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Development and standerdization of custard apple basundi

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Abstract

In this study, we aimed to prepared basundi by using different levels of custard apple pulp (*Annona squamosa L.*) with a view to optimize the process for its manufacture and to study its chemical and sensory qualities. The basundi was prepared from different proportions of rabri and custard apple pulp i.e. 100:0 (B₀), 80:20 (B₁), 70:30 (B₂), 60:40 (B₃), 50:50 (B₄). The mean sensory score of basundi was within the acceptable range. The highest sensory score for color and appearance, taste, flavour, consistency and overall acceptability was 8, 8.3, 8.4, 7.8 and 8.4 respectively. Prepared custard apple basundi contain 53.90 % moisture, 1.56 % ash, 10.85 % crude fat, 7.5 % crude protein, 26.19 % carbohydrate, 46.11 % total solid and 0.42 % acidity.

Keywords: Basundi, Custard apple pulp, Chemical Composition, Sensory evaluation

Introduction

Annona squamosa L is a small tree which grows wild in many places in the north of south America, Central America, and the Caribbean region. It has been brought to tropical Asian countries and Brazil for commercial cultivation before three hundred years back (beerh, 1983) [4]. It is widely cultivated and highly esteemed especially in India and Pakistan. It produces globular or heart shaped fruits with diameter of approximately 12cm and weight about 150 gm. they are familiar by different common names. The most popular commercially notified names are ata, pihna and fruta-de-conde (Brazil), sweetsoap and sugar apple (English) sitaphal, sharifa and sithphalam (India) schuppenannone (Germony). The fruits are formed by the fusion of many ripened ovaries and the receptacle. They break into segments and facilitate exposure of a white cream colored pulp imbining black glossy seeds. The pulp may be consumed raw or transformed into various food products and tastes aromatic sweet, with custard like flavor. It has great potential for value addition through processing (Kotecha *et al.*, 2000).

Annona squamosa, and *cherimoya* fruits are valued for their nutritional status as compared to other types. The fruits yeilds about 40-50 % pulp having 26.4⁰BX (TSS), 5.5 pH and 0.5% tannins (Najundaswamy and Muhadeviah, 1990) the pulp is of pleasant texture and flavor. It is sweet and slightly acidic. The food value is predominately associated with sugar (12 to 22%) and protein content (1.6%) (Pal and Kumar, 1995). The processed products and byproducts of custard apple are nutritionally important. It finds important to preserve the fruits by monitoring the shelf life of fresh fruit or fruit pulp as secondary raw material for transforming in the form of different new food products facilitating value addition.

Basundi is one of the heat dessicated indigenous products in western part of India, mostly Maharashtra and Gujarat. Basundi can be classified in the condensed milk group along with rabri, khoa, mithai and kheer and can be considered similar to sweetened condensed whole milk (Raghavan, 1960) [12]. *Basundi* is traditional heat desiccated whole milk product prepared by partial dehydration of milk with sugar. The dehydration of milk is done in karahi over direct fire or *shegadi*. The original volume is reduced to about 40 to 50 per cent basundi is popular milk delicacy having sweetish caramel and pleasant aroma, light to medium brown color, thick body and creamy consistency with or without soft texture flakes that are uniformly suspended throughout the product. It contains all the solids of the milk in appropriate concentration plus additional sugar and dry fruits (pagote, 2003) [8].

Materials and Methods**Materials**

The raw materials utilized during present investigation like custard apple pulp, sugar and milk were procured from local market of Parbhani, Maharashtra.

Equipments and Machineries

Equipments like, pH meter, weighing balance, hot air oven, muffle furnace and other utensils required was used from the Department of Food Trade and Business Management, VNMKV, Parbhani.

Chemicals and Glasswares

The chemicals and glasswares required for analysis purpose were taken from the Department of Food Trade and Business Management, VNMKV, Parbhani.

Method

Preparation of custard apple basundi

The basundi samples were prepared as per the procedure given by De (1980) [5] with slight modification is shown in fig 1. Experimental trials were conducted to decide the levels of addition of custard apple pulp in the basundi.

Table 1: Formulation of custard apple basundi to standardize the level of custard apple pulp

Sample Code	Ingredients		
	basundi	Sugar (%)	Custard apple pulp (%)
B ₀	100	6	00
B ₁	80	6	20
B ₂	70	6	30
B ₃	60	6	40
B ₄	50	6	50

B= Basundi

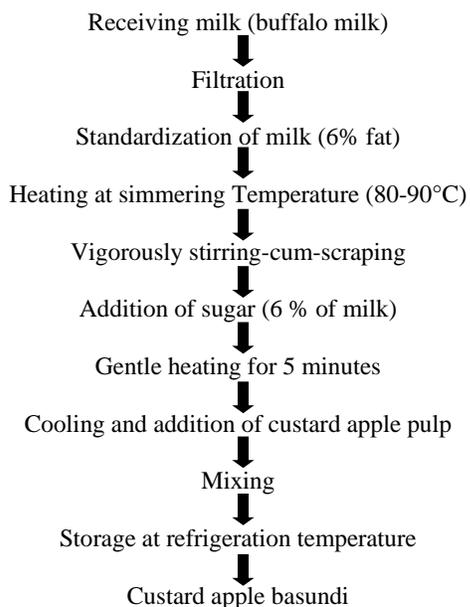


Fig 1: Flow sheet for preparation of custard apple basundi

Proximate composition of custard apple basundi

Chemical constituents like moisture, protein, carbohydrate, fat, ash of custard apple basundi were determined by (AOAC, 1990) [1].

