STUDIES ON PREPARATION OF FLAVOURED MILK FROM COW MILK BLENDED WITH SAFFLOWER MILK

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ABSTRACT

The preparation of flavoured milk from different proportion of cow milk blended milk safflower milk 100:0 (T₀), 80:20 (T₂), 70:30 (T₃), 60:40 (T₄) and 50:50 (T₅) was prepared and studied the acceptability. On an average the flavoured milk of treatment T₀, T₁, T₂ and T₃ contained fat 3.0 per cent, protein 3.20, 3.08, 2.91, 2.78 and 2.65 per cent, ash 0.72, 0.68, 0.66, 0.62 and 0.59 per cent total solids 15.21, 14.59, 14.03, 13.58 and 13.10 per cent, respectively. The sensory score overall acceptability of flavoured milk of treatment T₀, T₁, T₂ and T₃ were 8.94, 8.66, 8.01, 7.30 and 6.37. The overall acceptability score of T₁ has acceptability close to control (T₀). The overall acceptability score of T₂ and T₃ were also rated between like moderately to like very much. The cost of production of one litre flavoured milk of treatment T₁, T₂, T₃ and T₄ was Rs. 12.63, Rs. 11.63, Rs. 10.64 and 9.65. Thus this proved that the cost of flavoured milk could be minimized by using safflower milk and cow milk blended and blending could be done to the maximum proportion of 50:50.

Key words : Flavoured milk, Safflower milk, Cow milk.

INTRODUCTION

Milk production of India has risen gradually from a level of 17.0 million tonnes in 1950-51 to a level of 90.7 million tonnes in the year 2004-05. As per scientific recommendations of ICMR 280 g of milk per day per capita for consumption, however per capita availability of milk in India is only 232 g during the year 2004-05 (Tripathy, 2006). India ranks first in the milk production which account for about 10 per cent of the worlds milk production. The milk production in India is on a small scale and scattered, more over milk is perishable article and requires being disposed of immediately, either fluid or for preparation of products or for both. Half of the milk produced in the country is utilized at fluid milk and rest is concertied into tradional milk products (Rao and Raju 2003). From these some part of milk is used for making special milk like flavoured milk, soft curd milk, fermented milk standardized milk, and recombined milk are humanized milk.

Flavoured milk a beverage in which sugar flavouring agents colouring material are added milk it contains all the constituents of milk. It is good source of proteins, cabrohydrates and mineral. Provides energy and water to digest the food, regulate body temperature and prevent dehydration. Vegetative proteins from non legumes, particularly safflower occupied a unique and important position in the diet because they form a major and cheap source of vegetable proteins, fat, minerals and calories. Safflower milk does not contain, cholesterol and is rich in polysaturated fatty acids and have been shown to prevent an increase in serum cholesterol on a high fat diet and thus considered anti antherogenic. Safflower milk seems to be useful for lactose intolerant people and infants allergic to cow and buffalo milk. The cost of production of safflower milk is very less as compared to cow and buffalo milk. So looking to the improtance of safflower milk, efforts have been made to prepare flavoured milk from cow milk blended with safflower milk.

MATERIAL AND METHODS

Safflower seeds were used for preparation of safflower milk 50 gm dehusked safflower seeds was weighed and warmed with hot water and then
it was ground with addition of water and filtered through muslin cloth (Seed : water ratio 1:10). So as to have consistency as that of milk. To improve heat stability sodium hexameta phosphate @ 0.2 per cent, common salt @ 0.05 per cent and sugar @ 0.2 per cent were added to enhance its taste and acceptability. The milk as then boiled. The milk so obtained had creamy colour nutty flavour, Sweet taste and consistency as that of cow milk.

**Fig 1.** Flow diagram for preparation of safflower milk

- Dehusked safflower seeds (50 gm)
- Seeds washed with hot water
- Grinding of seed (in small amount of water)
- Filtration (Final seed to water ratio 1:10)
- Addition of sodium hexameta - phosphate (@ 0.2 per cent)
- Addition of common salt (@ 0.05 per cent)
- Heating of milk
- Safflower milk (500 ml)

**Standardization of safflower milk and cow milk:**

The safflower milk thus prepared as shown in Fig. 1 was adjusted the fat level of 3.0 per cent in the milk by adding safflower seed extract. The cow milk was standardized to 3.0 per cent fat and 9.0 per cent SNF. Standardization was done by adding skim milk and skim milk powder.

**Preparation of flavoured milk:**

For preparation of flavoured milk the procedure given by De (1982) was followed with slight modification.

The measured quantity of cow milk/safflower milk was taken. The milk was filtered through muslin cloth. The cow/safflower milk was standardized to 3.0 per cent fat and 9.0 per cent SNF. Milk was heated to 75°C. Then it was allow to cool upto 5°C after cooling, colour and flavours were added in milk. Milk was filled in bottle and capping milk was stored in refrigerator.

**Fig.2 : Flow diagram for preparation of flavoured milk**

- Receiving milk
  - (Cow milk/blended milk)
  - Filtration /clarification
  - Standardization (3.0 per cent fat and 9.0 per cent SNF)
  - Addition of sugar @ 8.0 per cent sugar
  - Heating of milk (Upto 78°C)
  - Cooling to 50°C
  - Addition of colour and flavour
  - Bottle filling
  - Capping
  - Storage in refrigerator
  - Flavoured milk

**Chemical analysis:** The samples from various treatment combinations were chemically analyzed for fat (IS; 1224, Part-I, 1997), Protein (A.O.A.C. 1965), total solids (IS: 1479, Part II, 1961). The carbohydrate was estimated by subtraction method i.e. Carbohydrate = Total solids - (Fat + Protein + Ash).

