Studies on physico-chemical properties of shrikhand from buffalo milk blended with sweet corn milk

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ABSTRACT

In this study, the attempt have been made to prepared shrikhand from blends of sweet corn milk and buffalo milk in different proportion and study the chemical composition shrikhand. On an average the moisture content of Shrikhand blended with sweet corn milk was found to be 32.5, 33.8, 34.3 and 35.9 per cent, fat 9.3, 8.4, 7.4 and 6.5 per cent, protein 9.14, 8.72, 8.33 and 7.74 per cent, ash 0.84, 0.73, 0.64 and 0.45 per cent, carbohydrate 60.3, 65.2, 70.3 and 74.5 per cent and total solids 66.57, 65.57, 64.87 and 63.5 per cent for treatment T0, T1, T2 and T3 respectively. It was also observed that as the blending of sweet corn milk increased, there was decreased in fat, protein, ash, total solids content of Shrikhand blended with sweet corn milk and increased in moisture and total sugar content.

Key words: Buffalo milk, Chemical composition, Shrikhand, Sweet corn milk.

INTRODUCTION

Shrikhand, a semi solid, sweetish-sour fermented milk product is prepared by fermentation of milk with lactic acid bacteria expulsion of whey from the curd to yield chakka followed by mixing with sugar, flavouring agent and spices. Charoli, cardamom, nutmeg, saffron and almond are added to improve the taste and nutritional quality. Generally buffalo milk is used for manufacture of chakka which gives higher overrun and receives consumer’s preference. However, cow milk production is increasing at faster rate during last 5-6 years due to increase in crossbred cows. Surplus cow milk is available in cities as well as household level in village for conversion of milk into milk products. But there are problems of getting satisfactory yields of shrikhand prepared from cow milk due to low fat and total solids of milk. India has a very rich variety of fermented foods prepared from milk, cereals, pulses vegetables, fruits and fish. Milk and milk products like curd, buttermilk lassi and shrikhand is inseparable dish in a regular diet of Indians. In all these milk-based products, the biochemical change is the production of lactic acid from lactose by lactic acid bacteria (LAB) like Lactococci, Leuconostocs, Streptococci and Lactobacilli. Shrikhand is a very popular and delicious product liked by many Indian and is consumed it regularly during various occasions due to its pleasant taste and aroma. Because of this, shrikhand has a good market value and manufactured with different brands. Shrikhand with different aroma and taste was prepared by incorporating different fruit pulps and spices. (Meena, 2013).

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factor at all in heart disease (Sandhya, 2010). Recently herbal products either in the form of cosmetics or food has become more popular in the world market. Epidemiological data as well as in vitro studies strongly suggest that food containing phyto-chemical with anti-oxidation potential have strong protective effect against major disease risks including cancer and cardiovascular disease. (Kaur and Kapoor, 2002).

Sweet corn belong to the species as a most remarkable cereal grain, *zea mays* L or maize corn is one of the major cereal crop in the world. Cereals and legumes are important contributors of carbohydrates and proteins to the diet, especially for the vegetarian population of the world. Ancient peoples in Asia used techniques of hydrolyzing starch and proteins in these products to improve the digestibility and organoleptic properties of their food. Asians have been pioneers in the development of fermented plant proteins to produce meat-like flavors and Indians discovered methods for souring and leavening cereal–legume batters.

**MATERIALS AND METHODS**

The materials used and methods employed during the course of present investigation on preparation of *Shrikhand* from blends of buffalo milk with sweet corn milk are as under.

**Buffalo milk and sweet corn:** Fresh and standardized buffalo milk was obtained from the local market of Latur city of Natural Milk Pvt, Ltd, Latur. Fresh sweet corn variety, Masti (F1, Hybrid) of Nuziveedu seeds Pvt, Ltd, was purchased from local market of Latur city.

**Analysis:** *Shrikhand* was analysed for fat by Gerber’s method as in IS: SP (Part XI) 1981, protein as IS: SP (Part XI) 1981, total sugar by the volumetric (lane-Eyon) method as a described in IS: SP (partXI) 1981, moisture, ash and total solids by standard procedure as described in IS: SP (Part XI) 1981. The data obtained in the present study were subjected to statistically by analysis using completely randomized design (CRD) as per Panse and Sukhatme (1985).

