Sensory evaluation of stirred papaya yoghurt during storage period

Publication History
Received: 30 October 2015
Accepted: 27 November 2015
Published: 1 December 2015

Citation
SENSORY EVALUATION OF STIRRED PAPAYA YOGHURT DURING STORAGE PERIOD

A. Punnagaiarasi*, A. Elango, G. Rajarajan, N. Karthikeyan and C. Pandiyan

Corresponding author: email: punnagai7080@gmail.com; and Research Assistant.
2. Professor and Head, 3, 4. Assistant Professors, 5. Associate Professor Department of Livestock Products Technology (Dairy Science), Veterinary College and Research Institute, Namakkal-2, Tamil Nadu, India.

Abstract

Yoghurt is a fermented milk product traditionally obtained by lactic acid fermentation through the action of lactic acid bacteria *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus salivarius* subsp. *thermophilus*. The nutritional value of yoghurt is made up of the nutrients of the milk and the nutrient among metabolites produced during the fermentation by lactic acid bacteria. There are many health benefits from yoghurt. Lactic acid aids in calcium absorption and digesting some of the lactose for people with lactose intolerance, Yoghurt also acts as an antibiotic, protects against gastrointestinal upset, decreases risk of cancer, lower blood cholesterol especially low density lipoprotein cholesterol and help the body to assimilate protein, calcium and iron. The organisms in yoghurt also can produce some B vitamins which are needed by the human body. Collectively, these contribute to a high level of nutrition and contribute to the strengthening of the immune system (Salwa *et al.*, 2004).

The present study was conducted to develop stirred yoghurt by incorporating papaya fruit in order to improve the nutritional benefit of yoghurt. Samples were analysed for sensory quality during different storage period of zero, 7th, 14th and 21st day. Four treatments (Control, T1, T2, T3 and T4) were conducted using different inclusion level of papaya fruit each at different levels (0 %, 5.0%, 10%, 15% and 20 %) respectively. Significantly higher values were observed in sensory evaluation in 10 per cent papaya incorporated yoghurt when compared with the other treatments. From the results of the present study, it can be concluded that yoghurt can be incorporated with 10 per cent papaya fruit to enhance the nutritional quality without altering the sensory quality of yoghurt.

**Keyword:** Stirred papaya yoghurt - Sensory quality – Storage period

**MATERIALS AND METHODS**

**Milk**

Fresh cow milk obtained from the Dairy Farm, Veterinary College and Research Institute, Namakkal was used.

**Skim milk Powder**

Skim milk powder testing 5per cent moisture and 95per cent solubility was purchased from Aavin.

**Sugar**

Commercially available good quality cane sugar was used.
**Starter cultures**
Freeze dried DVS cultures containing yoghurt bacteria *Lactobacillus delbrueckii* ssp. *bulgaricus* and *Streptococcus salivarius* ssp.*thermophilus* obtained from Chr. Hansen, Denmark was used in this study.

**Papaya**
Good quality papaya fruit purchased from local market in Namakkal

**Methods**

**Preparation of fruit pulp**

Fresh ripened fruit of papaya were purchased and after gentle wash under tap water, the fruits were subjected to pulp extraction.

```
Ripend papaya
↓
Washing
↓
Peal outer covering
↓
Cut into slices
↓
Remove the seeds
↓
Extract fruit pulp
```

**Procedure for the preparation of plain yoghurt**

Plain yoghurt was prepared using fresh milk. Skim milk powder at the rate of 4 per cent (w/v) and sugar at the rate of 6 per cent (w/v) were added to it and homogenized at 2500 psi. The contents were mixed well and pasteurized at 85°C for 30 minutes, cooled to room temperature and inoculated with 2 per cent of yoghurt cultures containing *Lactobacillus delbrueckii* ssp. *bulgaricus*, and *Streptococcus salivarius* ssp. *thermophilus*. It was then mixed well and incubated at 42°C for 4 to 5 hours and finally stored at 5°C.

