



Application of Kidneybean Flour on Savory Sev Preparation and Its Nutraceutical Profile

KEYWORDS

Bengalgram, Kidneybean, Organoleptic Characteristics, Namkeen Sev.

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ABSTRACT The food industry is directing new product development towards the area of functional foods and functional food ingredients due to an increasing market demand for healthier foods. Nearly two-thirds of the American population takes at least one type of nutraceutical health product regularly. Bengalgram is a unique legume, used to prepare a variety of traditional food products. Since ancient times, these are generally consumed as items of snacks or as special item for occasions in different parts of India. Kidneybean is traditionally consumed as whole legume in Northern parts of India; they are valued for their protein, starch, low fat content, and high moisture content. Information available on the quality of snacks made from bengalgram flour and health benefits of kidneybean flour, both the legume were chosen to incorporate in the preparation of value added nutraceutical sevs. The present study was undertaken to evaluate organoleptic characteristics and nutraceutical profile of the different Sevs made up of different blends. Traditional Sev (control) and four blends were prepared with Dehusked Bengal gram flour replaced by Whole Bengalgram flour (10%) and Whole Kidney bean flour (10-40%). The blend TS4 was highly acceptable in reference to organoleptic characteristics like Taste and overall acceptability. Hence the composition of the blend TS4 is highly recommended for sev preparation i.e. 50% dehusked bengalgram flour with 10% of Whole bengalgram flour and 40% Whole kidneybean flour. TS4 found to present proximate value addition with fibre (3.11%), Protein (19.95%), carbohydrates (35.23%), Fat (33.71%), moisture (2.4%) and ash (5.6%).

Introduction

Pulses are rich in proteins and constitute an important item of the diets of the population of Asia and Africa. They are next to cereals in their food value. Bengal gram is one of the principle pulses grown in India.

The Consumption of kidney bean is not very much popular in India as compared with bengalgram although it has many health benefits. It has high fibre and low fat content.

Rajmah (*Phaseolus vulgaris*) is traditionally consumed as whole legume in Northern parts of India. Rajmah is also known as kidney bean, garden bean, field bean and French bean. This legume is widely grown in Southern Mexico and Central America for its edible bean and pods (Chatterjee and Bhattacharya, 1986). It is high in cellulose, non cellulosic polysaccharides, and lignin so has been reported to have hypocholesterolemic and hypoglycemic effects comparable to Bengalgram (*Cicer arietinum*) and fenugreek seeds (*T. foenum graeum*). Chickpea (*cicer arietinum* L.) commonly known as Bengalgram belongs to family Leguminosae and sub family Papilionaceae is an important legume of Asia and Africa (Singh, 1995). Recently, beans have been cited for imparting specific positive health potentiating responses (hypocholesterolemic response, mitigation of diabetes and colonic cancer, and in weight control) when properly positioned in the diet.

Research has demonstrated that increased consumption of dietary fiber and moderated starch digestion (resistant starch) that are available from dry beans possess specific physiological responses of health significance. Kidney beans are, valued for their protein and starch and low fat content, high moisture content, extended storage period and high storage temperature (Fekadulemessa, 2004).

Phaseolus vulgaris extract has been shown in vitro to in-

hibit the activity of alpha amylase and may help promote weight loss by interfering with the digestion of complex carbohydrates to simple, absorbable sugars (Xiangming, et al., 2010)

Whole kidneybean flour and Whole Bengalgram flour contains nutraceutical like fibre which resist to digestion by the alimentary enzymes of humans and have a role in all functions of the digestive system, from mastication to stool evacuation. Fibre rich diets require longer chewing time, so time for swallowing is slower implying greater salivation that will positively affect oral hygiene. Soluble fibres, due to their viscosity, slow gastric emptying and increase gastric distension lasting longer the feeling of satiety. At the small bowel, soluble fibre again due to formation of viscous solutions slows transit time. Soluble fibres form a highly viscous gel-like fluid with food in the small intestines. The high viscosity is responsible for the delayed absorption of glucose in the intestines and regulates the blood glucose levels in the diabetics. It also helps in the reduction of the serum cholesterol and triglycerides levels and increasing HDL levels. Fibres, both soluble and insoluble prevent the re-absorption of the bile acids from the small intestine back into circulation thereby reducing the circulating cholesterol.

