

Study about sensory attributes of lassi blended with papaya pulp

Dheeraj Kumar Mishra¹, Pushp Raj Shivahre^{2*}

¹ Research Scholar, Udai Pratap College, Varanasi, Uttar Pradesh, India

² Assistant Professor, Udai Pratap College, Varanasi, Uttar Pradesh, India

Corresponding Author: Pushp Raj Shivahre

DOI: <https://doi.org/10.66856/ijaps.2026.8.2.8129>

Abstract

The study was undertaken in Pashu Pradarshan Prakshetra, (Dairy farm) Department of Animal Husbandry and Dairying Udai Pratap collage, Varanasi. Present time trends and changing consumer needs indicate a great opportunity for innovation in development of fruits product and plant based new dairy products of value addition. This study was undertaken with the objective to analyze the sensory attributes of Lassi blended with the papaya pulp using 9-point hedonic scale by panel of semi trained judges. The treatment details were T0 control sample (0% papaya pulp + 10% sugar), T1 (5% papaya pulp +10 % sugar), T2 (10% papaya pulp + 10% sugar), T3 (15% papaya pulp + 10% sugar), T4 (5% papaya pulp + 15% sugar), T5 (10% papaya pulp + 15% sugar), T6 (15% papaya pulp + 15% sugar) and T7 (14% papaya pulp + 10% sugar). The flavor scores of papaya lassi for the treatments T0, T1, T2, T3, T4, T5, T6, and T7 were 7.00, 7.50, 7.60, 7.16, 7.80, 8.90, 7.22 and 7.16, respectively. The body and texture score of papaya pulp lassi were 7.32, 7.00, 7.44, 8.70, 6.66, 7.30, 7.64, and 7.10 were T0, T1, T2, T3, T4, T5, T6 and T7, for papaya lassi respectively. The sensory score for color and appearance of T0, T1, T2, T3, T4, T5, T6, and T7, were 6.98, 7.18, 7.76, 7.2, 7.3, 8.9, 8.0 and 7.3 respectively in papaya pulp lassi. The overall acceptability of papaya lassi i.e. ranged in between 7.16 to 8.9 for papaya lassi. Among the 7 treatments, T5 (10 percent of papaya pulp and 15 percent of Sugar) highest score for all sensory parameters and have greater consumer acceptability.

Keywords: Dahi, lassi, papaya pulp, sensory attribute

Introduction

Milk is a clean lacteal secretion obtained by the complete milking of healthy milch animals, properly fed and kept, excluding that obtained within 15 days before and 5 days after calving: From nutrition point of view milk is the most nearly perfect food to us. The body needs more than thirty distinct materials in food. No single food stuff in nature supplies all but milk supplies nearly all the nutrients. Milk is the most wholesome single food available in nature for health and medicine, which has never been debated. It is rich in nutritive value and important source of food for human. Milk is the most precious liquid food in nature and supplies body building proteins, bone forming minerals, health giving vitamins and energy giving lactose and milk fat. India has highest milk production in the world i.e., 239.30 million ton with per capita availability of 471 gm/day in 2023-24 (BAHS, 2024). A fermented milk product also known as cultured dairy foods. The cultured dairy products or cultured milk product are dairy foods that have been fermented with lactic acid bacteria such as *Lactobacillus*, *Leuconostoc* and *Loctococcus* which increase the self-life of product as well as add the taste and Improves the digestibility of milk. About 9 percent of the total milk produced in India is converted into fermented milk product (Singh, 2007) [17]. Milk is a clean-perfect food source packed with vital vitamins and minerals that keep our bodies healthy and strong. It is loaded with nine essential nutrients that immensely benefits our health in the following ways: Calcium which builds healthy bones and teeth maintains bone mass, Protein which serves as a source of energy builds/repairs muscle tissue, Potassium that helps maintain a

healthy blood pressure, Phosphorus which strengthens bones and generates energy, Vitamins D that helps maintain bones, Vitamins B12 that helps maintain healthy red blood cells and nerve tissues, Vitamins A that helps maintain the immune system, normal vision and skin, Riboflavin (B2) which converts food into energy, Niacin which metabolites sugars and fatty acids.

