

Sensory evaluation of some selected products of quality protein maize

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The nutritional well being of all people in the society is very important for the development of the nation .Malnutrition is a widespread problem in developing countries with large population living below poverty line. Malnutrition is the insufficient, excessive or imbalanced consumption of nutrients. There are several million undernourished children in India who are in the pre-school age group. Majority of the nutrients are provided through staple cereals we consume such as rice, wheat and maize. However, the protein content of cereals, our major source of amino acids, is deficient in lysine and tryptophan. Quality Protein Maize (QPM) is enriched maize with high lysine and tryptophan which was deficient in normal maize. In the present study, the acceptability of QPM products was studied through sensory evaluation method for the four products namely, QPM shakarpara and QPM mathri and wheat shakarpara and wheat mathri. It was found that the acceptability of QPM shakarpara and QPM mathri were quite satisfactory as compared to the same products prepared with wheat.

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INTRODUCTION

The nutritional well being and health of all people are vital prerequisites for the development of the society. Malnutrition is a widespread problem, particularly in developing countries with low per capita income and with large population living below poverty line. Malnutrition is the insufficient, excessive or imbalanced consumption of nutrients. The most recent estimate, released in October 2010 by FAO, estimates that a total of 925 million people are undernourished in 2010 compared with 1.023 billion in 2009. One of the major reasons for this is the lack of sufficient quality protein in the diet of people, specially children and women of child bearing age. Majority of the nutrients are provided through staple cereals consumed such as rice and wheat. After wheat and rice, the most important cereal grain in the world is maize, providing nutrients for humans and animals and serving as a basic raw

material for the production of starch, oil and protein, alcoholic beverages, food sweeteners and more recently, fuel (Mane and Shadakshrsamy, 2001; Kataki and Babu, 2003).

However, the protein content of maize, major source for amino acids, is deficient in the amino acids lysine and tryptophan. When many decades ago a maize-variant was discovered with lower alpha zein levels, the protein content was balanced with non-zein proteins, raising the relative level of lysine. Using natural variation, breeders were able to combine low alpha zein levels with quantitative trait loci that restore kernel hardness and called these maize lines 'quality protein maize' (QPM). Quality protein maize is nutritionally enriched maize with high content of lysine and tryptophan and a better balanced amino acid composition. It has good agronomic performance and better tolerance to major insect pests and diseases. Indeed QPM has been a great success in countries where maize is the staple for human consumption.

In India, around 6.5 million tons (roughly 50 per cent of total consumption) goes for feed use, primarily for poultry feed. Another 1 million tons of corn is used by the starch industry.

Hence, the present study has been taken to see the acceptability of QPM so as to popularize this nutrient rich cereal for better health of people.

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The objective of the study was to see the acceptability of QPM products as compared to the wheat products.

METHODOLOGY

The raw materials required for the study, namely, wheat and QPM, were made available from the local market and Department of Genetics and Plant breeding, Institute of Agricultural Sciences, B.H.U., Varanasi, respectively.

To increase the digestibility and to make the bound niacin available to the body, 1 per cent lime treatment was given to QPM. The maize was then heated for 30 minutes at simmering temperature and then left over night. Next morning, it was washed several times to remove lime and then sun dried and kept in containers.

Wheat was washed, sun dried and kept in containers.

The following products were prepared and standardized

– Shakarpara

– Mathri

Score card:

The score cards were prepared for the paired comparison test and hedonic scale rating. 50 people were selected to judge the products for sensory evaluation. All the score cards mentioned date, name of the judge and desired conditions for evaluation.

The results obtained were analysed with the help of relevant statistical tools.

OBSERVATIONS AND ASSESSMENT

The following results were obtained for the acceptability of product -1 (QPM and wheat shakarpara).

From the Table 1, it can be seen that out of 100 per cent respondents who found wheat shakarpara to be very good, 66.7 per cent are those who found QPM shakarpara to be very good in external appearance. None of the respondents found either of the products to be poor or excellent.

From the Table 2, it can be seen that 64 per cent of the respondents found the taste of wheat shakarpara to be very good where as only 58 per cent of the respondents found the taste of QPM shakarpara to be very good. None of the respondents found the taste of wheat shakarpara to be excellent where as 34 per cent of the respondents found the taste of QPM shakarpara to be excellent.

Table 3, shows that 16 per cent of the total respondents liked the wheat shakarpara very much where as 66 per cent of the total respondents like the QPM shakarpara very much. 18 per cent of the respondents extremely liked the QPM shakarpara where as as none of the respondents extremely liked the wheat shakarpara.

