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Value Added Products of Pearl Millet Foods: Adoption and Acceptability by Rural Women

D. V. Singh [a++*] and Priyanka Chand [b#]

[a] Krishi Vigyan Kendra, Tonk, Rajasthan, India.
[b] ITM University, Gwalior, M.P., India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Investigations were carried out to assess the sensory evaluation (organoleptic tests) and adoption feasibility of different pearl millet products among rural women. Study was conducted in Tonk district of Rajasthan state. Total 25 rural women of Sangrampura, Khandawa, Harbhamata, Palai and Damodarpura villages were purposively selected for this study. Results indicate that on the basis of comparative sensory evaluation and rank wise preferential choice of pearl millet products, majority of women accepted *ladoo* (mean score 2.68) and *shakarapare* (mean score 2.50) which got rank I and II and salty products ranked III and IV. Overall adoption feasibility of these products was 79 per cent which means high level of adoption of these products.

Keywords: Value addition; pearl millet; organoleptic tests; adoption feasibility.

[++] *Senior Scientist & Head;*
[#] *Research Scholar;*
**Corresponding author: E-mail: drdvs.org@gmail.com;*

1. INTRODUCTION

Pearl millet provides staple food for millions under the most vulnerable farming system in dry and semi-arid regions of Asia and Africa. Pearl millet is well adapted to drought prone areas, low soil fertility and high temperature situations. In India, it is the fourth most important cereal crop after rice, wheat and sorghum. In Rajasthan its average area of production is 3.47 million hectare, productivity 1436 kg per ha in 2021-22. It is nutritionally superior to major cereals with respect to protein, energy, vitamins and minerals [1]. Besides, millets are also rich source of dietary fibre, phytochemicals, micronutrients and nutricereals. In view of health and nutritional benefits and to sustain the production of bajra, it becomes necessary to promote these nutria-cereals among masses. Though, pearl millet is good as far as nutritive value is concerned, but still there are some major constraints that obstacle its diversified utilization [3,4]. One of the major constraints with the utilization of pearl millet is the property of the flour to acquire a rancid odour within few days of milling. Various processing techniques like malting, blanching, sprouting, dry heat treatment, fermentation and soaking can be used to overcome these constraints [5].

The processing technique not only helps in improving the availability of nutrients but also enhance the shelf life of pearl millet flour [6-7]. Pearl millet grains are very high in calories and that's why they do wonders for growing children and pregnant women [8]. To overcome the problems of under-nutrition and over-nutrition there is need to develop value added fibre rich products from cereals and nutritional evaluation of new crop varieties and preparation of value added products.

2. METHODOLOGY

The present study was conducted in Tonk district of Rajasthan state during 2021 and 2022 because district have more than 70,000 ha area under pearl millet and having very good condition in the state as per area and yield of pearl millet and farmers family are mostly using pearl millet as staple food in the food system in the distirct. Five villages namely, Sangrampura, Khandawa, Harbhamata, Palai and Damodarpura were selected randomly. 5 respondents from each village were selected purposively. A total of 25 rural women respondents were selected purposively from these villages who had interest in getting new skills for making value added products of pearl millet. A well designed intervention programme comprised of motivational lectures, demonstrations, training programme and literature was provided to rural women. During training programme value added products of pearl millet namely, *ladoo*, *matar*, *sev* and *shakarpare* were prepared infront of them and given them to taste these. Results are presented in terms of organoleptic (sensory) evaluation of each products, comparative and rank wise preferential choice of each product and adoption feasibility of pearl millet products.

3. RESULTS AND DISCUSSION

Sensory evaluation means to explore the possibility of acceptance of pearl millet products on the basis of five parameters viz., colour, texture, taste, flavours and appearance. The data in Table 1 indicate that taste of pearl millet *ladoo* by rural women respondents were preferred to appreciate extent (mean score 2.80) and got rank I followed by flavor (mean score 2.76), colour (mean score 2.68) and got rank II and III respectively. Sensory evaluation score assigned to pearl millet *matar* depicted that taste of *matar* was appreciated by majority of the rural women and got rank I (mean score 2.64) followed by flavor (mean score 2.48) and appearance(mean score 2.34) having rank II and III respectively. Whereas, sensory evaluation score of *sev* and *shakarpare* in terms of various parameters were comparatively the same as in the other products and also appreciated by majority of respondents in respect of their taste, flavor and texture.

Data presented in Table 2 on overall acceptability or acceptance of different pearl millet product, clearly show that sweet pearl millet products i.e. *ladoo* and *shakarpare* were preferred to maximum extent of appreciable (mean score 2.68 and 2.50, respectively) and got rank I and II, whereas salty products got rank III and IV having mean score 2.39 and 2.20, respectively.

Table 3 shows the data regarding perceived feasibility of pearl millet products, overall adoption feasibility index was found 79 per cent which means of high percentage of adoption feasibility. However, highest score was obtained on practicability attributes i.e. 96.8 per cent. This might be due to the facts that rural women respondents found these products were easily demonstrable and triable. This trend was

followed by simplicity (81.3%), relative advantage (77.6%) and compatibility (61.3%). These results are in consonance with Sain [4] and Malik and Verma [9]. This might be due to the fact that rural women found these products having low initial costs, physically, culturability and socially compatible and easy to demonstrable to other fellow or rural women.

