



FORMULATION AND STANDARDIZATION OF PRICKLY PEAR BURFI WITH CORN SILK

¹M. Yazhini, ²Dr.K.U.Pavitra Krishna

¹UG Student, ²Head of the Department

Bsc. Food Science and Processing Management,

Subbalakshmi Lakshmipathy college of Science, Madurai, India.

ABSTRACT: The Cactaceae family includes many of the most commercially valuable species in the Cactaceae genus. Prickly pear and corn silk have ultimate cooking and health benefits that can help promote health and prevent certain diseases. It is used in Mexican folk medicine for ulcers, liver disease, and other problems, so it is also imported into food stores. The health benefits of prickly pear were lower cholesterol, improve digestion, reduce the risk of diabetes, boost immunity and promote bone growth. Cactus pear is a fruit that is often consumed fresh. There are many methods of storing fruits. In this world of growing interest in healthy food and lifestyle, it makes sense to market crops that can promote health and wellness. This section needs to evaluate the benefits and thoughts of this plant in human life, especially with the help of nutrition for the nephritis patients and the food products it contains, in terms of health.

INDEX TERMS: Opuntia prickly pear, Inflammation, Nutrition, Anti-oxidant, Culinary, Corn silk .

INTRODUCTION:

Cactus belongs to the plant Cactaceae, also known as cactus or prickly pear. It is a dicotyledonous plant represented by the transition to arid and semi-arid climates in tropical and subtropical regions of the world. It is also called blush, tuna, sabra, and spade cactus. It has large, flat green pads and is often called a cactus. These are served in Mexican egg dishes, salads, tacos, and soups. The small fruit that grows on the cactus is prickly pear or tuna. Its color varies and can be green, red, purple, purple or yellow-orange. It is a sweet, edible cactus fruit with health benefits. It has ultimate cooking and eating habits that help promote health and prevent certain diseases. It is used in Mexican folk medicine to treat ulcers, hepatitis and other problems, so it is also imported into the markets.

The health benefits of prickly pear include that it can lower cholesterol, improve digestion, reduce the risk of diabetes, boost immunity and strengthen bones. This antioxidant-rich fruit also helps strengthen blood vessels, reduce weight and reduce pain. Prickly pear fruit is shown in figure 1.



Figure 1- Prickly pear



Figure 2-Corn silk

Corn is an important herb and traditional medicine used by the Chinese and Native Americans to treat many ailments. It has antioxidant properties and health applications such as diuretic, hypoglycemic, antidepressant and anti-fatigue in many recipes. Other uses of corn include tea and supplements for urinary problems. Recent research shows it can reduce blood pressure, cholesterol, diabetes and pain. Antioxidants are compounds that protect body cells from free radicals and oxidative stress. Oxidative stress is an important factor in many diseases such as diabetes, heart

disease, cancer and inflammation. Excessive inflammation has been linked to many diseases, including heart disease and cancer. It also lowers blood sugar levels and helps control diabetes symptoms. It lowers cholesterol by lowering total and LDL cholesterol (bad), while raising HDL cholesterol (good). The corn silk is shown in figure 2.

1.1 SELECTION AND STORAGE:

Growing and caring for new cactus plants from spring through fall and peak summer. Pick fresh fruit by hand when the rind turns black. Do not eat fruits that are too cold because they usually do not ripen after harvest. Also, don't buy fruit that is too soft, mushy, or shriveled. Ripe prickly pear fruit can be stored at room temperature for only 3-5 days. For long-term use, store in the refrigerator for 5-7 days. Cut slices will keep for up to a week if wrapped in plastic and properly stored in the refrigerator.

1.1.1. Preparation and serving methods

- Care must be taken to prepare and eat hardy cacti. To prepare, cut the peel with a knife. If necessary, wear thick gloves to avoid injury from claws.
- If the fruit is ripe, you can peel the skin. Cut off the head. Cut the meat into cubes or slices as needed.
- Here are some tips for eating: Fresh fruit, ripe prickly pear fruit is best enjoyed on its own, without additional sweeteners / additives.
- Ice cream, jam, preserves, jelly, etc. It can also be used in preparation..



