FORMULATION OF **RASOGOLLA FROM COW MILK BLENDED WITH SAFLOWEET MILK**

A.T. Lokhande, V.S. Deshmukh, S.B. Adangale, L.E. Khating and T.R. Walkunde

Department of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri – 413 722, India

**ABSTRACT**

To prepare rasogolla from cow milk blended with safflower milk is an economic alternative. Rasogollas were prepared from different proportion of cow milk and safflower milk 100:0 (T₀), 70:30 (T₁), 60:40 (T₂), and 50:50 (T₃). The hedonic sensory score for rasogolla samples obtained from treatment T₀, T₁, T₂ and T₃ were 8.84, 8.55, 8.16 and 7.46, respectively. It was observed that rasogolla prepared from 50 parts of cow milk and 50 parts of safflower milk was acceptable and economical. On an average the rasogolla of treatment T₃ contained 6.92 per cent fat, 6.70 per cent protein, 39.89 per cent sucrose, 0.96 per cent ash and 54.22 per cent total solid. Cost of production of T₀ treatment was Rs.65.33/kg which got reduced to Rs.59.91 (T₁), 58.85 (T₂) and 56.86 (T₃). The advantage of safflower milk is that it is cheaper and rich in polyunsaturated fatty acid.

Key words: Rasogolla, Cow milk, Safflower milk.

**INTRODUCTION**

Rasogolla is a popular traditional sweet available throughout the country, specially in the Eastern parts of the country on account of its high palatability and delightful taste. Addition of safflower milk to cow milk may be possible alternative to reduce cost for preparation of rasogolla. Safflower seeds contain protein 13.5%, fat 25.6%, carbohydrate 17.9% and appreciable amount of calcium and phosphorus. Safflower milk contains fat 4.55%, protein 2.30%, carbohydrate 2.21%, ash 0.62% and total solid 9.68%. The cost of production of safflower milk was found to be Rs.2.06 per litre (Maske, 1997).

Safflower is rich in polyunsaturated fatty acids which are shown to prevent the increase in serum cholesterol on a high fat diet. Safflower milk does not contain any antinutritritional factor. Safflower milk seems to be useful particularly for lactose intolerant people and infant allergic to cow and buffalo milk. The cost of production of safflower milk is very low as compared to cow milk. So, looking to the importance of safflower milk this experiment was conducted to prepare low cost rasgolla from safflower milk blended with cow milk and acess their palatability.

**MATERIAL AND METHODS**

Cow milk was procured from University Dairy Farm. Pure safflower seeds for preparation of safflower milk were obtained from University Central Farm. Food grade citric acid was used as coagulant.

**Preparation of safflower milk:**

Safflower milk was prepared as per the method described by Maske (1997). 200 gm of safflower seed were weighed, washed with hot water and then blended in mixture, final seed to water ratio was maintained as 1:5. The milk was then filtered...
to remove seed coat. To improve its heat stability sodium hexametaphosphate was added at 0.2%. Also common salt at 0.05% and sugar at 0.2% were added to enhance its taste and acceptability. The milk was then brought to boil which had cream colour and nutty flavour.

**Blending of cow milk and safflower milk**

For preparation of rasogolla, following blends of cow milk and safflower milk were studied.

- **T₀**: 100% cow milk (control)
- **T₁**: 70% cow milk + 30% safflower milk
- **T₂**: 60% cow milk + 40% safflower milk
- **T₃**: 50% cow milk + 50% safflower milk

**Flow chart of preparation of rasogolla**

Cow milk + Safflower milk

↓

Heating (90°C)

Cooling to (70°C)

Addition of 1.5% citric acid solution

Mixing and setting

Draining of whey

Manual kneading of chhana

Ball making (10 g)

Cooking in sugar syrup

(50% sugar syrup for 20 minutes)

Soaking in sugar syrup

(40% sugar syrup for 4 hrs.)

Rasogolla

The product was evaluated for its sensory quality by 9 panel of judges using 9 point Hedonic scale as described by Gupta (1976). Rasogolla samples were analysed for fat as per the method described by Wankhed and Tharanthan (1976), protein by A.O.A.C. (1965), sucrose ash and total solid by I.S.I. Method (1981). The number of trials triplications were fine. Cost of rasogolla was worked out. The results were subjected to statistical analysis by using completely randomized block design as described by Panse and Sukhatme (1967).