Dahi is one of oldest and the most popular traditional fermented milk product similar to yoghurt consumed by large section of population in the Indian subcontinent. Dietetic significance of dahi in India is due to its good taste, high nutritive value, and therapeutic property in mild ailments and above all its long keeping quality than milk in tropical climate (Sarkar, 2008) [15]. Dahi or crude means the product obtained from pasteurized or boiled milk by souring, natural or otherwise, by a harmless lactic acid culture. Other harmless bacterial culture may also be used in conjunction with lactic acid bacteria cultures for souring. Dahi may contain added cane sugar. Dahi shall have the same minimum percentage of milk fat and milk solids- not-fat as the milk from which it is prepared. Where dahi or crud is solid or offered for sale without any indication of class of milk, the standards prescribed for dahi prepared from buffalo milk shall apply. Milk solids may be also be used in preparation of this products. (As per Food Safety and Standards Regulations 2011) [9].

Lassi is a popular indigenous fermented milk beverage, which is usually prepared by mixing dahi and water in required proportions. It is served on very large scale in cold drink shops and restaurants during summer in almost every state in India. (Campbell Platt, 1994). Lassi one of the

fermented milk products is ideal for serving with hot dishes as after eating believed to be a folk remedy for gastroenteritis. Lassi is not only perfect as a morning smoothie, but it is also relished as a hot weather refreshment to beat the scorching heat and it acts as an energizing liquid meal or it provides relief after eating a delicious but hot spicy meal. Thus, lassi is a digestive aid for afternoon meal; it settles the upset stomach and it the perfect cooling agent, (Anonymous 2006) [1]. Lassi was usually prepared by mixing dahi and water in approximately equal parts with sugar, salt along with flavoring materials. Lassi a dietary food of high therapeutic value, popular in South and North India, made by breaking up the curd into fine particles by agitation. Optionally, sugar syrup is added to have 12-15% sugar in finished product (Bhandari, 1985) [4]. Lassi is generally served cold and is enjoyed by all age groups of people specially during summer. Lassi is one of the ready to serve fermented milk beverages. Many a time "chhachh" is also referred to as, "lassi" by technocrats in literature. However, lassi is a popular product close to sweet stirred yoghurt has been used as a refreshing beverage from time immemorial in India, especially in western, northern and central regions.

Papaya (*Carica papaya*) is a tropical fruit having commercial importance because of its high nutritive and medicinal value. Papaya cultivation has its origin on south Mexico and Costa Rica Total annual world production is estimated at 6 million tonnes of fruits. India leading producers are Brazil, Mexico, Nigeria, Indonesia, China, Peru, Thailand, and Philippines (Notional Horticulture Board). Papaya has so many health benefits like, Gives Glowing skin, boosts digestive health, Great food for diabetics, loaded with anti ageing benefits, reduces cholesterol levels, Helps in weight loss, Nutritional facts of papaya. Papaya fruit with its seed and leaves are excellent sources of vitamins, minerals, fibres, and antioxidants. It contains an abundant amount of vitamins A, B, C, E, K and potent antioxidant papaya leaves are rich in minerals such as phosphorus, iron, potassium, Calcium, and magnesium. papaya seed contain fatty acids and papaya oil, Papaya leaves are best Platelet in human blood. Diabetic people have to follow various food restrictions, especially related to carbohydrates intake. Fortunately, an ideal food option for people suffering from diabetes is papaya. Its high natural sugar and antioxidants content makes it a good choice. There is enough evidence that suggests that papaya has a hypoglycemic effect on the body which decreases blood glucose levels.

