



Preparation of *Lassi* from safflower milk blended with buffalo milk

V.S. MANE, S.G. NARWADE, R.P. KADAM AND A.T. SONTAKKE

ABSTRACT : The present investigation was carried out to assess the suitability of safflower milk in preparation of *Lassi*. The preparation of *Lassi* from different properties of safflower milk and buffalo milk with addition of 16 per cent sugar of *Lassi* with different flavours was studied. It was observed that the *Lassi* prepared from 75 per cent safflower milk and 25 per cent buffalo milk with rose flavour was acceptable (8.2) scoring between like very much to like extremely. The rose flavour was found to be the most acceptable level.

KEY WORDS : *Lassi*, Safflower milk, Buffalo milk, Blend, Flavour

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INTRODUCTION

Fermented milks are well known throughout the world for their taste, nutritive value and therapeutic properties. Often these are prescribed by physician for controlling the gastrointestinal disorders. Amongst the various fermented milks, *Lassi* as cultured beverage and is popular product in India is not only refreshing, delicious and nutritive but also it also possesses thirst quenching property and a high therapeutic value, due to which it is quite popular amongst all age group (Mathur, 1991).

In spite of remarkable increase in milk production, the milk and milk products out of reach of the vulnerable people, due to high cost of milk and milk products. This calls for development of low cost substitute for milk and milk products in the country. Scientists have standardized the procedure for manufacture of

milk and milk products from soya milk. Occasionally other protein products such as groundnut and sesame cake have also been used for preparation of milk like beverages, but those products could not become popular for some reasons. The substitute milk must be more or less similar to cow milk and low in fat. The preparation of safflower milk seems to be an alternative to milk. Efforts have been made to prepare low cost milk using safflower seed. Mhaske (1997) prepare safflower milk from safflower seed was similar to cow milk. The composition of safflower milk from safflower seed was similar to cow milk. The composition of safflower milk was as follows,

Fat – 4.55 per cent, Protein – 2.30 per cent, Carbohydrate – 2.21 per cent, Ash – 0.62 per cent, Total solids – 9.68 per cent.

Utilization of safflower in manufacture of milk products not only bring down cost of these products, making them within the reach of vulnerable people, but can also be useful for the people who are either allergic to cow or buffalo milk or lactose intolerance problems. Moreover, safflower milk does not contain any cholesterol. The safflower oil is rich in polyunsaturated fatty acids, which helps in lowering the blood cholesterol and in preventing heart diseases (Shivkumar *et al.*, 1993). So the product prepared from safflower milk would prove to be very useful to the people who are suffering from cardiovascular diseases.

An attempt therefore was made to prepare *Lassi* from safflower milk and buffalo milk blend.

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MATERIAL AND METHODS

During the course of present investigation on the studies of preparation of *Lassi* from safflower milk blended with buffalo milk. The materials used and methods employed are delineated here under.

Methods :

1) Buffalo milk 2) Safflower seed 3) Sugar 4) Sodium chloride 5) Sodium hexametaphosphate 6) Dahi culture 7) Flavour : orange, rose, mango.

Preparation of safflower milk :

The safflower milk was prepared as per the method given by Mhaske (1997). Two hundred grams of safflower seed were weighed and washed with hot water and then blended in mixer. Final seed to water ratio was maintained as 1:3, so as to here consistency and fat per cent as that in buffalo milk. The milk was then filtered to remove seed coat. To improve its heat stability, sodium hexametaphosphate was added @ 0.2 per cent, common salt @ 0.05 per cent (Sugar @ 0.2 %) was added enhance its taste and acceptability. The milk was then brought to boil and the milk obtained had cream colour and nutty flavour.

Blending of safflower milk and buffalo milk :

For preparation of *Lassi*, following blends of buffalo milk and safflower milk was studied with different flavours

- T₀ R = 100% buffalo milk + rose flavour
- T₀ O = 100% buffalo milk + orange flavour
- T₀ M = 100% buffalo milk + mango flavour
- T₁ R = 75% buffalo milk + 25 % safflower milk + rose flavour
- T₁ O = 75% buffalo milk + 25 % safflower milk + orange flavour
- T₁ M = 75% buffalo milk + 25 % safflower milk + mango flavour
- T₂ R = 50% buffalo milk + 50 % safflower milk + rose flavour
- T₂ O = 50% buffalo milk + 50 % safflower milk + orange flavour
- T₂ M = 50% buffalo milk + 50 % safflower milk + mango flavour
- T₃ R = 25% buffalo milk + 75 % safflower milk + rose flavour
- T₃ O = 25% buffalo milk + 75 % safflower milk + orange flavour
- T₃ M = 25% buffalo milk + 75 % safflower milk + mango flavour

Preparation of *Lassi* :

Lassi was prepared as per the procedure described by De (1980) with slight modification. Blended milk was used for boiling for 10 minutes and then cooled to room temperature.