Nutraceuticals become more popular now days to overcome metabolic ailments and stress as a result of new dynamic world change and environment. The use of nutraceuticals, as an attempt to accomplish desirable therapeutic outcomes with reduced side effects, as compared with other therapeutic agents has met with great monetary success. Sevs are cheap and basic dry snack with greater shelf life for preservation, transport and consumption.

Considering the information available on the quality of snacks made from bengalgram flour and health benefits of

kidneybean flour, both the legumes were chosen to be incorporated in various snacks. The present study was undertaken to evaluate organoleptic characteristics of the different Sevs made up of different blends with their proximate analysis.

In the light of above, the objective of the present study was to optimize the formulation of value added namkeen Sev from whole Bengalgram and kidneybean flour along with the evaluation of organoleptic characteristics and proximate analysis.

Materials and methods

Local variety bengalgram, Kidney bean (Rajmah), refined groundnut oil; all spices were procured from local market, Jabalpur. The ingredients used are listed in Table-1. Dehusked bengalgram (split dhal), whole bengalgram and kidneybean (whole) was ground in a mill to obtain flour and was passed through 60 mesh sieves and stored in airtight plastic containers at room temperature until required for the preparation of blends. Four blends (TS1-TS4) and one control were prepared by using randomized block design. In which the code BF is used for whole Bengalgram Flour (BF10) indicating the 10% incorporation of whole Bengalgram Flour. KF is used for Whole Kidneybean flour (KF10-KF40) i.e. 10%-40% of Whole Kidneybean flour and SF is used for Split Dhal Bengalgram Flour (Dehusked Bengalgram Flour). The method of Berry et al., 1986 was used to prepare namkeen sev. Finished products were evaluated for organoleptic characteristics followed by their proximate analysis.

Table 1: Ingredients used in the preparation of Sev.

S. No.	Ingredients	Quantity
1.	Bengalgram flour/treated blends	100 g
2.	Common salt	3.0 g
3.	Red chili powder	0.5 g
4.	Turmeric powder	0.5 g
5.	Refined Groundnut oil	3.0 g
6.	Water	60 ml
7.	Ajwain powder	3.0 g

Organoleptic evaluation:

The organoleptic evaluation of prepared products was performed by the panel of 10 judges based on the sensory attributes like color and appearance, texture, flavor, taste and overall acceptability. The evaluation was done on a Nine Point Hedonic Scale as described by Sharma et al., (1992).

Proximate Analysis:

The proximate analysis of the finished products were carried out for the estimation of moisture, protein, fat, ash, fibre and carbohydrates percentages by following the methods given by AOAC manual (1992).

Statistical Analysis:

Analysis of variance was obtained to know the significance level among all the samples of Sev, prepared from different blends of flour. The data were statistically analyzed by using SPSS version 20 software.

RESULTS

The present investigation was carried out with the objectives to enhance the nutritional value according to acceptance of the traditional Sev made up of split dhal flour of

bengalgram by incorporating the kidneybean flour and whole bengalgram flours. This study was conducted by the evaluation for organoleptic characteristics of the Sevs presented in Table-2, and by the estimation of proximate content in the finished sevs are presented in Table-3.

Table 2: Organoleptic Characteristics of Different Sevs Prepared from Various Blends of Flour.