Dairy starter cultures are carefully selected microorganism, which are deliberately added to milk to initiate and carry out desired fermentation under controlled conditions in the production of fermented milk product. Most of them belong to lactic acid bacteria (*Lactococcus*, *Lactobacillus*, *Streptococcus* & *Leuconostoc*). In some cases, few non-lactic starters (bacteria, yeast and molds) are also used along with lactic acid bacteria during manufacturing of specific fermented milk product. (Md Rezaul *et al*, 2017) [12].

Material and Methods

The present investigation entitled "Sensory attribute of Lassi preparation blended with Papaya Pulp" was undertaken in

the Dept. of Animals Husbandry and Dairying Udai Pratap College Varanasi-221002, Uttar Pradesh, India. All the raw material was collected from the local market of Varanasi and milk was collected from the college dairy farm. It was ensured that the materials used were free from any kind of infestation.

The type and source of various ingredients used during the present investigation are represented as under.

Buffalo Milk

The whole fresh and clean buffalo milk was collected from College Dairy Farm and Standardize at 6% Fat.

Sugar

Good quality, clean, crystalline refined sugar was purchased from the local market of Varanasi.

Dahi Culture

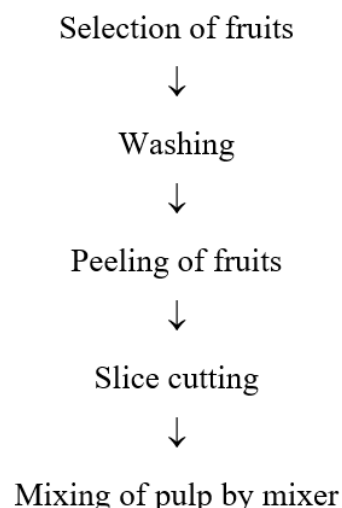
The starter cultures of specific bacteria (*L. bulgaricus*) was obtained from the College chemical laboratory, pure and maintained in the laboratory and the same culture was used throughout the investigation.

Papaya Fruit

Fully ripened Papaya fruit was obtained from the local market of Varanasi.

Preparation of Papaya Pulp

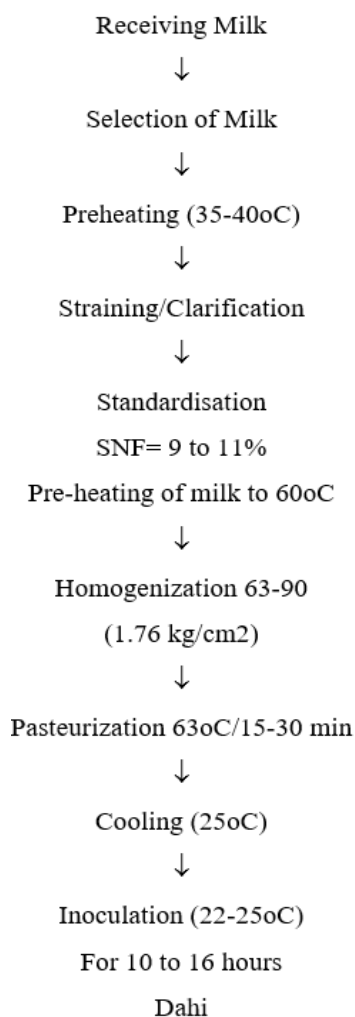
Prior to the preparation of "Papaya pulp" the first papaya fruit was washed with clean water. The Peel was removed. The slices were cut with the help of a knife and finally it was converted into a homogeneous mass of pulp by putting it into a mixer.



