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Studies on preparation of *basundi* blended with custard apple pulp

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Abstract

The present study entitled “Studies on preparation of *Basundi* blended with Custard apple pulp” was conducted with the aim to standardized process of preparation of Custard apple in *basundi*, having suitable treatment combinations. After preliminary trials three levels *viz.* 5, 10 and 15 per cent were selected to add custard apple pulp in *basundi*. Three levels were compared to control and a result obtained was statistically analyzed to arrive at suitable conclusion. From the results it was observed that addition of custard apple in *basundi* increased in moisture (49.36 to 54.86 per cent), decreased in fat (11.71 to 10.55 per cent), as well as protein (9.02 to 7.20 per cent) and total carbohydrate (28.11 to 25.95 per cent) and decreased in ash (1.78 to 1.45 per cent), Sucrose (16.88 to 18.29 per cent) and total solid (50.63 to 45.38 per cent) content significantly in treated product as compared to control. Control *basundi* rated highest score for colour and appearance (8.20), and treatment T2 rated high score in consistency (8.10), overall acceptability (8.08) and highest score for flavour (8.25) with 10 per cent custard apple pulp addition than other treated samples. Overall acceptability score was decreased in treated product however addition of custard apple pulp up to 15 per cent does not rejected the product by sensory panel. *Basundi* blended with custard apple pulp was evaluated for cost of production of 1 kg *basundi* for treatments T₀, T₁, T₂ and T₃ were 219.75 to 230.14 respectively. The maximum cost (230.14) was for the treatment T₃ and the minimum cost (219.75) was for the treatment T₀.

Keywords: *Basundi*, flavour, *chakka*

Introduction

Basundi is also a heat desiccated sweetened milk like rabri. The difference between the two is based on the texture. Rabri has very distinct hard flaky layer of clotted cream whereas *basundi* is generally homogenous or have very soft and fine flakes, which in fact are very fine heat coagulated protein particles. *Basundi* has sweetish cooked to caramelized flavour and its colour varies from white to slight brown. (BIS 1981) ^[1] *Basundi* is one of the heat desiccated 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) ^[3]. India is the highest milk producing country in the world with an annual growth rate of 6.26 per cent. Milk production of India is 165.4 MT and per capita availability is 355 gm/day. Where as in Maharashtra it is 243 gm/day (NDDB Statistics, 2017) ^[2]. In India, out of total milk produced buffalo milk contributes 55 per cent and cow milk 40.50 per cent. However global share for cow and buffalo milk is 83.00 and 13.00 per cent, respectively in total world milk production (Anonymous -2016). Chikhalikar, *et al.* (2000) ^[4] the pulp is used in preparation of ice-cream and beverages. Custard apple fruit is excellent source of carbohydrates, minerals, and protein. It is also a good source of vitamin A and C. Generally, the fruit is grown on hills and barren land and farmers used to collect the fruit from these plants and sell them in the market. Custard apple helps to strengthen immunity. As an excellent source vitamin c, it furnishes anti-inflammatory and immune boosting properties. The fruit gives healthy skin and hair. Custard apple prevents strokes and heart attack with its rich content of magnesium. It also content potassium keeps blood pressure under control. The fruit has anti-cancer properties with compounds like acetogenin and alkaloids, the risk of cancer and renal failure go down. It also aids in digestion due to good content of fiber. Custard apple highly recommend for diabetic patients for two reasons one, the fruit has natural sugar which does not harm the body and secondly the fiber content slows down the absorption of sugar.

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Material and methods

The present study on “Studies on preparation of *Basundi* blended with custard apple pulp” was carried out at the Department of Animal Husbandry and Dairy Science, College of Agriculture, Vasantao Naik Marathwada Krishi Vidyapeeth, Parbhani. Milk was standardized to 6 per cent fat and 9 per cent SNF by Pearson’s formula and Good quality ripened fresh custard apple fruit was procured by from local market of Parbhani.

