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## Development of pumpkin peel cookies and its nutritional composition

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### Abstract

In India pumpkin has been used in huge quantities and it is well known that pumpkin is a nutritious food. So, in a very large amount of pumpkin peel are also produced and its gone as a waste item. The objectives of this study were develop and standardize pumpkin peel based biscuit and analyze the proximate component of developed product. Biscuits prepared by 20% of pumpkin peel flour were most accepted by the panel members on 9-point hedonic scale of sensory evaluation. Proximate analysis in which moisture, protein, fat, fibre, carbohydrate, energy and ash value had been calculated and the mean value of the analysis are respectively- Moisture (6.59%), Fat (21.75gm/100gm), Protein (0.08gm/100gm), Carbohydrate (69.40gm/100gm), Fibre (0.16gm/100gm), Ash (1.91gm/100gm) and Energy (473.71kcal/100gm). Hence, the biscuit is quite rich in nutrient and can be used for combating malnutrition and also for the pregnant women.

**Keywords:** Pumpkin, nutrient and malnutrition

### Introduction

Pumpkin is one of the widely used vegetables in India. Despite being very important for human nutrition for constituting sources of fibers, calories, fats, carbohydrates, proteins, minerals, and vitamins, vegetables are not very well exploited and are often wasted by the general population, which occurs from cultivation to the final consumption. Most losses result from the non-exploitation of the edible, non-traditional parts of vegetables, such as leaves, peels, and seeds. Studies on the proximal composition of minerals from fruit peels and seeds in Brazil have reported that many nutrients contained in peels and seeds have higher contents than the pulp. Therefore, flour from vegetable residues have been employed aiming at reducing production costs and providing nutritional enrichment through the manufacturing of breads, cakes, cookies, cereal bars, vitamin supplements, and juices with final products added with improved nutritional and/or sensory quality. Pumpkins (*Cucurbita maxima* L.) contain a great amount of vitamin A, complex B vitamins, calcium, and phosphorus<sup>[1]</sup>, in addition to carbohydrates and other components of high nutritive and bioactive values. Pumpkin peels do not present significant contents of carbohydrates, lipids, iron, and potassium; however, this part of the vegetable have substantial amounts of proteins and fibers, in addition to ascorbic acid and calcium, which presented relevant concentrations in comparison with the pulp, a commonly consumed part<sup>[2]</sup>. Therefore, the use of pumpkin peel in flour production may lead to improved nutrients exploitation. So, in that view the objective of the study is To develop and standardize pumpkin peel based biscuit and To analyze the proximate component of developed product

### Methodology

**A) Locale of the study:** The study was conduct in the Department of Food Science and Nutrition, College of Community and applied sciences, MPUAT, Udaipur.

**B) Collection of Sample:** Pumpkin, which comes from the cucurbita family, was selected for the preparation of products. Pumpkins were procured from the local market of Udaipur city. Pumpkins were peeled, washed and dried in the hot air oven. Dried peel was ground in to powder and used for biscuit preparation.

### C) Processing of Sample

- Preparation and standardization of product
- Preparation of the biscuit
- Evaluation of the blood sugar level
- Proximate analysis of the product

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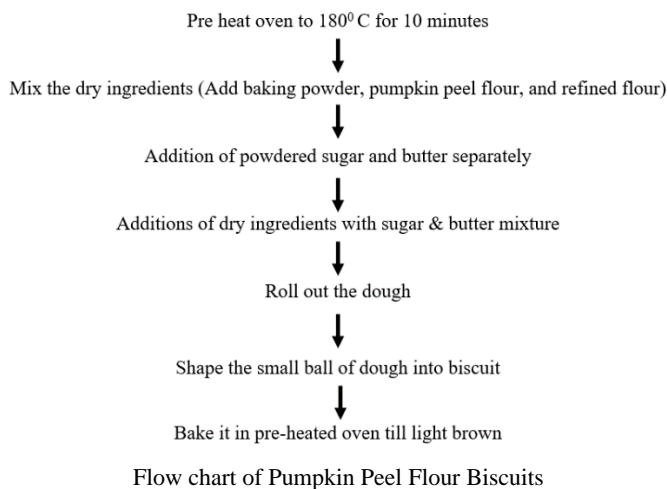