Preparation of Dahi

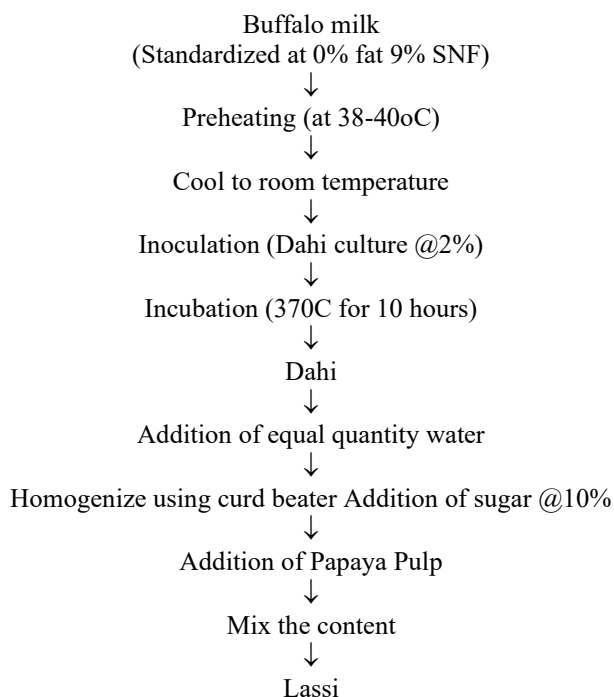
The Lassi was manufactured as per the standards procedure given by De (1980). The flow diagram of the same is as under. One liter of fresh, clean and dust free buffalo milk was taken for each of the treatments, then the milk is pre-heated at 35-40 °C for 5 min and subsequently the milk was cooled at room temperature. After cooling 1% Dahi culture "*Streptococcus lactis*" was added in it and kept it for incubation at 37°C for 10 Hrs.

Flow Chart of Dahi Making



Preparation on Lassi

The Dahi obtained was then broken and an equal quantity of clean potable water was added in Dahi and churned by using a churner method. After that papaya pulp was added as per treatment combination mentioned in the section.



Details of Treatment Combinations

- For the preparation of buffalo mil Lassi blended with Papaya pulp following treatments combination studied was as under. Overall 7 treatment combination were under taken in present
- T0 is the control product in which 0% Papaya Pulp and 10 percent Sugar and Dahi are mix with.
- T1 is Lassi prepared from amount of sugar is 5 percent papaya pulp/with 10 percent sugar.
- T2 is Lassi prepared from amount of sugar is 10 percent papaya pulp/with 10 percent sugar.
- T3 is Lassi prepared from amount of sugar is 15 percent papaya pulp/with 10 percent sugar.
- T4 is Lassi prepared from amount of sugar is 5 percent papaya pulp/with 15 percent sugar.
- T5 is Lassi prepared from amount of sugar is 10 percent papaya pulp/with 15 percent sugar.
- T6 is Lassi prepared from amount of sugar is 15 percent papaya pulp/with 15 percent sugar.
- T7 is Lassi prepared from amount of sugar is 14 percent papaya pulp/with 10 percent sugar.

Sensory Evaluation of Lassi

The Sample of Lassi where evaluated for flavour, body and texture, color and appearance and over all acceptability and lassi samples were also evaluated for flavour, body and texture, color and appearance, sweetness and over all acceptability on a 9-point headonic scale by Sensory Panel consisting 5 Judges.

Numerical values of the score cord as under

Quality	Score
Like Extremely	9
Like Very Much	8
Like Moderately	7
Like Slightly	6
Neither Like nor Dislike	5
Dislike Slightly	4
Dislike Moderately	3
Dislike Very Much	2
Dislike Very Extremely	1

The score of various treatments in respect of color and appearance, flavor, body, and texture, sweetness and overall acceptability was worked out.

Statistical analysis

The data obtained in the present investigation was tabulated. The data were analyzed statistically by using Completely Randomized Design (CRD).

Result and Discussion

The acceptability of the control and experimental lassi samples was evaluated based on sensory attributes, namely flavour, body and texture, colour and appearance, and overall acceptability. Sensory evaluation was conducted using a 9-point Hedonic Scale by a panel of five judges. The scores obtained for these sensory parameters were recorded, statistically analyzed, and the results are presented in Table 1.

