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Sensory and Nutritional Evaluation of Pumpkin Seeds Katli as a Cheaper Substitute of Dry Fruit Katli

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Abstract

The aim of this study is to provide low cost relishing nutritious food to the masses of underprivileged section of the country. In this study a cheaper substitute of *kajukatli* sweet formulated by replacing costly dry fruits with Pumpkin seeds flour . The developed recipe was well accepted by the expert panel with overall acceptability(i.e. 7.3 ± 0.15) comparable to the test product (i.e. 7.6 ± 0.10) regarding the sensory attributes of appearance, colour, taste and texture. Cost analysis of the developed product revealed that the cost of the recipe (62 Rs. /100gm) was nearly half of the test product (111 Rs. /100gm) . Present study explored numerous nutritional and therapeutic benefits of consuming pumpkin seeds products.

Key words: Pumpkin seeds, traditional recipes, tryptophan.

Introduction:

Pumpkin seeds are also known as "*Cucurbita Maxima*", are small, flat, green, edible seeds. Pumpkin seeds are covered by a white husk. Pumpkin seeds are mostly thrown away after use these are rich in proteins, fatty acids, fibre and minerals, they are being regarded valuable for the food industry. **Seema Pateletal (2013)** the seeds of pumpkin are generally considered to be agro – industrial wastes and discarded. In some parts of the world, the seeds are consumed raw, roasted or cooked only at the domestic scale. Pumpkin seeds have a nutritious sweet flavour, like a dry fruit. It is a means of improving the nutritional status of the population. Pumpkin seeds are known as a common seeds. Pumpkin seeds have many magical functions in human health. It helps to cure diseases like depression and hypercholesterolemia which leads to cardio vascular disorders. **Dr B.R. Chaudhary (2013)** Pumpkin is a temperate crop that grows best at 21 to 320°C. Freezing kills the plants and cool weather below 160°C slows or stops the growth. Pumpkin seeds germinate within 3-4 days at a soil temperature and from 6 to 12 days at 200°C. Sowing in June - July and February – March ensured proper maturity of both fruits and seeds. **George Mateljan Foundation et al (2018)** Pumpkin seeds are generally available in prepackaged containers as well as bulk bins. The bins containing the pumpkin seeds are covered during storage for a good product turnover so as to ensure the seeds maximal freshness. **Sohini Roy and Santa datta et al. (2015)** pumpkin seeds kernel contains 27% saturated fatty acid content and comprises of 16% palmitic acid and 11 % stearic acid. The concentration of unsaturated fatty acids is 66% consisting of 13% oleic acid and 53% linoleic acid. The most significant finding was an increase in HDL cholesterol, a benefit that is well established to lower the risk of cardiovascular complications. The alcoholic extract of pumpkin seed had shown significant reduction in TC, LDL, VLDL and TG's. **Mukesh Yadav, Shalini Jain, Radhatomaret al. (2010)** pumpkin is one

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of the well known edible plants and has substantial medicinal properties due to the presence of unique natural edible substances. It contains several phytoconstituents belonging to the categories of alkaloids, flavonoids and palmitic, oleic and linoleic acid. **Kumar Pratyush, Dorcusmasih, Chitrasankar et al. (2015)** observed that Pumpkin is cultivated through the world for use as vegetable as well as medicine. It has been used traditionally as medicine in many countries such as china, India, Mexico, Brazil and America. **Rosa Martha Perez Gutierrez et al. (2016)** pumpkin seeds and seed oil are a rich source of phytosterols, proteins, polyunsaturated fatty acids, antioxidant vitamins, carotenoids, tocopherols and various elements due to these components are attributed providing many health benefits. **Sharma G and Lakhawat S. et al. (2017)** pumpkin seeds are rich in medicinal and nutritive components, due to which reason they are applied in therapeutic purposes across the globe. The seeds are an excellent source of protein and also have pharmacological activities such as anti-diabetic, antifungal, antibacterial, anti-inflammation activities and antioxidant effects.

