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Studies on physico-chemical properties of *lassi* blended with jamun powder (*Syzygium cumini*)

SC Mane, Dr. BC Andhare, ST Mane and SG Khandagle

Abstract
Lassi was prepared by using of buffalo milk blended with jamun powder (*Syzygium cumini*), adding sugar 10% by weight of *lassi* and jamun powder as per the treatment combinations T_1, T_2, T_3 and T_4 was finalized on weight basis of curd 0 per cent, 0.5 per cent, 1 per cent and 1.5 per cent jamun powder added respectively. Sensory evaluation of *lassi* taken by the panel of judges. The product obtained was subjected for chemical analysis. On an average, the jamun powder used in *Lassi* for the treatment T_1, T_2, T_3 and T_4 contained moisture was found to be 76.99, 75.78, 74.28 and 73.01 per cent, fat 3.25, 3.16, 3.04 and 2.95 per cent, protein 3.09, 3.23, 3.36 and 3.51 per cent, ash 0.72, 0.75, 0.76 and 0.77 per cent, total solids 23.01, 24.22, 25.72 and 26.99 per cent and carbohydrate 15.95, 17.08, 18.56 and 19.76 per cent, respectively. The observation in respect of titratable acidity was found to be 0.73, 0.85, 0.96 and 1.06 per cent and pH was found to be 4.29, 4.21, 4.18 and 4.15 per cent respectively.

Keywords: Jamun powder, Buffalo milk, *Lassi*

Introduction
Lassi is a popular indigenous fermented milk beverage, which is usually prepared by mixing *dahi* and water in equal proportions. It is served on very large scale in cold drink shops, bars and restaurants during summer in almost every state in India (Campbell Platt, 1994) [7].
Lassi is a traditional cooling drink used to slake thirst. The level of quality varies greatly. *Lassi* is also known as butter milk in rural India. *Lassi* is a little acidic, creamy, thick liquid with a strong scent. *Lassi* is primarily composed of water, with 3% fat, 2.8% protein, 4.5% lactose and 12.15% sugar. *Lassi* is typically made in Maharashtra from buffalo milk curd, which has a rich scent, a creamy look, and a flavors that is gently acidic and sweet. (Mule *et al*., 2018) [14].
Jamun *(Syzygium cumini* L.) is commonly known as Indian Blackberry, Jambul, Black Plum and Java Plum and it belongs to the family Myriaceae. Large trees cultivated in India for the edible fruits that are reported to contain huge amount of vitamin C, gallic acid, tannins and anthocyanins includes cyanidin, petunidin and malvidin glucoside. The fruit's high anthocyanin content gives it a flavour that is a combination of sweet, moderately acidic and astringent, and it tends to turn the tongue purple. When compared to other common fruits like the guava, papaya, banana and sapota, jamun fruits have a higher amount of antioxidant activity. The pulp of jamun is highly nutritive and contains important minerals like sodium, potassium, calcium, phosphorous, iron and zinc, water soluble vitamins like ascorbic acid (Vit.C), thiamine (B1) and niacin (B3), carbohydrates like glucose, sucrose, maltose, fructose, galactose and mannose, free amino acids like alanine, asparagine, tyrosine, glutamine and Cysteine. (Chavan *et al*., 2019) [18]
It is a good source of mineral salts. In every 100 grammes of fruit, there are 15 mg of calcium, 55 mg of potassium, 35 mg of magnesium, 15 mg of phosphorus, 26.2 mg of sodium and 18 mg of vitamin C. Per 100 g of edible fruit, it offers 62 Kcal of energy. Carotene (48 mg/100 g) and folic acid (3 mg/100 g) are present in good amounts. Jamun fruit, especially those from Pakistan's Punjab region, is useful in the treatment of breast cancer because it appears to prevent the spread of breast cancer cell lines. The jamun fruit is effective in lowering the risk of spleen enlargement and has a number of medical qualities, including stomachic, astringent, anti-scorbutic, diuretic, anti-diabetic, antioxidant and anti-proliferative. The use of fruit concentrate to treat chronic diarrhoea has a very long history. (Sadawarte *et al*. 2015) [17].
Jamun is regarded as a conventional treatment for diabetes management. Jamun specifically affects the pancreas, which is the main organ responsible for creating diabetes. The jamun seeds contain a kind of glucose called jamboline, which prevents starch from turning into sugar when the production of glucose, the primary cause of your high sugar levels, is raised. (Bhowmik *et al*. 2013) [5].