Flavor Acceptability

From the Table 1.the mean flavour scores of papaya blended lassi of different treatment were ranged from 7.00 to 8.90.

The flavor score of lassi sample for the treatment. The highest score i.e., 8.90 was obtained for papaya lassi prepared using 10 percent papaya pulp and 15 percent sugar of lassi and lowest score i.e., 7 was obtained for papaya lassi prepared by using 0 percent papaya pulp and 10 percent sugar.

Data presented in table clearly indicated that the treatment T5 was significantly superior over all the treatment, which was the blend of 10 percent papaya pulp and 15 percent sugar in lassi and highly preferred in respect of flavor by the panel of judges.

The result found in the present finding for flavor was more or lassi similar with the result of Kadam *et al.* (2005) ^[11] who prepared a soya milk blended lassi and noted the average sensory score for flavor 7.50 to 8.40.

Gavhane *et al.* (2015) ^[10] who mentioned that sugar and papaya pulp individually as well as in combination has significant effect on flavor of lassi. He stated that the papaya pulp as fruits additive is efficient or beneficial for flavor development in lassi.

Body and Texture Acceptability

The value recorded in respect of body and texture score of final products are show in Table 1. It was concluded that the body and texture score ranges from 6.66 to 8.70 for Papaya Lassi. The highest body and texture score were recorded for treatment T3 i.e., 8.70 which was blend of 15 percent Papaya Pulp and 10 percent Sugar in Lassi whereas, lowest body and texture score was recorded for treatment T1 i.e., 7.00 which was blend of 5 percent Papaya Pulp and 10 percent Sugar in Lassi. It was observed that the treatment T3 were significantly superior over the rest of all treatments. While all treatment is significantly different from each other.

The result of present study was more or lassi similar with the findings of Dhumal *et al.* (2018) and Gavhane (2015) ^[8, 10], Who reported that lassi prepared form pudina extract, strawberry pulp and papaya pulp was superior to the normal lassi with respect to body and texture.

Color and Appearance Acceptability

The average score for color and appearance is presented in Table 1. It was that the acceptability of papaya blended lassi in terms of color and appearance under treatments T0, T1, T2, T3, T4, T5, T6, T7 were 6.98, 7.18, 7.76, 7.2, 7.3, 8.9, 8.0, 7.3 the treatment T4 was significantly superior to other treatment. Whereas treatment T5 was superior than T4. It may be seen that, 10 percent Papaya Pulp, 15 percent sugar blended lassi was preferred by the judges, as for as color and appearance character was concerned.

The color and appearance score of present study agreed with the findings of Gavhane (2015) ^[10], who concluded that levels of papaya pulp had significant effect on color and appearance score of lassi, it indicates that blending of papaya pulp was beneficial in lassi.

Overall Acceptability

It was shown in the Table 1 that the average score for overall acceptability ranges from 7.16 to 8.9 for papaya lassi. The maximum score for over all acceptability was noted for treated T5 i.e., 8.9 (10 percent papaya pulp and 15 percent sugar) whereas; minimum score was noted for treatment T7 i.e., 7.16 (14 percent papaya pulp and 10 percent sugar).

From above data it was concluded that the treatment T5 was significantly superior over treatment T0, T1, T2, T3, T4, T6 & T7 in respect to overall acceptability. While all treatment is significantly different from each other.

The result obtained from this study was more or less similar with the result found by Kadam *et al.* (2005), Bagal *et al.* (2007), Patidar and Prajapati (2010), Nair *et al.* (2007), Bhutkar (2011) and Shuwu *et al.* (2011) ^[2, 5, 11, 13, 14, 16] in their research study.