1.1: Objectives

The Pumpkin seeds have been found to possess tremendous health friendly features:

1. To conduct a survey to find out most popular dry fruit sweet.
2. To develop dry fruit sweet.
3. To study the organoleptic acceptability of developed product from pumpkin seeds identical to investigated highly popular sweet.
4. To calculate the nutritive value of the prepared products.
5. To perform the cost of the developed food product.

2. Materials and methods

2.1 Procurement of Raw Material

The fresh and dry seeds of *CucurbitaMaxima* and other ingredients purchased from the local market of Meerut, Khanpur and Gohana used in the products formulation. The study was carried out from January to May 2018.

2.2 Experimental site

Control and test sample prepared in the Food lab of BPSIHL, BPSMV Khanpur Kalan (Sonapat)

2.3 Organoleptic Evaluation of Products Expert Panel

Freshly prepared hot products were served to test panel members consisting of 9 experienced panel members. The 9-point hedonic scale was used for the purpose. The evaluation was based on color, texture, appearance, taste and overall acceptability. Sensory evaluation was done once a day for three consecutive days, to check the consistency of results obtained.



Figure 1: Steps of the food product formulations and evaluation.



Statistical Analysis

The data collected from sensory evaluation were statistically analyzed by using Mean and Standard Deviation (SD) of each class of each group, for every preparation was calculated. Standard Errors Mean (SEM) was calculated from mean and S.D. values. The data is presented as **Mean \pm SEM**.

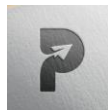
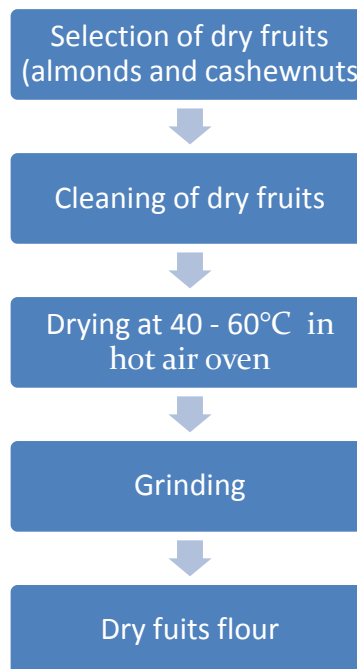
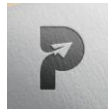


Figure 2: Preparation of dry fruits flour



Control (dry fruit Katli) sample prepared by the following method

Heat a non-stick fry pan. Add Khoa and sugar. Stir constantly until syrup turns frothy and sticky consistency. Reduce the flame and add powdered dry fruits. Combine well without forming any lumps. Stir continuously and when the mixture thickens. Mixture starts frothy and leaves the pan. Switch off stove. Pour the mixture in a greased tray, cool at room temperature. Cut into pieces and serve.



2.1: Preparation of Pumpkin seeds flour is depicted in figure 3

Figure 3: preparation of pumpkin seeds flour





Table 1: Ingredients for Pumpkin seeds Katli

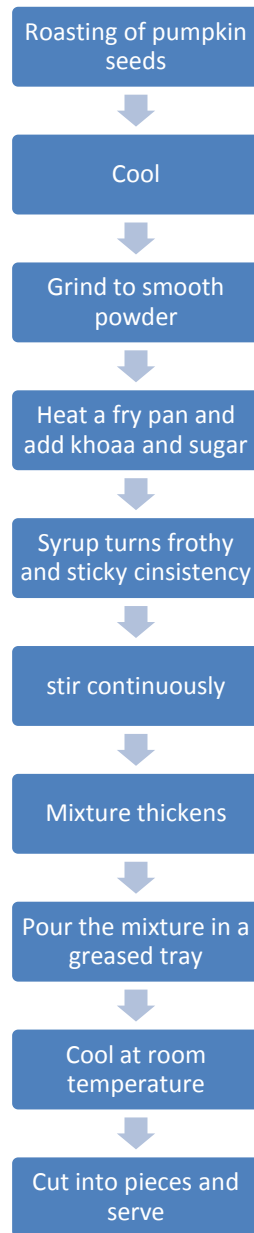
Ingredients	Control (Dry fruits Katli)	Pumpkin seeds Katli
Khoa	50g	50g
Almonds	50g	-
Cashew	50g	-
Sugar	50g	50g
Pumpkin seeds	-	100g

