MILK SHAKE FORTIFIED WITH KARONDA AND PAPAYA PULP

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ABSTRACT

A study was undertaken to explore the possibility of utilizing karonda and papaya fruit pulp in preparation of milk shake. Karonda which is richest source of iron, Vit-C was used @ 5, 10 and 15 percent. Papaya which is also a good source of Calcium, phosphorus and iron was used @ 2.5, 5.0 and 7.5 percent. Papaya pulp fortified @ 7.5 percent and karonda pulp fortified @ 10 percent produced the best quality flavoured milk shake.

Keywords: Milk Shake, Karonda, Papaya, Sensory evaluation, fat, protein

INTRODUCTION

Milk shake, a product of western origin is obtained by freezing a mix very similar to soft serve ice-cream mix i.e. milk, skim Milk powder, stabilizers & sugar & speed mixing the frozen product in mixer to make it pourable & generate foam in it. The most commonly used flavours blends are of rose, coffee, and chocolate. Incorporation of fruit & fruit products in the milk products to render good flavours, increase palatability and nutritive value is a very old practice. Fruit pulp if added to the milk shake. Not only improve its acceptability but also improve its nutritional quality at the same time, it will give good market to the preserved food products which is ultimately going to help the farming community engaged in fruit production preservation & also dairy production.

The ripe fruit of karonda (Carissa carandas L.) contains 73.89% moisture, 20.170 Brick T.S.S., 11.48% total sugar and 1.75 mg/1200 g. sorbet acid (Joshi et al. 1986) Karonda fruit is one of the richest sources of iron i.e. 39.1% on the DM basic (Anaymous, 1979) It is also rich source of vitamin C (Misra et al. 1968).

Papaya (Carica Papaya) which contains high quantities of Vit-A, fair quantities of Vit-C, Some riboflavin and niacin & is a good source of calcium, Phosphorus and iron. Its calorific value is quite low which makes it very suitable for inclusion in a non-fattening diets. (Rana, 2002). Papaya ranks second only to mango as a source of precursor of Vit-A.

Considering the importance of Karonda and Papaya fruits which has also got district flower besides good nutritional quality a research work was done on incorporation of karonda & Papaya pulp in milk shake. This will also help to develop a new variety of nutritious cold drink.

MATERIALS AND METHODS

For preparation of milk shake cow milk was obtained from the dairy unit of the College of Agriculture, Dapoli, SMP, Stabilizer (gelatin), Sugar, and fruits (karonda and papaya) were purchased from the local market. The milk shake was prepared as per the procedure given by Sharma and Gupta (1978) with slight modification. The flow diagram of manufacture is as given below.
Cow milk
↓
Preheating (40°C)
↓
Addition of 5% SMP (paste)
↓
Heating (70°C)
↓
Addition of sugar (10%) and stabilizer (0.5%)
↓
Mixing filtration
↓
Pasteurization (72°C for 30 minutes)
↓
Cooling and ageing (10°C for 2-3 hrs.)
↓
Addition of fruit pulp
↓
Speed mixing (90-120 second)
↓
Ready to serve

To finalize the levels of fruit pulp for incorporation, preliminary trails were conducted. Trials showed that addition of more than 7.5 percent papaya pulp resulted in a partial curdling of milk shake making it unpourable. This may be due to the fact that the latex of the plant papaya (carica papaya) yields papain and several other proteases which has a powerful milk clotting activity (webb et al. 1987) which was not like by the judges where as karonda level more than 15 per cent gave slight purent taste to the product which was disliked by the judges.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀L₀</td>
<td>Control</td>
</tr>
<tr>
<td>T₁L₁</td>
<td>5% Karonda pulp</td>
</tr>
<tr>
<td>T₁L₂</td>
<td>10% Karonda pulp</td>
</tr>
<tr>
<td>T₁L₃</td>
<td>15% Papaya pulp</td>
</tr>
<tr>
<td>T₂L₁</td>
<td>2.5% Papaya pulp</td>
</tr>
<tr>
<td>T₂L₂</td>
<td>5.0% Papaya pulp</td>
</tr>
<tr>
<td>T₂L₃</td>
<td>7.5% Papaya pulp</td>
</tr>
</tbody>
</table>

Analysis of Milk Shake

Fat content was determined by using standard Gerber method described in IS : 1224 (Part-I), 1977 T.S. determined by Gravimetric method as per IS.1479 (Part-II) 1961 titratable acidity determined according to IS : 1479 (Part-I) 1960. Protein content was determined by micro-kjeldal method (Chaudhari, 1959) Sensory evaluation of fruit flavoured milk shake was done by nine point Hedonic scale given by Amerine et al (1965). The data obtained from seven replication was analyzed statistically (R.B.D.) according to method described by Snedecor and Cochran (1989).