1.1.2. Safety profile

- Accidental handling of barged spikes in the tufts (glochids) can give a long-lasting pain and irritation at the site of contact. In untreated cases, granulomatous lesions may manifest in some people. Prepared prickly pears, however, can be safely eaten in pregnant mothers and children as well.
- Corn silk recommended level is 400-450mg/day. If it exceeds it may cause some digestive problems for some persons but not for everyone.

1.2 NEED AND SCOPE OF THE STUDY

Fruits and vegetables plays a vital role in Indian diet from ancient period of human health. Consumption of fruits and vegetables significantly contribute in providing us a well balanced diet. Fruits possess a significant nutrients with potential health benefits and act as a immune boosters. In this digital world all are engaged in numerous professions for income generation is spend less time in food preparation and health monitoring. The sedentary life style, poor eating habits, modified food behaviours and lack of time facilitate the incidence of various degenerative diseases. The processed foods occupys major role in nutritional status, the nutritious foods with updated processing techniques improve the food selection as well the food behaviour. Further, it also gives an opportunity to utilize fruit which are available throughtout the year. The present study increases the vitamins, minerals intake and improves the nutritional status. The new food product development in fruits will provide the new fruit flavour for children and also facilitate the employment generation in food processing sectors.

OBJECTIVES:

- To formulate and standardization of the new product
- To analyse the product
- To design and label the product
- To find and analyse the cost of product

To formulate the new product



To assess the analysis of product



To design and label the product



To find the cost analysis of the new product

Materials & Methods:**PROCUREMENT OF RAW MATERIALS:**

The raw materials such as prickly pear fruit, dessicated coconut, corn flour, ghee, cardamom powder, corn flour, milk, sugar, salt, corn silk bought from departmental stores in Madurai.

CHEMICALS:

The chemicals and reagents used for the study where Laboratory reagent (LR), Analytical reagent (AR) or Guarantee reagent (GR) grades.

UTENSILS:

Stainless steel vessels, spoon, plate, ladle, knife, tray and bowl where used for preparing and serving the developed products.

ENERGY SOURCE:

Electric current and liquid petroleum gas were used as heating sources.

