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Standardization and Sensory Evaluation of Sorghum Chakli Enriched with Moth bean dal Flour

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INTRODUCTION

Sorghum (Jowar) is one of the most nutritious cereals,& is an important dry land crop grown in marginal land with minimum inputs. It is now recognize worldwide as a smart crop capable for providing food, feed, fodder fuel especially under moderate imputes especially in water deficient enviourments.

India produces about the same amount of 8.0 million tons of sorghum grain from much reduced area of 8.45m ha (2007-08).Area under Khrif sorghum has come down from 10.7/m ha to less than 4.0m ha over. The last 30 years decline in Rabi

Sorghum & millets are excellent source of carbohydrate micronutrients & phytochemicals with nutrceutical properties. They contain7-10%protein,2-5% fat 65-70%avalible carbohydrate 15-20% dietary fibre.Niacin & pyridoxine contents in pearl millet are higher than all other cereals. Sorghum is an admirable source of B-group vitamins. Proteins of sorghum are limiting in lysine & tryptophan content they complement well with lysine rich vegetables & animal protein & form nutritionally balanced composites of high biological value.

Nutritive value
Sorghum (main nutrient contain/100gm)

Energy (kcl)	Protein (gm)	Carbohydrate(gm)	Fat (gm)	Calcium (mg)	Iron (mg)
349	10.4	72.6	1.9	25	4.1

Moth bean dal (Matki dal)

The moth bean (Vigna acontilifolia) also called mat bean or Turkish gram in some parts of the world is native to India, Pakistan, and Burma. It is an important pulse crop of arid and semi-arid regions of India and Pakistan. It has multi-uses and adapts to extremes or uncongenial ecological niches particularly, in areas receiving fewer rains with erratic distribution. Moth bean is a hot weather, drought resistant legume. The plant resembles a small mat, it is a ground-hugging plant and only about a foot high. The densely matted branches, which grow horizontally and have deeply notched leaflets on long leaf branches, are somewhat similar to the leaves of certain varieties of sweet potatoes.

Matki dal contain high amount of proteins, including the essential amino

acid isoleusine & lysine,& are an essential source of inexpensive protein in many parts of the world for those who adhere to a vegetarian diet are cannot afford meat.

Apart from a high level of proteins, matki Dal also contain dietary fiber, folate, vitamin B1, & & minerals all with virtually no fat.

Moth bean's Dal (main nutrient contain/100gm)

Energy(kcl)	Protein (gm)	Carbohydrate	Fat (gm)	Calcium(mg)	Iron(mg)
330	23.6	56.5	1.1	75	7.05

Objectives

1. To study the nutrient contents of sorghum & Moth bean Dal.
2. To do the sensory evaluation of *Chakli* prepared with standard Combination.

METHODOLOGY

The study was under taken to know the utility of Chakli with the combination of sorghum & moth bean dal.It was standardized with different proportion of sorghum & moth bean dal from 60:40,70:30,80:20 and 90:10 were compared with 100% sorghum Chakli .

The standardize sample was selected by panel of 5 judges; there were 5 judges. The study was carried out in Nutrition laboratory of Smt. Radhadevi Goenka College for women, Akola.

It was aimed to assess the need of Chakli in society & response of Chakli prepared in the combination of sorghum & moth bean dal .

Sensory evaluation of sorghum chakli fortified with moth bean dal flour. Preparation of score card:

Before execution of sensory evaluation score card was prepared. The characteristic used were Appearance, Colour, Shape, Taste, Texture, Odour, Flavour, and Mouth feel score it out of 10 marks each.

Sr. no.	Chakli sample	Score (Out of 10 Marks to each)								
		Appearance	Colour	Shape	Taste	Texture	Odour	Flavor	Mouth feel	Over all acceptability
1.	A									
2	A1									
3	A2									
4	A3									
5	A4									

Spearmans rank correlation coefficient

$$r_s = 1 - \frac{6\Sigma d^2}{n^3 - n}$$

significance of r is tasted at 5.1 and 1.1 level of significance with (n-2) DF for table value of r

RESULT AND DISSCUSSTION

The chakli prepared by 5 different standards was offered to judges for testing, Appearance, Colour, Shape, Taste, Texture, odor, Flavors and Mouth feel.