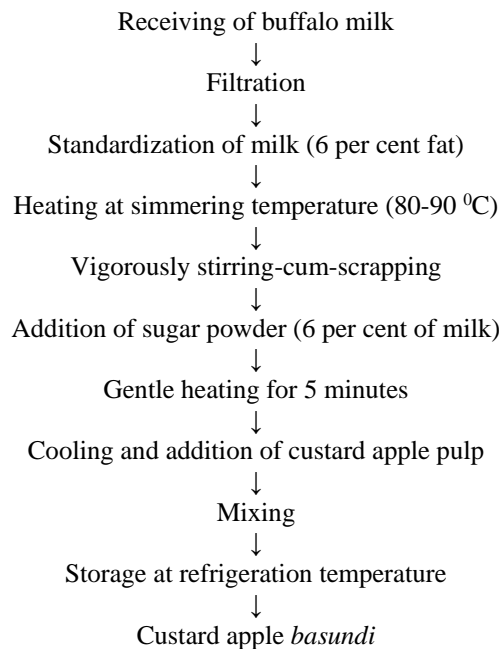
Treatment Details

Following treatment combinations were considered for studies on preparation of *Basundi* blended with custard apple pulp.

Treatment combinations

- T0= Buffalo milk *basundi* (control sample)
- T1= 95 parts of *basundi* + 5 parts of *custard apple pulp*
- T2= 90 parts of *basundi* + 10 parts of *custard apple pulp*
- T3= 85 parts of *basundi* + 15 parts of *custard apple pulp*

Flow diagram for preparation of *Basundi* blended with Custard apple pulp



Sensory Evaluation

Sensory evaluation of *basundi* blended with custard apple pulp was carried out by a panel of judges so as to grade the product and to know the acceptability. It was judged for colour and appearance, flavour, body and texture and overall acceptability by using 9-point Hedonic scale.

Analysis

The moisture content of *basundi* was determined by standard procedure described by BIS (1981) [1]. Fat content was determined by Gerber’s method described in BIS (1977), Protein content of was determined by the Microkjeldahl method as described in BIS (1981) [1], total ash content of was

determined by method given by BIS (1981) [1], Carbohydrate content was estimated by subtraction method i.e. Carbohydrate = Total solids - (fat + protein + ash), Total solids was determined as per the method given in BIS (1981) [1], Sucrose content of *basundi* sample was determined as per BIS procedure BIS (1981) [1] for condensed milk.

Statistical Analysis of data

The results obtained during the course of investigation were subjected to statistical analysis of using completely randomized block design as described by Panse and Sukhatme (1985).

Table 1: Sensory evaluation of *basundi* blended with custard apple pulp

Organoleptic parameters	Flavour	Colour & Appearance	Consistency	Overall Acceptability
T ₁	7.80	8.20	7.80	7.93
T ₂	8.10	8.10	8.00	8.05
T ₃	8.25	7.90	8.10	8.08
T ₄	7.26	7.80	7.67	7.70

Result and Discussion

Sensory Evaluation

The various treatment combinations of *basundi* were subjected to sensory evaluation for colour and appearance, flavour, consistency and overall acceptability attributes by a panel of judges using a 9-points hedonic scale. The scores for flavour for treatments range between 7.65 to 8.25 (table 1). Flavor is the most important component of sensory quality.

Treatment T₂ obtained highest score for flavor i.e. (8.25) while treatment T₃ obtained lowest score for flavor i.e. (7.65). When *basundi* fortified with more than 10 parts of custard apple pulp then taste score of *basundi* starts to get decreases. These results are in close agreement with the results obtained by Patel *et al.* (2003a.) [5] Sensory scores for colour and appearance range between 8.20 to 7.80 per cent (table 1). The colour and appearance score for

T₀ is highest (8.20) i.e. T₀ treatment is better than rest of treatments. The colour and appearance score of *basundi* was significantly influenced by the level of custard apple pulp. Which are in agreement with the studies of Patel *et al.* (2003a) [5]. Sensory scores for consistency range between 8.10 to 7.67 (table 1). The consistency score for T₂ is higher (8.10) i.e. T₂ treatment than rest of treatments, while treatment T₃ obtained lower score for flavor i.e. (7.67). Which are in agreement with the studies of Patel and Upadhyay (2003a) [5]. Overall acceptability range between 8.08 to 7.70 (table 1). The maximum score (8.08) was obtained for the treatment T₂ and the minimum score (7.70) was obtained for the treatment T₃.