The following results were found for the acceptability of the product-2 (QPM and wheat mathri). Based on the external appearance, it was found that 12 per cent of the total respondents found the wheat mathri to be excellent where as 64 per cent of the total respondents found the QPM mathri to be excellent. None of the respondents found either of the

Table 1. Distribution of level of acceptability of QPM and wheat shakarpara based on external appearance

QPM	Wheat									
	Poor		Good		Very good		Excellent		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Poor	--	--	--	--	--	--	--	--	--	--
Good	--	--	5	11.9	1	33.3	--	--	6	12
Very good	--	--	22	52.4	2	66.7	--	--	24	48
Excellent	5	100	15	35.7	--	--	--	--	20	40
Total	5	100	42	100	3	100	--	--	50	100
Percentage	10.0		84.0		6.0		--		100.0	

Table 2. Distribution of level of acceptability of QPM and wheat shakarpara based on taste

QPM	Wheat									
	Poor		Good		Very good		Excellent		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Poor	--	--	--	--	--	--	--	--	--	--
Good	--	--	--	--	4	12.5	--	--	4	8.0
Very good	--	--	9	50.0	20	62.5	--	--	29	58.0
Excellent	--	--	9	50.0	8	25.0	--	--	17	34.0
Total	--	--	18	100	32	100	--	--	50	100
Percentage	--		36.0		64.0		--		100.0	

Table 3. Distribution of level of acceptability of QPM and wheat shakarpara based on hedonic rating

QPM	Wheat							
	Like extremely		Like very much		Like moderately		Total	
	No.	%	No.	%	No.	%	No.	%
Like extremely	--	--	4	50.0	5	11.9	9	18.0
Like very much	--	--	4	50.0	29	69.0	33	66.0
Like moderately	--	--	--	--	8	19.0	8	16.0
Total	--	--	8	100.0	42	100.0	50	100.0
Percentage	--	--	16.0		84.0		100.0	

Table 4. Distribution of level of acceptability of QPM and wheat mathri based on external appearance

QPM	Wheat									
	Poor		Good		Very good		Excellent		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Poor	--	--	--	--	--	--	--	--	--	--
Good	--	--	--	--	1	33.3	1	16.7	2	4.0
Very good	--	--	2	14.3	11	36.7	3	50.0	16	32.0
Excellent	--	--	12	85.7	18	60.0	2	33.3	32	64.0
Total	--	--	14	100	30	100	6	100.0	50	100
Percentage	--	--	28.0		60.0		12.0		100.0	

Table 5. Distribution of level of acceptability of QPM and wheat mathri based on taste

QPM	Wheat									
	Poor		Good		Very good		Excellent		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Poor	--	--	--	--	--	--	--	--	--	--
Good	--	--	1	3.1	--	--	--	--	1	2.0
Very good	--	--	16	50.0	7	41.2	--	--	23	46.0
Excellent	--	--	15	46.9	10	58.8	1	100.0	26	52.0
Total	--	--	32	100	17	100	1	100.0	50	100
Percentage	--	--	64.0		34.0		2.0		100.0	

Table 6. Distribution of level of acceptability of QPM and wheat mathri based on hedonic rating

QPM	Wheat							
	Like extremely		Like very much		Like moderately		total	
	No.	%	No.	%	No.	%	No.	%
Like extremely	--	--	--	--	11	28.9	11	22.0
Like very much	--	--	12	100.0	25	65.8	37	74.0
Like moderately	--	--	--	--	2	5.3	2	4.0
Total	--	--	12	100.0	38	100.0	50	100.0
Percentage	--	--	24.0		76.0		100.0	

products to be poor (Table 4).

From the Table 5, it can be seen that 34 per cent of the respondents found the taste of wheat mathri to be very good where as only 46 per cent of the respondents found the taste of QPM mathri to be very good. 2 per cent of the respondents found the taste of wheat mathri to be excellent where as 52 per

cent of the respondents found the taste of QPM mathri to be excellent.

From the Table 6, it can be seen that 74 per cent of the total respondents liked the QPM mathri very much where as only 24 per cent of the respondents liked the wheat mathri very much. None of the products was extremely liked by any respondent.

Conclusion:

It was found that the acceptability of QPM shakarpara and QPM mathri were quite satisfactory in terms of acceptance as compared to the same products prepared with wheat. QPM is enriched maize with high lysine and tryptophan which was deficient in normal maize and other cereals which are normally used as staple food. It is good for growing children and provides better taste and acceptability. Hence, its use in the diet of human beings should be promoted in order to eradicate the nutrient deficiency among the vulnerable group, specially children.

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