Pumpkin peel

Pumpkin peel powder

**Table 1:** Preparation of the biscuit Amount and ingredients used for preparation of Pumpkin Peel Flour Biscuits

S. No.	Ingredients	Amount (gm)
1	Refined Wheat Flour	400 gm
2	Sugar (powdered)	200 gm
3	Milk Powder	250 gm
4	Butter	250 gm
5	Baking Powder	1-1 ½ tea spoon
6	Pumpkin peel flour	80 gm



### Nutritional Analysis of Sample through AOAC Determination of Moisture

Moisture content of flour is very important for its shelf life, lower the flour moisture, the better its storage stability. Hruskova and Machova observed that the changes in the moisture contents depends on the short time storage conditions and had a different time course in the individual locations. Standardized Procedure of AOAC [3] was followed

Mean value of nutrient composition of Pumpkin Peel Flour Biscuits

Pumpkin Peel Flour Biscuits	Moisture (%)	Fat g/100g	Protein g/100g	Fibre g/100g	Carbohydrate g/100g	Energy k.cal/100g	Ash g/100g
	6.59	21.75	0.08	0.16	69.40	473.71	1.91

**Proximate analysis of the product-** pumpkin flour biscuits were developed for the proximate analysis in which moisture, protein, fat, fibre, carbohydrate, energy and ash value had been calculated and the mean value of the analysis are

respectively- Moisture (6.59%), Fat (21.75gm/100gm), Protein (0.08gm/100gm), Carbohydrate (69.40gm/100gm), Fibre (0.16gm/100gm), Ash (1.91gm/100gm) and Energy (473.71kcal/100gm).

Mean score of sensory qualities of Pumpkin Peel Flour Biscuits

Sr. No.	Name of recipe	Consistency	Color	Texture	Taste	Appearance	Overall acceptability
1.	Biscuits (30%)	7.53	7.33	7.56	7.17	7.30	7.30
2.	Biscuits (20%)	7.87	7.40	7.90	7.43	7.57	7.57

Biscuits prepared by 20% of pumpkin peel flour were most accepted by the panel members. It was good in taste and appearance. Whereas biscuit prepared by 30% of pumpkin peel flour was also good in overall acceptability.

to estimate the nutrients composition of foods.

### Determination of Crude Fat

The sample of dried feed stuff is placed in a continuous extractor (Soxhlet) and subjected to a extraction with ether. The ether soluble substances thus removed are collected in a flask dried and weighed. The material extracted include besides the triglycerides material such as phospholipids, sterols, essential oils, pigments, waxes, etc hence term "crude fat" [4, 5]. If the sample contains water- soluble sugars as in molasses, the weighed sample should be washed with water and dried before extraction.

### Determination of Crude fibre

The dry, fat free material is boiled successively with dilute acid and dilute alkali for a specified time period and filtered. The residue was dried and ignited. The loss in weight on asking gives crude fibre. This consists chiefly of cellulose and lignocelluloses [6, 7].

### Determination of total Ash

Ash comprises the mineral contents of foods and feeding stuff, which can be determined by igniting a known amount of dried material (moisture free fees) in a muffle furnace.

### Determination of Protein

Crude protein was estimated by Micro Kjeldhal method (AOAC, 1995) using Kel Plus [8].

### Determination of Carbohydrate

The total CHO content in maize flour was calculated by difference method.

Total CHO (%) = 100- (Moisture + Crude Protein + Total Ash + Fat + Crude Fibre)

### Sensory evaluation of developed products

The acceptability of gravies were evaluated by a panel of 10 judges using 9-point Hedonic Scale (Ranganna, 1986) [9] to test the liking or disliking of products. Semi -trained panel did the evaluation. The panelist asked to record the level of liking or disliking by giving marks for various characteristics of the products. The samples were rated on 9-point Hedonic Scale for quality attributes according to following grade descriptions and scoring.

### Result and Discussion

### Conclusion

Pumpkin is very popular in all over the India, it well known that pumpkin is rich source of nutrients, but generally people do not use the pumpkin peel in the diet. It was found during the study that pumpkin peel also having nutrients such as protein, energy, fat and fibre. The developed pumpkin flour can be used as a base in any product. The developed biscuit can be given to the malnourished children and pregnant women.

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