Treatment Code	Treatment Decode	Colour and Appearance	Flavour	Texture	Taste	Overall acceptability
Control	SF100	8.4	7.6	7.7	6.1	7.6
TS1	BF10:KF10:SF80	6.7	6.6	6.6	5.1	6.5
TS2	BF10:KF20:SF70	7	6.2	7.1	6.3	6.4
TS3	BF10:KF30:SF60	6.1	6.3	6.2	5.5	5.8
TS4	BF10:KF40:SF50	6.2	5.8	7.2	6.4	6.9
P-value (df=4)		0.051*	0.004*	0.005*	0.001*	0.000**

Note: SF = Split dhal Bengalgram flour, BF = Whole Bengalgram flour, KF = Whole Kidneybean flour.

*P<0.05 and **P<0.001 by applying ANOVA.

Table 3: Mean percent for proximate component of different Sevs prepared from various blends of flour.

Treatment	Treatment Decode	Moisture%	Protein%	Fat%	Ash%	Fibre%	Carbohydrates%
Control	SF100	1.77	19.07	37.85	7.2	1.4	32.71
TS1	BF10:KF10:SF80	2.65	19.25	33.85	8.4	2.03	33.82
TS2	BF10:KF20:SF70	2.02	19.42	41.71	6.2	2.39	28.26
TS3	BF10:KF30:SF60	1.96	19.6	35.28	7.4	2.75	33.01
TS4	BF10:KF40:SF50	2.4	19.95	33.71	5.6	3.11	35.23

Note: SF = Split dhal Bengalgram flour, BF = Whole Bengalgram flour, KF = Whole Kidneybean flour.

Discussion

The traditional Sev made from dehusked bengalgram flour was found to be improved by the replacement of whole bengalgram flour (10%) and kidneybean flour (10%-40%). The formulated products were subjected to evaluation for organoleptic characteristics.

Organoleptic evaluation revealed that the quality characteristics were found to be significantly different from each other in various treatment products. Variance due to judges did not exist, indicating that panelist group was homogeneous. TS4 scored for color and appearance (6.2), flavor (5.8), and taste (6.4) whereas improved texture for treatment TS4 scored (7.2). TS4 was found to have the highest overall acceptability scores (6.9) hence the most accepted product (Sev) among the various blends.

Proximate analysis confirm the maximum protein, fibre and carbohydrates present in TS4, 19.95%, 3.11% and 35.23% respectively with the low fat content i.e. 33.71% in comparison with other treatment product and control.

Conclusion

The results of the study clearly show that there were significant differences in organoleptic characteristics of the Sev

prepared from different blends of flour. The blend TS4 was the most suitable one for Sev preparation because it was highly acceptable in organoleptic characteristics. Hence the composition of the blend TS4 is highly recommended for Sev preparation which is composed of 50% split dhal bengalgram flour with 10% incorporation of whole bengalgram flour and 40% kidneybean flour.

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REFERENCE

1. A.O.A.C. Official Methods of Analysis,(16th ed.),(1992), Washington, D.C.: Association of official analytical chemists.
2. Berry, SK., Kulkarni, SG., Senghal, et al., (1986), Studies on the utilization of post cold stored potatoes in the preparation of potato-besan 'Sevian'. Ind. Fd. Packer, 40: 42-49.
3. Chatterjee, BN and Bhattacharya, KK., (1986), Principle and practices of grain legume production. New Delhi, Oxford and IBH Publishing Company.
4. Fekadulemessa., (2000), Effects of traditional processing of haricot bean (*Phaseolus vulgaris* L.) on nutritional composition. J. Fd. Sci. Technol., 41 (1), 99-102.
5. Sharma, GK., Madhura, CV and Arya, SS., (1992), Studies on preparation, packaging and storage of besan (Bengal gram flour) burfi. J. Fd. Sci. Technol., 29, 289-292.
6. Singh, U., (1995), Methods of dehulling of pulses: A critical appraisal. J. Food Sci. Technol., 32, 81-93.
7. Xiangming, Wu., Xiaofeng, Xu., Jianguo, Shen., et al., (2010), Enhanced Weight Loss From a Dietary Supplement Containing Standardized *Phaseolus vulgaris* Extract in Overweight Men and Women. The J Appl Res., 10 (2), 73-79.