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Standardization, nutritional and sensory analysis of Proso Millet Halwa

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Abstract

Proso millet are highly nutritious but lack gluten. It is especially rich in proteins, vitamins, minerals, and micronutrients. The objective of the present study was the development of proso millet product and their quality evaluation. The developed proso millet halwa had protein content was 20.31g, carbohydrates 100.44g, energy 539.52kcal/100g. Calcium content was 60.26 mg, iron 2.26 mg and phosphorus content of 143.45mg /100g. Sensory evaluation was assessed using a hedonic scale of nine points. Found that overall acceptability of proso millet halwa was good.

Keywords: Proso millet, quality evaluation, standardize, acceptability

1. Introduction

Proso millet (*Panicum miliaceum* L.) is resistant to salt, alkali, cold and drought and can be cultivated in various types of soil even under poor growing conditions (Zhang *et al.*, 2014) [3]. It is superior to rice and wheat, because it provides protein, mineral and vitamins to the poor where the need for such nutrients is in high demand (Tylor *et al.* 2008) [5]. It is rich in minerals and trace elements like iron, magnesium and phosphorus (Reddy *et al.* 2007) [4] and is desirable for human food because it is easily digestible and is gluten-free. Proso Millet is an annual grass and is visually very similar to foxtail millet. It is slightly richer in protein and fat than other millet. Proso millet flour can be used a substitute for rice flour in snack foods. A significant portion of proso millet grain is also used for non-food purpose such as bird feed. Health benefits of Proso Millet are Beneficial in preventing pellagra and niacin dependent conditions, Useful for people with coeliac disease, Decreases risk of cancer, Useful for strengthening bones, weight loss etc.

Hence seeking these positive properties of *proso millet* the present study was conducted to develop *Proso millet* product and its quality evaluation.

2. Material and Methods

2.1 Procurement of raw materials

Proso millet and other ingredients were procured from local market of Udaipur city.

2.2 Processing of Proso millet and development of flours

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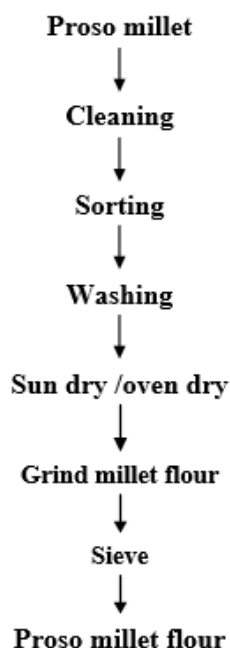


Fig 1: Flow diagram of processing of proso millet

2.3 Development and Standardization of Halwa

The hundred gram proso millet flour were used to develop Halwa.

Table 1: Standardized recipes Halwa

Ingredients	T1(g/ml)100%
Proso Millet Flour	100
Sugar	10
Ghee	20
Cardamom powder	5
Dry Fruits	5
Water	25



Methods of cooking

- Heat Ghee in pan.
- Take the *proso millet* flour out of hot ghee on low flame.
- Then add sugar to it and roasted it till golden brown.
- Add cardamom powder and pour water.
- Serve with Dry fruits.

2.4 Sensory Characteristics

The sensory characteristics of products were judged by the panel of ten semi-trained member from the department of food science and Nutrition, Udaipur. The panelists were asked to evaluate the product for different sensory attributes namely colour, flavor, taste, texture, appearance, overall acceptability. Nine point Hedonic scale and score Card method were used for evaluation of sensory characteristics of food products.

2.5 Nutrient Composition

Moisture, crude protein, fat, ash, crude fiber, iron and calcium were determined by the method of (AOAC, 1980) [1].

2.6 Statistical Analysis

All the obtained data of chemical analysis and sensory evaluation were statistically analyzed using Mean, Standard Error to the standard method.

3. Result

Results of sensory evaluation of halwa prepared with *proso* flour presented in (Table 2 and Fig. 1) revealed that the overall acceptability of halwa 7.89. This indicated that the recipes were found under the category of 'liked moderately to liked very much. Standard halwa exhibit highest scores for all sensory attributes i.e. 8.11±0.12 (appearance), 8.70±0.20 (color), 7.0±0.5 (texture), 7.42±0.19 (flavour), 7.66±0.13 (taste) and 7.89±0.07 (overall acceptability). However incorporation of *proso millet* flour in halwa upto 100 percent level maintains like moderately on the basis of 9 point hedonic scale

Table 2: Mean Sensory Scores of proso millet halwa

Parameters	Colour	Taste	Flavor	Texture	Apperance	Overall Acceptability
Halwa	8.70±0.20	7.66±0.13	7.42±0.19	7.0±0.5	8.11±0.12	7.89±0.07

3.2 Nutritional Composition of proso millet halwa

The nutrient composition of *proso millet* halwa was found to be 30.2 per cent moisture, 20.31 per cent protein, 6.28g percent fat, 2.04g percent ash, 2.01g percent fiber, 100.44g percent carbohydrate, 539.52 kcal percent energy, 9.75g percent total dietary fiber per 100g.

Table 3: Proximate composition of proso millet Halwa

Proximate composition	Mean± SD
Moisture(g)	30.2±1.20
Ash(g)	2.04±0.40
Crude fiber(g)	2.01±0.85
Fat(g)	6.28±0.8
Crude Protein(g)	20.31±0.14
Energy(kcal)	539.52±4.36
Carbohydrates (g)	100.44±2.64
Total Dietary Fiber (g)	9.75±0.03

Minerals of *proso millet* halwa was 2.26 mg iron, 60.26 mg calcium, and 143.45g magnesium, 379.6 mg phosphorus content in per 100 g.

Table 4: Minerals of proso millet halwa

Mineral	Mean± SD
Iron(mg)	2.26±0.42
Calcium(mg)	60.26±0.66
Magnesium(mg)	143.45±1.27
Phosphorus(mg)	379.6±2.56

4. Conclusion

From this study it may be concluded that *proso millet* halwa prepared with 100 per cent proso millet flour incorporation had better nutrient and sensory properties, colour, taste, flavour etc. and it also improved the nutritional profile. Therefore, results suggest that there is a great scope for use of

value added halwa using *proso millet* and it can be concluded that *proso millet* can be utilized for achieving nutrition and food security for India.

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