Method of preparation

Roast the pumpkin seeds until crisp and aromatic. Cool and grind to smooth powder. Heat a non-stick fry pan. Add khoa and sugar. Stir constantly until syrup turns frothy and sticky consistency. At this stage reduce the flame to low and add powdered seeds. Combine well without forming any lumps. Stir continuously when the mixture thickens. When the mixture starts frothy and leaves the pan. Switch off the stove. Pour the mixture in a greased tray and cool at room temperature. In pumpkin seeds Katli there is no addition of dry fruits.



Figure4: method of preparation of pumpkin seeds Katli





3. Result and discussion

The present study focuses on development of day to day home based food products containing seeds or flour of *cucurbitamaxima*. Organoleptic evaluation was done, by panel of expert members and scoring was done by using 9 points Hedonic scale (B. Srilakshmi 2007).

3.1 Organoleptic acceptability of *Katli* incorporated with pumpkin seeds

The *Katli* was prepared by its original recipe (control) dry fruits *Katli*, substituted with *cucurbita maxima*'s flour. Sensory evaluation was done by a panel of experts, and the scores were given, for all the types of *Katli* for its colour, appearance, texture, taste and overall acceptability. The scores here are represented as Mean \pm SEM. The result of sensory analysis presented in table-indicates that scores of *Katli* were maximum control (dry fruits *Katli*) and fell in moderately desirable. Sensory evaluation scores of *Katli* prepared by pumpkin seeds (7.3 ± 0.15) are same in attributes of colour, appearance, flavour; texture and taste.

Table 2: Organoleptic acceptability of *Katli* incorporated with pumpkin seeds.

Product (<i>Katli</i>)	Colour	Appearance	Texture	Taste	Overall acceptability
Dry fruit <i>Katli</i>	7.7 \pm 0.22	7.5 \pm 0.24	7.5 \pm 0.17	7.6 \pm 0.23	7.6 \pm 0.10
Pumpkin seed <i>Katli</i>	7.0 \pm 0.28	7.4 \pm 0.29	7.3 \pm 0.37	7.6 \pm 0.28	7.3 \pm 0.15

Mean \pm SEM.

