

Development of Value Added Multi Millets Namkeens

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Abstract

The study was carried out keeping in mind the current interest of value addition of foods because of increasing awareness among the consumers. Millets are one of the oldest foods known to human and possibly the cereal grain to be used for domestic purpose. Millets are highly nutritious, non-glutinous and not acid forming foods, they are soothing and digest. The main of study conducted was to develop a value added multi millets namkeens.

A value added multi millets namkeens are rich in fibre, rich in various proportions of millets flour such as jowar, foxtail millet, Ragi, Bhajra and little millet. Two variations of multi millets namkeens developed with different millet and pulses flour combinations were attempted in this investigation. One variation is with jowar flour 20%, bhajra flour 20%, little millet flour 10%, ragi flour 10%, foxtail millet flour 10%, besan flour. combination and another one is only with jowar flour 10%, bhajra flour 20%, little millet flour 10%, ragi flour 10%, foxtail millet flour 10%, besan flour 10%, black gram dhal flour combination. The common ingredients used were 20%, carom seeds, spices and oil for frying.

The standardization trials indicated that variation-2 was accepted highly. The present study was carried out with 20 semi – trained panellists. Sensory qualities included appearance, colour, texture, odour, and overall acceptability. A 9- point hedonic rating scale was used. The variation-2 was found to have increased scores in taste, odour, texture and overall acceptability. The developed product contained Energy – 477kcal, Proteins – 12.61g Fat - 30g, Fibre – 2.03g, Carbohydrates – 49, Ash – 3.14%, Moisture -2.75%, for 100gms on dry basis of shelf life of 15 days. The product developed is a nutritionally enhanced product which is rich in antioxidants, gluten free, this product can be consumed by all age individuals and also by gluten intolerant individuals, which is quite safe as the product constitutes millets which are low in glycemic load.

Marketing was done on the standardised product value added multi millets Namkeens through packaging and labelling.

Keywords: millets, value addition, good source of nutrients.

I. INTRODUCTION:

Millets are small seeded grains, widely grown around the world as cereal crops or grains for human

consumption or as fodder. Millets are nutri-cereals which are sorghum, Pearl millet and small millets (Finger millet, Foxtail millet, Kodo millet, Little millet, Barnyard millet and Proso millet).

In India, millets have been mentioned in some of the oldest Yajurveda texts, thus indicating that millet consumption was very common, pre-dating to the Indian Bronze Age (4,500 BC). Till 50 years ago, millets were grown in large areas in India and were a staple diet. But with the shift in food preferences and availability of global foods and cuisines, the native foods were forgotten. The highly nutritious millets were replaced with “refined” foods.

Despite numerous qualities, utilization of millets as food is confined to the traditional consumers, particularly the tribal populations. This is mainly due to the non-availability of consumer friendly, ready-to-use/ready-to-eat millet based products. Recently, millets have gained attention and efforts are under way to obtain their convenient and value added processed products. For example, Government of India announced the 2018 year as “National Year of Millets”.

Millets can very well fit into multiple cropping systems under irrigated as well as dry land farming; and provide nutritious grain as well as fodder in a short span. Their prolonged and easy storability under ordinary conditions has accorded them the status of “*famine reserves*”. This aspect is very important as Indian agriculture suffers from vagaries of monsoon. The most important minor millets cultivated in India are: finger millet (ragi), proso millet, barnyard millet, Italian millet kodo millet and little millet. (International Journal of marketing, Financial services and Management Research ISSN 2277-3622 VOI.2, No. 4, April, 2013)

India is one of the leading countries in the world the production of sorghum. The area under this millet is 42.6 million acres, and the production of the grain is estimated about 7.4 million tonnes. It is chiefly cultivated in Uttar Pradesh, Punjab, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Maharashtra and Rajasthan.

In India Jowar is mainly a crop of plains, and is grown as both kharif and rabi. The kharif crop sown between May and July and harvested between October and December. The rabi crop sown between September and November, is harvested between January and March

Uses:

The grains eaten by breaking, it and cooking, it in the same way as rice or by grinding in into flour and preparing unleavened bread from it. The stern and leaves are used as cattle fodder especially in India.

Millets Contains essential nutrients such as

Further, millets are rich sources of minerals like iron, calcium, zinc, magnesium, phosphorous and potassium.

Jowar: Rich in calcium, iron, protein and fibre including essential nutrients, potassium. and phosphorus, B vitamins like thiamine and riboflavin. Rich in phytochemicals including tannins, phenolic acids and anthocyanins.

Bajra: Bajra is a very good source of protein, it contains all essential amino acids and is particularly high in lysine, methionine, and cysteine. It is rich in folate, potassium. magnesium, copper, zinc and vitamin E, B-Complex, calcium and iron.