**RESULTS AND DISCUSSION**

The requisite samples of *Shrikhand* blended with sweet corn milk the finished product were subjected for the proximate analysis viz. fat, protein, total sugar, moisture, ash, total solids. The results obtained on account of this parameter are presented in table below:

From above table fat content ranges from 9.3, 8.4, 7.4 and 6.5, for treatment T₁, T₂, T₃ and T₄ respectively. The highest fat content was recorded for treatment T₁ (9.3) per cent and the lowest fat content were recorded for treatment T₄ (6.5) per cent. The fat content in the finished product was decreased due to the less amount of fat in sweet corn milk. i.e. 1.05 per cent. The decreasing composition of *shrikhand* fat was supported by Nadaf et al. (2012) in the *shrikhand* prepared by using different level of gulkand significantly decreased the fat content in the *shrikhand*. The highest fat content was obtained in the control i.e. 8.03 while the lowest in treatment T₂ i.e 6.76 per cent respectively and Deshpande et al. (2008) also recorded that the fat per cent were decreased with increase in soy milk concentration. The protein content ranges from 9.14, 8.72, 8.33 and 7.74, for treatment T₁, T₂, T₃ and T₄ respectively. It was also observed that the highest protein content was in T₁ and the lowest was found in T₄. The protein content in the finished product was decreased due to the less amount of protein in sweet corn milk. i.e. 2.56 per cent. Nigam et al. (2005) also observed similar trends in their study and mentioned the same reason as we found that is protein content decreased with increased in papaya pulp. i.e. 7.44 to 6.9 per cent. Total sugar content ranges from 60.3, 65.2, 70.3 and 74.5 for treatment T₁, T₂, T₃ and T₄ respectively. Carbohydrate content were found to be in increasing order from T₁ to T₄. It might be due to high total sugar content in sweet corn milk. Moisture content ranges

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Fat</th>
<th>Protein</th>
<th>Total sugar</th>
<th>Moisture</th>
<th>Ash</th>
<th>Total solids</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>9.3</td>
<td>9.14</td>
<td>60.3</td>
<td>32.5</td>
<td>0.64</td>
<td>66.57</td>
</tr>
<tr>
<td>T₂</td>
<td>8.4</td>
<td>8.72</td>
<td>65.3</td>
<td>33.8</td>
<td>0.73</td>
<td>65.57</td>
</tr>
<tr>
<td>T₃</td>
<td>7.4</td>
<td>8.33</td>
<td>70.3</td>
<td>34.3</td>
<td>0.64</td>
<td>64.87</td>
</tr>
<tr>
<td>T₄</td>
<td>6.5</td>
<td>7.74</td>
<td>74.5</td>
<td>35.9</td>
<td>0.45</td>
<td>63.5</td>
</tr>
</tbody>
</table>

**Preparation of sweet corn milk**

1. Receiving of sweet corn
2. Dehusking of cobs and removal of silks
3. Sorting mature dough stage corns
4. Peeling and shelling of the corns
5. Blending of corn grains with water (1:2)
6. Grinding
7. Filtered through muslin cloth
8. Filling in beaker and
9. Cold storage (5°C)

Fig-1: Flow diagram for preparation of sweet corn milk.
Preparation of shrikhand (Aneja et al., 2002)

Buffalo Milk + Sweet corn milk (as per treatments) ↓
Boiling for 5 min ↓
(25-30 °C) ↓
Inoculation @ 1% standard dahi culture (NCDC-167) ↓
Incubation (at 37 °C for 8 hrs) ↓
Dahi ↓
Drainage of whey ↓
Chakka ↓
Addition of sugar and cardamom (Sugar 60 %weight of Chakka) (Cardamom @1 g /kg) ↓
Seiving and kneading ↓
Packaging ↓
Cooling and Storage (4-6 °C)

REFERENCES