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Development of millet based instant soup mix and Pulav mix

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Abstract

The present study was carried out with the objective to develop Instant Soup Mix and Pulav Mix from millets, dehydrated vegetables and natural herbs like are Basil (Tulsi), Curry, Green Coriander, Mint, and Bay leaves. These herbal formulation increases antioxidant quality of soup and Pulav mix. The selected millets were pre-processed, milled and blended in various proportions to formulate instant soup and Pulav mix namely T₀, T₁, T₂. The prepared product samples were evaluated for sensory evaluation, Proximate composition and shelf life. When sensory qualities among different formulation were evaluated, sample T₁ in instant soup mix and T₂ in instant pulav mix was found to be highly acceptable with significant difference when compared to other formulations. Instant mixes did not reveal any pathogenic organism when it is stored for 2 months in laminated pouches under normal room condition. The results of nutritional analysis showed that enrichment with millets and herbs significantly increases the sensory and other nutritional benefits, shown in results and discussion sections. Preparation of this soup mix is so easy that it can be termed as convenient healthy soup mix.

Keywords: Instant Soup mix, Instant Pulav Mix, formulation, millets, herbs, nutritional analysis

Introduction

A modern lifestyle of many Indian people today, especially living in big cities, needs fast paced and practical things almost in all aspects, including preparation, processing and presentation of food. It creates a society who loves instant food products such as food that are ready to cook and ready to eat. One of the potential products that can be developed into an instant food is functional soup and pulav mix (Upadhyay *et al.*, 2017) ^[7].

Soup is probably one of man's oldest foods, since it must have developed about the time when boiling was found to be a way of cooking food. It is a very fast form of cookery. Soups can be of poultry, meat or sea food, or of vegetables or combination of all in hot/boiling water until the flavour is extracted, forming a broth. However different in styles, but technically all the soup preparation involves the processes of boiling for flavour extraction and heat induced composition interaction. The word "soup" is originated from the teutonic word, suppa, which describes a medieval dish consisting of a thick stew poured on slices of bread, called sop, used to soak up the liquid. Soup is the one of the traditional food which can be classified as an appetizer, warm food during cold and sick. In this modern era homemade soup is replaced by commercially prepared instant soup such as canned, dehydrated, and frozen soups as soup preparation is a time consuming process. Instant mixes can become an alternative food for breakfast because of its high energy and nutrient content, ease of preparation and minimum serving time (Gokulakrishnan, 2014) ^[6].

Soup mix fortified dehydrated vegetables should be rehydrated and cook within minimum period to have nutritional and palatable product (Abeyasinghe and Illeperuma, 2006) ^[3].

The objective of this study was to develop a dehydrated instant soup mix and Pulav mix with millets, dehydrated vegetables and natural herbs. As a dry product, instant mixes can be stored for a longer period. Apart from good storage stability of these products, the products with nutritional/therapeutic properties will be well received all over the world because of the increasing health consciousness amongst the population.

Material and Methods

Selection of raw material

The millets like Pearl millet (*Pennisetum glaucum*), Finger millet (*Eleusine coracana*), Foxtail millet (*Setaria italica*), maize (*Zea mays*), Sorghum (*Sorghum bicolor*) and Oats (*Avena sativa*), kodo millet and Little millet were selected for soup and Pulav mix formulation. Vegetables such as carrot, potato, onion, peas, garlic and ginger and herbs like Basil (Tulsi), Curry, Green Coriander, Mint, and Bay leaves were collected from local market. Other seasoning ingredients such as dehydrated onion flakes and garlic flakes, coriander powder, black pepper powder, cumin powder and black salt was purchased from local supermarket and used for the present study.

Formulation of Instant soup Mix

The ingredients are weighed accurately with weighing balance as per selected proportions and mixed with the flours like Ragi flour, foxtail flour, bajra flour, maize flour, sorghum flour and oats thoroughly. The other ingredients like herbs, dehydrated vegetable powder and spice powder were added to the prepared flour mix and again mixed thoroughly. After the preparation, the instant soup mix has to be stored at ambient temperature. The production process flowchart of instant soup formulation is given in the Fig. 1. The recipes of formulated Instant Soup Mix namely T₀, T₁, T₂ is illustrated in the Table 1.

Formulation of Instant Pulav Mix

The ingredients required for the preparation of instant pulav mix are weighed accurately as per selected proportions and mixed (Ragi, foxtail, Kodo, little millet) thoroughly. The other ingredients like herbs, dehydrated vegetable powder and spices were added to the millets and again mixed thoroughly. After the preparation, the instant pulav mix has to be stored at ambient temperature. The step wise procedure for preparation of instant pulav mix is shown in fig. 2. The recipes of formulated Instant Pulav Mix namely T₀, T₁, T₂ is illustrated in the Table 2.

Sensory Evaluation of Instant soup and Pulav mix

The value added convenient instant mix samples along with control were given to the panel members for organoleptic evaluation. Ten panel members assessed for the acceptability of the value added instant mixes. Each attribute was scored based on its intensity scaled on a 9-point hedonic scale (9 = liked very extremely, 8 = liked very much, 7 = like moderately, 6 = liked slightly, 5 = neither liked or disliked, 4 = disliked slightly, 3 = disliked moderately, 2 = disliked very much, and 1 = disliked extremely) for color, flavor, taste, texture, appearance and overall acceptability (Amerine MA, 1967)^[1].