Recent studies have proven that regular consumption of pearl millets help in preventing gallstones in women. They contain insoluble fibers which not only speed up intestinal transit time but also reduce the secretion of bile acids.

Ragi (Finger millet): Ragi is a good source of Calcium, Iron, Protein, Fiber and other minerals. Millets are also rich in phytochemicals (polyphenols, tannins, phytosterols) and antioxidants; however, they do contain some anti-nutritional factors that can be reduced by certain processing treatments.

Materials and methods:

Materials required

- Jowar(sorghum)
- foxtail millet flour
- Ragi flour
- Bhajra flour
- little millet flour
- black gram dhal flour
- Bengal gram dhal flour
- Carom seeds
- White sesame seeds
- Curry leaves
- Green chilies
- Oil
- Packaging material
- Equipments such as Weighing machine, frying pan, bowl and vessels etc.

Method:

the method used for study is experimental

Development of product

The method used in development of value added millets Namkeen Various trails were carried out in developing in value added millets namkeens with varying proportions of different ingredients such as jowar flour, foxtail millet flour, Ragi flour, Bhajra flour, little millet flour, black gram dhal flour, Carom seeds, Curry leaves, Green chilies, salt and oil. millets Namkeens were prepared in each trials and compared with Maida Namkeens. evaluation of each trial was done and adjust were made in the proportions of the ingredients depending on the dough pliability time of kneading and rolling was done. sensory evaluation was done by 20 panel members using 9-point hedonic rating and result were tabulated. Based on results value added variation has been standardized with appropriate packaging, nutritional labelling with focus on shelf life studies, budgeting and marketing.

STANDARDIZATION OF MILLETS NAMKEENS (FINAL PRODUCT)

Take a bowl add jowar flour10%-bhajra flour20%-little millet flour10%- ragi flour 10% -foxtail millet flour10%

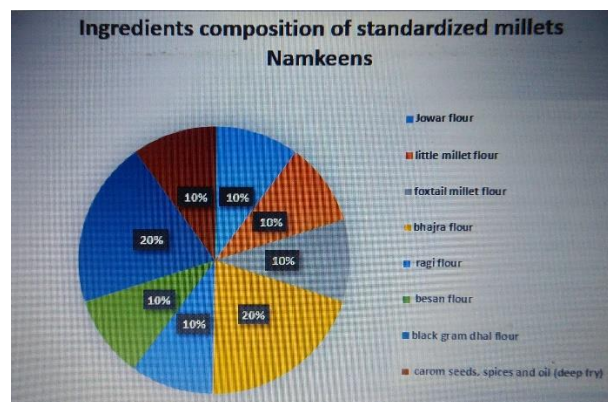
Bengal gram dhal flour 10% - black gram dhal flour 20%

Carom seeds2%+ white sesame seeds2%+ green chilies paste3%+salt2%+ hot oil 1%=10%

Add 50 ml Of hot water to it and stir it
 ↓
 mix it well and make it a soft dough kneed it
 ↓
 Fill dough into a namleens maker mould
 ↓
 Take a heavy bottom pan add 100ml of sun flower oil
 ↓
 after reaching smoking point Pour namkeens by pressing mould
 ↓
 Deep fry it for 5min in 100-degree Celsius temperature and sever it hot

Ingredients composition of standardized millets Namkeens

Ingredients	Quantity per 100g
Jowar flour	10%
little millet flour	10%
foxtail millet flour	10%
bhajra flour	20%
ragi flour	10%
besan flour	10%
black gram dhal flour	20%
carom seeds, spices and oil (deep fry)	10%