Material and Methods

The following materials was used for the successful completion of present research study. Gupta, S. K. and S. Kulkarni. (1983) [11]. Recent technological advances in milk-based beverages. Indian Dairyman, 35(1): 593-601

Collection of buffalo milk

The Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani College of Agriculture, Department of Animal Husbandry and Dairy Science provided the complete, fresh, clean buffalo milk.

Microbial cultures

The standard dahi culture was used for the preparation of curd.

Chemicals and glasswares

Appliance and utensil cleaning and sterilizing Test tubes, beakers, measuring cylinders, pipettes, spoon and stainless steel cutlery were among the glass items cleaned in water with detergent powder. Washing under running water helped to get rid of any remaining solution. For six hours, the test tubes and flasks were sterilized in a hot air oven at 100 ℃

Sugar powder

Sugar powder was used for the preparation of *lassi* obtained from local market.

Collection of Jamun powder

Good quality Jamun powder was purchased from local market source of buying.

Mixer cum grinder

The electric mixer cum grinder was used for the preparation of fine Jamun powder, available in the PG laboratory.

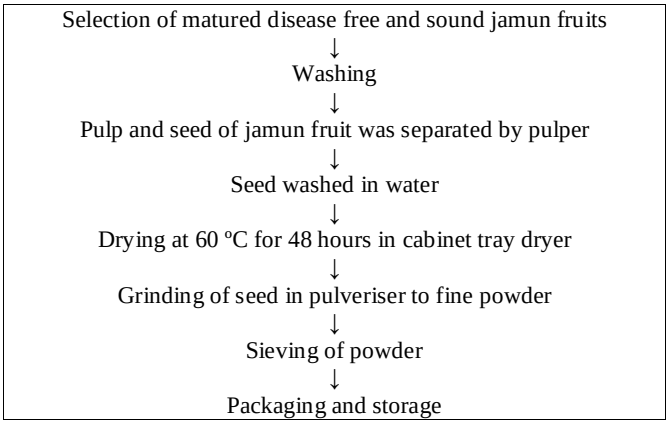
Water

Clean, potable water was used to make the *lassi* for the manufacture of the product.

Methods

Jamun powder

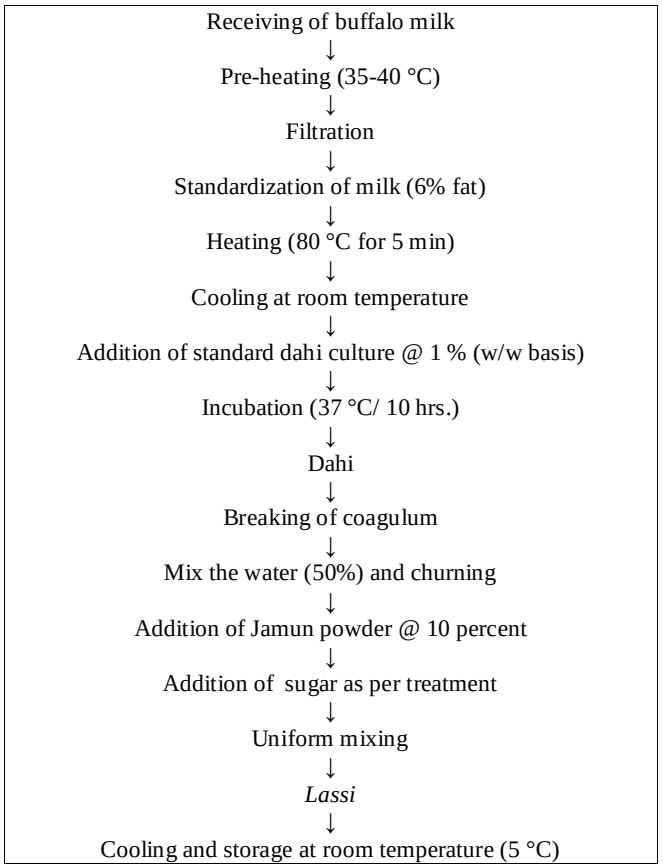
Jamun fruits must be chosen that are evenly ripened, disease-free and healthy. A pulper was used to separate the jamun fruit's pulp and seed. The seed was rinsed in water, dried in a tray dryer at 60 ℃ for 48 hours to finish drying and was then ground into a fine powder in a pulverizer.



