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RESEARCH ARTICLE

DEVELOPMENT AND QUALITY EVALUATION OF PUMPKIN *(Cucurbita pepo)* PRESERVE: A Value Added Product.

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Abstract

The preservation of fruits and vegetables by different methods is an important manufacturing step that is used to provide food safety, maintain quality, extend shelf-life, and prevent spoilage. Pumpkin preserve is a sweet spread made of pumpkin cooked, then lightly sweetened. It falls into the same category as jelly and jam. The pumpkin preserve is prepared by boiling of pumpkin pulp and sugar till it reaches 68ºBx and then addition of spices like cardamom. Pumpkin preserve have a several health benefits as well a good source of B-complex group of vitamins like niacin, vitamin B-6 (pyridoxine), thiamin and pantothenic acid. It is also rich source of minerals like copper, calcium, potassium and phosphorus. Finished product was observed by panelist and based on results it is concluded that the preparation of muskmelon butter. Amongst the prepared treatments Pumpkin Preserve with Cinnamon (0.15%), clove and nutmeg (0.5%) treatment were found to be a best. The Pumpkin Preserve is rich in Vit C, it also have Vit A, Potassium, Calcium, and some other nutrient. With these studies we can say that the Pumpkin Preserve having a sufficient health benefits hence it is highly acceptable by consumer. C.B Ratio for Pumpkin Preserve was 1.30 with the evaluated C.B.Ratio it is concluded that the product is economically beneficial.

1. INTRODUCTION

Fruit Preserves are preparation of fruits, vegetables and sugar, often canned or sealed for long term storage. The preparation of fruit Preserves today often involve sadding commercial or natural pectin as a gelling agent, although sugar or honey may be used as well. The term 'Preserves' is usually interchangeable with 'jams'. Some cook books define Preserves as cooked and gelled whole fruit (orvegetable), which includes a significant portion of the fruit. (Srinivasan *et al.*, 2004).

Pumpkin (Cucurbita pepo) has received considerable attention in recent years because of the nutritional and health protective values of the seeds. The seed is an excellent source of protein and also has pharmacological activities such as anti-diabetic, antifungal, antibacterial, anti-inflammation activities and antioxidant effects (Nkosi et al., 2006). Besides, the pumpkin is economical and a nutrient dense source, the pumpkin seed flour fortified complementary food mix is economical, with highly acceptable sensory qualities and a rich nutritive value (Dhiman, 2009). Stevenson (2007) quoted that, pumpkin seeds offer a nutritious, sweet, somewhat soft and chewy snack or food additive.

Pumpkins, like other squash, are native to North America. Pumpkins are widely grown for commercial use, and are used both in food and recreation. Pumpkins vary greatly in shape, size and colours. Pumpkins, in general, feature orange or yellow colour; however, some varieties exhibit dark to pale green, brown, white, red and gray.

Their colour is largely influenced by yellow-orange pigments in their skin and pulp. Its thick rind is smooth with light, vertical ribs.

In structure, the fruit features golden-yellow to orange flesh depending up on the poly-phenolic pigments in it. The fruit has a hollow centre, with numerous small, off-white coloured seeds interspersed in a net like structure. Pumpkin seeds are a great source of protein, minerals, vitamins, and omega-3 fatty acids (Karmes *et al.*, 2006).

Additional and longer studies using these value added products are recommended to further target population, and mainly in young children, adolescents, women of reproductive ages and pregnant women. According to Eller (2007), as a nutritious snack, ¼ cup of pumpkin contain under 200 calories. This amount also provides 15 to 50 percent of several important nutrients including protein, zinc, iron, magnesium and manganese. The pumpkin also contain beneficial fatty acids and amino acids.

Pumpkins have one of the highest levels of Antioxidants of any nut, seed or food. They are also loaded with tons of vitamins and minerals that the body needs, 'A handful a day to keep the doctor away' (Leung, 1996). The present study entitled "Development and Quality Evaluation of Pumpkin *(Cucurbita maxima)* Preserve: A Value Added Product." was carried out with the following objectives.

- To Formulate and standardize the standard and pumpkin preserve.
- To assess the organoleptic evaluation of standard and pumpkin preserve.
- To estimate the nutrient analysis of the processed pumpkin preserve.
- To calculate the cost of the pumpkin preserve products.

