

Research Paper

Value Addition in Sorghum cut- chips using different levels of Soyabean flour

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ABSTRACT

The nutritional contribution of sorghum towards meeting daily requirements rank next to wheat and rice. However, like other cereals, sorghum protein is deficient in lysine. To overcome this drawback blending of sorghum with legume like soyabean would probably balance the amino acid composition. Therefore, a study was planned to add the nutritive value in sorghum cut- chips using different levels of sorghum flour.

The cut-chips were prepared by adding soyabean flour at 0, 10, 20, 30 per cent level. The nutritive value revealed that the protein content of the product was increased whereas carbohydrate level of soyabean flour. However, the energy value of the product did not differ significantly with addition of soyabean flour in the product. The mean comparison of the organoleptic attributes revealed that for appearance, texture and taste of cut- chips enhanced with 30 per cent soyabean flour were the best for mouth feel and overall acceptability also the cut-chips enhanced with 30 per cent soyabean flour was scored highest. On the basis of sensory quality it can be concluded that the cut chips prepared with the addition of 30 per cent soyabean flour was the best. Therefore, it is suggested to incorporate soyabean flour in common food stuff to cope up with protein malnutrition.

Keywords: Sorghum, Soyabean and value addition.

Introduction

Sorghum is consumed in different geographical areas such as in India sorghum is mainly consumed in the form of unleavened pancake (Bhakari). However, cut chip several indigenous process recipes food such as Bhatwadi, Roti, Papadi is consumed in the semi arid tropics. Sorghum also used as Ugali in Africa, South of Sahara, Kisra in Sudan and semi arid Africa Porridge and Bogode in Botswana, Sankati or Mudda in Southern India, Ogi and Tuwo type of porridge in Nigeria and Injera in Ethiopia. The protein content of the grain varies according to varieties of sorghum and growing conditions. The percentage of different protein fractions to the total protein of sorghum grown in India is albumin 5, globulin 6.3, prolamine 46.4 and glutelin 30.4. Amino acid analyses of various protein fractions show that there is better distribution of all essential amino acid in the globulins than in prolamine. Sorghum protein is superior to wheat protein in biological value and digestibility.

Soyabean cultivation has taken a big 'strike' in

the country during the past few years. Major productions of India are M.P. (84 per cent) M.S. (8 per cent) Rajasthan (6 per cent) and U.P. (1 per cent). In Vidarbha of M.S. the crop is becoming popular due to higher yield and better remunerative prices. Soyabean however, has some unacceptable qualities such as beany flour, anti nutritional factor and poor cooking quality. Due to this reason major portion of production goes for oil extraction and the by product, soyabean meal is used as animal feed.

Protein of soyabean yields all the essential amino acid in adequate amount except for methionine and cystine which are deficient. Soyabean rich in lysine and can be used to supplement a staple diet. Use of soyabean for food purposes it is essential to developed food products. One of the major constrain in availability of soyabean food is lack of simple low cost technologies of small industry level to prepared products similar to traditional foods.

In country like India more than 50 per cent of the population is below the poverty line, many of them suffer from nutrition deficiency diseases like proteins, vitamins and minerals under nutrition. The importance of protein can be realized from the simple fact that its deficiency not only retards physical growth but also affect the proper development of brain. Because of poverty and religious belief the majority of the population in India depends mainly upon plant proteins cereal and legume. They cannot consume protein rich food like eggs, milk, meat, etc. Therefore, emphasis should be given on cereal and pulses.

The nutritional contribution of sorghum towards meeting daily requirements ranks next to wheat and rice, however like other cereal, sorghum protein are deficient in lysine. In addition they have a high level of leusine causing imbalance in amino acid profile and lowering in their nutrition quality. The grain sorghum also contain phenolic compound namely tannins which decreases protein utilization.

To overcome these drawbacks at least, some extent numerous investigators recently proposed germination and fermentation, as a way to improve cereal protein quality. These proteins are rich in lysine. Therefore, blending of sorghum with legume would probably balance the amino acid composition. Sorghum based diet with soyabean seems to be quite promising in bridging protein calorie gap.

Therefore, the study was planned with the objectives to developed a nutritious recipes prepared with the addition soyabean flour to sorghum in different levels, to standardize the cut chips prepared with sorghum and soya flour and to judge the quality of the product by conducting sensory evaluation.

Methodology

The sorghum and soyabean were procured from local market of Akola. The proximate composition of Sorghum and Soyabean was determined in Biochemistry laboratory and product preparation, sensory evaluation was undertaken in Nutrition laboratory of Smt. Radhadevi Goenka College for women, Akola.

The proximate composition of Sorghum and Soyabean flour for moisture, ash, crude protein, lipid and carbohydrates was determined by AOAC method. The product Cut chips fortified with Soyabean flour was selected for standardization and sensory evaluation. The product Cut chips was prepared with different blends of Sorghum and Soyabean flour, the process was repeated till a satisfactory product was obtained in order to ensure standard product. The product was then subjected to sensory evaluation by the panel of 10 judges. Ready coded Cut chips were served one after another and subjected to score the sample. The judges were asked to avoid discussion during sensory evaluation. The experiment was conducted for three consecutive days. The significant differences between Sorghum and Soyabean Cut chips at different levels were determined by fishers "F" Test. The mean scores of different characteristics like appearance, texture, taste, month feel and overall acceptability was compared.