RESULTS AND DISCUSSION

Statistical interpretation of Variation 1 Versus Variation 2 for Namkeens

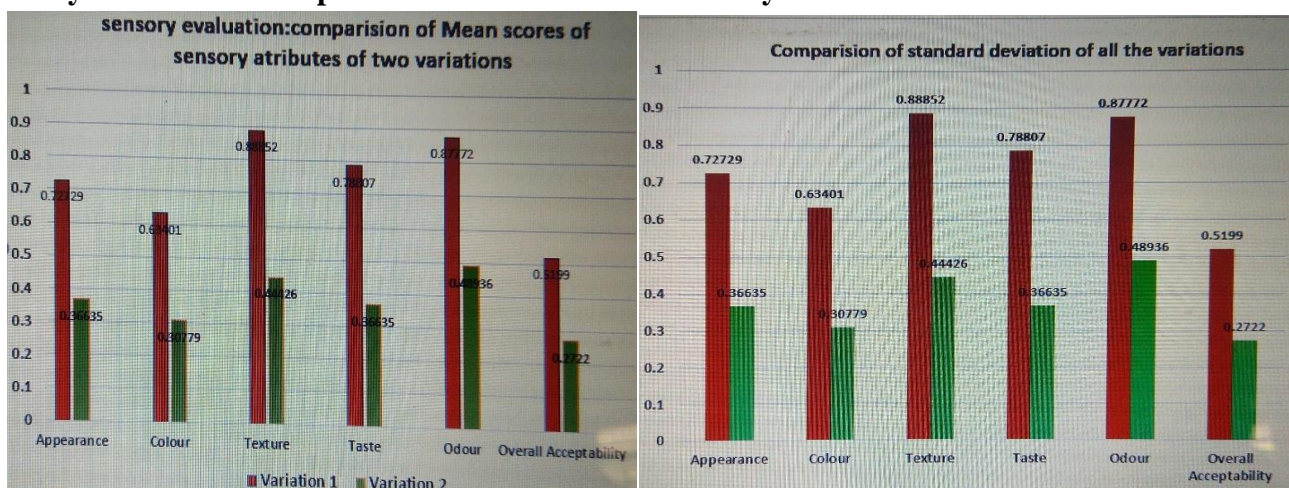
	Variation	N	Mean	Std. Deviation	Ttest statistic. p-value
Appearance	Variation1	20	7.3500	.72729	-8.238, 0.001
	Variation2	20	8.8500	.36635	

Colour	Variation1	20	7.4250	.63401	-9.360,
	Variation2	20	8.9000	.30779	<0.001
Texture	Variation1	20	7.5000	.88852	-5.627,
	Variation2	20	8.7500	.44426	<0.001
Taste	Variation1	20	7.9000	.78807	-4.889,
	Variation2	20	8.8500	.36635	<0.001
Odour	Variation1	20	7.9250	.87772	-4.116,
	Variation2	20	8.8500	.48936	<0.001
Overall Acceptability	Variation1	20	7.8250	.5199	-7.734,
	Variation2	20	8.8400	.2722	<0.001

Interpretation:

1. At 5% level of significance, there is significant difference between mean responses of appearance between variation 1 and variation 2 with p-value<0.001.
2. At 5% level of significance, there is significant difference between mean responses of colour between variation 1 and variation 2 with p-value<0.001.
3. At 5% level of significance, there is significant difference between mean responses of texture between variation 1 and variation 2 with p-value<0.001.
4. At 5% level of significance, there is significant difference between mean responses of taste between variation 1 and variation 2 with p-value<0.001.
5. At 5% level of significance, there is significant difference between mean responses of odour between variation 1 and variation 2 with p-value<0.001.
6. At 5% level of significance, there is significant difference between mean responses of overall acceptability between variation 1 and variation 2 with p-value<0.001.

Sensory Evaluation: comparison of Mean scores of sensory attributes of all the variations



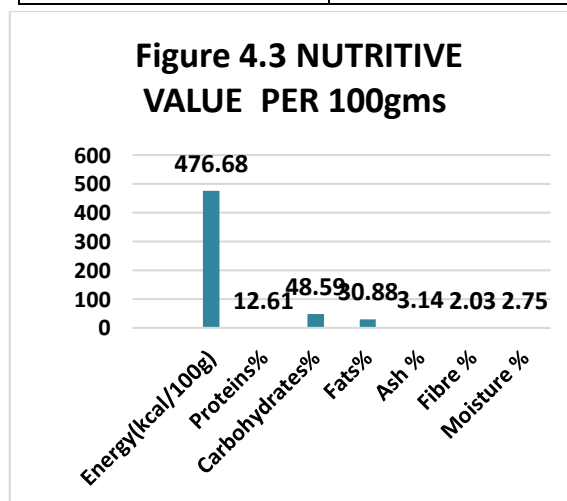
Interpretation:

Both figures explain the comparisons of mean scores and standard deviation of sensory attributes of all the variations. In figure 1 the comparison of mean scores of sensory attributes of all variations says that variation 2 is having highest mean scores than variation 1. Whereas figure 2 shows the comparisons of

standard deviation of sensory attributes of all the variations it revealed that variation 2 has lowest standard deviation than variation 1. From this comparison it is identified that variation 2 is highly accepted by consumers.

Proximate analysis (Nutritive value) of the value added multi millets namkeens

NUTRIENTS	VALUE PER 100gms
Energy(kcal/100g)	477. kcal
Proteins	12,61g
Carbohydrates	48.59g
Fats	30.88g
Ash	3.14g
Fibre	2,03g
Moisture %	2.75



The above table and graph depicts the results of proximate analysis - the nutritional composition of the standardized millet Namkeens with natural ingredients for 100g. Nutrients like energy, protein, fat, carbohydrate, fiber, content of the product was analyzed and compared its nutritive value with commercially available stick biscuits.

