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### Sensory evaluation of fresh Jamun (*Syzygium cumini*) yoghurt

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#### Abstract

The present investigation entitled "Process Standardization and Quality Evaluation of Jamun (*Syzygium cumini*) Yoghurt" was undertaken during 2014-15 with a view to standardize the process for preparation of jamun yoghurt with improved therapeutic value using jamun juice and aspartame. It was observed that, all the sensory attributes Viz., colour and appearance, flavor, body and texture and overall acceptability of fresh yoghurt samples under different treatment combinations were significant. The colour and appearance, flavour, body and texture and overall acceptability score ranged from 7.70 (T<sub>0</sub>) 8.23 (T<sub>3</sub>), 7.33 (T<sub>6</sub>) to 8.60 (T<sub>4</sub>), 7.03 (T<sub>5</sub>) to 8.20 (T<sub>0</sub>) and 7.60 (T<sub>0</sub>) to 8.57 (T<sub>4</sub>), respectively. The treatment combination T<sub>4</sub> (9 per cent jamun juice and 0.035 per cent aspartame) found sensorily superior over the rest of treatment combinations. The effect of levels of jamun juice and aspartame was significant. However, their interaction effect was non significant for all sensory attributes.

**Keywords:** Yoghurt, Jamun, sensory evaluation

#### Introduction

Yoghurt is a rich source of protein, carbohydrates, vitamins, fat, phosphorus and calcium. During production of yoghurt from milk and its fermentation processes the lactose, fat and protein of milk partially destroyed therefore yoghurt easily digested. Moreover absorption of calcium from yoghurt is higher than milk, due to the acidic nature of yoghurt that ionizes calcium and thus increased its bioavailability in intestine. Therefore yoghurt is being pleased everywhere for its beneficial properties.

In India, according to FSSR (2011) yoghurt can be defined as a food produced by culturing cream, milk, partially skimmed milk and skim milk, used alone or in combination with a characteristic bacterial culture that contains lactic acid producing bacteria, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Yoghurt should contain at least 3.0 per cent of milk fat, 8.5 per cent of milk solids not fat and milk proteins not less than 3.2 per cent with a titratable acidity of not less than 0.85 per cent, expressed as lactic acid. Traditionally yoghurt is made from cow, buffalo, goat and sheep milk. Yoghurt is considered as healthy food due to its high digestibility and bioavailability of nutrients and also can be recommended to the people with lactose intolerance, gastrointestinal disorders such as inflammatory bowel disease and irritable bowel disease and aids in immune function and weight control. Yoghurt provides resistant, anti-oxidants, anti-scorbic, anti-cancer and remedy for digestion problems and to ease constipation, diarrhea and other intestinal problems. It is good for patients facing bone problem and proper way of the digestion in all human being (Prasad and Srinivas, 1987) [15]. Jamun fruit extract showed antimicrobial and cytotoxic activities and may potentially be used on topical antimicrobial products. In comparison to other non-traditional fruits jamun showed considerable high antioxidant activity, which contain constituent such as anthocyanins, tannins and flavonoids. The anthocyanin composition was characterized by the presence of 3, 5-diglucosides of five out of six aglycones commonly found in foods. Fruits contain many different kinds of anti-oxidant compounds, including flavonoids, phenolics, carotenoids and vitamins, which are all considered beneficial to human health, for decreasing the risk of degenerative diseases by reduction of oxidative stress and for the inhibition of macromolecular oxidation (Adelia *et al.*, 2011) [1].

## Materials and Methods

### Starter Culture

The freeze dried pure cultures of *Lactobacillus bulgaricus* and *Streptococcus thermophilus* were procured from the National Collection of Dairy Cultures (NCDC), Division of Dairy Microbiology, National Dairy Research Institute, Karnal (India).

### Jamun Juice

The jamun juice was purchased from Post Harvest Technology Unit, Department of Horticulture, Post Graduate Institute, Mahatma Phule Krishi Vidyaapeeth, Rahuri (M.S.).

