

Acceptability of pearl millet flakes

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■ **ABSTRACT** : A study to evaluate the quality of two pearl millet recipes viz., chivda and seasoned wet flakes prepared from pearl millet flakes was carried out at Krishi Vigyan Kendra and Regional Agricultural Research Station, Bijapur during 2011-12. The flakes were prepared from pearl millet composite cv. ICTP-8203 having bold and uniform size seeds. The sensory evaluation and acceptability of the two recipes with respect to appearance, colour, taste, aroma and texture were conducted by 15 judges panel using hedonic score method. The results revealed that both the products were equally acceptable when the moderate acceptability was compared (60%), but when the high acceptability was compared, seasoned wet flakes were more preferred (33.33%) than chewda (20.00%). Further, the nutritional superiority of this millet is an added advantage which will help to create its space and demand in the food industry.

■ **KEY WORDS** : Pearl millet, Nutritive value, Flakes, Recipes, Acceptability

Pearl millet is also known as cat tail millet or bulrush millet. This is an important crop in arid and semi-arid regions of Asia and Africa. Pearl millet is the fourth most important crop in India next to rice, wheat and sorghum and the second major coarse cereal grain after sorghum. Pearl millet is extensively cultivated in poor fertile and water deficit soils, mostly under low and erratic rainfall situations. India is the largest producer of pearl millet in the world (Balasubramaniyan and Palaniappan, 2002). In Karnataka, it covers an area of 3.10 lakh ha and production being 3.00 lakh tonnes (Anonymous, 2012). It is largely grown for home and local consumption and the marketable surplus is limited. Pearl millet can substitute wheat and rice if other alternatives of its utilization are developed and introduced in the food industry. Added to this, the nutritional superiority of this millet compared to other cereals will also add value to commercial exploitation of this millet. It is high in protein as compared to other cereals. It contains all essential amino acids and is particularly high in lysine, methionine, and cysteine. It is rich in folate, potassium, magnesium, copper, zinc, vitamin E and B-complex. It is rich in calcium and iron too (Table A).

In spite of its high nutritional quality, the consumption of pearl millet is less because of its poor shelf-life, but research

shows that, shelf-life can be increased through different processing methods. Hence, pearl millet was introduced in its processed and novel form *i.e.* flakes which is the trend of modernized world and its acceptability was tested.

■ RESEARCH METHODS

The study was carried out at Krishi Vigyan Kendra and Regional Agricultural Research Station, Bijapur, Karnataka during 2011-12. Flakes was prepared from pearl millet composite cv. ICTP 8203. The seeds were bold and uniform. Thus, the quality of flakes was also good. Two recipes were prepared from this flakes *i.e.* pearl millet chewda as a snack item and pearl millet seasoned wet flakes as a breakfast item. Pearl millet chewda was prepared by seasoning the dry flakes using oil, mustard seeds, garlic, curry leaves, red chilli powder, groundnut, salt and roasted chickpea. Pearl millet seasoned wet flakes was prepared by seasoning the wet flakes using oil, onion, green chilli, curry leaves, turmeric, salt, tomato and groundnut. For preparation of wet flakes just sprinkle water over the flakes till it becomes moist and not soak the flakes in water like rice flakes. The sensory evaluation and acceptability of these two selected recipes was conducted by 15 judges using the hedonic score method (Swaminathan, 1995) and the

Table A : Nutritional composition of different cereals and millets

Cereals and millets (100g)	Protein (g)	Carbohydrates (g)	Energy (kcal)	Iron (mg)	Calcium (mg)	Zinc (mg)	Fat (g)
Rice	6.4	79.0	346	1.0	9.0	143	0.4
Wheat	12.5	69.4	341	4.9	48	355	1.7
Jowar	10.4	72.6	349	4.1	25.0	222	1.9
Maize	11.1	66.2	342	2.3	10.0	348	3.6
Foxtail millet	12.3	60.6	334	6.3	30	290	4.3
Little millet	7.7	63.7	328	7.1	20	220	4.7
Finger millet	7.1	72.7	331	5.4	330	283	1.3
Pearl millet	11.6	67.1	360	8.8	50	296	5.0

scale ranged from 5 to 1 (Highly acceptable-5, moderately acceptable-4, acceptable-3, less acceptable-2 and poorly acceptable-1). Percentage of acceptability was calculated.