Flow chart for preparation of jamun powder

Preparation of Jamun powder *lassi*

Jamun powder *lassi* was prepared as per the procedure followed by Gupta and Kulkarni (1983) [11] with slight modification.



Flow chart for preparation of Jamun powder *lassi*

Two liters of fresh, clean and dust free buffalo milk was received for each of the treatment, pre-heated milk is at 35-40 ℃ and standardized the milk at 6% fat. After standardization the milk heated at 80 ℃ for 5 min and subsequently milk was cooled at room temperature. After cooling 1% standard dahi culture was added in it and kept it for incubation at 37 ℃ for 10 hrs. After getting the dahi, it was broken up and equal parts clean, potable water were added. The mixture was then churned. After that Jamun powder added as per treatments combination. Then 10% sugar was added total weight of product then the prepared *lassi* was mixed uniformly. Then the prepared Jamun *lassi* was kept at 5 ℃.

Treatment combinations

For preparation of *lassi* by using jamun powder and adding sugar 10% by weight of *lassi* and jamun powder as per the treatment combinations was finalized on weight basis as follows: The different levels were tried and compared with control (T_1).

T_1 - control.
T_2 - 99.5 parts of curd + 0.5 parts jamun powder.
T_3 - 99 parts of curd + 1 parts of jamun powder.
T_4 - 98.5 parts of curd + 1.5 parts of jamun powder.

Sensory evaluation

Various treatment combinations of the finished product were subjected to sensory evaluation by panel of judges using 9-point Hedonic scale (Gupta, 1976) [20].

Statistical method

The information gathered for the current inquiry was organized in tables. According to Panse and Sukhatme, the data were statistically evaluated using the Completely Randomized Design (CRD) (1985). The significance of the result was evaluated on the basis of critical difference.

Result and discussion

The developed product form all the treatment combinations were served to the panel of judges. The scores given for various parameters for the sensory evaluation were compiled analyzed and results are presented in Table 1. Was concluded that the treatment T_3 was significantly superior over treatments T_1, T_2 and T_4 in respect to overall acceptability. While T_3 significant with T_2 and T_2 with T_1. Then treatments T_4 are significantly different from each other.

The outcomes of this study are more or less consistent with those observed by Kadam *et al.* (2006) [12], Bagal *et al.* (2007) [4], Bhutkar (2011) [6] in their research study.

Table 1: overall acceptability score of developed *lassi*

Parameter	Sensory score (out of 9.0)			
Treatment	Colour and appearance	Flavour	Body and Texture	Overall acceptability
T_1	8.10	7.99	8.04	8.12^{b}
T_2	8.24	8.13	8.17	8.25^{ab}
T_3	8.38	8.27	8.32	8.40^{a}
T_4	7.50	7.40	7.44	7.52^{c}
SE±0.007274 CD= 0.263248				

