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DEVELOPMENT AND STANDARDIZATION OF PROSO-MILLET MILK BURFI

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ABSTRACT:

Barfi is a milk-based sweet from the Indian subcontinent with a fudge-like consistency. Its name comes from the Persian and Urdu word for snow. Barfi is consumed throughout India and Pakistan and is especially popular in North India. The formulation of the burfi using proso millet milk, and other ingredients, along with an analysis of its nutritional composition. Proso millet is known for its rich protein content, essential amino acids, dietary fibre, vitamins, and minerals, making it a valuable addition to the diet, especially for vegetarians and those with gluten intolerance. The methodology involves the preparation of proso millet milk burfi using a standardized recipe, followed by nutritional analysis to determine its protein content, amino acid profile, and other essential nutrients. The study also explores variations in the recipe to enhance flavour, texture, and overall acceptability. Ingredients were procured from the local market. They were cleaned, peeled and washed. Loads were recorded, ground /cut whitened and saved for drying out. The dehydrated ingredients were ground, packed and sealed. Burfi's were prepared using standard procedures. Proso millet, renowned for its gluten-free nature and nutritional richness, serves as the primary ingredient in this value-added product. The project aims to optimize the processing parameters to achieve a burfi with superior sensory attributes, including texture, flavour, and appearance, while maintaining its nutritional integrity.

Key words: Proso millet milk, Dry dates, Cashew, almonds.

INTRODUCTION:

Burfi, is a delightful sweet treat that hails from Northern India but is worth savouring anywhere in the world! Imagine a dessert with a texture similar to fudge, but instead of chocolate, it's made with milk solids. The name "burfi" makes more sense when you realize that in Persian and Urdu, it denotes snow and ice, referring to the milk solids in the recipe and the resulting white colour. Traditionally, burfi is white due to its milk base, but many variations exist. People often embellish it with additional treats like pistachios, cashews, or

peanuts, much like fudge with walnuts. Regional versions might include fruits, saffron, rose water, gram flour, or almonds. Cooks shape burfi into squares, diamonds, or circles. It's a delightful treat often served during festivals, especially Diwali, the festival of lights (A Kumar 2016)

Micronutrient deficiency has profound effects on physical and mental development eroding the quality of human resources. Micronutrients such as vitamin A, Protein, Iron and Antioxidants are also involved in the function of the immune system, their deficiency can lead to potentially harmful infections, and enhancing vitamin A intake may reduce maternal mortality. Hence, the combination of food groups helps to reduce the micro nutrient deficiency. This study was taken up to combat the micronutrient deficiencies which are the main public health problems. Hence, it was decided to incorporate the food groups to produce protein rich products. Cereal grains contain relatively little protein compared to legume seeds, with an average of about 10–12 per cent on dry weight. (Suchita, B., 2017) Cereals are deficient in lysine and rich in methionine. Pulses are deficient in methionine and rich in lysine. Hence, there is an improvement in protein quality of both proteins. Therefore, amino acids can be balanced by a combination of cereals and pulses. Fruits and vegetables are available in large quantities. They are characterized by a high dietary fibre content resulting with high water binding capacity. Vitamin A is an antioxidant which is key to the growth and repair of tissues and helps the body to fight with infections, keep eyes healthy, nourish epithelial tissues in the lungs, as well as of the skin. (Aneja, 1997) Therefore, maximum retention of beta-carotene is of utmost importance for the preservation of the attractive appearance and dietary value of the product. Apart from being high in carotenoids, carrots are also high in dietary fibre. Carrot is rich in insoluble fibre, could reduce cholesterol levels and can be should be exploited as an ingredient. Oil seeds and nuts are rich in protein and in addition they contain a high value of fat. Hence, they are not only good sources of protein but are concentrated source of energy. In order to achieve a protein product, burfi was formulated as a protein product. (Rajorhia, G. 1982)