■ RESEARCH FINDINGS AND DISCUSSION

Flaking is a process that is widely used for making foods from cereals, and both sorghum and millet can be flaked. Pearl millet grains are pearled, moistened with water and steamed or cooked to gelatinize some of the starch, dried to a moisture content of about 17 per cent and then either pounded in a special mortar or rolled between flaking rolls to produce a flat product. The flakes are further dried and can be stored for several months. In India poha and avalakki are flaked foods based on sorghum and millet.

In this study, pearl millet flakes were prepared. Two

recipes were prepared from this flakes *i.e.* pearl millet chewda as a snack item and pearl millet seasoned wet flakes as a breakfast item.

With regard to seasoned wet flakes (Table 1), the sensory evaluation revealed that the appearance (53.33%), colour (53.33%), taste (53.33%), aroma (46.66%) and texture (66.66%) were moderately acceptable (60 %) followed by highly acceptable (33.33%). The overall acceptability of seasoned wet pearl millet flakes was moderately acceptable (60.00%) followed by highly acceptable (33.33%).

Further sensory evaluation of pearl millet chewda (Table 2) revealed that, the appearance (46.67 %), colour (60.00%), taste (46.67 %), aroma (26.67 %) and texture (40%) were also moderately acceptable. The overall acceptability of pearl millet chewda was moderately acceptable (60%) followed by highly

Table 1 : Organoleptic acceptability of seasoned pearl millet wet flakes

Parameters	Highly acceptable	Moderately acceptable	Acceptable	Less acceptable	Poorly acceptable
Appearance	6 (40.00)	8 (53.33)	1 (6.66)	-	-
Colour	4 (26.66)	8 (53.33)	3 (20.00)	-	-
Taste	6 (40.00)	8 (53.33)	1 (6.66)	-	-
Aroma	4 (26.66)	7 (46.66)	4 (26.66)	-	-
Texture	4 (26.66)	10 (66.66)	-	1 (6.66)	-
Overall acceptability	5 (33.33)	9 (60.00)	1 (6.66)	-	-

Figures in parentheses indicate percentages

Table 2 : Organoleptic acceptability of pearl millet chewda

Parameters	Highly acceptable	Moderately acceptable	Acceptable	Less acceptable	Poorly acceptable
Appearance	4 (26.66)	7 (46.67)	2 (13.33)	2 (13.33)	-
Colour	-	9 (60.00)	5 (33.33)	1 (6.67)	-
Taste	4 (26.66)	7 (46.67)	3 (20.00)	1 (6.67)	-
Aroma	4 (26.67)	4 (26.67)	6 (40.00)	1 (6.66)	-
Texture	5 (33.33)	6 (40.00)	2 (73.33)	1 (6.66)	-
Overall acceptability	3 (20.00)	9 (60.00)	2 (13.33)	1 (6.66)	-

Table 3 : Comparison of acceptability between chivda and wet flakes

Parameters	Highly acceptable	Moderately acceptable	Acceptable	Less acceptable	Poorly acceptable
Chivda	3 (20.00)	9 (60.00)	2 (13.33)	1 (6.66)	-
Seasoned wet flakes	5 (33.33)	9 (60.00)	1 (6.66)	-	-

acceptable (20.00%).

When the high acceptability of seasoned wet flakes and chewda was compared, the results revealed that wet flakes was more acceptable than chewda (Table 3).

A study by Malleshi *et al.* (1989) revealed that cereals and legumes, individually or as composites, are the main source of nutrients for weaning children in developing countries. Among cereals, pearl millet (*Pennisetum glaucum* syn. *P. americanum*, *P. typhoideum*) is considered to have one of the best protein quality or amino acid scores. The nutritional value of pearl millet is greatly enhanced when mixed with legumes because, the latter complements its profile of essential amino acids (Serna-Saldivar *et al.*, 1991).

Conclusion:

It is observed of late that, the food habits of people have changed. They are preferring healthy, nutritious and ready-to-cook/eat foods due to paucity of time. To increase the consumption and create demand for pearl millet in food industry, it needs to be introduced in its novel form. Hence, pearl millet was introduced in the form of flakes and two recipes were prepared i.e pearl millet seasoned flakes and pearl millet chewda. It was found that, both the products were equally acceptable when the moderate acceptability was compared, but when the high acceptability was compared, seasoned wet flakes was more preferred than chewda. Further, the nutritional

superiority of this millet is an added advantage which will help to create its space and demand in the food industry.

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