Physico chemical analysis of developed *lassi*

Table 2: Chemical composition of jamun powder *Lassi*

Treatment	Acidity	pH	Moisture	Fat	Protein	TS	Ash	Carbohydrate
T1	0.73	4.29	76.99	3.25	3.09	23.01	0.72	15.95
T2	0.85	4.21	75.78	3.16	3.23	24.22	0.75	17.08
T3	0.96	4.18	74.28	3.04	3.36	25.72	0.76	18.56
T4	1.06	4.15	73.01	2.95	3.51	26.99	0.77	19.76

Acidity

Titratable acidity per cent of *lassi* were ranges 0.73, 0.85, 0.96 and 1.06 per cent for treatment T_1, T_2, T_3 and T_4 respectively. All the developed treatments were significantly different from each other. The highest acidity content was noted in treatment T_4 *i.e.* 1.06 and lowest acidity content was noted in T_1 *i.e.* 0.73. The difference in content of *lassi* for the treatments might be due to the level of blending of jamun powder. All treatments different from each other while the data recorded of acidity content in above study was in agreement with the findings of below research workers. It indicated that, as the levels of mango pulp in *lassi* increased there was increased the acidity of *lassi* these results were also in agreement with the results obtained by Laxminarayan and Shankar (1980) [13] and agreement with the results obtained Avatade (2007) [2].

PH

From Table 2 it was noted that the average pH of jamun powder *lassi* were found to be 4.29, 4.21, 4.18 and 4.15 for the treatments T_1, T_2, T_3 and T_4 respectively. From above data it was observed that the addition of jamun powder level in *lassi* increases the pH of *lassi* decreased. Highest value of pH recorded for T_1 *i.e.* 4.29 which was normal *lassi* and lowest value of pH recoded for T4 *i.e.* 4.15 which was blend of 1.5 parts of jamun powder in *lassi*

As above same trend was recorded by Upadhyay (2017) [19], who produced carrot *lassi* and recorded average pH range in between 4.43 to 3.98 for T_5 to T_1, Sharma *et al.* (2016) [18], who developed synbiotic *lassi* containing honey.

Moisture

From the above data it was concluded that the average moisture content of jamun powder *lassi* with control sample decreased from 76.99 to73.01 per cent. From Table no 2 it was observed that the moisture content of the *lassi* was observed to be 76.99, 75.78, 74.28 and 73.01 per cent for treatments T_1, T_2, T_3 and T_4 respectively. It was also observed that the moisture content was in decreasing order from treatment T_1 to T_4. The high amount of water percentage recorded in plain *lassi*, while the moisture content decreases as the level of jamun powder increased and the lowest value for moisture content was observed in T_4 which contain 1.5 parts of jamun powder. All the treatments were significantly different from each other.

The present investigation findings are in agreement with the findings of Chawla (2017) [9], who reported that the moisture content was reduced with the addition of mango powder and beetroot powder to the recipe.

Fat

Data tabulated in Table 2 explain the average fat content in developed *lassi* under the treatment T_1, T_2, T_3 and T_4 were, 3.25, 3.16, 3.04 and 2.95 per cent respectively. The highest fat per cent was recorded for treatment T_1*i.e.* 3.25 and the lowest fat per cent was recorded for treatment T4 *i.e.* 2.95 per cent. Above findings clearly shows that, as the level of blending of jamun powder in to the *lassi* was increased, the fat content in the final product was proportionally decreased. This decrease in fat per cent might be due to the low fat content in Jamun powder. There was a significant difference (p<0.05) in fat content for T_1, T_2, T_3 and T_4.