Sensory evaluation of basundi

Basundi with different blends of custard apple pulp was evaluated for sensory characteristics like color, flavor, texture, consistency and overall acceptability by 10 semi-trained panel members comprised of academic staff members of the Department of Food Trade and Business Management, CFT, Parbhani, Judgment was made through rating of product on a

9 point Hedonic Scale with corresponding descriptive terms ranging from 9 'like extremely' to 1 'dislike extremely'.

Results and Discussion

Sensory evaluation of basundi

Organoleptic characteristics are pivotal in judging the suitability of product as consumer point of view. In order to study the effect addition of different levels of custard apple pulp in rabri i.e., 0, 20, 30, 40 and 50% level. The result is presented in table-2.

Table 2: Sensory evaluation of basundi blended with various levels of custard apple pulp

Sample code	Color and Appearance	Taste	Flavor	Consistency	Overall acceptability
B ₀	7.8	7.9	8.0	7.3	7.9
B ₁	7.8	7.4	7.9	7.4	8.0
B ₂	8.0	8.1	8.3	7.6	8.3
B ₃	7.3	7.2	7.4	7.2	7.3
B ₄	6.5	6.7	6.5	7.0	6.8
Mean	7.48	7.46	7.62	7.3	7.66
S.E ±	0.09	0.03	0.09	0.05	0.08
CD at 5%	0.29	0.11	0.29	0.18	0.24

*Each value is average of three determinations

B₀– Basundi 100%.

B₁– Basundi 80%: Custard apple pulp 20%

B₂– Basundi 70%: Custard apple pulp 30%

B₃– Basundi 60%: Custard apple pulp 40%

B₄– Basundi 50%: Custard apple pulp 50%

Color is considered as one of the important consumer quality judging parameter in selection of food products. Attractive color of product is a must have in fast moving consumer goods to appeal consumer for consumption. Data from table 2 revealed that sample B₂ had the highest score for color i.e. (8.0). With gradual increase in level of custard apple pulp color and appearance found to decrease hence sample B₃ and B₄ scored (7.3 and 6.5).

Flavor being a combination of taste, smell and mouth feel, has large number of factors it. Sample B₂ obtained highest score for flavor i.e. (8.3) while sample B₄ had lowest score for flavor i.e. (6.5). The sample B₂ obtained maximum score for taste (8.1) where as sample B₄ obtained fewer score for taste (6.7). When basundi fortified with more than 30 % of custard apple pulp then taste score of basundi decreases.

The sample B₂ founded good consistency with obtaining highest score for consistency i.e. (7.6), while sample B₄ obtained fewer score about (7). The sample B₂ obtained higher score for overall acceptability (8.3) as compared to control and other sample. However among other treatments B₂ was better and was mostly acceptable.

Gaikwad *et al.*, (2015) [7] reported the sensory scores for flavor, body and texture and color and appearance and sensorial characterization of ujani basundi and basundi are 8.29±0.86, 8.32±0.86, 8.64±0.93 and 8±0.93, 8.1±1.43, 7.9±1.43 respectively for ujani basundi and basundi.

Proximate composition of custard apple basundi

The chemical composition of custard apple basundi was studied with respects to moisture, ash, crude fat, crude protein, total solids, carbohydrate and acidity. The results are presented in table-3.

Table 3: Proximate composition of control basundi and custard apple basundi

Sr.no	Chemical parameter (%)	Control basundi	Custard apple basundi
1	Moisture content	49.93	53.90
2	Ash content	1.77	1.56
3	Crude Fat	12.03	10.85
4	Crude protein	9.02	7.5
5	Total solids	50.02	46.11
6	Acidity	0.38	0.42
7	Carbohydrate	27.25	26.19

It was observed that the moisture content of basundi blended with 30 % custard apple is 53.90 % which is higher than the control basundi sample. This might be due to the high moisture content in the custard apple pulp.

The results in this investigation was comparable with the Gaikwad and Hembade (2012) ^[6] who reported the moisture content of ujani basundi was 54.60 per cent.

Fat content and protein content of custard apple basundi (B₂) is 10.85 and 7.5 per cent which is lower than the control basundi samples. As the custard apple pulp level increases the fat and protein level is decreases. This might be due to low fat and protein content in custard apple pulp. The above results are comparable with the findings of patel (1999) ^[11] who developed procedure for making basundi on commercial scale. He reported the fat content of basundi is 11.61 per cent and patel and upadhyay (2001) ^[9] studied the physico-chemical composition of basundi and reported the protein content 7.7%. Custard apple basundi contain 1.56 per cent ash, 46.11 per cent total solid, 26.19 per cent carbohydrate and 0.42 per cent acidity. These results are comparable with the results reported by patel and upadhyay (2003b) ^[10].

Conclusion

Thus in light of scientific data of the present investigation, it can be concluded that the basundi blended with 30% of custard apple pulp shows the highest sensory score for each sensory attributes. Hence custard apple basundi gives superior taste, flavour and overall acceptability than plain basundi and it is more nutritious.

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