Burfi, prepared from Proso millets is a delicious sweet confectionery. There are many varieties of burfi, depending on the ingredients mixed with it, viz., besan burfi (made with gram flour), kaaju burfi (made with cashew nuts), and pista burfi (made with pistachio) etc., (Gargade, D.A. 2004) and fruits/ spices added to it, viz., mango burfi, coconut burfi, and cardamom burfi etc. However, burfi prepared with the combination of food groups have not been tried so far. Objective of the study was to formulate protein rich foods by incorporating protein rich sources such as Almonds, Cashews, Pistachios, Dates, and many more to assess the physico-chemical components of formulated Protein burfi products. (Gargade, D.A. 2004)

MATERIALS AND METHODS:

Materials:

Proso millet, almonds, cashew, dry dates, pista, ghee, food processor, mixing bowl, measuring cups, stainer, stove.

Methods:

Preparation and processing:

Cooking: In a pressure cooker, add proso millet and water. Cook for a whistle and then simmer for 20 minutes.

Blending: Once cooled, take 2 cups of cooked millet and blend it with 3.5 cups of water on high speed in a mixer.

Straining: Strain the millet milk using a strainer.

EXTRACTION OF PROSO MILLET MILK:

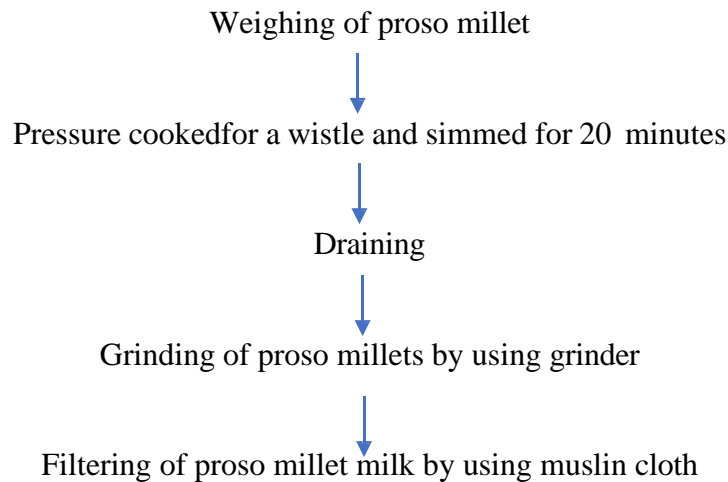


Fig. 1 Proso millet milk



PROSO-MILLET MILK

PROCEDURE :

1. Take 100ml of proso millet milk and boiled for 10 minutes till milk becomes thick and condensed
2. Take equal quantity of dry fruits (almonds, dry dates, cashewnut) and roast them to attain good texture.
3. All of dry fruits were added into food processor and make them into powder. The blended powder is roasted on pan for 3-5 minutes.
4. 40ml of condensed milk is added into the mixture and cooked till it becomes thick consistency.
5. Transfer the mixture into the tray, spread it evenly and divided it into shapes.

PREPARATION OF BURFI:

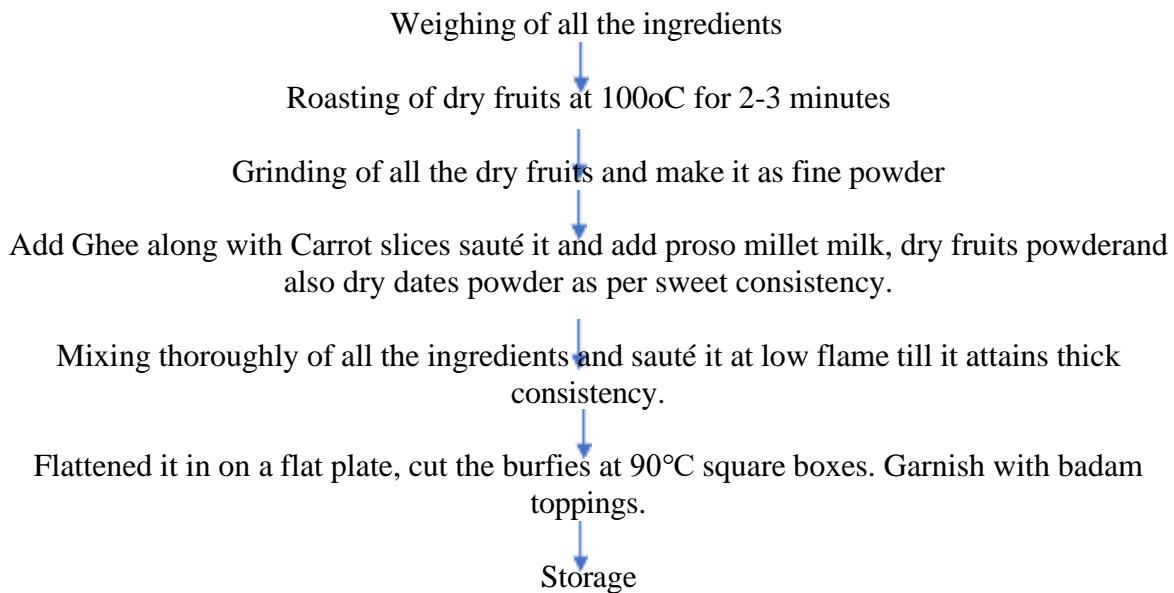


Fig: 2 PROSO-MILLET MILK BURFI

Table 1 Different formulations tested for proso millet milk burfi

S.NO	SAMPLE	TREATMENT -1	TREATMENT - 2	TREATMENT - 3
1.	Proso millet milk	50ml	45ml	40 ml
2.	Dry dates	15gm	25gm	20 gm
3.	Cashew nuts	15gm	10gm	15gm
4.	Almonds	10gm	10gm	15gm
5.	Ghee	5ml	10ml	10ml

PHYSICO CHEMICAL ANALYSIS

TITRATABLE ACIDITY:

Preparation of Sample:

Take a known volume of the sample (usually 10-50 mL) and transfer it into an Erlenmeyer flask. If the sample is very acidic, you might need to dilute it with distilled water to bring the titration within a measurable range. Add 2-3 drops of phenolphthalein indicator to the sample. Phenolphthalein is colourless in acidic conditions and turns pink in alkaline conditions, making it useful for detecting the endpoint of the titration.

Fill a burette with the standard NaOH solution. Record the initial volume of NaOH in the burette.

Slowly add the NaOH solution from the burette to the sample while continuously swirling the flask to mix. By using a magnetic stirrer, place the flask on the stirrer and turn it on to maintain a consistent mixing rate. Watch for the first permanent colour change in the (Gaithersburg, MD, 2006) solution, which indicates that the endpoint has been reached. The solution should turn a faint pink colour that persists for about 30 seconds.

Record the final volume of NaOH in the burette. Calculate the volume of NaOH used by subtracting the initial volume from the final volume.

The titratable acidity is often expressed in terms of a specific acid, such as tartaric acid in wine or citric acid in fruit juices. Use the following formula to calculate the titratable acidity (Sadler, G.D et al., 2010) Titratable Acidity (g/L) = (Volume of sample (L) / Volume of NaOH used (L)) × Normality of NaOH × Equivalent weight of acid

MOISTURE:

The moisture content of the sample was determined by using the method of (AOAC 2007)

Procedure:

1. The petridish with lid was weighed.
2. The 5 g of the sample was weighed into the petridish and spread evenly for uniform drying.
3. Oven was set at 100 to 105 and the petridish with sample was placed inside the oven with lid open for 15 - 17 hours.
4. The petridish was cooled in a desiccator with lid open for 1-2 hours.
5. The petridish with sample was weighed.
6. This was prepared for all samples till constant weight was achieved.