These above results are in agreement with the results recorded by Avtade (2007) [2] who also noticed that with the increased level of fruit pulp there was proportionate decreased in the fat content of *lassi* and also Upadhyay (2017) [19], who also studied that the addition of carrot juice in *lassi* significantly decreased the fat content of *lassi.*

Protein

From the table 2 it was observed that the average protein content of the final product was found to be 3.09, 3.23, 3.36 and 3.51 per cent for treatments T_1, T_2, T_3, and T_4 respectively. All the treatments T_1, T_2, T_3, and T_4 having significant difference with each other (p<0.05). Protein content of jamun powder blended *lassi* was increased from 3.09 to 3.51 per cent. This might be due to the addition of jamun powder, the jamun powder contains low protein as

compared to buffalo milk. The lowest protein was recorded for treatment T_1 *i.e.*, 3.09 per cent and the highest protein content was recorded for treatment T_4 *i.e.*, 3.51 per cent**.**
Similar result was observed by Ghule (2015) [10] that protein per cent is increased with increased with strawberry pulp.

Total solid
Table 2 indicates the ranges from total solid content in jamun powder *lassi* were 23.01, 24.22, 25.72 and 26.99 per cent for treatment T_1, T_2, T_3 and T_4 respectively. The total solid percentage in jamun powder blended *lassi* was increases from treatment T_1 to T_4. The highest total solids content was recorded for treatment T_4 *i.e.* 26.99 (blended with 1.5 parts of jamun powder), while lowest total solids contents was recorded for treatment T_1 *i.e.* 23.01. It was observed from above findings that, as the level of jamun powder was increased, the total solids content of the final product was increased. All treatments of jamun powder *lassi* with control sample were significantly differ from each other.
The results recorded in present investigation are in agreement with the findings of the following research workers.
Chawla (2017) [9], noticed the same pattern as before and came to the conclusion that the vitamin A-fortified *lassi*, which was created utilizing natural sources like mango powder and beetroot powder, increased the total solid content of the finished product compared to the regular *lassi*
Bagal *et al.* (2016) [3], studied that used papaya pulp to make *lassi*, As a result, he claimed that the addition of papaya pulp level greatly increased the total solid content.

Ash
According to data in Table 2, the average ash percentages in jamun powder *lassi* for treatments T_1, T_2, T_3 and T_4 were 0.72, 0.75, 0.76 and 0.77% respectively.
The values recorded were found to be increasing order from treatment T_1 to T_4. The ash content was found highest in T_4 (blended with 1.5 parts of jamun powder) samples *i.e.* 0.77 per cent and lowest in control sample *i.e.* 0.72 per cent *lassi* respectively. The ash content in jamun powder *lassi* increases as we increase the parts of jamun powder, this might be due to the higher percentage of ash in jamun powder as compared to buffalo milk.
The values reported for ash content in the present investigation are comparable with the findings of the following research study.
Pardhi *et al.*, (2014) [16], who studied on finger millet *lassi* recorded the ash content of *lassi* was significantly increased with the addition of finger millet.
Ghule *et al.*, (2015) [10], who noticed that the addition of different level of strawberry in *lassi* increased then there was significant increase in the ash content of *lassi*.

Carbohydrate
Above data presented in the Table 2 given that, the average carbohydrate content of jamun powder *lassi* was noted 15.95, 17.08, 18.56 and 19.76 for the treatments T_1, T_2, T_3 and T_4 respectively. Carbohydrate content of jamun powder *lassi* with control sample increased from 15.95 to 19.76 per cent. The highest carbohydrate content was observed in T_4 *i.e.* 19.76 per cent and lowest was observed in T_1 (control sample) *i.e.* 15.95 per cent. Above results recorded that the carbohydrate content in all samples were differed significantly (p<0.05). Above findings clearly shown that when jamun powder level in *lassi* increased there was proportionally increased in the carbohydrate content of the final product.
Present findings are in agreement with the findings, Akhter (2004) [1], who claimed that the addition of various sugar levels had a significant impact on fermented dairy products.

Conclusion
Jamun powder *lassi* can be made by combining standard dahi culture at a rate of 1% with 10% sugar and various amounts of jamun powder**.** The sensory analysis showed that the panel of judges and consumers both appreciated all of the final product samples. T_3 (1% of jamun powder) receives the highest rating across all sensory metrics and has higher consumer acceptability of the four treatments. Jamun powder addition altered the physico-chemical makeup of *lassi*. It was shown that as the amount of jamun powder grow, the amount of total solids, carbohydrates, protein, ash content and acidity increased while the amount of fat, moisture, pH of the developed *lassi* content reduced.

