EFFECT OF QUALITY OF MILK AND SUGAR LEVEL ON COMPOSITION AND YIELD OF MALAI-POORI – A TRADITIONAL MILK PRODUCT OF VARANASI

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ABSTRACT

The yield of malaipoori was estimated using cow, buffalo and mixed milk and 4, 8 and 12 percent level of sugar on product weight basis. Production was found to be variable with different types of milk and various levels of sugar. The average yield of malaipoori was estimated as 13.50, 12.50 and 13.16 per cent respectively from buffalo, cow and mixed milk. The effect of interactions of different types of milk and various levels of sugar on yield of malaipoori were found to be highly significant (p < 0.01). The fat and protein contents of malaipoori were influenced by kind of milk samples and sugar content. A highly significant difference was also observed in the chemical composition viz. moisture, protein, total solids and ash content of malaipoori in M1, M2 and M3 groups of milk (p<0.01).

INTRODUCTION

Most of the western type dairy products manufactured by unorganized and organized sector of the dairy industry are reaching near saturation demand level in the existing domestic and international market. The entire range of Indian milk products represent the most promising venture for diversification Indian milk products are the largest and latest growing segment of the dairy industry and offer opportunity for absorbing the growing milk surplus, (Aneja, 1992). In recent years, the focus of research and development has been on the application of technology for mass production of indigenous sweets.

Among the fat rich dairy products malai - poori is not known by Indian population except in Varanasi. Malaipoori is a form of concentrated and compact white cream formed as a thick layer of fat and coagulated protein as a result of simmering and evaporative process. It is scooped with the help of a flat ladle and laid aside to cool. Common practice is to boil the milk and place the malai to form a thin cake like a poori. The estimated daily production of malai - poori in Varanasi is 500 kg. It is nutritionally rich with 40-50 per cent milk fat, 8-10% per cent protein, 75 – 80 per cent total solids and 2.3 per cent ash.

No published information is available on the quality of malai - poori prepared from different types of milk and different levels of sugar.

The present investigation was undertaken with a view to standardize the product mix and to estimate the yield of malai - poori.

MATERIAL AND METHODS

Fresh cow, buffalo and mixed milk samples were collected from morning milking of healthy animals maintained at BHU Dairy Farm, Varanasi.

The samples of milk were analysed for fat, specific gravity, acidity, total solids (TS) and solid-not-fat (SNF) as per I.S.: 1479 (Part II) – 1961, I.S.: 2785 (Part-I0) 1964 and IS: 1224, 1977 specifications.

Standardization of milk and preparation of milk sample: For each sample 3 liters of cow, buffalo and mixed milk was standardized to 4, 6 and 5.5 per cent fat respectively. Three levels of sugar (4, 8 and 12 per cent) were added to malai formed.
Preparation of malai - poori: Malai-poori was prepared in the laboratory using the technology adopted by Halwais in Varanasi. First of all, milk samples were boiled without stirring in the open shallow stainless steel pan. Milk was heated at 80°C in a shallow pan to facilitate the formation of the creamy layer on the liquid air interface of milk. The milk during boiling is not stirred to obtain higher yield and allowed to cool gradually in a separate open pan. Thereafter sugar was added to the concentrate at the rate of 4, 8 and 12 per cent of total product to develop sweet taste and caramelized flavour.

**PROCESS FLOW**

Pre heating of milk (35 – 40°C) ↓
- Filtration ↓
- Standardization ↓
- Heating ↓
- Continuous heating (at 80°C) for 3 – 4 h ↓
- Collection of creamy layer ↓
- Cooling to 30°C ↓
- Separation of creamy layer from milk with the help of flat ladle ↓
- Separation of liquid from lower surface of malai layer ↓
- Addition of sugar on creamy layer ↓
- Malai-poori ↓
- Packaging ↓
- Storage (at 5°C) ↓

Malai-poori obtained from each treatment was weighed separately to calculate the yield on percentage basis.

**RESULTS AND DISCUSSION**

The data were statistically analyzed to find out the significance of different types of milk and sugar levels on the quality and quantity of malai - poori. The different treatment combinations included three types of milk viz., buffalo milk (M1), cow milk (M2) and mixed cow and buffalo milk (M3) and sugar levels @ 4 (S1), 8 (S2) and 12 per cent (S3). All the treatment combinations were replicated thrice during entire period of experiment.

**Chemical Composition of Malai - poori**: The average moisture content of malai-poori in M1, M2 and M3 groups of milk was 18.73 ± 0.15, 20.82 ± 0.09 and 20.08 ± 0.9 per cent respectively. The moisture per cent decreased (p < 0.05) as fat per cent increased in milk.

The average protein content in sugar group S1, S2 and S3 was estimated as 9.43 ± 0.02, 8.73 ± 0.01 and 8.46 ± 0.16 per cent respectively. The difference in these values from M1 to M2, M1 to M3 and M2 to M3 was significantly high (p < 0.01).

The average total solids (TS) content in sugar group S1, S2 and S3 were 77.97 ± 0.28, 81.96 ± 0.01 and 85.96 ± 0.01 per cent respectively. These differences in the value obtained between the groups were highly significant (p < 0.01).

The average ash content of malai-poori samples prepared from milk group M1, M2 and
M were recorded as 2.13 ± 0.01, 2.20 ± 0.01 and 2.22 ± 0.01 per cent, respectively. The difference in the values found between the group M1 and M2 was significantly high (p < 0.01). The average ash content in group S1, S2, and S3 was 2.135 ± 0.008 (2.204 ± 0.004) and 2.216 ± 0.004 per cent respectively. The ash content in the samples increased significantly (p < 0.01) as levels of sugar increased in the malaipoori.

**Yield of malaipoori:** The result on yield of malaipoori prepared from different types of milk and three levels of sugar are presented in Table 1.

**Table 1.** Mean yield of malaipoori prepared from different types of milk and three levels of sugar.

<table>
<thead>
<tr>
<th>M × S</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Overall average</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>12.50</td>
<td>13.50</td>
<td>14.50</td>
<td>13.50 ± 0.34</td>
</tr>
<tr>
<td>M2</td>
<td>11.50</td>
<td>12.50</td>
<td>13.50</td>
<td>12.50 ± 0.20</td>
</tr>
<tr>
<td>M3</td>
<td>12.67</td>
<td>13.16</td>
<td>14.16</td>
<td>13.16 ± 0.20</td>
</tr>
<tr>
<td>Mean</td>
<td>12.05</td>
<td>13.05</td>
<td>14.05</td>
<td>13.05 ± 0.49</td>
</tr>
</tbody>
</table>

**REFERENCES**


