International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 08 | Aug - 2021 ISSN: 2582-3930

"STUDIES ON PREPARATION AND DEVELOPMENT OF LEGUME BASED SOUP PREMIX BLENDED WITH SOME VEGETABLES."

V. S. Bote[1], A. G. Mane[2].

[1]*Processing and Food Engineering Department, Sahyadri College of Agricultural Engineering, Yeshwantnagar, Karad, Satara*
[2]*Processing and Food Engineering Department, Sahyadri College of Agricultural Engineering, Yeshwantnagar, Karad, Satara*

Abstract - The present research was conducted to formulate a highly nutritious and protein rich soup powder from combination of germinated red gram, horse gram, green gram, green pea and soybean flours blended with some dried vegetables such as carrot, onion, tomato, potato. The preparation of soup powder was carried by different variations of legumes. The germinated legume flours were used in combination with Tomato powder, rice flour, cumin, coriander, black pepper, red chill and Himalayan salt. Sensory analysis was carried out by 20 trained panelists and four sample variations were analyzed using a 9-point hedonic scale. The average scores obtained from different attributes indicated that sample-I was accepted according to sensory analysis. The chemical analysis of soup pre-mix was carried out to determine parameters such as moisture content, ash content, protein, carbohydrates, fat and total energy. Therefore, sample-II was superior according to the chemical analysis of soup pre-mix. From the day of preparation of soup pre-mix, we observed no changes in attributes like flavor, texture, color and taste up to 45-50 days.

Key Words: Soup pre-mix, Vegetables, legumes flour, Sensory analysis, Himalayan salt, sample-I, sample-II

1. INTRODUCTION

In today's fast and modern lifestyle, many people especially living in big cities, needs fast paced and practical things almost in all aspects, including preparation, processing and presentation of food. Thus, there is a high demand for instant food in market like Ready to Eat, Ready to Serve, Ready to Cook. For fulfilling consumer social requirements dried soup pre-mix play a vital role [1]. Legumes are rich source of protein and have good nutritive value and they have longer life without refrigeration [2]. All the soup pre-mix were made from combination of different vegetables. Therefore, this project is carried out to prepare the highly nutritious soup powder from combination of different legumes and some vegetables. It will be specially prepared with the germinated soybean flour, germinated horse gram flour, red gram flour, germinated green gram flour, green pea flour, rice flour, carrot, potato and tomato powder and by the addition of spice-mix like fennel seeds, asafetida, red chilli powder, coriander and salt as per taste. Soybean (Glycine max.) is an important legume which is used in various soups. Soybeans are also known to possess some anti-nutrients that inhibit the action of trypsin, chymotrypsin and amylase [3]. Horse gram (Microtome uniform Lam.) is a popular pulse, locally known as kulthi belongs to the family Fabaceae that still remain an under exploited legume crop. Pigeon pea or red gram (Calanus cajon (L.) seeds are made up of 85% cotyledons, 14% seed coat, and about 1% embryo, and contain a variety of dietary nutrients [4]. Green gram (Vigna radiata) is good source of carbohydrates, proteins and minerals and its protein quality is similar to or better than other legumes. Green Peas are starchy, but high in fiber, protein, vitamin A, vitamin B6, vitamin C, vitamin K, phosphorus, magnesium, copper, iron, zinc and lutein. Rice flour is used as a thickening agent in a recipes of soup pre-mix, it an effective substitute for corn-starch. There are various soup pre-mix that may not have a long shelf life. So, we can use some natural preservative such as Himalayan salt or Pink salt. Keeping in view the nutritional value of legumes and to make it easily available, a ready to eat soup pre-mix will be prepared. It is well known that the good quality and reasonable ratio of dehydrated legume-based soup depend on variety and functional properties of supplemented individuals.

2. MATERIALS AND METHODS

2.1 Materials: Soybean, Green gram, Red gram, Horse gram, Green pea, Rice, Himalayan Salt, Green coriander, Basil, Mint powder, Black pepper powder, Cumin's, Garlic powder, Tomato powder, Dried carrots, Dried onions, Dried potato.

2.2 Pre-processing of Raw Material: Vegetables were cleaned, peeled and are pre-processed before slicing into small parts and blanched in hot water as a requirement of process at 98^0C for at least 5 min and at most up to 8 minutes. Then they are being cooled using cold water wash.