The product was subjected to shelf life studies in both room temperature (36°C) and refrigeration temperature (0-5°C)

It revealed that the millet Namkeens stored in refrigeration temperature (0-5°C) has higher shelf life for about 20 days, whereas in room temperature has higher shelf life about 15 days without any changes in sensory attributes of the Namkeens, but after 15 days the Namkeens turned hard and changes the colour was observed. In refrigeration temperature (0-5°C) after 20 days slight changes were observed like changes on colour, moisture and texture of Namkeens

Table. 4.15. Shelf life study of standardized value added millet Namkeens (physical examination)

physical examination	room temperature (36°C)		
	3 days	6days	10days
Days			

appearance	Golden yellow	Golden yellow	Golden yellow
odour	No off odour	No off odour	No off odour
Presence of infestation	absent	absent	absent

RESULTS

Most of the millet Namkeens commercially available in the market are made with Maida, baking powder. Usually commercial millet Namkeens are prepared with maida, baking powder along with chemical preservatives, acidity regulators, food colors etc. this caused the need for this study.

Various trials were made in an attempt to get a with Natural Ingredients that is acceptable by the general population.

1st trial was done with Jowar flour20%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 20%-carom seeds, spices and oil (deep fry)10%. which was very good, kept in room temperature for 20 days.

Next trial was made with Jowar flour10%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 10%- black gram dhal flour 20%- carom seeds, spices and oil (deep fry)10% and other natural ingredients, which was giving crispy can be kept at room temperature for 15 days.

Among the two trials second trial was accepted by most of the population were the proportion of the trial was Jowar flour10%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 10%- black gram dhal flour 20%- carom seeds, spices and oil (deep fry)10%. It was giving a very good odour and taste.

Sensory evaluation conducted by 20 semi trained panel members the results indicated that millet Namkeens with different variations was acceptable to consumers.

The millet Namkeens with Natural Ingredients had the highest mean scores for all attributes being compared. In The figures 4.10 and 4.11 explain the comparisons of mean scores and standard deviation of sensory attributes of all the variations. In figure 4.10 the comparison of mean scores of sensory attributes of all variations says that variation 2 is having highest mean scores than variation 1. Whereas figure 4.11 shows the comparisons of standard deviation of sensory attributes of all the variations it revealed that variation 2 has lowest standard deviation than variation 1. From this comparison it is identified that variation 2 is highly accepted by consumers

SUMMARY

- Commercially prepared Namkeens contains many chemical preservatives, additives, artificial colours and has less nutritive value. So this caused a reason to develop millet Namkeens with natural ingredients.
- Millet Namkeens with Natural Ingredients is a unique blend of Jowar flour10%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 10%- black gram dhal flour 20%- carom seeds, spices and oil (deep fry)10%. more developed flavor.
- Organoleptic sensory evaluation was done by a group of 20 semi trained judges and the response was recorded and tabulated.
- The scores are statistically interpreted by using mean, standard deviation and paired t-test and the results revealed that variation 2 is accepted than variation 1.
- The variation – 1 (jowar flour 40%, bajra flour 40%, curry leaves 5%, chilli flakes 5%, ginger 5%, garlic 5% oil for deep fry) appearance was good.

- The variation 2 was with (Jowar flour10%-bhajra flour20%-little millet flour 10%- ragi flour 10% - foxtail millet flour10% - besan flour 10%- black gram dhal flour 20%- carom seeds, spices and oil (deep fry)10%.) was good accepted by semi trained panel members.
- The variation 2 was subjected to proximate analysis and the results revealed that the millet Namkeens has rich in protein, when compared to the commercial sticks available in the market.
- Hence variation 2 was standardized and sold at the exhibition conducted; the feedback from the customers was good, making it consumable by all age group people on daily basis.
- This millet stick with Natural Ingredients is nutritionally adequate with good amount of calories, fiber, protein, vitamins, minerals and antioxidants and also has following health benefits.
- Healthy colon
- Low GI
- Calming mood food
- High in protein
- Gluten free
- Helps to optimize kidney, liver and immune system health
- Rich in Anti-oxidant
- Detoxifies body.
- They contain high amount of lecithin
- Lecithin is good for nervous system.

CONCLUSION:

Government of India announced 2018 year as “National Year of Millets”

so, I have selected the project topic as value added Millet Namkeens.

The Millet Namkeens were prepared with natural ingredients and rich in protein. It can be preserved without any added preservatives and flavoring agents. The millet Namkeens has good acceptable taste and good flavor, most of all age group people are addicted to junk foods which effect the health of individual. So this product is help full to be used as snacks. This product has good quality, nutritious and health benefits with maximum consumer acceptance.

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