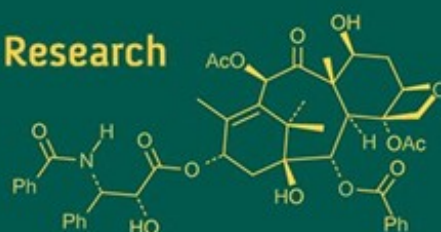


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**Khobragade SP**

PhD scholar Dairy Science,  
Mahatma Phule Krishi  
Vidyapeeth Rahuri,  
Maharashtra, India

**Kamble DK**

Head, Department of Animal  
Husbandry and Dairy Science,  
Mahatma Phule Krishi  
Vidyapeeth Rahuri,  
Maharashtra, India

**Khomane VB**

PhD scholar Dairy Science,  
Mahatma Phule Krishi  
Vidyapeeth Rahuri,  
Maharashtra, India

**Patil BD**

Deputy Director of Research,  
Mahatma Phule Krishi  
Vidyapeeth Rahuri,  
Maharashtra, India

**Bhalerao BM**

Assistant professor, Division  
of Soil Science, RSCM College  
of Agriculture Kolhapur,  
Maharashtra, India

**Kubade KB**

PhD scholar Dairy Science,  
Mahatma Phule Krishi  
Vidyapeeth Rahuri,  
Maharashtra, India

**Selection of guava form for preparation of guava lassi**

Khobragade SP<sup>1</sup>, Kamble DK<sup>2</sup>, Khomane VB<sup>3</sup>, Patil BD<sup>4</sup>, Bhalerao BM<sup>5</sup>, Kubade KB<sup>6</sup>

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**ABSTRACT**

Lassi is one of the most popular traditional fermented milk beverages. Lassi is prepared by blending dahi with water to obtain a uniform consistency, followed by the addition of sugar or salt. Guava (*Psidium guajava* L.) is an important tropical fruit widely cultivated in India and it contains dietary fibre, vitamins A and C, folic acid and essential minerals such as potassium, calcium and iron. It also possesses pharmacological properties such as antioxidant, *anti*-inflammatory, antibacterial and anticancer activity. There are three different forms of guava of the selected cultivar Lalit (red fleshed) were used, viz., fresh guava pulp ( $F_1$ ), processed guava pulp ( $F_2$ ) and guava powder ( $F_3$ ) for preparation of lassi. On the basis of sensory evaluation it was found that the lassi prepared by addition of fresh guava pulp had obtained maximum scored among other two forms under study and this selected form had scored 7.83, 8.02, 8.07 and 7.97 for colour and appearance, Consistency, Flavour and overall acceptability respectively.

**Keywords:** Lassi, Guava, Sensory evaluation, Form

**Introduction**

Lassi is one of the most popular traditional fermented milk beverages widely consumed in India due to its refreshing taste, nutritional value, and probiotic benefits. It is typically prepared by blending curd (dahi) with water to obtain a uniform consistency, followed by the addition of sugar or salt depending on consumer preference (Aneja *et al.*, 2002) [1]. The presence of lactic acid bacteria (LAB) in lassi not only contributes to its characteristic flavor and texture but also enhances its digestibility and therapeutic value, making it an important functional dairy product (Thillipudi *et al.* 2024).

In recent years, there has been increasing interest in the development of value-added lassi by incorporating fruit pulps and other natural ingredients to improve its nutritional, sensory, and functional properties. Among various fruits, guava (*Psidium guajava* L.) is an important tropical fruit widely cultivated in India. It is highly nutritious and rich in dietary fiber, vitamin C, vitamin A, folic acid, and essential minerals such as potassium, calcium, and iron. Additionally, guava possesses several pharmacological properties including antioxidant, antimicrobial, *anti*-inflammatory, and anticancer activities, which make it a suitable ingredient for functional food development (Nasseer *et al.* 2018) [2].

The incorporation of guava into lassi not only enhances its flavor, color, and acceptability but also improves its nutritional and health-promoting attributes. However, guava can be incorporated in different forms such as fresh pulp, processed pulp, and powder, each of which may have a distinct effect on the physicochemical characteristics, microbial quality, and sensory attributes of the final product. The selection of an appropriate form of guava is therefore crucial for achieving a desirable balance between quality, stability, and consumer acceptability.