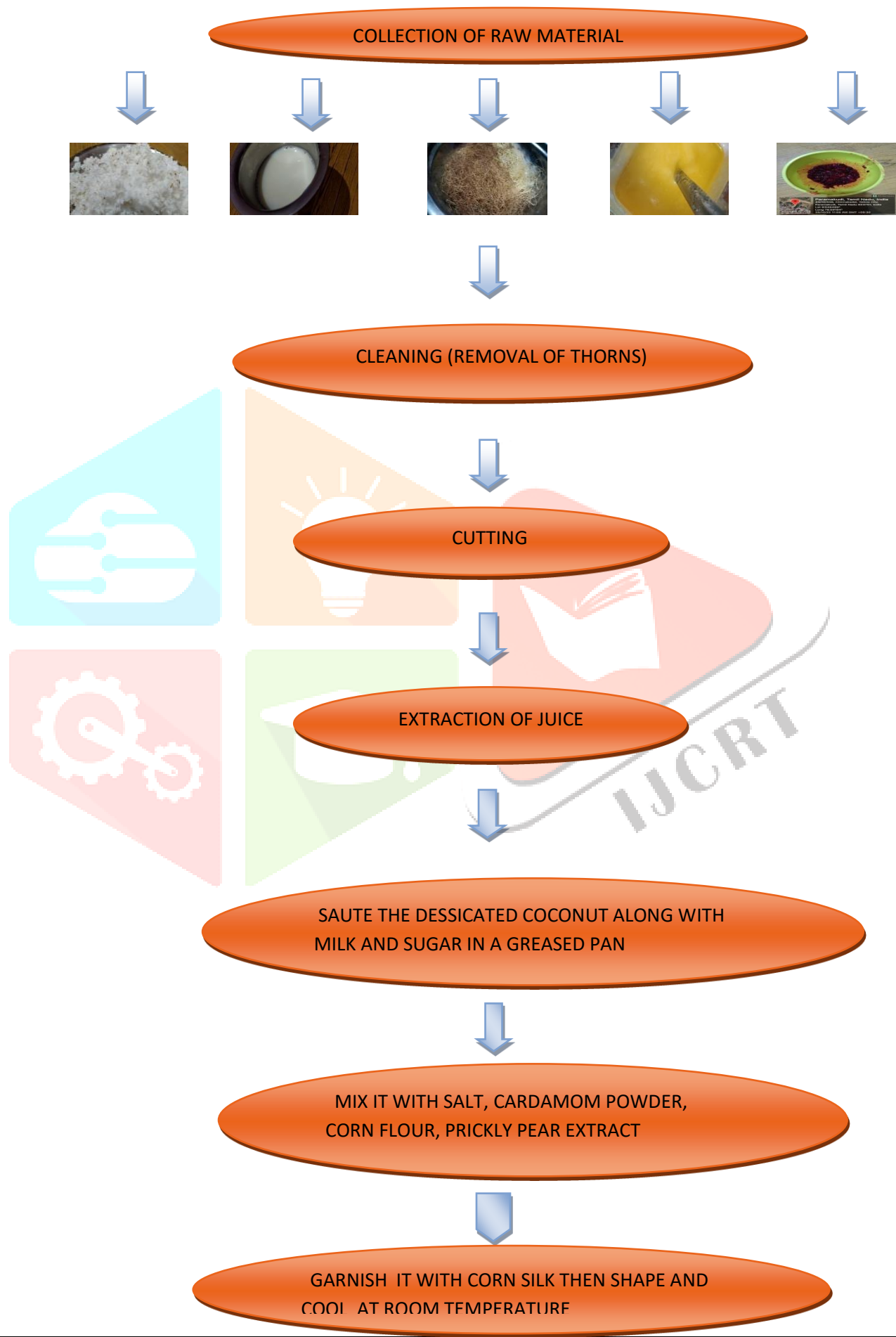
EQUIPMENT AND PURPOSES:

| S.no | EQUIPMENTS | PURPOSES |
|------|-------------------------------------|---|
| 1. | Weighing balance | To weigh the raw materials |
| 2. | Electronic balance | To weigh the chemicals and sample for nutrient analysis |
| 3. | Mixer | For powdering and mixing the ingredients |
| 4. | Hot air oven | For moisture estimation |
| 5. | Photo electric calorimeter | Estimation of iron, calcium, phosphorus, β – carotene |
| 6. | Laminar air flow chamber | For microbial analysis |
| 7. | Muffle furnace | For ashing the sample |
| 8. | Refrigerator | To store the reagent |
| 9. | Bomb calorimeter | Determination of energy |
| 10. | Autoclave | Sterilization |
| 11. | UV spectrophotometer | For polyphenol, flavonoids, and antioxidant estimation |
| 12. | Atomic absorption spectrophotometer | For zinc and magnesium estimation |
| 13. | SOCS plus apparatus | For fat estimation |
| 14. | Fibro plus apparatus | For crude fibre estimation |

Methods:

1. First of all, the matured prickly pear fruit should be allowed to cut off the two ends of the fruit by using the sharp edge knife. Cut it through the skin lengthwise using two forks for remove the peel easily. Discard the remaining seeds and pulps.
2. Then cut into pieces and blend it in accordance to get extract from that fruit.
3. Depending on the size of pears, 6 to 12 fruits will get you about 1 cup of juice.
4. Then add 150 g of Dessicated coconut and saute it by combining with a small amount of milk at a medium flame. Add few drops of ghee to get some aroma.
5. Then add 100gms of sugar to get the consistency of burfi. Add 5ml of prickly pear extract to improve the color attribute. Then add 4 tbsp of corn flour to improve the texture.
6. Then mix it with 2 pinches of cardamom flavor. Saute it and garnish the corn silks.
7. Mix it accordingly and off the stove. Shape and cool it completely for 1hour before placing it in a tight box. Then stored at a cool place (at ambient temperature, 35-45 deg celcius)