**Sensory evaluation:** The flavoured milk prepared under different treatment combinations were suspected to sensory evaluation by a panel of judges for colour and appearance, flavour consistency and mouth feel. The scoring was done on 9 point hedonic scale as described by (Gupta 1976).

**Statistical analysis:** The data contained were analyzed statistically by using completely randomized design as per method prescribed by Panse and Sukhatme (1985).
Cost of production of flavoured milk:

The various constituents required for manufacture of flavoured milk was rated as per prevailing market price and cost per litre of flavoured milk was worked out.

RESULTS AND DISCUSSION

Milk used for preparation of flavoured milk

Flavoured milk was prepared with cow milk blended with safflower milk. The flavoured milk prepared from cow milk served as control. The chemical composition of cow milk and safflower milk used for preparation of flavoured milk is given in Table 1. It can be seen from Table 1 that protein, carbohydrate, ash and total solids content of cow milk was significantly higher than safflower milk.

Chemical composition: The chemical composition of flavoured milk is presented in Table 2. From the Table 2 it is observed that the fat content of flavoured milk in all the treatment combination was same. As the cow milk and safflower milk used for preparation of flavoured milk was decreased from 3.20 (T0) to 2.65 (T4). It might be due to decreasing level of cow milk which contained more protein than safflower milk. Rajesh Kumar et al. (1989) observed protein content of flavoured milk like beverage as 3-13 per cent. The total solids content in T0 was highest (15.21%) and lowest in T4 (13.10). There was decrease in total solids content in flavoured milk with increased level of safflower milk. There were significant differences in total solids content of flavoured milk. There results were in agreement with the findings of Rajesh Kumar et al. (1989) who reported total solids content of flavoured milk like beverage as 15.13 per cent.

Sensory evaluation: It was observed from Table 3 that treatment T0 which is control scored the highest score followed by T1, T2, T3 and T4 (6.65). This indicated that increase in proportion of safflower milk in the blend, decreased the score of colour and appearance of flavoured milk. There results were in agreement with the findings of Narwade (1999) and Dhanwade (2000). The score in respect of flavour ranged between 6.41 to 8.94 for T4 and T0 treatment combinations. Significant differences were observed in the flavour score. In case of consistency the score recorded seem to be highest for T0 (8.88) and lowest in T4 as

Table 1. Average chemical composition of cow milk and safflower milk used for preparation of flavoured milk

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Type of milk</th>
<th>Fat (%)</th>
<th>Protein (%)</th>
<th>Carbohydrate (%)</th>
<th>Ash (%)</th>
<th>Total solids (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cow milk</td>
<td>3.00</td>
<td>3.38</td>
<td>4.90</td>
<td>0.72</td>
<td>12.00</td>
</tr>
<tr>
<td>2.</td>
<td>Safflower milk</td>
<td>3.00</td>
<td>2.18</td>
<td>2.08</td>
<td>0.56</td>
<td>7.82</td>
</tr>
</tbody>
</table>

Table 2: Chemical composition of flavoured milk

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Constituents (Per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fat</td>
</tr>
<tr>
<td>T0</td>
<td>3.00</td>
</tr>
<tr>
<td>T1</td>
<td>3.00</td>
</tr>
<tr>
<td>T2</td>
<td>3.00</td>
</tr>
<tr>
<td>T3</td>
<td>3.00</td>
</tr>
<tr>
<td>T4</td>
<td>3.00</td>
</tr>
<tr>
<td>S.E. ±</td>
<td>0.00</td>
</tr>
<tr>
<td>CD at5 %</td>
<td>0.00</td>
</tr>
</tbody>
</table>
6.15. The significant differences were found amongst the treatment combinations. Incase of mouth feel the mean score ranged from 6.31 to 8.98. It was lowest in T4 and highest in T0. There were significant differences in the mouth feel score of treatment T2, T3 and T4. The results obtained were in agreement with the findings of Narwade (1999).

The overall acceptability score for treatment T0, T1, T2, T3 and T4 were 8.94, 8.66, 8.01, 7.30 and 6.37 respectively. Treatment T0 was significantly superior over rest of the treatments. The flavoured milk of treatment T0, T1 and T2 were rated in between like very much and like extremely. Flavour milk of T3 were rated in between like moderately and like very much, while the flavoured milk of treatment T4 was rated in between like slightly and like moderately. The results obtained were in agreement with the results documented by Dhanwade (2000).

**Cost**: The figures in Table 4 revealed that the cost of product so workout was 14.62 for pure flavoured milk (T0) where as cost of (flavoured milk blended with safflower milk) treatment combination T1, T2, T3 and T4 was Rs. 12.63, 11.63, 10.64 and 9.5 respectively. The cost of flavoured milk of treatment T4 in comparatively less than rest of the treatments. This milk was liked by the consumers.

**CONCLUSION**

It may be conducted that low cost flavoured milk could be preferred by using safflower milk blended with cow milk with addition of 8 per cent sugar and rose flavour. The cost of production of flavoured milk of treatment T4 was Rs. 9.65 only.

**REFERENCE**


ISI (1961). IS 1479 Determination of total solids Part - II.