Moreover, different forms of guava may influence factors such as viscosity, total soluble solids, acidity, and storage stability of lassi. Variations in processing methods (such as drying or pulping) can also affect the retention of nutrients and bioactive compounds. Therefore, it is essential to systematically evaluate the effect of different guava forms on the quality parameters of lassi. Considering these aspects, the present investigation was undertaken to study the selection of suitable guava form (fresh pulp, processed pulp, and guava powder) for the preparation of guava lassi. The study aims to evaluate the impact of these forms on sensory characteristics, physicochemical properties, microbial quality, and overall acceptability of the product, in order to identify the most appropriate form for the development of high-quality guava lassi.

**Materials and methods**

The present investigation was carried out at the Department of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri. The fresh, clean cow milk was procured from Research Cum Development Project (RCDP) on cattle, Department of Animal Husbandry and Dairy Science (AHDS), M.P.K.V., Rahuri. Good quality of cane sugar, guava powder and guava fruit was procured from local market of Rahuri.

**Corresponding Author:****Khobragade SP**

PhD scholar Dairy Science,  
Mahatma Phule Krishi  
Vidyapeeth Rahuri,  
Maharashtra, India

## Preparation of form of guava

### Fresh guava pulp

Fresh guava fruit were collected and thoroughly washed under running tap water to remove adhering dirt and impurities. The cleaned guava fruits were cut into small pieces and then grind in a mixer to obtain a uniform pulp. The prepared guava pulp was stored at  $5 \pm 2^\circ\text{C}$  till it uses.

### Processed guava pulp

Fresh guava fruits were collected and thoroughly washed under running tap water to remove adhering dirt and impurities. The cleaned fruits were then cut into small pieces. The fruit pieces were grinding in a mixer to obtain a uniform pulp. The prepared pulp was then treated with 0.1 per cent potassium metabisulphite to prevent microbial spoilage and stored at  $5 \pm 2^\circ\text{C}$  until further use.

### Preparation of guava lassi

The guava lassi was prepared as per the method suggested by Patange *et al.* (2018) [3] with certain modifications. Initially cow milk was taken and filtered through muslin cloth, after that the milk was standardized to 4 per cent fat.

Fresh cow milk containing 3.5 per cent of fat was taken and preheated at  $35\text{--}40^\circ\text{C}$  and followed by straining. The milk was then standardized as per the treatment requirements and pasteurized at  $80^\circ\text{C}$  for 15–30 minutes. After pasteurization the milk was allowed to cool at  $22\text{--}24^\circ\text{C}$ . The same milk was inoculated with 1 per cent LF-40 lactic starter culture and permitted to incubate at  $22^\circ\text{C}$  for 10–12 hrs. After which dahi was formed. The prepared dahi was then subjected to agitation and 10 per cent water was added to obtain a uniform consistency. Further, guava pulp was added as per the treatment, followed by the addition of sweetener. The mixture was properly mixed to obtain a homogeneous lassi. The prepared lassi was then packaged as per the treatments and finally stored at  $5 \pm 1^\circ\text{C}$ .

All these three treatment combinations were analyzed for sensory qualities and one best was selected.

### Sensory evaluation

The acceptability of lassi was analyzed through organoleptic evaluation. A sensory judging panel of eight panelists was formed. A 9-point hedonic scale proforma was used for a scoring. The panelists evaluated lassi for color and appearance, flavor, consistency and overall acceptability.

### Statistical analysis

To generate meaningful inferences, the data of storage samples were analysed using (CRD) Completely Randomized Design and (FCRD) Factorial Completely Randomized Design (Snedecor and Cochran, 1994).

## Result and discussion

### Effect of form of guava on sensory qualities of lassi

#### Colour and appearance

Data depicted in Table 1. revealed that the colour and appearance scores of lassi were significantly affected by the different forms of guava and the scores ranged from  $7.83 \pm 0.01$  to  $6.75 \pm 0.02$ . The

mean maximum score for colour and appearance ( $7.83 \pm 0.01$ ) was obtained for the treatment F<sub>1</sub> (fresh guava pulp). The panel of judges rated that fresh guava pulp imparted a attractive natural and uniform colour to the lassi. The treatment F<sub>2</sub> (processed pulp) showed slightly lower scores ( $7.47 \pm 0.01$ ), which might be due to minor colour changes during processing. In case of F<sub>3</sub> (guava powder), the product exhibited comparatively dull colour and less uniform dispersion, hence it was scored the lowest ( $6.75 \pm 0.02$ ) among all treatments. The colour and appearance scores of F<sub>1</sub> (fresh pulp) and F<sub>2</sub> (processed pulp) were found to be at par may be due to the presence of lycopene while lower score of F<sub>3</sub> may be attributed to loss of colour during drying, leading to a dull appearance.