Fruit pulp was analyzed for fat, total solids, titratable acidity and protein, using the methods given by AOAC (1975).
RESULTS AND DISCUSSION
The data given in (Table 1) indicate that fruit pulp had higher total solids. Karonda pulp had high titratable acidity (0.36 percent) as compared to papaya pulp (0.06 percent).

The observations a chemical and sensory quality of milk shake are presented in Table-2. The highest total solids content was recorded for 15% Karonda pulp level. Same trend was noticed in case of titratable acidity. It was observed that with the increase in level of karonda pulp and papaya pulp there was significant increase in the total solids content. With increase in the level of pulp there was significant decrease in the fat and protein content. Milk shake containing 7.5 percent level of papaya had most appealing colour and appearance. It had pleasing and appealing yellowish colour. Lower level of papaya pulp procured low score which may be due to faint full yellow colour. In case of karonda pulp the highest score for colour & appearance was obtained at 10% level. Treatment T1T3 showed lowest score due to dull appearance and dark colour. Karonda flavoured milk shake showed less smooth surface as compared to papaya flavoured milk shake.

Consistency score was increased with increase in the level of papaya pulp. But in case of karonda milk shake the score increases upto 10% level of karonda with the score of 7.14. The milk shake should have uniform pourable and desirable viscosity as accepted for consumption. Milk shake without addition of any fruit flower (control) showed very less acceptability score for consistency with the score of 6.49 which may be due to very thin consistency of milk shake, which was not liked by the judges.

From the average figure of overall acceptability in the table-2, it is seen that milk shake prepared by using 7.5% papaya pulp scored highest. Points (7.91) followed by 2.5% and 5.00% with score of 7.35 and 7.61, respectively. In case of karonda flavour, milk shake with 10% karonda pulp was superior (7.29) to that of 5 and 10 percent level with the score of 6.84 and 6.43, respectively.

CONCLUSION
On the basic of results obtained it is to state that among the levels, 7.5 percent papaya pulp and 10 percent karonda pulp were found most acceptable by the judges.
REFERENCE:


Table-1 : Chemical composition of fruit pulp (per cent)

<table>
<thead>
<tr>
<th>Fruit pulp</th>
<th>Fat</th>
<th>Protein</th>
<th>Total solids</th>
<th>Titratable acidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karonda</td>
<td>0.12</td>
<td>0.95</td>
<td>33.15</td>
<td>0.36</td>
</tr>
<tr>
<td>Papaya</td>
<td>0.29</td>
<td>0.51</td>
<td>11.10</td>
<td>0.06</td>
</tr>
</tbody>
</table>
### Table-2 : Chemical and sensory quality of Fruit flavoured milk shake

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Chemical composition</th>
<th>Sensory evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fat</td>
<td>Total solids</td>
</tr>
<tr>
<td>Control (T₀L₀)</td>
<td>3.87</td>
<td>27.14</td>
</tr>
<tr>
<td>Karonda pulp 5% (T₁L₁)</td>
<td>3.52</td>
<td>27.76</td>
</tr>
<tr>
<td>Karonda pulp 10% (T₁L₂)</td>
<td>3.42</td>
<td>28.25</td>
</tr>
<tr>
<td>Papaya pulp 15% (T₁L₃)</td>
<td>3.32</td>
<td>29.20</td>
</tr>
<tr>
<td>Papaya pulp 2.5% (T₂L₁)</td>
<td>3.67</td>
<td>26.63</td>
</tr>
<tr>
<td>Papaya pulp 5.0% (T₂L₂)</td>
<td>3.53</td>
<td>26.04</td>
</tr>
<tr>
<td>Papaya pulp 7.5% (T₂L₃)</td>
<td>3.46</td>
<td>25.81</td>
</tr>
</tbody>
</table>