### Aspartame (Artificial sweetener)

Standard quality aspartame (Neutrasweet, brand USA) was purchased from Pooja Chemicals, Mumbai (M.S.).

### Preparation of Jamun yoghurt

The Yoghurt was prepared by using the procedure prescribed by Sharma and Singh (1981) [6] with some minor modifications. Fresh good quality cow milk (3.5 % fat) was taken and added skim milk powder @ 4% subjected to filtration/clarification. The mix was pre-heated to 60°C and homogenized single stage at 2000-2500 psi, the milk was heated to 85°C for 30 min and then cooled to 43 ± 1°C, aspartame was added. It was then inoculated @ 2% with *Lactobacillus bulgaricus* and *Streptococcus thermophilus* (1:1 ratio) which were mixed well and incubated at 43 ± 1°C for 5 hours in plastic cups/containers. When the curd has set firmly, it is transferred in refrigerator and stored at 5 ± 2°C.

### Sensory Evaluation

Yoghurt samples were subjected to the sensory evaluation. The samples of yoghurt were provided to the panel of five semi trained judges for sensory evaluation. The scoring was recorded by using 9 point Hedonic Scale (Appendix-I) as per IS: 6273 (Part –II) 1971.

**Table 1:** Effect of treatment combinations of fresh yoghurt samples

Treatments	Mean Score			
	Colour And Appearance	Flavour	Body And Texture	Overall Acceptability
T <sub>0</sub> (J <sub>0</sub> A <sub>0</sub> )	7.70 <sup>a</sup>	7.83 <sup>b</sup>	8.20 <sup>f</sup>	7.60 <sup>a</sup>
T <sub>1</sub> (J <sub>1</sub> A <sub>1</sub> )	8.00 <sup>d</sup>	7.85 <sup>b</sup>	7.93 <sup>e</sup>	8.13 <sup>c</sup>
T <sub>2</sub> (J <sub>1</sub> A <sub>2</sub> )	7.93 <sup>cd</sup>	8.17 <sup>c</sup>	8.03 <sup>e</sup>	8.30 <sup>d</sup>
T <sub>3</sub> (J <sub>2</sub> A <sub>1</sub> )	8.23 <sup>e</sup>	8.47 <sup>d</sup>	7.50 <sup>c</sup>	8.40 <sup>d</sup>
T <sub>4</sub> (J <sub>2</sub> A <sub>2</sub> )	8.13 <sup>e</sup>	8.60 <sup>d</sup>	7.67 <sup>d</sup>	8.57 <sup>e</sup>
T <sub>5</sub> (J <sub>3</sub> A <sub>1</sub> )	7.83 <sup>bc</sup>	7.30 <sup>a</sup>	7.03 <sup>a</sup>	7.83 <sup>b</sup>
T <sub>6</sub> (J <sub>3</sub> A <sub>2</sub> )	7.73 <sup>ab</sup>	7.33 <sup>a</sup>	7.30 <sup>b</sup>	7.93 <sup>b</sup>
SE ±	0.04	0.05	0.05	0.05
CD at 5%	0.13	0.16	0.14	0.14

### Colour and Appearance

Table 1 it was revealed that, all the treatment combinations with different levels of jamun juice and aspartame had higher mean colour and appearance score than T<sub>0</sub> (7.70). It might be due to an attractive light purple colour of jamun juice. Colour and appearance score within treatments also differ significantly. T<sub>5</sub> and T<sub>6</sub> (12 per cent jamun juice) had intense purple colour as compare to other treatment combinations in the study and was less liked by judges. Treatments T<sub>3</sub> and T<sub>4</sub> were significantly (P < 0.05) superior than rest of the treatment combinations. Treatment T<sub>3</sub> (9 per cent jamun juice and 0.025 per cent aspartame) received maximum score (8.23), while treatment T<sub>6</sub> (12 per cent jamun juice and 0.035

per cent aspartame) received minimum score (7.73) for colour and appearance of fresh yoghurt. The different treatment combinations had significant (P < 0.05) effect on colour and appearance score of yoghurt samples. The treatment combinations T<sub>1</sub> and T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> and T<sub>5</sub> and T<sub>6</sub> were at par with each other. The treatment T<sub>0</sub> significantly differed than other treatment combinations.