2.1 PREPARATION OF PRICKLY PEAR BURFI:



2.2 FLOW CHART OF DEVELOPED PRICKLY PEAR BURFI:

Figure 3:

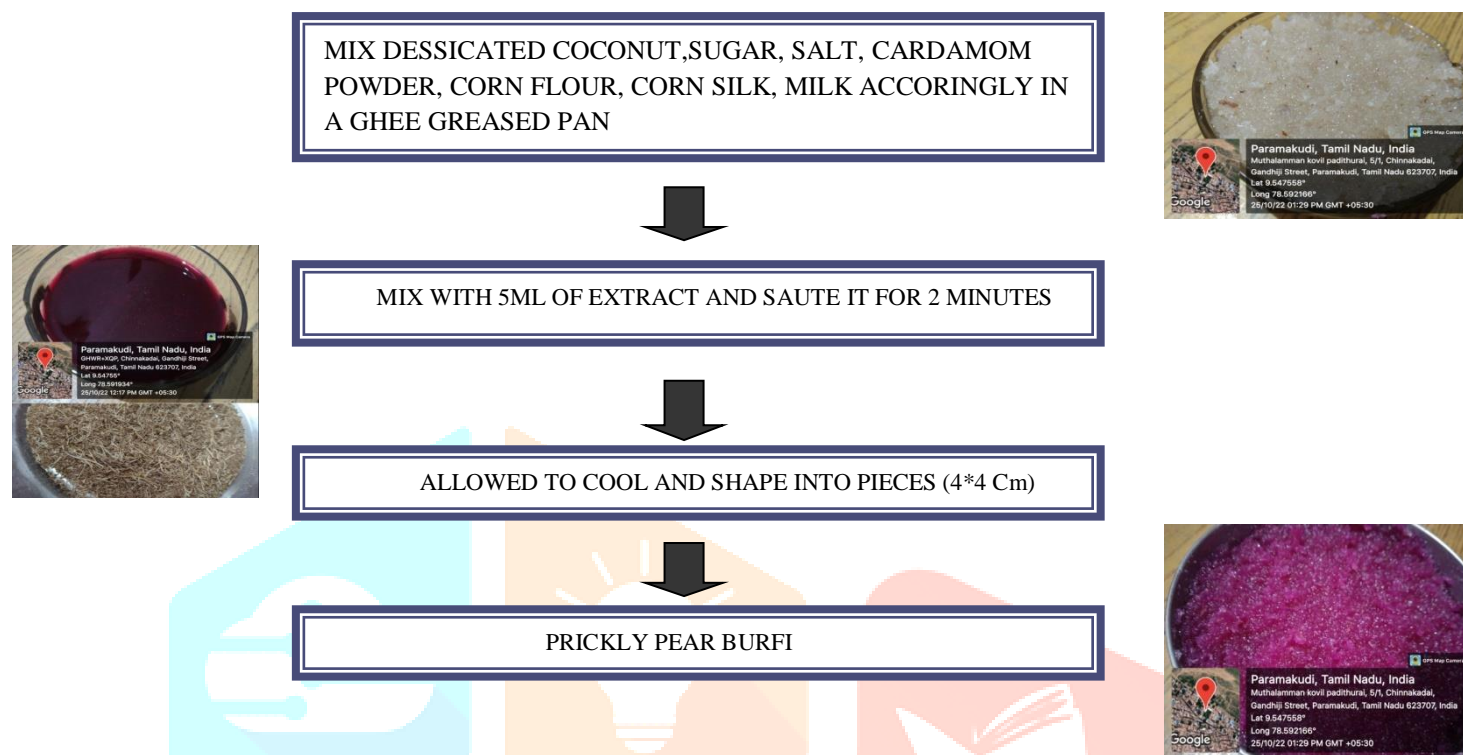


FIGURE- 3

Organoleptic or sensory Evaluation:

When the quality of a food product is assessed by means of human sensory organs, the evaluation is said to be sensory or subjected or organoleptic evaluation. Sensory quality is a combination of different sense of perception coming in choosing and eating a food. Appearance, flavor, and mouth feel decides the acceptance of the food. The developed food product along with its variation was evaluated by the panel of Judges, by using 5 points hedonic scale rating. Prickly pear burfi with 5, 10 and 15ml were extracted in the burfi. Out of these, PPB 1 got preferred by all panel members. Prickly pear burfi samples were shown in table 1.

TABLE 1

| S.no | Ingredients | Quantity(g) | | | |
|------|--------------------|-------------|-------|-------|-------|
| | | Control | PPB 1 | PPB 2 | PPB 3 |
| 1. | Prickly pear juice | - | 10ml | 15ml | 20ml |
| 2. | Dessicated coconut | 150g | 150g | 150g | 150g |
| 3. | Corn flour | 5g | 5g | 5g | 5g |
| 4. | Ghee | 5ml | 5ml | 5ml | 5ml |
| 5. | Cardamom powder | 1g | 1g | 1g | 1g |
| 6. | Milk | 15ml | 15ml | 15ml | 15ml |
| 7. | Sugar | 100g | 100g | 100g | 100g |
| 8. | Salt | 0.5mg | 0.5mg | 0.5mg | 0.5mg |
| 9. | Corn silk | - | 50mg | 50mg | 50mg |

PACKAGING:

Packaging as distinct from mere packaging plays its most visible as catalytic role in a modern economy. For my product prickly pear burfi I had chosen plastic container as packaging material. The standardized samples of PPB were packed in plastic container for store 30 pieces, tightly sealed and store in cool and dry place at 25°C. The products packed in plastic container did not show any significant difference in the sensory scores during the storage period. The figure of packaging shown in below.

LABELLING:

Every package shall have there on label securely affixed there to declaration as to the name and address of the manufacturer or if the manufacturer is not the packer the name and address of the packer with written consent of the manufacturer. The common or generic name of the commodity contained in the package, net quantity in terms of standard unit. Date of packaging or the commodity is manufactured and the sale price is within the MRP (Maximum Retail Price), if sizes are relevant, dimensions of the commodity contained in the package. The figure of labeling shown in below.



SENSORY EVALUATION



PACKAGING & LABELLING

Nutrient analysis:

Nutritional quality can be assessed by chemical or instrumental analysis for specific nutrients (Norman et al., 2005). The nutritional value for prickly pear burfi sample was recognized and done at the Tamilnadu Foodgrains Marketing Yard (TFMY) food products analytical lab and research centre. It was located in sikkandarchavadi at Madurai, tamilnadu, India.