Such trend with respect to colour and appearance was noticed by Jitendar *et al.* (2016) [4] in preparation of the misti dahi with incorporation of guava pulp. Also, similar results recorded by Patil *et al.* (2025) who developed guava burfi and reported that colour and appearance score improved by using guava pulp.

Mean  $\pm$ SE of three replication

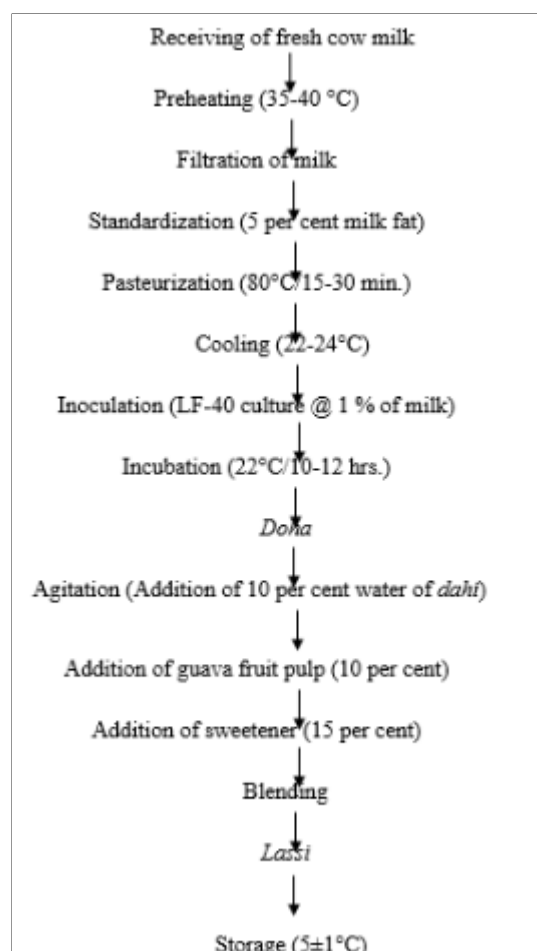


Figure 1. Flow chart for preparation of guava lassi

Table 1. Effect of form of guava on sensory quality (score) of lassi

| Treatments          | Sensory attributes    |                   |                   |                       |
|---------------------|-----------------------|-------------------|-------------------|-----------------------|
|                     | Colour and appearance | Consistency       | Flavour           | Overall acceptability |
| F1 (Fresh pulp)     | $7.83 \pm 0.01^b$     | $8.02 \pm 0.01^b$ | $8.07 \pm 0.01^c$ | $7.97 \pm 0.01^c$     |
| F2 (Processed pulp) | $7.47 \pm 0.01^b$     | $7.88 \pm 0.01^b$ | $7.32 \pm 0.01^b$ | $7.55 \pm 0.01^b$     |
| F3 (Powder)         | $6.75 \pm 0.02^a$     | $7.53 \pm 0.03^a$ | $6.27 \pm 0.01^a$ | $6.85 \pm 0.02^a$     |
| SE (m)              | 0.15                  | 0.06              | 0.061             | 0.098                 |
| CD ( $P < 0.05$ )   | 0.47                  | 0.20              | 0.18              | 0.29                  |

(continued on next page)

## Consistency

Data depicted in Table 1. revealed that the consistency scores of *lassi* ranged from  $7.53 \pm 0.03$  to  $8.02 \pm 0.01$ . The maximum score was recorded for treatment F<sub>1</sub> ( $8.02 \pm 0.01$ ), while the minimum score was observed in treatment F<sub>3</sub> ( $7.53 \pm 0.03$ ). Treatment F<sub>2</sub> was found to be statistically at par with F<sub>1</sub>. The treatment F<sub>3</sub> showed lower scores, which may be due to poor dispersion and weaker structural network of guava powder, leading to comparatively inferior body and texture. The finding is corresponding with Singh *et al.* (2014) who developed the whey incorporated with fresh guava pulp and stated that the consistency score was increased with addition of guava pulp. Similarly, Jitendar *et al.* (2018) formulated *Mishti dahi* by using fresh guava received significantly highest score for consistency.