**RESULTS AND DISCUSSION**

Chemical composition of rasogolla prepared from different blends of safflower milk and cow milk is presented in Table 1. The rasogolla prepared from 50:50 blends of cow milk and safflower milk had somewhat lower fat, protein, sucrose and total solid. This may be due to the lower total solid content of safflower as compared to cow milk. Similar findings were reported by Katara and Bhargava (1990) for soybased rasogolla.

**Sensory evaluation of rasgolla**

The sensory score of rasgolla (Table 2) decreased as the proportion of safflower milk in the blend increased. The colour and appearance score of different blends of rasgolla ranged between 8.88 to 7.66. This may be due to pale yellow colour of safflower milk which gives characteristic dark creamy shade to the product. Flavour score of rasgolla also decreased from 8.89 to 7.55, due to characteristic oily flavour of safflower milk. Similar findings were reported by Maske (1997), Gadhave (2001). Body and texture score was influenced by the proportion of safflower milk. The taste score of rasgolla decreased from 1.88 to 7.31, as the proportion of safflower increased in the blend. This may be due to initial little bitter taste of safflower milk. The overall acceptability score of rasgolla decreased from 8.84 to 7.46. It decreased with increased proportion of safflower milk in the blend decreased overall acceptability score of rasgolla. It was proved that blending of safflower milk with cow milk to minimum extent of 50:50 was acceptable and economical.
The cost of production of rasgolla prepared from different blends of cow milk and safflower milk was calculated and the same is presented in Table 3. Based on experimental trials, the quantities ingredient required for preparing 1 kg rasgolla were worked out. The cost was calculated on the basis of market price of ingredient. The cost of production of 1 kg rasgolla from cow milk (T0) was Rs.65.33, which decreased to 59.91 (T1), 58.55 (T2) and Rs.56.86 (T3) respectively. This proved that the cost of rasgolla can be minimized by using safflower milk and cow milk blend.

### Table 3: Cost of production of rasogolla per kg.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particulars</th>
<th>Rate (Rs/kg)</th>
<th>T₀ Quantity (Rs.)</th>
<th>T₀ Amount (Rs.)</th>
<th>T₁ Quantity (Rs.)</th>
<th>T₁ Amount (Rs.)</th>
<th>T₂ Quantity (Rs.)</th>
<th>T₂ Amount (Rs.)</th>
<th>T₃ Quantity (Rs.)</th>
<th>T₃ Amount (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cow milk (ml)</td>
<td>12</td>
<td>1</td>
<td>12</td>
<td>700</td>
<td>8.40</td>
<td>600</td>
<td>7.20</td>
<td>500</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>Safflower milk (ml)</td>
<td>2.25</td>
<td>Nil</td>
<td>Nil</td>
<td>300</td>
<td>0.67</td>
<td>400</td>
<td>0.90</td>
<td>500</td>
<td>1.12</td>
</tr>
<tr>
<td>3.</td>
<td>Citric acid (ml)</td>
<td>330</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Sugar (kg)</td>
<td>13</td>
<td>0.5</td>
<td>6.50</td>
<td>0.5</td>
<td>6.50</td>
<td>0.5</td>
<td>6.50</td>
<td>0.5</td>
<td>6.50</td>
</tr>
<tr>
<td>5.</td>
<td>Miscellaneous</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7.</td>
<td>Quantity of rasogolla obtained from 1 lit of milk (kg)</td>
<td>0.375</td>
<td>0.360</td>
<td>0.350</td>
<td>0.345</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Cost of production of 1 kg rasogolla (Rs.)</td>
<td>65.33</td>
<td>59.91</td>
<td>58.85</td>
<td>56.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cost of production

The cost of production of rasgolla prepared from different blends of cow milk and safflower milk was calculated and the same is presented in Table 3. Based on experimental trials, the quantities ingredient required for preparing 1 kg rasgolla were worked out. The cost was calculated on the basis of market price of ingredient. The cost of production of 1 kg rasgolla from cow milk (T₀) was Rs.65.33, which decreased to 59.91 (T₁), 58.55 (T₂) and Rs.56.86 (T₃) respectively. This proved that the cost of rasgolla can be minimized by using safflower milk and cow milk blend.

### CONCLUSION

Based on the above results it may be concluded that, the rasgolla prepared from cow milk and safflower milk blend (50:50) was acceptable. The advantage of using safflower for rasgolla preparation is that, it does not contain cholesterol. Safflower milk is rich in polyunsaturated fatty acid which helps in lowering blood cholesterol.
REFERENCES


Research, New Delhi.