Chemical Analysis

The custard apple *basundi* prepared under various treatments were subjected to analysis viz., moisture, fat, protein, ash, carbohydrate, total solids and sucrose. Moisture content in custard apple *basundi* varied due to incorporation of different blends of custard apple pulp. Average moisture content range between 49.36 to 54.86 per cent (Table 2). As custard apple pulp increased in *basundi*, the moisture content in *basundi* was also increased. This might be due to the moisture content in custard apple pulp. These findings are in close agreement with the reports, Gaikwad and Hemade (2011b). Fat content in custard apple *basundi* ranged between 11.71 to 10.55 per cent (Table 2). It was also observed that maximum fat content was in T₀ (11.71) and minimum fat content in T₃ (10.55).

The above results are comparable with the findings of Patel (1999) and Dubal (2009). Protein content of the product ranged between 9.02 to 7.20 per cent (Table 2). It was also observed that as the addition of custard apple pulp level increases the protein content of the product decrease. Results are in agreement with Patel and Upadhyay (2001). Ash content of the product ranged between 1.78 to 1.45 per cent (Table 2). It was observed that as the custard apple pulp level increases the ash content level of the product was decreased. Results are in agreement with Patel (1999) and Patel and Upadhyay (2001). The carbohydrate content of product ranged between 28.11 to 25.95 per cent (Table 2). The highest carbohydrate content was recorded for treatment T₀ i.e. 28.11 and the lowest value was recorded for treatment T₃ i.e. 25.95 per cent. Results are in agreement with Patel (1999) and Patel and Upadhyay (2001). Total solids content of product ranged between 50.63 to 45.38 per cent. The highest total solids content was recorded for treatment T₀ (50.63) and the lowest total solids content was recorded for treatment T₃ (45.38). Results are in agreement with Patel (1999) and Patel and Upadhyay (2001). The sucrose content of product was found to be 16.88, 17.09, 17.43 and 18.29 per cent for treatment T₀, T₁, T₂ and T₃ respectively. It was also observed that as the addition of custard apple pulp level increases the sucrose content of product increases. The results are in agreement with Patel and Upadhyay (2001) and Gaikwad and Hemade (2011b).

Table 2: Effect of different treatments on chemical composition of custard apple *basundi*

Chemical constituents (%)	Moisture	Fat	Protein	Total solid	Carbohydrate	Ash	Sucrose
T ₁	49.36	11.71	9.02	50.63	28.11	1.78	16.88
T ₂	52.20	11.16	7.70	47.80	27.25	1.68	17.09
T ₃	53.70	10.95	7.37	46.30	26.40	1.57	17.43
T ₄	54.86	10.55	7.20	45.38	25.95	1.45	18.29

Conclusion

The *basundi* prepared by blending 10% custard apple pulp shows highest overall sensory score (8.08). Which ranked as like very much to like extremely and lowest score was found for *basundi* blended with 15% custard apple pulp. Hence it is concluded that the *basundi* blended with 10% custard apple pulp is more nutritious for consumers. The chemical composition of *basundi* T₂ contains moisture 53.70, fat 10.95, protein 7.37, ash 1.57, carbohydrate 26.40, total solids 46.30 per cent and sucrose 17.43, cost of *basundi* blended with custard apple pulp was higher than control. The cost of production of *basundi* blended with 10% custard apple pulp was Rs. 227.05/kg.

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