2.3 Drying Process Used: Ingredients mentioned above after cold wash are being dried using hot air flow process. Convective drying consists of passing heated air through layers of the product. It can be conducted with tray or cabinet dryers, where perforated trays hold thin layers. Red gram, Horse gram, Green grams are soaked for at least 6 hours. Green peas are boiled for 30 minutes and soybean is soaked overnight for 12 hrs. Then their mixture is dried with hot air-drying process, grinded and sieved for homogeneous granularity. Complete dried powder is sieved into 60 mesh size.

2.4 Preparation of spice mix powder: All the spices like mint powder, basil, cumin's, black pepper, coriander and mace were taken in equal quantity. Cumin seeds, and coriander were roasted separately and then all spices were

ground together and kept in an airtight container for further use.

2.5 Preparation of soup powder: All the components like germinated soybean powder, green gram powder, Red gram powder, Horse gram powder, rice flour, and all the above ingredients were mixed together in varied proportions and they were then analyzed using sensory analysis.

2.6 Preparation Soup Powder: For preparation of soup powder add soybean and green gram flour, horse gram flour or red gram flour then add tomato powder and dried vegetables (Onion, Potato, Carrot) after that add rice flour then add spice mix powder then add Himalayan salt then all these ingredients mix properly and now soup powder is ready to store.

2.7 Variations: Four major variations were carried out and were analyzed for its sensory acceptability. Variations were mainly in the amount of soybean flour, green gram flour, Red gram flour or Horse gram flour.

Table 1: Ingredients for Different Composition of Mix Vegetable Soup Powder with All the Ingredients

Ingredients	Mix 1 (M1) gm	Mix 2 (M2) gm	Ingredients	Mix 3 (M3) gm	Mix 4 (M4) gm
Horse gram flour	20	10	Red gram flour	20	10
Soya bean flour	10	20	Soya bean flour	10	10
Green gram flour	10	10	Green gram flour	10	20
Green pea flour	10	10	Green pea flour	10	10
Rice flour	15	15	Rice flour	15	15
Himalayan salt	5	5	Himalayan salt	5	5
Spice Powder	15	15	Spice Powder	15	15
Dried Vegetables (Onion, Potato, Carrot, tomato powder)	15	15	Dried Vegetables (Onion, Potato, Carrot, tomato powder)	15	15
TOTAL	**100**	**100**	**TOTAL**	**100**	**100**

Proximate Analysis Moisture, Ash, protein, fat crude fiber content of dried vegetarian soup mixtures was determined according to AOAC [5] standards.

Sensory Evaluation of Herbal Soup Samples

Ours shortlisted soup samples are sensory evaluated for characteristics like flavor, color, appearance taste, dissolution rate etc. 10 grams of soup sample is mixed with 65 ml of water for evaluating its sensory characteristics. Ghavidel, R.A et al method [6] was used to carry out sensory evaluation of soup sample by ten panelists, who were not alcoholic and nonsmoker. Sensory characteristics are measured using Hedonic scale. Which has total 9 grade points from 1 to 9 and least to most prefer. A stainless-steel pan was used for sample collection of soup, 0.55 grams are mixed in 100 ml Luke warm water and stir properly in 800 C for 7 minutes. For each sample panelists graded their likings on 9 hedonic scale. The scores represented the following: 1-dislike extremely,2-dislike very much, 3-dislike moderately, 4dislike slightly, 5-neither like nor dislike, 6-like slightly, 7-like moderately, 8-like very much and 9-like extremely, this nomenclature is used as per Ghavidel and Prakash work in 2007 (7). Then to have a composite and stable value of each characteristic, all 10 values are averaged and reported.

3. RESULT AND CONCLUSION

Sensory evaluation has emerged as an essential component of food product development and standards for setting up, testing, analyzing and interpreting sensory results are now at an advanced stage. The sensory evaluation of developed soup premix of various compositions with mix1, mix2, mix3, mix4 was carried out and the final samples of Soup premix quantity were selected from the best sensory scores of all samples to select sensory acceptable soup premix. The prepared soup premix was analyzed with 9point hedonic scale for different attributes viz. color, taste, texture and overall acceptability by the panel of 10 judges (below 15 years and between 15-25 years). The sensory acceptable soup premix sample was used to calculate different chemical properties. The chemical properties of soup premix such as a moisture, total fat, carbohydrates, proteins, fiber, energy and ash content was determined.