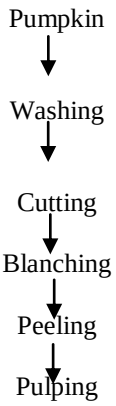
2. MATERIALS AND METHOD:

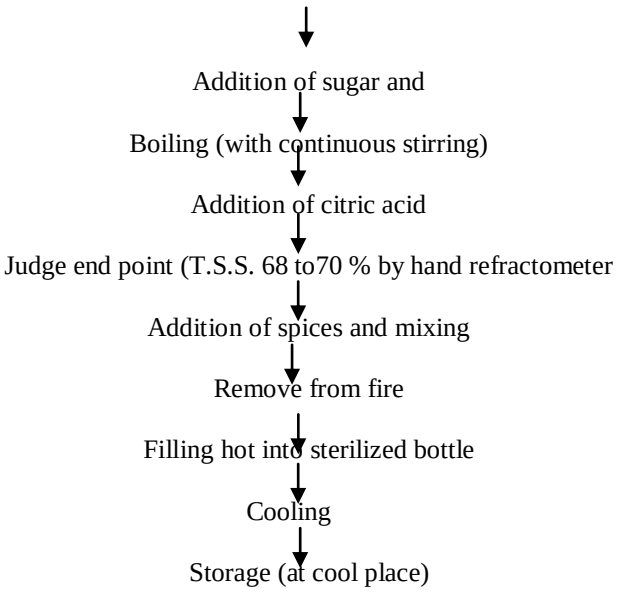
A pumpkin (Cucurbita Pepo) which comes from the cucurbita family was selected for the value added product. Pumpkins were procured from the local market and the seeds were removed and subjected to cleaning.

2.1. Formulation of of Pumpkin Preserve:

TREATMENT/ INGREDIENTS	T_1	T_2	T_3
Pumpkin Pulp	100gm	100 gm	100 gm
Sugar	80g	80g	80g
Citric acid	2g	2g	2g
Cinnamon	0.15g	0.30g	0.45g
Clove	0.5g	0.10g	0.15g

2.2. Flow sheet for Preparation of Pumpkin preserve:





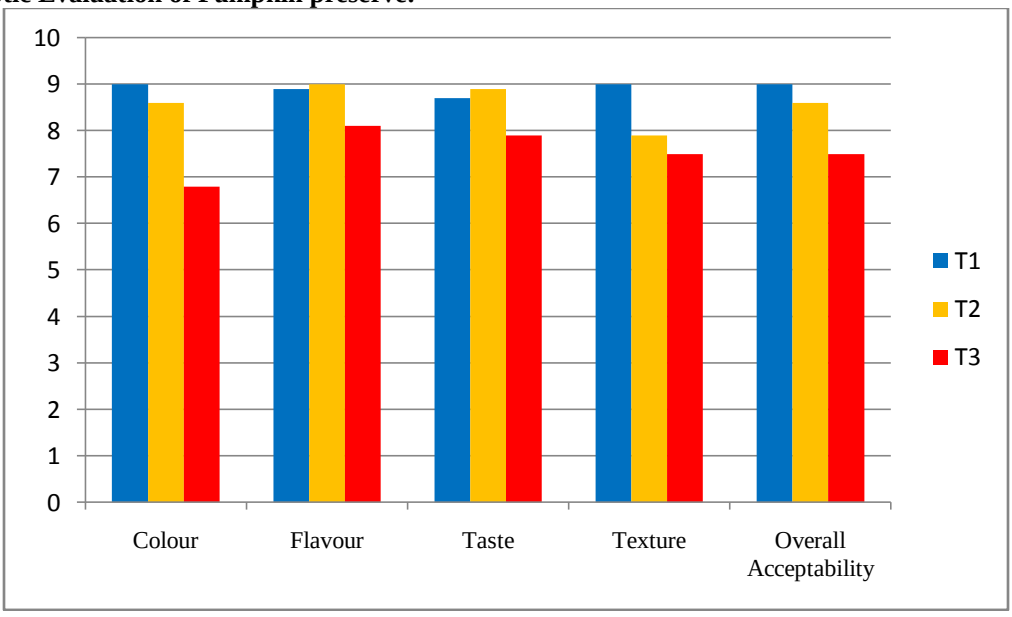
For the preparation of Pumpkin Preserve, ripe pumpkin are used. The ripe Pumpkin are light yellowish at outer side. After the collection of raw Pumpkin wash with potable water and then cutting by using knife. The blanching is done for inactivation of enzyme and softening of tissue. The blanching treatment is given at 80 °C - 90ºC temperature for 5 min. after that peeling is done by using peeler. After that by using pulper the Pumpkin pulp are prepared. Then addition of sugar into pulp with continuous stirring. 0.5% citric acid are added into the pulp act as acidulates in Pumpkin Preserve, boiling the pulp up to the end point 68 to 70°Brix T.S.S. judge by hand refractometer. Then addition of spices into the pulp and mix it properly then remove from fire and filling into sterilized bottle then cool it and storage at cool place.

