Studies on preparation of basundi blended with custard apple pulp

Bawale SM, Dr. SG Narwade and Kamble NS

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). Chikhalkar, 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.
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, Vasantrao 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.

Flow diagram for preparation of Basundi blended with Custard apple pulp

Receiving of buffalo milk
↓
Filtration
↓
Standardization of milk (6 per cent fat)
↓
Heating at simmering temperature (80-90 °C)
↓
Vigorously stirring-cum-scraping
↓
Addition of sugar powder (6 per cent of milk)
↓
Gentle heating for 5 minutes
↓
Cooling and addition of custard apple pulp
↓
Mixing
↓
Storage at refrigeration temperature
↓
Custard apple Basundi

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

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

<table>
<thead>
<tr>
<th>Organoleptic parameters</th>
<th>Flavour</th>
<th>Colour &amp; Appearance</th>
<th>Consistency</th>
<th>Overall Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>7.80</td>
<td>8.20</td>
<td>7.80</td>
<td>7.93</td>
</tr>
<tr>
<td>T2</td>
<td>8.10</td>
<td>8.10</td>
<td>8.00</td>
<td>8.05</td>
</tr>
<tr>
<td>T3</td>
<td>8.25</td>
<td>7.90</td>
<td>8.10</td>
<td>8.08</td>
</tr>
<tr>
<td>T4</td>
<td>7.26</td>
<td>7.80</td>
<td>7.67</td>
<td>7.79</td>
</tr>
</tbody>
</table>

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
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 decreases. 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

<table>
<thead>
<tr>
<th>Chemical constituents (%)</th>
<th>Moisture</th>
<th>Fat</th>
<th>Protein</th>
<th>Total solid</th>
<th>Carbohydrate</th>
<th>Ash</th>
<th>Sucrose</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>49.36</td>
<td>11.71</td>
<td>9.02</td>
<td>50.63</td>
<td>28.11</td>
<td>1.78</td>
<td>16.88</td>
</tr>
<tr>
<td>T2</td>
<td>52.20</td>
<td>11.16</td>
<td>7.70</td>
<td>47.80</td>
<td>27.25</td>
<td>1.68</td>
<td>17.09</td>
</tr>
<tr>
<td>T3</td>
<td>53.70</td>
<td>10.95</td>
<td>7.37</td>
<td>46.30</td>
<td>26.40</td>
<td>1.57</td>
<td>17.43</td>
</tr>
<tr>
<td>T4</td>
<td>54.86</td>
<td>10.55</td>
<td>7.20</td>
<td>45.38</td>
<td>25.95</td>
<td>1.45</td>
<td>18.29</td>
</tr>
</tbody>
</table>

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.

References

2. NDDB Milk production in India, NDDB, Gujarat, 2017.