## Flavour

The flavour of guava *lassi* is the combined effect of taste and aroma imparted by guava and milk base. The data presented in Table 1. illustrate that the mean flavour scores were  $8.07 \pm 0.01$ ,  $7.32 \pm 0.01$  and  $6.27 \pm 0.01$  for the treatments F<sub>1</sub>, F<sub>2</sub> and F<sub>3</sub>, respectively. The flavour score was significantly ( $P < 0.05$ ) affected by the different forms of guava. The maximum score for flavour was recorded for treatment F<sub>1</sub> ( $8.07 \pm 0.01$ ), whereas the minimum score was observed in F<sub>3</sub> ( $6.27 \pm 0.01$ ). The higher score in F<sub>1</sub> might be attributed to the presence of fresh guava pulp, which imparted a natural flavour and pleasant aroma to the *lassi*. In contrast, lower score in F<sub>3</sub> may be due to loss of volatile flavour compounds during drying and processing, resulting in comparatively less pronounced flavour.

Similar findings observed by Vandana (2019) [5] who prepared shrikhand by incorporating fresh guava pulp that improve the flavor of shrikhand. This result also in accordance with Kad *et al.* (2016) [6] who prepare guava burfi and observed that the fresh guava pulp enhances the flavor of burfi and received highest flavour score.

## Overall acceptability

The results displayed in Table 4.4 indicated that all the treatments differed significantly ( $P \leq 0.05$ ) with respect to overall acceptability. The average scores for overall acceptability of *lassi* varied from  $6.85 \pm 0.02$  to  $7.97 \pm 0.01$ . The maximum mean score was observed for treatment F<sub>1</sub> ( $7.97 \pm 0.01$ ) followed by F<sub>2</sub> ( $7.55 \pm 0.01$ ) and F<sub>3</sub> ( $6.85 \pm 0.02$ ). The higher acceptability of F<sub>1</sub> may be attributed to a desirable balance of colour, consistency and flavor of *lassi*, which made the product more appealing to the judges. Treatment F<sub>2</sub> showed slight reduction in acceptability compared to fresh pulp could be due to minor losses in flavour caused by added preservative during processing. On the other hand, the minimum overall acceptability score was recorded in F<sub>3</sub>, which may be due to dull appearance, grainy consistency and less pronounced flavour of the product.

Such trend with respect to overall acceptability was noticed by Jitendar *et al.* (2016) [4] who incorporated fresh guava in *misti dahi* which received higher overall acceptability score. The present results are in accordance with Madhu (2021) [7] who prepared yogurt using fresh guava pulp and reported that significantly increase overall acceptability of yogurt.

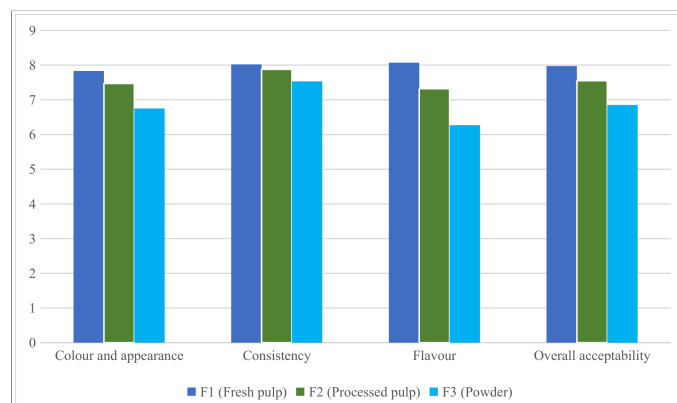


Figure 1. Effect of form of guava on sensory quality (score) of *lassi*

## Conclusion

present study indicated that the resultant product was analysed for sensory parameters of colour and appearance, consistency, flavour and overall acceptability. From this study it was summarized that *lassi* prepared by addition of fresh guava pulp form was most acceptable. The selected form had score 7.83, 8.02, 8.07 and 7.97 for colour and appearance, Consistency, Flavour and overall acceptability respectively.

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