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Development and quality evaluation of value added pumpkin seed products

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Abstract

The pumpkin seeds are one of the underutilized crops. Generally it is considered as an agro waste. Pumpkin seeds are rich in macro and micro nutrients such as protein, fat, iron, zinc, magnesium and calcium. In this study the pumpkin seeds are used to produce value added food product like Mathri and Halwa. The sensory evaluation was done of these products and the acceptability of these products was good. The proximate composition of pumpkin seed Mathri was evaluated. The result showed that roasted pumpkin seeds Mathri is quite rich in protein (20.15%) and highest amount of crude fat content was exhibited in pumpkin seed Mathri (31.1%), crude fiber and carbohydrate content to 2.50% and 33.0%. The pumpkin seeds mathri contained ash was found to be 8.78%. The pumpkin seed could be incorporated in foods to increase the nutritional value especially in diets that are deficient in the macro and micronutrients.

Keywords: Underutilized crop, sensory evaluation, proximate composition, macro and micronutrients

Introduction

Pumpkin belongs to the genus Cucurbita and family Cucurbitaceae is grown all around the world for a variety of reasons. It is used as a food material, animal feed, and for decoration purposes. Though the flesh of different vegetables have found their way into the Indian diet for time immemorial, the seeds have almost always been discarded as waste in spite of having a great nutritive value. After harvesting, the seeds are often used as animal feed, ground up for fertilizer or even discarded in spite of having very nutritious and best quality oil and rich source of protein. With increased public awareness in sustainable agriculture, clean and efficient energy and waste management technologies, pumpkin seeds have the opportunity to capture a new and emerging market share in the snack food industry. The use of these by-products adds value to the production, besides contributing to the formulation of new food products and minimizing losses. So, it gives new opportunity to explore the possibilities for the production technologies for the different value added products from pumpkins seeds^[1]. Pumpkins are consumed as freshly boiled and steamed or in processed form like soup and curry. It is high in β -carotene, which gives it yellow or orange color. Beta-carotene in plants that have a pleasant yellow-orange color is a major source of vitamin A^[2]. It is also high in carbohydrates and minerals. Consumption of carotene containing foods helps in the prevention of dermatological ailments, eye disorders and certain cancers^[3]. Incorporation of β -carotene rich ingredients in the form of pumpkin powder or flour in food products is therefore considered a very effective approach to eradicate vitamin-A related health problems^[4]. Nutritional and health protective value of pumpkin draws considerable attention of food scientists in recent years^[5]. Food is one of our most basic needs, which provides us energy and also nourishes all our internal organs of the body. Plants produce oil seeds, grains, fruits and vegetables^[6]. Pumpkin has gained a considerable attention in recent years for its nutritional and health promoting values. Pumpkin is cost effective and a nutrient rich source; the pumpkin seed flour incorporated complementary food mix is highly nutritive and economical with highly acceptable sensory attributes^[7].

Objective of study

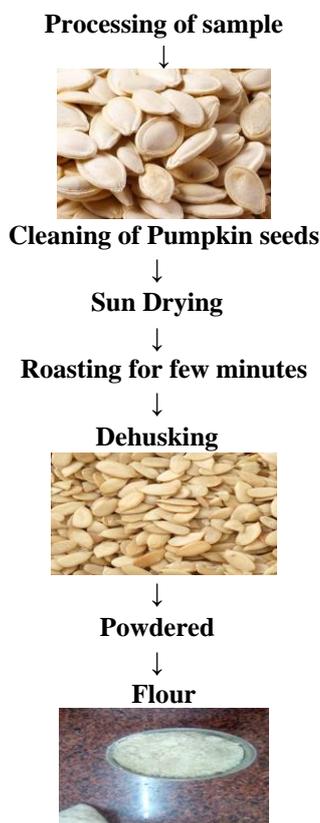
1. To develop the pumpkin seed product and its organoleptic evaluation.
2. To determine the proximate composition of the developed product.

Methodology

A) Locale of the study- The present study entitled development of underutilized product with pumpkin seed is carry out to powder and its products. The study will be conduct in the Department of Food Science and Nutrition, College of Home Science, MPUAT, Udaipur.

B) Collection of Sample- Pumpkin seed which come from the cucurbita family will be selected for the preparation of products. Pumpkins will be procured from the local market of Udaipur city.