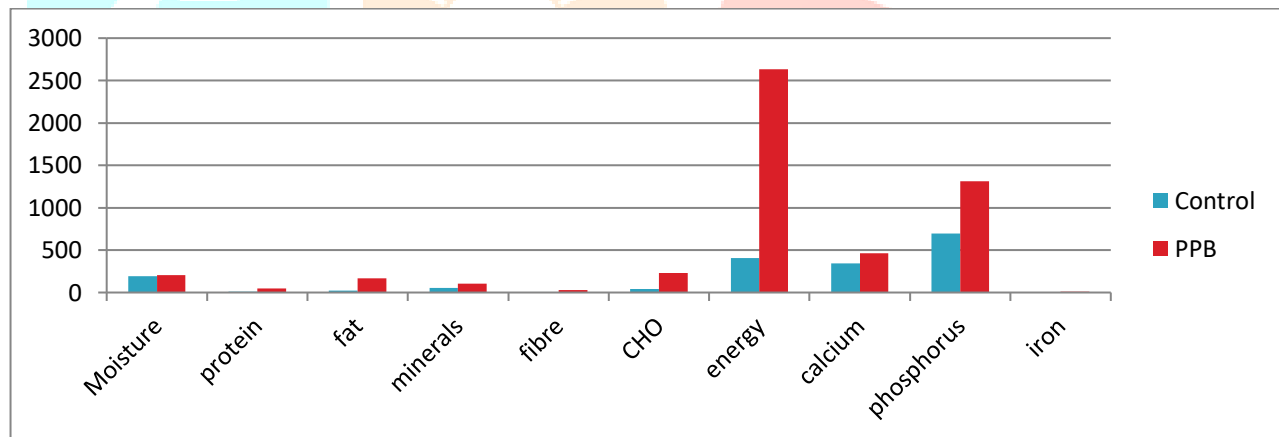
| S.no | Estimation | Value in % |
|------|--------------|------------|
| 1 | Moisture | 28.2 % |
| 2 | Fat | 17.7% |
| 3 | Crude fiber | 23.2% |
| 4 | Total ash | 0.7% |
| 5 | Carbohydrate | 30.4% |
| 6 | Energy | 479kcal |
| 7 | Protein | 4.2% |



The presence of moisture content in prickly pear burfi is 28.2%, the presence of fat is 17.7%, the presence of crude fiber is 23.2%, the presence of total ash is 0.7%, the presence of carbohydrate is 30.4%, the presence of energy is 479kcal, and the presence of protein is 4.25. prickly pear burfi is rich in fiber, carbohydrate and moisture content so it is totally recommended for nephritis patients.

Nutritional composition for prickly pear/100g:

| Compositions | Values | % of RDA |
|----------------------|---------|----------|
| Energy | 41 kcal | 2% |
| Protein | 0.7 g | 1% |
| Fat | 0.5 g | 2.5% |
| Carbohydrate | 10 g | 7% |
| Dietary Fibre | 3.6 g | 9% |
| Potassium | 220 mg | 5% |
| Calcium | 56 mg | 6% |
| Magnesium | 85 mg | 21% |
| Iron | 0.30 mg | 4% |
| Vitamin A | 43 IU | 1.5% |
| Vitamin C | 14mg | 23% |



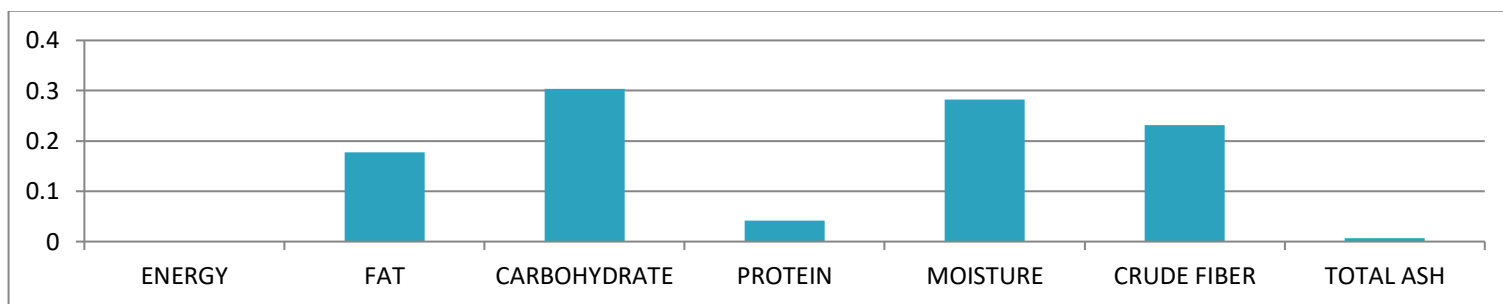
RESULTS AND DISCUSSION:

Acceptability of the developed PPB and its variation

The sensory outcome revealed the developed products the overall mean score in PPB1 was highly acceptable. The result revealed that PPB1, secured highest score in all the sensory attributes which was more or less equal to the developed products.