2.3. Organoleptic Evaluation:

The Institute of Food Technologies (IFT) defines sensory evaluation as "The scientific disciple used to evoke measure, analyze and interpret human reactions to those characteristics of foods and beverages as they are perceived by the senses of sight, smell, taste, touch and healing (Murano, 2003).

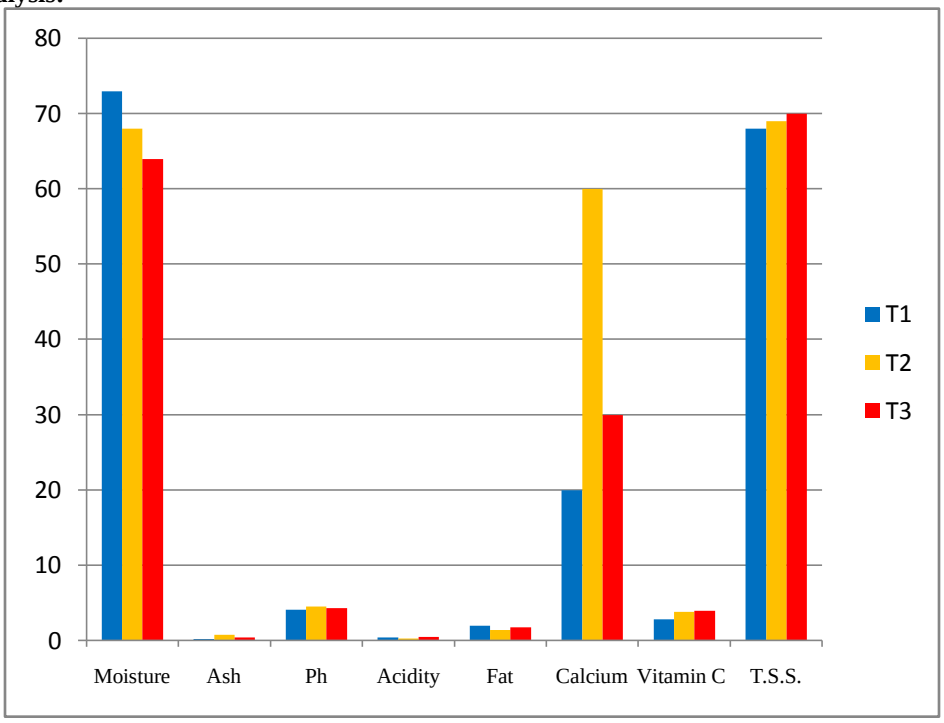
The sensory characteristics of the products such as color, taste, flavor, and texture were evaluated by panel judges using nine point hedonic scales. The acceptability and their marks used as follow:

Organoleptic Evaluation of Pumpkin preserve:



The average rating for color of different treatment of pumpkin preserve was found to be 8. The average rating for flavor of different treatment of pumpkin preserve was found to be 8. The average rating for taste of different treatments of Banana muffin to be 8. The average rating for texture was to be 8.

2.4. Nutrient Analysis:



To select the best quality product the sample of the product is passed through out the different criteria. The chemical analysis is one of the criteria to select the quality product. In that different parameters are examined like Fat, Acidity, Moisture, Ash, Vitamins and Minerals, etc. By taking various tests there are different values of such parameters evaluation were found that Vitamin C content is more in Pumpkin Preserve. By comparing standard value with three sample found that treatment T_1 is closer to the standard value hence treatment T_1 is selected.