Reference

1. Akhter N. The effect of different levels of starter culture and sugar on fermentation characteristics of Misti Dahi. MS Thesis, Department of Dairy Science, Bangladesh Agricultural University, Mymensingh, Bangladesh; c2004.
2. Avtade NB. Utilization of pomegranate juice in the preparation of Lassi. M.Sc. (Agriculture) Thesis, Submitted to Dr. PDKV Akola, Maharashtra; c2007.
3. Bagal SV, Todkar SR, Thalka TR. Utilization of papaya pulp for lassi preparation, Advances in Life Sciences. 2016;5(20):8963-8969.
4. Bagal SG, Chavan KD, Kulkarni MB. Studies on Preparation of Lassi from High Acid Cow Milk. J Dairying, Foods and H.S. 2007;26(2):80-84.
5. Bhowmik D, Gopinath Kumar P, Duraivel S, Aravind G, Kumar SPK. Traditional and medicinal uses of Indian blackberry. Journal of Pharmmuacogony and Phytochemistry. 2013;1(5):36-40.
6. Bhutkar SS. Studies on Preparation of Lassi from Buffalo Milk Blended with Coconut Milk. Res. J Animal Hus. & Dairy Sci. 2011;3(2):70-72.
7. Campbell Platt G. Fermented foods-A world perspective. Food Res. Internat. 1994;27(2):253-257.
8. Chavan PB, Padghan PV, Andharepatil PS. Studies on Sensory Evaluation of Diabetic Shrikhand by using Jamun (*Syzygium cumini* L.) Pulp. Asian Journal of Dairy research. 2019;38(4):318-321.
9. Chawla R, Sivakumar S. Development of vitamin A fortified lassi using natural sources. The Pharma Innovation Journal. 2017;6(11):326-329.
10. Ghule BK, Desale RJ, Gavhane MS, Khore MC. Preparation of strawberry Lassi. Research Journal of Animal Husbandry & Dairy Science. 2015;6(1):22-26.
11. Gupta SK, Kulkarni S. Recent technological advavances in milk-based beverages. Indian Dairyman. 1983;35(1):593-601.
12. Kadam PS, Avahad VB, Sharma SK, Mote RH. Studies on preparation of lassi concentrate. J Soil and Crops. 2006;16(1):121-126.
13. Laxminarayana H, Shankar PA. Fermented milk in human nutrition. Indian Dairyman. 1980;32(2):120-121.

14. Mule SM, Jadhav SR, Kadam SS, Dandekar VS, Ramod SS. Manufacturing technology and production cost of low fat lassi preapared by incorporation of lemon grass (*Cymbopogon citratus* L.) extract. Journal of Pharmacognosy and Phytochemistry. 2018;7(5):2782-4.
15. Panse VG, Sukhatme PV. Statistical methods for agricultural workers. I. C. A. R. Publication, 4th Ed; c1985.
16. Pardhi PS, Desale RJ, Mule PR, Ghule BK, Tambe DR, Gavhane MS. Studies on finger millet lassi. Asian J Dairy & Food Res. 2014;33(4):255-258.
17. Sadawarte PD, Pujari KH, Sonawane SK, Arya SS. Potential food application and health benefit of jambhul. The Indian Journal of Nutrition and Ditetics. 2015;53(3):343-352.
18. Sharma R. Production and processing quality of milk products. Published by International Book Distributing Co. Charbagh, Lucknow (U.P); c2016.
19. Upadhyay S, Parimita, Kumar P. Preparation of carrot lassi. The Pharma Innovation Journal. 2017;6(8):302-305.
20. Gupta VP, Jain PK. Certain classes of univalent functions with negative coefficients. Bulletin of the Australian Mathematical Society. 1976 Jun;14(3):409-16.