Nutrient Analysis of formulated Instant soup mix and Pulav mix

Moisture content and nutrient analysis such as total carbohydrate, protein, fat, was evaluated for both formulated Instant Soup Mix (FISP) and formulated Instant Pulav Mix using AOAC method (2000)^[4].

Shelf life and Cost analysis

Formulated Instant Soup Mix and Formulated Instant Pulav Mix was packed in air tight high density poly ethylene bags

under sterile conditions and kept in room temperature (Anitha *et al.*, 2016)^[2]. Samples are taken at monthly intervals for a period of two months and overall acceptability was evaluated. The cost per kg of FISP was calculated from the total quantity of ingredient used along with miscellaneous cost and it was compared with commercial soup powder.

Results and Discussion

Sensory Evaluation of the Instant soup Mix and Pulav mix

Sensory analysis of millets incorporated Instant soup and Pulav mix samples T₀, T₁, T₂ was carried out on the basis of colour, flavour, taste, appearance and overall acceptability with the help of panelist on 9-point hedonic scale (Amerine MA, 1967)^[1]. Based on sensory evaluation sample T₁ and T₂ of Instant soup and Pulav mix respectively were standardized. The results were depicted in Table 3 and 4 respectively.

Table 1: Formulation of Instant soup Mix

Ingredients	Formulation		
	T ₀	T ₁	T ₂
Foxtail millet	-	12	10
Pearl millet	-	12	10
Finger millet	-	12	11
Sorghum	-	12	10
Oats	-	8	10
Maize	-	4	10
Dry vegetable mix	84	20	20
Pepper	4	4	4
Onion flakes	2	2	2
Garlic flakes	2	2	2
Coriander powder	2	2	2
Cumin powder	2	2	2
Black salt	4	4	4
Herbs	-	4	3

Table 2: Formulation of Instant Pulav Mix

Ingredients	Formulation		
	T ₀	T ₁	T ₂
Foxtail millet	80	25	25
Finger millet	-	20	25
Little millet	-	15	15
Kodo millet	-	15	15
Dry vegetable mix	10	15	10
Spices	5	5	5
Herbs	3	3	3
Salt	2	2	2

Table 3: Sensory evaluation of the Formulated Instant Soup Mix

S.no	Parameter	Values		
		T ₀	T ₁	T ₂
1	Colour	7	8	6
2	Flavor	6	7	7
3	Taste	6	8	7
4	Appearance	6	8	7
5	Overall acceptability	6	8	7

Table 4: Sensory evaluation of the Formulated Instant Pulav Mix

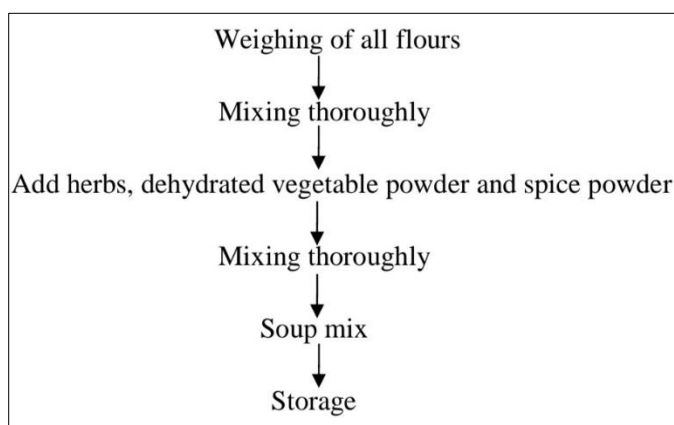
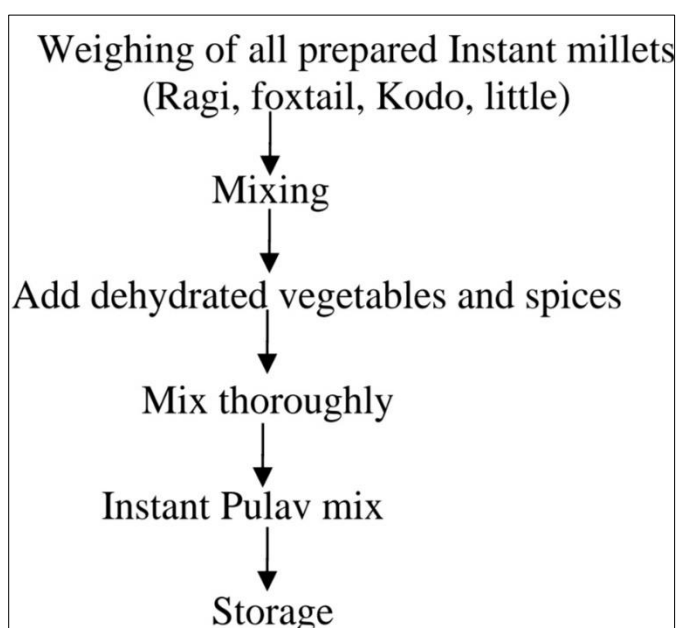
S.no	Parameter	Values		
		T ₀	T ₁	T ₂
1	Colour	6	6	8
2	Flavor	7	8	8
3	Taste	6	7	8
4	Appearance	7	8	9
5	Overall acceptability	7	8	9