Dry fruit *Katli*: 100% dry fruits

Pumpkin seeds *Katli*: 100% pumpkin seeds

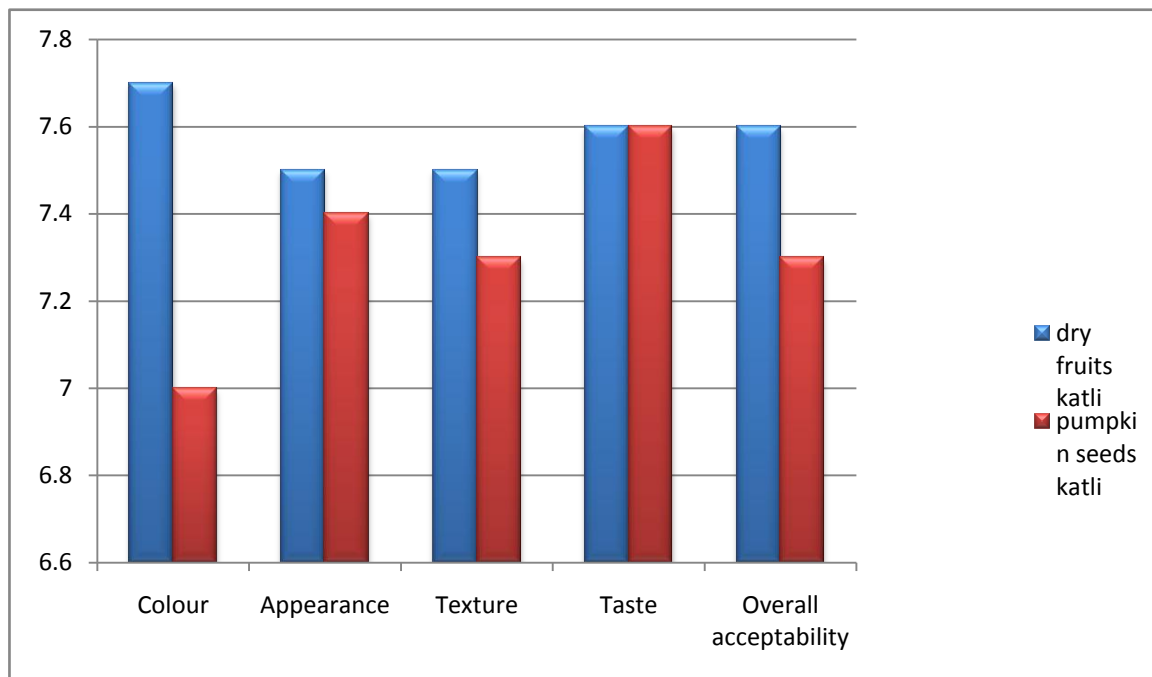


Figure 5: Organoleptic Parameters of Katli Incorporated with Pumpkin seeds



Figure 6: Dry fruits Katli



Figure 7: Pumpkin seeds Katli



3.2: Nutrient composition of *Katli* incorporated with pumpkin seeds

The nutrient composition of control (dry fruits almonds and cashew nuts *Katli*) and pumpkin seeds *Katli* is given in table 3. The substitution of *Katli* with 100gm pumpkin seeds provided the enhancement of energy, protein, fibre and iron. And lesser in carbohydrate (24g) and fat (205g) as compared to dry fruits *Katli* (control) having carbohydrate (29.6g) and fat (209.4g).

Table 3: Nutrient Composition of *Katli* Incorporated with Pumpkin Seeds

Product (<i>Katli</i>)	Energy (kcal)	Protein (gm)	Carbohydrate (gm)	Fat (gm)	Fibre (gm)	Calcium (mg)	Iron (mg)
Dry fruits <i>Katli</i>	739.7	28.7	29.6	209.4	1.4	471	8.37
Pumpkin seeds <i>Katli</i>	968	37.98	24.0	205	6.5	383	11.04

3.3: Comparative Cost Analysis of Pumpkin Seeds *Katli* as a Substitute of Dry Fruit *Katli*

We show that the cost of dry fruits *Katli* is higher than the pumpkin seeds *Katli* because pumpkin seeds are a low cost dry fruits and it is found at a cheaper price. Dry fruit *Katli* popularly known as *KajuKatli*. Pumpkin seeds *Katli* having lower price as compared to dry fruit *Katli*. In test sample all the dry fruits replaced completely by pumpkin seeds only to decrease to decrease its cost to a considerable extent.

Table 4: Cost Analysis of Pumpkin Seeds *Katli* as a Substitute of Dry Fruit *Katli*

Ingredients	Khoa	Almonds	Cashew nuts	Sugar	Pumpkin seeds	Total cost/100gm
Dry fruit <i>Katli</i> (control)	300Rs/kg	880Rs/kg	1000Rs/kg	40Rs/kg	-	111Rs
Pumpkin seeds <i>Katli</i>	300Rs/kg	-	-	40Rs/kg	150Rs/kg	62Rs



4. Conclusion

The main aim of this study is to incorporate the energy and protein rich sweet in the plate of poor and under privilege people with the use of an important and neglected dry fruit without significantly compromising on the taste and acceptability. Present study proves that Pumpkin seeds are a low cost dry fruit substitute having comparable sensory acceptability. Hence pumpkin seeds can easily replace most of the costly recipes prepared by using dry fruit (almond and cashew nuts). Pumpkin seeds are a good source of dietary fibre and two treatments are used (control-dry fruits Katli) and Pumpkin seeds Katli. Sensory characteristics of prepared products were evaluated as per the 9 points hedonic scale, by expert panel of 9 to 10 members. The overall acceptability of Katli is not much affected and both are same in taste.

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