Calculations $(w_2 - w_1) / (w_2 - w_3) \times 100$

Moisture% = $(w_2 - w_1)$

Where, W_1 = initial weight of the petridish (g)

W_2 = weight of the petridish with sample before drying (g)

W_3 = weight of the petridish with sample after drying (g)

PROTEIN:

Biuret Reagent: Dissolve 3 g of copper sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) and 9 g of sodium potassium tartarate in 500 ml of 0.2 mol/liter sodium hydroxide; add 5 g of potassium iodide and make up to 1 liter with 0.2 mol/liter sodium hydroxide. 2. Protein Standard: 5 mg BSA/ml. Apparatus and Glass wares required: Test tubes, Pipettes, Colorimeter, etc.,

Procedure:

1. Pipette out 0.0, 0.2, 0.4, 0.6, 0.8 and 1 ml of working standard in to the series of labelled test tubes.
2. Pipette out 1 ml of the given sample in another test tube.
3. Make up the volume to 1 ml in all the test tubes. A tube with 1 ml of distilled water serves as the blank.
4. Now add 3 ml of Biuret reagent to all the test tubes including the test tubes labeled 'blank' and 'unknown'.

5. Mix the contents of the tubes by vortexing / shaking the tubes and warm at 37 °C for 10 min.
 6. Now cool the contents to room temperature and record the absorbance at 540 nm against blank
 7. Then plot the standard curve by taking concentration of protein along X-axis and absorbance at 540 nm along Y-axis.
 8. Then from this standard curve calculate the concentration of protein in the given sample.
- Yoon Jung Park, 2022

Calculations:

OD of test (optical density)

Total protein (g o) = X Concentration of standard OD of standard

SENSORY EVALUATION:

Sensory evaluation is one of the important criteria for analysing and accepting of any food product by means of sense, taste, touch. The sensory evaluation for formulation and quality evaluation of proso millet milk burfi is carried to evaluate the acceptability on the basis of texture, appearance, taste, smell, and overall acceptability by using nine – point hedonic scale method by 10 trained panel members. Based on the results of the sensory evaluation any one of the variations will be selected for further analysis. (Acree, T. E , 1984)Sensory Evaluation of proso millet milk burfi. The results of sensory evaluation of formulated three variants

RESULT AND DISCUSSION

The burfi products ranged from 4cm to 5cm whereas the width measurement maintained at 1.5cm and thickness ranged from 1.5. The thickness was the highest due to the rapid solid formation of the milk present in the burfi. It may also be due to the fact that, carrot contains more fibre and fibre, and also the millet milk has high amount of dietary fiber , both soluble and insoluble. The insoluble fiber in millet is known as Prebiotic has a higher capacity of

S.NO	TRAILS	COLOUR	APPREANCE	TEXTURE	ODOUR	TASTE	OVERALL ACCEPTABILITY
1.	T1	7.0	7.0	7.5	6.5	7.0	7.0
2.	T2	7.5	7.0	8.0	7.0	7.5	7.5
3.	T3	8.5	8.0	9.0	8.5	8	8.5

binding with the liquid to form a shape and in this way solid formation happened in a short time.

Table 2 Sensory evaluation of proso millet milk burfi

The mean score of the sensory evaluation is obtained for the trails (T3) by overall acceptability. Therefore, from the results it is concluded that the Squash formulated with muskmelon and sarsaparilla scored maximum score so it was further subjected to quality analysis.

Table 3 Nutritional analysis of proso millet burfi for 5gm of sample

S.NO	NUTRIENT	VALUES
1.	Moisture	2.63%
2.	Fat	1.5%
3.	Protein	3.2gm
4.	Acidity	0.65%
5.	SNF	3.62%

CONCLUSION

The incorporation of Almonds, dry dates, prosomillet, and milk burfi combine to create a delectable treat that not only satisfies the palate but also offers numerous health benefits. The richness of almonds provides essential fats and protein, while dry dates add natural sweetness and fibre. Proso millet contributes a unique texture and nutritional profile, packed with vitamins and minerals. Blended together with milk, this burfi becomes a wholesome indulgence suitable for all occasions, balancing taste with nutritional goodness. Whether enjoyed as a dessert or a snack, this burfi stands out as a flavorful embodiment of both tradition and wellness, making it a delightful choice for anyone seeking both taste and nutrition in their sweets.

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