The results observed in present investigation are in agreements with the reports of Desai *et al.*, (1994) [4], Cinbas and yazici (2008) [3] and Hossain *et al.* (2012). George *et al.* (2010) [6] reported that, colour and appearance score of aspartame added yoghurt sample was slightly decreased than control yoghurt sample. Further they observed that, increasing aspartame levels in yoghurt samples slightly decreases glossy appearance of product.

### Flavour

It was revealed that, the score for flavour attribute of fresh yoghurt samples prepared under different treatments combinations ranged from 7.30 to 8.60 (Table 4.10 and Fig. 4). Treatment T<sub>4</sub> had highest flavor score among the rest of treatment combinations. Treatment combinations, T<sub>0</sub> and T<sub>1</sub>, T<sub>3</sub> and T<sub>4</sub>, T<sub>5</sub> and T<sub>6</sub> were at par with each other. The results agree with the findings of Desai *et al.* (1994) [4], they observed that, smell and taste of mango and pineapple yoghurt was significantly more than control sample. Huma *et al.* (2003) [7] reported that, the yoghurt samples containing 5 per cent sugar and 16 per cent apple puree showed maximum flavour score than 10, 12, 14 and 18 per cent apple puree levels. Patil *et al.* (2009) [16] reported that, addition of higher level of guava pulp adversely influenced flavor attribute of fruit yoghurt.

### Body and Texture

It was revealed that, different treatments combinations had significant (P < 0.05) effect on body and texture of the fresh yoghurt samples. The sensory score for body and texture under different treatment combinations ranged from 7.03 to 8.20 (Table 4.12 and Fig. 5). Treatment T<sub>0</sub> (control) had maximum body and texture score and treatment T<sub>5</sub> had lower score than other treatment combinations. Treatment combinations T<sub>1</sub> and T<sub>2</sub> were at par with each other. Body and texture score of fresh yoghurt showed declined trend with increasing juice levels. The treatment combinations with increased juice levels formed weak, loose body might be due to due to less total solids content of Jamun juice. Further as level of Jamun juice increased, firmness of product declined. The results in the investigation are in agreement with the findings of Aly *et al.* (2004) [2], Kale *et al.* (2007) [12], Vahedi *et al.* (2008) [18] and Walkunde *et al.* (2009) [19].

### Overall acceptability

It was revealed that, all the treatment combinations had significant (P < 0.05) effect on overall acceptability of fresh yoghurt samples (Table 4.14 and Fig. 6). The treatment combination T<sub>4</sub> (J<sub>2</sub>A<sub>2</sub>) had significantly higher overall acceptability score (8.57) over the rest of treatment combinations and which was the most acceptable treatment combination. However, Treatments T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub>, T<sub>5</sub> and T<sub>6</sub> were at par with each other. The treatment combination T<sub>4</sub> had good blend of natural flavor, desired body, smooth texture with attractive colour and appearance. The results are in agreement with Desai *et al.* (1994) [4], Aly *et al.* (2004) [2], Patel *et al.* (2009) [17], Hossain *et al.* (2012) and Dey *et al.* (2014).

## Conclusion

The better acceptable Jamun yoghurt could be prepared by using 9 per cent jamun juice and 0.035 per cent aspartame. It was further observed that treatment combination T<sub>4</sub> (J<sub>2</sub>A<sub>2</sub>) of fresh yoghurt containing 9 per cent jamun juice and 0.035 per cent aspartame was sensorily superior with overall acceptability score (8.57) over all other treatments studied.

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