Table 1: Overall average sensory evaluation of lassi blended with papaya pulp

No. of Treatment	Flavour	Body & texture	Colour & appearance	Overall acceptability
T0	7.00	7.32	6.98	7.8
T1	7.50	7.00	7.18	7.76
T2	7.60	7.44	7.76	7.5
T3	7.16	8.70	7.2	7.54
T4	7.80	6.66	7.3	7.66
T5	8.90	7.30	8.9	8.9
T6	7.22	7.64	8.0	7.16
T7	7.16	7.10	7.3	7.16

Conclusion

From the results of the present study, it may be concluded that the papaya pulp 10 percent the sensory evaluation revealed that the all samples of final product have consumer acceptability and liked by the panel of judged. Among the 7 treatments, T5 (10 percent of papaya pulp and 15 percent of Sugar) highest score for all sensory parameters and have greater consumer acceptability. Addition of papaya pulp changed the chemical composition of lassi. It was observed that as the level of papaya pulp increased, there was increased in Color and Appearance, Body and Texture, Flavor, fat, moisture, and protein Total solid content of papaya pulp.

Acknowledgments

The authors sincerely acknowledge Department of Animal Husbandry and dairying, UP College for providing the necessary facilities and support to carry out this work. No external funding was received for this study.

Reference

1. Anonymous. Market profile on chilled drinks and snacks, 2006. <http://www.Indiacookerylesson.com/fruitlassi.com>.
2. Bagal SG. Studies on the preparation of lassi from high-acid cow milk. *Journal of Dairying, Foods and Home Sciences*, 2007;26(2):80-84.
3. BAHS. <https://dahd.gov.in/sites/default/files/2024-11/BAHS-2024.pdf>, 2024.
4. Bhandari V. Effect of some processing variables on acid development in lassi from skim milk prepared by the continuous agitation method. *Indian Journal of Animal Sciences*, 1985;55(4):293-295.
5. Bhutkar SS. Studies on Preparation of Lassi from Buffao Mik Bended with Coconut Milk. *Research Journal of Animal Husbandry and Dairy Science*, 2011;3(2):70-72.
6. Campbell-Platt G. Fermented foods- A world perspective. *Food Research International*, 1994;27(3):253-257.

7. De S. Outlines of Dairy Technology. 2nd ed. Oxford University Press, New Delhi, 1980, 463-464.
8. Dhumal VS, Padghan PV, Shinde SP, Maske TA. Effect of pudina extract on physicochemical properties of lassi with optimized the level of pudina leaves. Journal of Pharmacognosy and Phytochemistry, 2018;SP1:2763-2766.
9. FSSAI. Food Safety and Standards (food products standards and food additives) regulation. Food Safety and Standards Authority of India, New Delhi, 2011.
10. Gavhane MS, Desale RJ, Ghule BK. Studies on effect of chemical and sensory aspect of papaya lassi. International Journal of Agricultural Science and Research, 2015;5(3):55-60.
11. Kadam PS, Kedare SD, Gharge PU, Ingole AJ. Studies on preparation of soya milk blended lassi. Journal of Soil and Crops, 2005;15(2):366-369.
12. Md. Rezaul Hai Rakib, Md. Ahsanul Kabir, Sardar Mahammad Amanullah. Starter Culture Used in the Production of Probiotic dairy products and Their Potential Applications: A Review. Chemical and Biomolecular Engineering, 2017;2(2):83-89.
13. Nair KK, Thompson DK. Selection of functional ingredients for directly acidified whey based lassi beverage. Journal of Food Science and Technology, 2007;44(5):521-523.
14. Patidar SK, Prajapati JB. Standardization and evaluation of lassi prepared using *Lactobacillus acidophilus* and *Streptococcus thermophilus*. Journal of Food Science and Technology, 2010;35(5):428-431.
15. Sarkar S. Innovations in India Fermented Milk Products - A Review. Food Biotechnology, 2008;22:78-97.
16. Shuwu MP, Ranganna B, Suresh KB, Veena R. Development of value added lassi using honey. Mysore Agricultural Sciences, 2011;45(4):757-763.
17. Singh R. Characteristics and technology of traditional Indian cultured dairy products. Bulletin of the International Dairy Federation, 2007;415:11-20.