**Table 1. Sensory attributes of plain yogurt and stirred papaya yoghurt**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Plain yoghurt (control)</th>
<th>Stirred papaya yoghurt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>T1</td>
</tr>
<tr>
<td>Color and</td>
<td>7.91±0.004c</td>
<td>8.09±0.003d</td>
</tr>
<tr>
<td>Appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body and</td>
<td>8.25±0.003c</td>
<td>7.98±0.004d</td>
</tr>
<tr>
<td>Texture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flavor</td>
<td>8.05±0.003d</td>
<td>7.81±0.003c</td>
</tr>
<tr>
<td>Overall</td>
<td>8.07±0.003d</td>
<td>7.96±0.003c</td>
</tr>
</tbody>
</table>
Flow diagram of preparation of papaya stirred yoghurt

Fresh milk
↓
Addition of skim milk powder (4 per cent) and Sugar (6 per cent)
↓
Homogenization (1000 psi)
↓
Pasteurization (85°C for 30 min)
↓
Cooling (42°C)
↓
Inoculation (2 per cent yoghurt culture)
↓
Incubating at 42°C /4-5 hrs
↓
Stirring
↓
Addition of papaya fruit pulp
↓
Mixing and storage (5°C)

Sensory evaluation of yoghurt

Panelists were asked to evaluate yoghurt quality on a 9-point hedonic scale with their preferences according to the scale (Amerine et al., 1965).

Statistical analysis

The data obtained in all the experiments were analyzed statistically by applying one way and two way ANOVA (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

Sensory Evaluation

The results pertaining to sensory qualities like colour and appearance, taste, flavour and body and texture of yoghurt by using 9 – point hedonic scale are presented in Table 1 and 2.

In general the use of fruit homogenate for making stirred yoghurt caused improvement in body and texture properties of the final product. This improvement could be due to the higher

<table>
<thead>
<tr>
<th>acceptability</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

Within a row values with different superscript letters are significantly different (p<0.05)
content of fibers associated with fruit homogenate added and this may lead to increase the viscosity and consequently improve the body and texture. It is clear that panelist’s preferred 10 per cent papaya stirred yoghurt compare to the other samples. So, addition of fruit to stirred yoghurt production may be contributed to increase the sensory quality of the final product.

Erdogan and Zekai (2009) stated that, fruit additions have an increasing effect on yoghurt consumption. The sensory scores of all the samples were decreased during storage period. This is may be due to the acidity development or the production of microbial metabolism which slightly harmed the rheological and sensory properties of the product.

Table 2: Sensory quality of stirred papaya yoghurt during different storage period

<table>
<thead>
<tr>
<th>Treatments /Days</th>
<th>0 day</th>
<th>7th day</th>
<th>14th day</th>
<th>21st day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour and appearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>8.11±0.004d</td>
<td>7.70±0.41c</td>
<td>6.65±0.021bb</td>
<td>5.00±0.131a</td>
</tr>
<tr>
<td>Stirred papaya (10 %) yoghurt</td>
<td>7.80±0.040d</td>
<td>7.66±0.042c</td>
<td>6.23±0.022bA</td>
<td>5.10±0.127a</td>
</tr>
<tr>
<td>Body and texture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>8.25±0.003dBB</td>
<td>7.65±0.45cB</td>
<td>7.32±0.042bb</td>
<td>7.03±0.052a</td>
</tr>
<tr>
<td>Stirred papaya (10 %) yoghurt</td>
<td>7.79±0.041dA</td>
<td>7.51±0.045cA</td>
<td>7.29±0.049b</td>
<td>7.00±0.049a</td>
</tr>
<tr>
<td>Flavour</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>8.05±0.003dBB</td>
<td>7.92±0.040cB</td>
<td>7.36±0.036bb</td>
<td>7.01±0.45a</td>
</tr>
<tr>
<td>Stirred papaya (10 %) yoghurt</td>
<td>7.77±0.040dA</td>
<td>7.52±0.038cA</td>
<td>7.28±0.040bA</td>
<td>7.00±0.046a</td>
</tr>
<tr>
<td>Overall acceptability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>8.06±0.003dBB</td>
<td>7.67±0.051cB</td>
<td>5.92±0.12bb</td>
<td>5.01±0.15bB</td>
</tr>
<tr>
<td>Stirred papaya (10 %) yoghurt</td>
<td>7.78±0.048dA</td>
<td>7.44±0.053cA</td>
<td>5.83±0.11bA</td>
<td>4.33±0.114aA</td>
</tr>
</tbody>
</table>

Within a column, values with different superscript letters are significantly different (p<0.05)

CONCLUSION

It can be concluded from the present study that the 10 per cent papaya stirred yoghurt preferred over other treatments. The papaya stirred yoghurt possessed the highest sensory and nutritional quality of the product.

REFERENCES