Results

Table - 1: Proximate chemical composition of Sorghum and soya flour (per 100 g edible portion)

Parameters	Sorghum (g)	Soya(g)
Moisture	11.25	8.2
Protein	8.50	43.2
Ash	1.62	4.5
Carbohydrate	72.80	20.8
Fat	2.95	19.4

Sorghum flour contains 11.25 per cent moisture, 8.50 per cent protein, 1.62 per cent ash, 72.80 per cent carbohydrates and 2.95 per cent fats. Whereas Soyabean flour contains 8.20 per cent moisture, 43.2 per cent protein, 4.50 per cent ash, 20.80 per cent

carbohydrates and 19.4 per cent fats. The chemical composition is in agreement with Manay and Shabakshanaswamy (1997) who have reported the chemical composition of Sorghum and Antia (1980) reported the nutritive value of soyabean. The recipe Cut chips was prepared by adding Soyabean flour in Sorghum flour at 0, 10, 20 and 30 per cent levels and calculated nutritive value is reported in table -2.

Table-2: Nutritive value of Sorghum Cut chips enhanced with different levels of soya flour

Variation	Sorghum (g)	Soya (g)	Protein (g)	Fat (g)	Carbohydrate (g)	Calories (Kcal)
S1	100	0	8.5	33.33	77.86	657.97
S2	90	10	15.10	35.83	72.52	665.99
S3	80	20	18.53	38.34	67.12	674.02
S4	70	30	21.68	40.84	61.80	682.04

The calculated nutritive value of product revealed that the protein content of the product was increased, whereas carbohydrates content was decreased with the increasing level of Soyabean flour. It was also observed that the energy value of the product did not differ significantly with the addition of Soyabean flour in the product.

Table-3: Mean values for different organoleptic attributes

Attributes	Appearance	Texture	Taste	Mouth feel	Over all acceptability
Variation					
S1	88.6	84.0	87.0	84.6	86.5
S2	86.0	86.0	84.6	86.0	85.65
S3	84.6	87.3	85.6	87.3	86.2
S4	90.0	88.2	89.0	88.0	88.8
F cal	0.666	0.254	1.486	0.776	0.733
F tab	4.07	4.07	4.07	4.07	4.07
	NS	NS	NS	NS	NS

The mean comparison of the organoleptic attributes revealed that for appearance the Cut chips fortified with 30 per cent Soyabean flour with Sorghum was superior for texture and Cut chips fortified with 30 per cent Soyabean flour was the best. For mouth feel and overall acceptability the Cut chips fortified with 30 per cent Soyabean flour was the highest scored product. The mean comparison of scores of different attributes like texture, flavour, taste, appearance, mouth feel and overall acceptability were recorded and found to be non significant differences with the treatment groups. Jayalakshmi and Neelkathan (1987) studied the acceptability of Sorghum- soya blends in South- Indian recipes and reported that soya flour could be incorporated up to 50 per cent level for making of deep fat fried product like Methu pakoda, Murukkn. For preparation of Puttu, Laddu, Upama and Roti Soya flour could be blended with Sorghum flour only up to 40 per cent level. However, Shrivastva (1990) reported that the use of malted Sorghum flour in supplementary foods for children in suitable and improve digestibility.

Conclusion

The Cut chips prepared from Sorghum and Soyabean blend at three different levels was palatable nutritious and low in cost. The sensory evaluation revealed that Cut chips prepared with 30 per cent

Soyabean flour scored highest rank. The mean comparison of scores of different attributes was found not significant.

It was suggested that Soyabean being the cheapest source of quality protein available from the household food stuffs. It may be used to prepare common daily food stuffs to increase its nutritive value, acceptability and palatability of product.

References

1. Anita, F.P. (1980): Composition of Soyabean, Clinical Dietetics and Nutrition, Oxford Medical Publication, London. P.P.243.
2. Jayalakshmi, N. and Neelakantan, S. (1987): Studies on the acceptability of Sorghum Soya blends in South Indian dishes and their keeping quality. The Indian Journal of Nutrition and Dietetics 24(5),136
3. Jadhav, S. J. and Jogalekar, N. V. (1984): Traditional processing of Sorghum in India. In nutritional and processing quality of sorghum IBH publishing Co. New Delhi. p.p.129.
4. Khan, Alam. (1990): Nutritional Significance and structure of Soya Carbohydrate, Nutritional abstract and review. 62,646.
5. Manay Shakuntala, N. and Shabakshanaswamy, M. (1997): Chemical composition of Sorghum food facts and principles, New age International publishers. Delhi, P.P.243-245.
6. Salunkhe, D. K. (1984): Sorghum grain quality problems and prospects. In nutritional and processing quality of sorghum. IBH Publication Co. New Delhi. p.p.12.
7. Shrivastava Sarita (1996): Uses of pop versus malted Sorghum flour in supplementary foods for children. International Sorghum and millets newsletters. PP.37, 71.