Table 2: Average sensory evaluation rating of prepared Soup Premix

Sample Name	Sensory Attribute			
	Color	Taste	Texture	Overall Acceptability
S1 Mix1	8.7	8.2	7.8	8.3
S2 Mix2	8.0	8.0	7.6	7.7
S3 Mix3	7.8	7.8	7.7	8.0
S4 Mix4	8.0	8.0	7.8	7.9

The chemical properties of final soup premix samples are Moisture content, fat, energy, ash content, carbohydrates, protein. The moisture content of samples is Mix1-7.69%, Mix2-7.13%, Mix3- 7.77% & Mix4-7.33%. The fat content in samples is Mix1-1.91%, Mix2-4.17%, Mix3-3.04% & Mix4-2.60%. The carbohydrates in the samples are Mix1-65.79 gm, Mix2-61.01gm, Mix3-68.25gm & Mix4-65.54gm. The protein content is Mix1-17.09gm, Mix2-19.03gm, Mix3-14.18gm & Mix4-15. 19gm.The energy content is Mix1-351.86kcal, Mix2-357.69kcal, and Mix-3-357.08kcal & Mix4-349.16kcal. The ash content is Mix17.52%, Mix2-8.66%, Mix3-6.76% & Mix4-9.34%. As the protein content is higher in Sample 2, is the acceptable and superior sample chosen by the sensory analysis.

Table no. 3 Chemical analysis of soup premix (Mix 1), (Mix 2), (Mix 3) & (Mix 4)

Description	Mix1 (Amount/100 g)	Mix2 (Amount/100 g)	Mix3 (Amount/100 g)	Mix4 (Amount/100 g)
Total Fat	1.91	4.17	3.04	2.60
Protein	17.09	19.03	14.18	15.19
Carbohydrates	65.79	61.01	68.25	65.54
Total Energy	351.86	357.69	357.08	349.16
Ash	7.52	8.66	6.76	9.34
Moisture	7.69	7.13	7.77	7.33

CONCLUSION

As per above experimental results, sensory accepted sample i.e.Mix-2 with high protein content is superior. It was concluded that soup premix developed with Horse gram flour(10gm), Soybean flour(20gm), Green gram flour(10gm), Green pea flour(10gm), Rice flour (15gm), Spice powder(15gm), Dried vegetable (15gm) and Himalayan salt (5gm) was accepted. Hence the development and utilization of such soup pre-mix will improve the nutritional status. However, further more studies should be conducted to investigate the possibility of using this legume as an ingredient on other food items i.e., other nutrient rich pulses that can increase the application of such value-added products. Also, the studies on shelf life of products can be taken into consideration for further use.

ACKNOWLEDGEMENT

The authors are thankful to the Faculty of Agriculture Engineering and Sahyadri College of Agricultural Engineering, Yeshwantnagar, Karad, Satara for providing financial assistance to carry out research work.

REFERENCES

1) Krejov, A., ernohorsk, T. and Meixner, D. (2007) Elemental Analysis of Instant Soups and Seasoning Mixtures by ICP-OES. Food Chemistry, 105, 242-247.
2) Chandramouli P., Divya V. S., Bharathi, A. Sivakami, B. Bharathiraja, J. Jayamuthunagai. 2012. Standardisation and Nutritional Analysis of Soup Powder Prepared from Moringa Oleifera, Solanum trilobatum, Centella asiatica. International Journal of Future Biotechnology, 1(1), 1-16.
3) Kulkarni S D. Soy based bakery products. Processed food Industry paper, 40-47, 2007.
4) Faris, D.G. and Singh, U. (1990) Pigeon pea: Nutrition and Products. In: Nene, Y.L., Hall, S.D. and Sheila, V.K. Eds., the Pigeon pea, CAB International, Wallingford, 401-434.
5) AOAC Standards, 18th edition, Washington DC (2005).
6) Axtell, B. (1992) Some Economic Considerations of Drying. Food Chain, 7, 17-18 6. El Wakeel, M.A. (2007) Ultra Structure and Functional Properties of Some Dry Mixes of Food. M.Sc. Thesis, Faculty of Agriculture, Ain Shams University, Cairo. 7
7) Kurien, P.P. (1981) Processing of Pulses. Proceedings of the Workshop on Grain Legumes, Protein Foods and Nutrition Development Association of India, Bombay, 68-77.