Nutrient analysis of the standardized PPB

The results stored the nutrients like protein, fat, minerals, fibre, carbohydrates, energy, moisture were calculated. The presence of moisture content in prickly pear burfi is 28.2%, the presence of fat is 17.7%, the presence of crude fiber is 23.2%, the presence of total ash is 0.7%, the presence of carbohydrate is 30.4%, the presence of energy is 479kcal, and the presence of protein is 4.25. prickly pear burfi is rich in fiber, carbohydrate and moisture content so it is totally recommended for nephritis patients.



Shelf life analysis of standardized PPB

Evidence suggest that is defined as the length of time a product may be stored without becoming unsuitable for use or consumption. Shelf- life depends on the degradation mechanism of the specified product. For my product prickly pear burfi I had chosen plastic container as packaging material. The products packed in plastic container did not show any significant difference in the sensory scores during the storage period.

Cost analysis of the standardized PPB

The course of processing and production, cost benefit analysis of the developed product were done and the overall product cost as \$55.

CONCLUSION:

An innovative product, standardization and formulated prickly pear burfi with corn silk configuration was successfully produced. According to the sensory Evaluation, the product was acceptable. I.e. overall acceptability is 4.8 for 5. Depending on the nutrient analysis, it was concluded that prickly pear burfi is the high calorie and nutritious containing product, Energy 479kcal, Protein 4.2%, Fat 17.7%, Moisture 28.2%, CHO 30.4% and Fiber 23.2%. The final composition of the product is selected based on sensory score. The product was having good nutritional value and sensory attributes. So it is totally recommended for the nephritis patients because this product is rich in carbohydrate, fiber and moisture content. This product is economically feasible.

Reference:

- Butera D, Tesoriere L, Di Gaudio F, et al. 2002 Antioxidant activities of Sicilian prickly pear (*Opuntia ficus indica*) fruit extracts and reducing properties of its betalains: betanin and indicaxanthin. *J Agric Food Chem.* 50(23):6895-6901.12405794.
- Fernando Díaz Sánchez ,et al. 2006, colorant extraction from red prickly pear(*opuntia lasiacantha*) for food application,Electronic journal of environmental, agricultural and food chemistry.
- El Kossori RL, Villaume C, El Boustani E, Sauvaire Y, Méjean L. Composition of pulp, skin and seeds of prickly pears fruit (*Opuntia ficus indica* sp.). *Plant Foods Hum Nutr.* 1998;52(3):263-270.9950087
- Yizhong, C., M., Sun, and H., Corke. 1998. Colorant Properties and Stability of Amaranthus Betacyanin Pigments. *J. Agric. Food Chem.* 46: 4491-4495.
- Sun, W., Schliemann, and H., Corke. 1998. Colorant Properties and Stability of Amaranthus Betacyanin Pigments. *J. Agric. Food Chem.* 46: 4491-4495.
- Castellar, R., J.M., Obón, M., Alacid, and J.A., Fernadez-López. 2003. Color properties and stability of Betacyanins from Opuntia Fruits. *J. Agric. Food Chem.* 51: 2772-2776.
- Jyoti singh, Baskaran Stephen Inbaraj, Sawinder kaur. (2022) Phytochemical Analysis and characterization of corn silk(*Zea mays*,G5417).
- Fazilatun Nessa, Zhari Ismail, Nornisah Mohamed (2012). Antimicrobial activities of extracts and flavonoid glycosides of corn silk.
- Shaikh Mohsin Shabbir, Syed Zubair Hussaini, Syed Majed Khateeb. (2022) Optimization of Formulation and development of beetroot fortified with coconut burfi.
- Vikas gupta, et al. (2010) Shelf life enhancement of coconut burfi- An Indian traditional sweet.