C) Processing of Sample- Seeds are remove and subjected to cleaning and then dry in the sun till the moisture will completely remove. Drying will be carried out in a hygienic environment and the seeds were free from insect, microbial spoilage and off odor.



D) Selection of recipes: Mathri and Halwa recipe is selected. Both will be made with incorporation of pumpkin seed flour.

- **Mathri:** Mathri is a Rajasthan snack. It is a kind of flaky biscuit from north-west region of India. It is made from flour, water, and cumin seeds (optional).
- **Halwa:** A sweet Indian dish consisting of flour boiled with milk, almonds, sugar, butter, and cardamom.

Proximate Composition Determination

Nutritional components: Pumpkin seed flour was analyzed for nutritional content. Nutritional evaluation of pumpkin seed flour was done for their proximate composition. Standard

procedures were used for the estimations. Percentage carbohydrate and energy contents were determined by calculation using difference method respectively. The procedures have been described here under.

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^[8] was followed 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 an 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"^[9, 10]. 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^[11, 12].

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^[13].

3.4.6: Determination of Carbohydrate

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

$$\text{Total CHO (\%)} = 100 - (\text{Moisture} + \text{Crude Protein} + \text{Total Ash} + \text{Fat} + \text{Crude Fibre})$$

Sensory evaluation of developed products

The acceptability of gravies were evaluated by a panel of 10 judges using 9-point Hedonic Scale (Ranganna, 1986)^[14] 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

The section of study sets forth clearly and precisely the finding and interpretation in the context of major objectives of study, thus providing a bird's eye view of complete study, which makes this section the most significant and crucial part

of the research work. The results of the study have been systematically illustrated with the help of Tables tracing the objectives of the presented under the following sections:-

Proximate Analysis

The chemical analysis of pumpkin seed Mathri for proximate composition revealed difference for moisture, fat, ash, protein, fibre and energy. Pumpkin seeds were consumed in the form of mathri. The results of the proximate composition of the samples (pumpkin mathri) are shown in Table. The moisture content was quite low and was found to be 5.47, respectively, which may be advantageous in view of the samples' shelf life. The result showed that roasted pumpkin seeds Mathri is quite rich in protein (20.15%). Thus, pumpkin seeds could contribute significantly to the recommended human daily protein requirement, which was reported to be ranged from 23% to 56% (NRC, 1980). The pumpkin seeds mathri contained ash and were found to be 8.78%, respectively. Since the ash content of a sample is a reflection of the minerals it contains therefore, pumpkin seeds are expected to be rich in minerals. Pumpkin seeds contained higher amount of oil. Highest amount of crude fat content was exhibited in pumpkin seed Mathri (31.1%) Fats are essential in diets as they increase the palatability of foods by absorbing and retaining their flavors and help in the transport of nutritionally essential fat-soluble vitamins (Omotoso, 2006).

As shown in Table, crude fiber and carbohydrate content to 2.50 and 33.0%.

Table 1: Proximate composition of pumpkin seed flour Mathri

Nutrition g/100g	Pumpkin seed Mathri
	Mean value
Moisture	4.47
Fat	31.1
Ash	8.78
Protein	20.15
Fibre	2.50
CHO	33.0

Sensory evaluation of pumpkin seed Mathri (mean Value)

Perceivable sensory characteristics have always been recognized to be the deciding factor in the acceptance and enjoyment of referred by masses and have an edge over other equally important and safety aspects. Therefore, all developed products were subjected to sensory evaluation (colour, appearance, flavor, texture, taste and overall acceptability on nine point hedonic rating scales by panel of 10 members. Sensory scores as assigned by the panel members for individual sensory attributes and overall acceptability were statistically analyzed and are presented in table for products Mathri and halwa.

Table 2: Sensory evaluation of pumpkin seed Mathri (mean Value)

Characteristics	Color	Taste	Flavor	Texture	Appearance	Doneness	Overall acceptability
Mean	8	8	8	7	8	8	8

Table 3: Sensory evaluation of pumpkin seed Halwa (mean Value)

Characteristics	Color	Taste	Flavor	Texture	Appearance	Doneness	Overall acceptability
Mean	8	8	7	7	8	8	8

Conclusion

This work has provided baseline information on the proximate composition of pumpkin seeds. Pumpkin seeds can be used with value addition of food ingredients, which can be helpful in several health aspects such as malnutrition etc. Hence it is rich in nutrients so it can promote the nutritional health status. So adequate and frequent consumption of pumpkin recipes can be used to increase a better nutrition and health.

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