The chemical analysis graphically represented above shows the difference between various chemical parameters with treatment T_1, T_2, T_3. Moisture content of treatment T_1 is 50 following with T_2 is 53 and T_3 is 54. Ash content of treatment T_1 is 0.4 following with T_2 is 0.4 and T_3 is 0.6. Fat content of treatment T_1 is 0.4 following with T_2 is 0.4 and T_3 is 0.3. Calcium content of treatment T_1 is 8.5 following with T_2 is 9 and T_3 is 8. Fibre content of treatment T_1 is1 following with T_2 is1 and T_3 is 2. The standard value for moisture content is 48, ash content is 0.5, fat content is 00, calcium content is 9 and fibre content is 1.5. The source for standard was taken from nutritional value based on USDA Nutrient Database SR18.

3. COST Of PRODUCTION

A. Personnel

	Day	Per month
Unskilled person	166.66	500
Sale man	100.00	3000
Chemist	100.00	30000
Skilled person	200.00	6000
Total	**566.66**	**17000**

B. Raw Material

Ingredients	Quantity	Price/kg	Quantity	Price
Pumpkin	1kg	33	23	690

Sugar	1kg	31.60	10	316
Cardamom	100gm	25	200 g	50
Sodium benzoate	100gm	15	50 g	7.5
Pouch	200	26	200	1260
Label	per	3	500	1500
Total				**2823.5**

C. Utility

Utilities	**Unit**	**Price**	**Unit**	**Price**
water	1 lit	20	7	140
Electricity	1unit	12	10	120
cylinder	1 lit	150	7	750
Total				**1010**

D. Other Expenses

Land/Building	266.66	8000
Stationary	100.00	3000
Miscellaneous	133.30	4000
Transportation	150.00	4500
Total	**649.99**	**19500**

E. Fix Cost

Machineries	**Unit**	**Price**	**Unit**	**Price**
Plate	1	50	8	400
Knife	1	15	4	60
Weighing balance	1	4000	2	8000
Spoon	1	50	5	250
Sealing machine	1	3000	1	3000
Handrefractometer	1	2000	1	2000
				13710

1.Depreciation

On fix cost @ 10% = $\frac{15114}{100}$ X 10 = 1511 (per year)

= 125 (per month)

2.Total capital investment = 566.66+2823.5+1010+649.99+1511

= 6561@18 %

= 6561*18/100 =1180. (per year)

= 1180./12 =98.41

3. Total working capital =566.66+1823.5+1010+649.99 =3050.16

4. Total cost of product =3050.16+80+98.40 =4574/25 =182

= Rs 18.00 per 100gm.

4.SUMMARY AND CONCLUSION

4.1. Summary

Fruits and vegetable based Pumpkin Preserve were developed by using Pumpkin, sugar, and citric acid with lab scale hand operated machinery. It is nutritious delicious tasty quality products that everyone can eat. A fruit

Preserve is a sweet spread made of fruit cooked to a paste, then lightly sweetened. It falls into the same category as jelly and jam. Cantaloupes were first cultivated in the Near East and were found growing in areas from Turkey to China, including northwest India, Afghanistan, and Uzbekistan. The Pumpkin Preserve have a several health benefits on digestive system, skin, for women, heart, during pregnancy, cancer, etc. In preparation of Pumpkin preserve pumpkin, sugar, Citric acid and spices were used.

4.2 Conclusion

From the result, it was concluded that good quality of Pumpkin preserve were prepared and was more acceptable organoleptically. Amongst the prepared treatments Pumpkin preserve the T1 treatment were found to be a best. It was also found that the prepared product contain high among of vitamin and others nutrients. The packaging material which is used to Pumpkin preserve was suitable for the product hence it is preferable packaging material.

In the Pumpkin preserve the functional properties of fruit Preserve does not changes, but increase nutritional properties due to Pumpkin preserve contains rich source of vit c and also other nutrients. As per cost evaluation the cost of production of Pumpkin preserve for 100gm was 18Rs. C.B Ratio for Pumpkin preserve was 1.30 with the evaluated C.B.Ratio it is concluded that the product is economically beneficial.

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