Table 5: Nutrient analysis of Formulated Instant soup mix

S.no	Parameter	VS*		
		T ₀	T ₁	T ₂
1	Moisture (%)	5.38 ±0.00	3.93±0.02	3.90±0.80
2	Ash (%)	1.78±0.15	1.54±0.20	1.58±0.14
3	Protein (%)	11.63±0.21	12.54±0.05	12.23±0.020
4	Fat (%)	3.25±0.02	3.29±0.08	3.53±0.03
5	Carbohydrates (%)	84.42±0.004	83.71±0.003	82.14±0.00
6	Calcium (g)	43.81±0.73	55.81±0.55	55.11±0.1
7	to (r ¹ 1)	8231±0.73	9.64±0.56	9410.1

Table 6: Nutrient analysis of Formulated Instant pulav mix

S.no	Parameter	VS*		
		T ₀	T ₁	T ₂
1	Moisture (%)	2.262±0.011	3.021±0.010	4.556±0.060
2	Ash (%)	1.62±0.05	1.33±0.02	1.13±0.02
3	Protein (%)	10.04±0.03	8.41±0.03	8.57±0.03
4	Fat (%)	1.65±0.04	3.52±0.03	3.60±0.02
5	Carbohydrates (%)	77.82±0.03	78.61±0.01	78.755±0.003
6	Calcium (g)	24.07±0.66	83.71±0.56	101.5±0.15
7	to (r ¹ 1)	2.26±0.07	3.09±0.04	3.31±0.07

**Fig 1:** Overall Methodology of Formulated Instant Soup Mix**Fig 2:** Formulation of Instant Pulav Mix

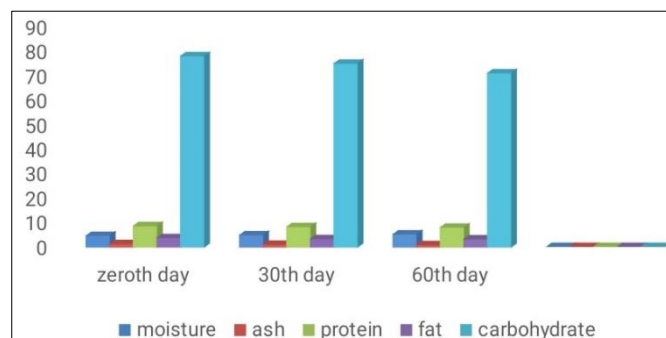
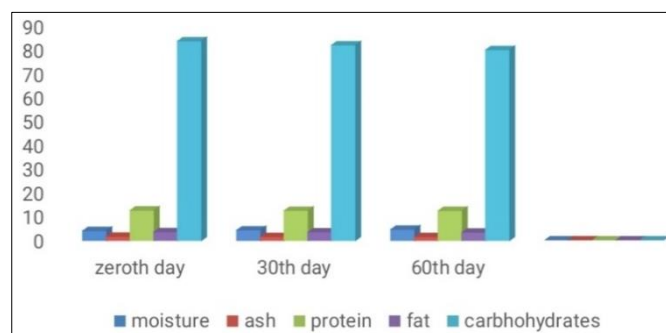
Nutrient analysis of formulated instant soup mix and Pulav mix

The nutrient analysis of the formulation is represented in the

Table 5 and 6 respectively. The moisture content present in found to be acceptable. The carbohydrate content of FISP and CSP was found to be almost similar with no significant difference. However, protein content was found to be high in FISP.

Storage studies of instant mixes

A storage study of instant mixes was performed by conducting different parameters for two months in open atmospheric condition. It helps to know how long the product can be stored in open atmospheric condition and the results obtained were shown in the figure 3 and 4.

**Fig 3:** Storage parameters of instant pulav mix**Fig 4:** Storage parameters of instant soup mix

From the figure 3 and 4 it was observed that instant mixes packed in LDPE shown minor variations in various parameters. As LDPE pouches have high moisture and water vapour barrier properties, minor moisture absorption is seen without any colour change in it.

Cost analysis

Cost per 100gm of Formulated Instant Soup Powder (FISP) and Formulated Instant Pulav Mix (FIPM) was found to be Rs.34/- and Rs.35/- respectively and it was affordable to all class of people. Moreover it is highly nutritional and rich in antioxidant activity. In addition to that, it poses antidiabetic activity and can utilize by all age group of people.

Conclusion

The major objective of this research is to identify an instant food which is easy to prepare and provides all nutrition required for a healthy living. This instant soup and Pulav mix prepared using millets, dehydrated vegetables, herbs and other seasoning ingredients is easy to prepare and it doesn't require a special preservation technique. Similarly shelf life was found to be good when stored under ambient condition. Cost of production was also found to be in acceptable level. It can be stored in an air tight container.

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