digestion, promote bone health, protect against birth defects, increase circulation, decrease the risk of diabetes, and generally tone up the body.

Chia seeds are tiny black seeds from the plant *Salvia hispanica*, which is related to the mint. Chia seeds contain a decent amount of protein. They also have a good balance of essential amino acids, so your body should be able to make use of their protein content.

Jaggery: The important benefits of jaggery include its ability to cleanse your body, act as a digestive agent, sweeten your food in a healthy manner, and provide good amounts of minerals. It activates digestive enzymes and functions like acetic acid in the stomach, thus speeding up digestion and smoothening the process, ultimately reducing strain on the intestines and the digestive tract.

Materials and Methods

In view of the fact that diets with high fibre and high polyphenol content are good for childrens, the current study was undertaken to develop a nutrimix cereals, condiments etc. for use as supplement for school going children.

Raw material

All grains were procured from the local market of Gwalior M.P. All the chemicals used in the present study were purchased from S.D. Fine Chemicals Ltd. Mumbai, India.

Methodology

- **Step 1:** Take Ddifferent amount of oats and grind it.
- **Step 2:** Now soybean weighing grinds it too.
- **Step 3:** Lastly take ragi 20 gm and chia seeds 10gm and grinds them both separately.
- **Step 4:** After grinding all the ingredients separately mix them with 10gm jaggery
- **Step 5:** Now take the weight of the mixture with weighing balance
- **Step 6:** After noting the weight, roast the mixture.
- **Step 7:** Finally fill the mixture after roasting into an air tight container

Proximate Composition

At first analysis carried out for raw fruits and subsequently for processed products. Oven drying method described by the Association of Official Analytical Chemists [5] was used for determination of moisture content by weighing in crucible and drying in oven at 105^0C, until a constant weight was obtained. The Kjeldah method was used to determine the protein content [6]. Carbohydrate was determined by chemical method [5]. Crude fibre was determined by chemical method [5]. Fat by [5]. All determinations were done in triplicate.

Statistical analysis

Statistical analysis all the experiments were conducted in triplicate and the mean and standard deviation were calculated using MS Excel software. The data were subjected to one-way analysis of variance (ANOVA).

Result and Discussion

Chemical Analysis

The proximate analyses of nutrimix powder play a crucial role in assessing its nutritional significance (<0.05). The chemical composition of nutimix powder for their moisture content, crude protein, Fat, total carbohydrates and crude fiber are shown in Table 1. The results of the proximate composition (Table 1) revealed that nutrimix powder have high amounts of protein, moisture, total carbohydrates, fat and crude fiber (16.66%, 6.99% 63.71%, 13.13%, and 11.70%, respectively [7].

Table 1: Chemical composition of nutrimix powder (n=3)

Parameters	Nutrimix powder
Moisture (%)	6.99±4.27
Protein (%)	16.66±12.95
Fat (%)	13.13±12.14
Carbohydrates (%)	63.71±27.53
Fiber (%)	11.70±13.37

Mean values in the same column followed by different superscripts differ significantly ($P < 0.05$).

The values in brackets are the standard deviation from the mean values.

It could be observed that nutimix powder are rich in protein and fiber. [8]**.** These results are in agreement with these stated by [9, 10, 11]. However, from the aforementioned obtained data, it could be clearly concluded that nutrimix powder contained considerable contents of components possessing the nutritional property of nutrimix. That mean. The high fiber content of nutimix product is believed to aid in the prevention of certain disease. Cereal and cereal products have been mentioned in connection with allergies celiac disease, obesity, dental career, cancer atherosclerosis goiter and diverticulosis. The review discusses the possible role of cereal in the prevention or cause of these health problems [8]**.**

Conclusion

Billions of people in the world today suffer from micronutrient deficiencies caused largely by deficiency of protein and minerals. Widespread malnutrition specially

among children is of great concern as it affect child growth, cognitive development and resistance to infection. The most severe problems of malnutrition usually more prevalent amongst resource poor, food insecure and vulnerable households but lack of diversity in diet resulted in substantial rise in numbers of micronutrient deficient in middle income and higher income families as well. Protein and minerals deficiency is the most common and widespread nutritional disorder in the world, and is a public health problem in both industrialised and non industrialized countries. Food fortification is the most cost effective, sustainable and optimal approach in the battle against micronutrient deficiency. The best combination of ingredients for the preparation of nutri-mix is 30% of oats flour, 30% soybean powder, 20% ragi and 10% chea seeds. It contained 16.66% of Protein, 11.70% 0f Fibre, 1.133% of Fat, 63.71% of carbohydrates and 6.99% of Moisture.

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