Table 1. Sensory evaluation of pearl millet products

N=25

Characters	Response Categories			Total Score	Mean Score	Rank
	Appreciable	Somewhat Appreciable	Not Appreciable			
Ladoo						
Colour	17 (51)	8 (16)	0 (0)	67	2.68	III
Texture	16 (48)	8 (16)	1 (1)	65	2.60	IV
Taste	20 (60)	5 (10)	0 (0)	70	2.80	I
Flavour	19 (57)	6 (12)	0 (0)	69	2.76	II
Appearance	17 (51)	5 (10)	3(3)	64	2.56	V
Overall Acceptance				**335**	**2.68**	
Matar						
Colour	11 (33)	7(14)	7 (7)	54	2.16	V
Texture	12 (36)	8 (16)	5 (5)	57	2.28	IV
Taste	16 (48)	9 (18)	0 (0)	66	2.64	I
Flavour	15 (45)	7 (14)	3 (3)	62	2.48	II
Appearance	14 (42)	6 (12)	5 (5)	59	2.34	III
Overall Acceptance				**298**	**2.39**	
Sev						
Colour	11 (33)	6 (12)	8 (8)	53	2.12	IV
Texture	14 (42)	3 (6)	8 (8)	56	2.24	II
Taste	13 (39)	8 (16)	4 (4)	59	2.36	I
Flavour	12 (36)	6 (12)	7 (7)	55	2.20	III
Appearance	11 (33)	5 (10)	9 (9)	52	2.08	V
Overall Acceptance				**275**	**2.20**	
Shakarpare						
Colour	15 (45)	6 (12)	4 (4)	61	2.44	IV
Texture	13 (39)	9 (18)	3 (3)	60	2.40	V
Taste	17 (51)	8 (16)	0 (0)	67	2.68	I
Flavour	15 (45)	9 (18)	1 (1)	64	2.56	II
Appearance	15 (45)	8 (16)	2 (2)	63	2.52	III
Overall Acceptance				**315**	**2.50**	

Table 2. Comparative sensory evaluation and rank wise preferential choice of pearl millet products

N=25

Characters	Pearl millet Products			
	Ladoo	***Matar***	***Sev***	***Shakarpare***
Colour	2.68	2.16	2.12	2.44
Texture	2.60	2.28	2.24	2.40
Taste	2.80	2.64	2.36	2.68
Flavour	2.76	2.48	2.20	2.56
Appearance	2.56	2.40	2.08	2.52
Overall Acceptance	2.68	2.39	2.20	2.50
Rank	**I**	**III**	**IV**	**II**

Table 3. Perceived adoption feasibility of pearl millet products

N=25

Attribute	Response Category			Total Score	Mean Score	Rank
	Agree(3)	Undecided(2)	Disagreed(1)			
Relative Advantage						
Low initial costs	12 (36)	13 (26)	0 (0)	62	2.48	I
Monetary benefits	11 (33)	9 (18)	5 (5)	56	2.24	IV
Consistency of use	10 (30)	13 (26)	2 (2)	58	2.32	III
Time saving	9 (27)	12 (24)	4 (4)	55	2.20	V
Multiple use potential	12 (36)	11 (22)	2 (2)	60	2.40	II
Total				**291**		
AFI = 77.6%						
Compatibility						
Cultural	16 (48)	9 (18)	0 (0)	66	2.64	I
Physical	15 (45)	10 (20)	0 (0)	65	2.60	II
Social	12 (36)	7 (14)	6 (6)	56	2.24	III
Situational	10 (30)	10 (20)	5 (5)	55	2.20	IV
Relational	6 (18)	10 (20)	9 (9)	47	1.88	V
Total				**289**		
AFI =77.2%						
Simplicity/Complexity						
Cognitive simplicity	19 (57)	6 (12)	0 (0)	69	2.76	III
Application simplicity	21 (63)	4 (8)	0 (0)	71	2.84	II
Resource Simplicity	0 (0)	11 (22)	14 (14)	36	1.44	V
Reversibility	25 (75)	0 (0)	0 (0)	75	3.00	I
Increase Efficiency	8 (24)	13 (26)	4 (4)	54	2.16	IV
Total				**305**		
AFI = 81.3%						
Practicability						
Communicability	15 (45)	10 (20)	0 (0)	65	2.60	III
Visibility of results	25 (75)	0 (0)	0 (0)	75	3.00	I
Demonstrability	23 (69)	2 (2)	0 (0)	73	2.92	II
Triability	25 (75)	0 (0)	0 (0)	75	3.00	I
Provision of modification	25 (75)	0 (0)	0 (0)	75	3.00	I
Total				**363**		
AFI = 96.8%						
Overall AFI = 79.0%						

4. CONCLUSION

Results indicated that there was high extent of appreciation of pearl millet products among rural women and they appreciated sweet products (*ladoo* and *shakarpare*) more in comparison to salty products. This means they appreciated these products irrespective of their taste, flavor, texture etc. Results indicate that on the basis of comparative sensory evaluation and rank wise preferential choice of pearl millet products, majority of women accepted *ladoo* (mean score 2.68) and *shakarapare* (mean score 2.50) which got rank I and II and salty products ranked III and IV. All the products have rank I in the reference of taste. However, overall adoption feasibility index of pearl millet products was 79 per cent which means high level of adoption.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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