Analysis of variance technique

The Chakli was prepared by 5 methods denoted by

A - Standard (sorghum 100%)

A1 - 90:10(90% sorghum &10% Moth bean dal)

A2 - 80:20(80% sorghum &20% Moth bean dal)

A3 -70:30 (70%sorghum & 30% Moth bean dal)

A4- 60:40 (60% sorghum & 40% Moth bean dal)

Table no.1
Overall acceptability score by judges

Sample	Judge1	Judge2	Judge3	Judge4	Judge5
A	7.40	8.71	6.08	7.87	6.18
A1	7.45	8.08	5.75	7.5	6.75
A2	6.63	6.47	5.03	5.73	5.90
A3	6.43	6.97	4.93	5.71	5.7
A4	6.63	5.71	4.50	5.30	5.6

The five samples score for appearance, colour, shape, taste, texture, odors, flavor, mouth feel where average & the average consider as over all acceptability score was analyze using analysis of variance one way classification .Table no. 1 reveals from the table that between group variance was significant. The comparison of means indicated that the average score of A & A1 product indicating that the overall performance of standard [A] and 90:10 [A1] were at par with each other indicating 10% replacement is acceptable.

Table no.2
Overall Rank given by Judges and Researches

Sample	Judge1	Judge2	Judge3	Judge4	Judge5	Researchers ranks
A	2	1	1	1	2	1
A1	1	2	2	2	1	2
A2	3	4	3	3	3	4
A3	5	3	4	4	4	3
A4	4	5	5	5	5	5

Table no. 2 presents the over all rank given by each judge to appearance,colour shap,taste,texture,flavor and mouth feel along with the researchers rank for each sample based on all the eight parameters of sensory evaluation, it reveals from the table, most of the rank assigned by the judges and researchers aggrement with each other Spearmans rank correlation coefficient between the rank given by researcher are presented in table no.3.

Table no.3
Rank Correlation between the Ranks by Judges and Researcher

Judges	Spearman's rank co-relation
1	0.20
2	1
3	0.8
4	0.8
5	1

The overall ranks for acceptability of the selected product & the researchers rank are presented in table no 3. The spearman rank's correlation between the ranks given by judges & the researcher where worked out & presented in the table chi-square calculation 1.78,was found to be non significant. Indicating that there is agreement in the rank given by researcher & judges.

SUMMERY AND CONCLUSION

The protein calorie malnutrition is very common problem in tropical and rural region in Maharashtra specially in Vidarbha, to overcome from the problem by supplementing protein like milk, meat and egg is not possible to everyone in the community. Hence it is needed to develop fortified recipe in the form of common food products.

p100gm. Sorghum flour contains 10.4gm. Protein,72.6gm, Carbohydrate, 1.9gm Fat, 349kcl Energy, 25mg.Calcium, 4.1mg iron. Whereas 23..6gm protein, 56.5gm carbohydrate, 1.1gm Fat, 330kcal Energy, 75mg Calcium, 7.05mg iron.

The Chakli get prepared with five different combination i.e. standard (100%sorghum), 90:10, 80:20, 70:30, 60:40 as the ratio of sorghum and moth bean respectively. The calculated nutritive value of the product revealed that the protein content of the product. As well as the need of Chakli in society.

The comparison of mean revealed that for shape and mouth feel the standard Chakli and the Chakli fortified with 10 percent moth bean flour with sorghum flour were superior, for appearance, colour,texture and odor the standard Chakli and Chakli fortified with 10 percent moth bean dal flour were best. For taste flavor along with overall acceptability the standard Chakli and the Chakli fortified with 10 percent moth bean dal flour were highest scored

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