Then Dahi culture @ 2.0 per cent was added and incubate for 12-16 hrs. prepared curd was broken with curd beater. The required amount of water (50% volume of dahi) and sugar (@ 16% of volume of *Lassi*) flavour was added. All the components were mixed thoroughly and transferred to storage at 10°C until consumption.

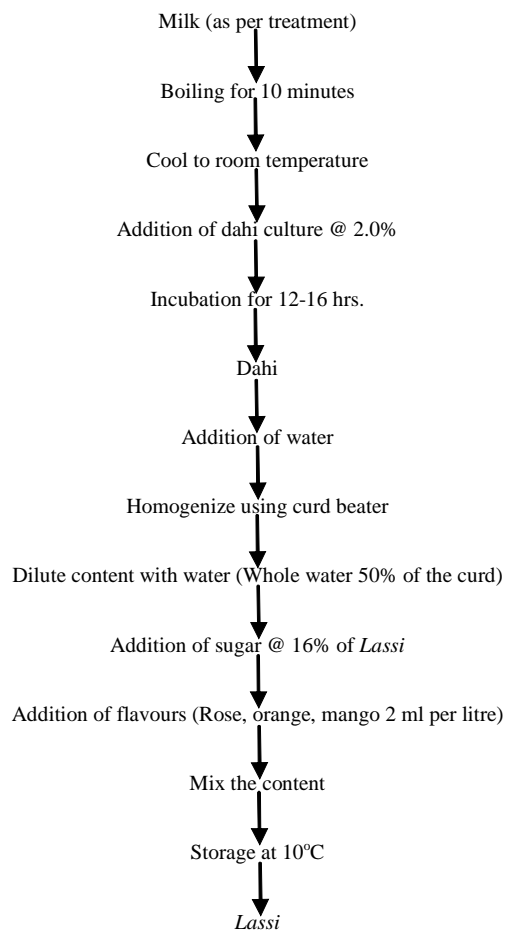


Fig. A : Flow diagram for preparation of *Lassi* from safflower milk blended with buffalo milk

Sensory evaluation of *Lassi* :

Sensory evaluation of *Lassi* was carried out by a trained panel of judges selected from the staff of Department of Animal Husbandry and Dairy Science, College of agriculture, VNMKV, Parbhani. The judges were asked to evaluate the product by using a 9-point hedonic scale (Amerine *et al.*, 1965). The product was evaluated for flavour, colour and appearance, body and texture and overall acceptability.

Chemical composition of *Lassi* :

Fat, total solids and ash content of *Lassi* were determined as per the method described in IS : 1981 protein content of *Lassi* was determined by AOAC method (1965) carbohydrate

was calculated by subtraction method.

Statistical design :

The results obtained during the course of investigation was subjected to statistical analysis by using Completely Randomized Block Design (Panse and Sukhatme, 1967).

RESULTS AND DISCUSSION

The results obtained during the course investigation preparation of *Lassi* from safflower milk blended with buffalo milk delineated hereunder :

The *Lassi* thus prepared was subjected to sensory evaluation and chemical composition.

Sensory evaluation of *Lassi* :

The *Lassi* samples prepared from safflower milk blended with buffalo milk were judged for sensory quality with respect to colour and appearance, flavour, body and texture and overall

acceptability by a panel of judges using 9-point hedonic scale.

The flavour score of *Lassi* :

The flavour score of *Lassi* as influenced by different levels of blending of safflower milk and buffalo milk have been depicted in Table 1.

From the Table 1, it was shows the flavour score of *Lassi* for different blends ranged between 7.0 to 9.0. In the control treatment T₀R was found to be superior over rest of the treatments.

The mean score of other control treatments T₀O and T₀M were 8.2 and 7.8. The mean score of *Lassi* prepared from blended milk treatments viz., T₁R, T₁O, T₁M, T₂R, T₂O, T₂M, T₃R, T₃O and T₃M were 8.8, 7.4, 7.8, 8.2, 7.6, 7.4, 7.8, 7.2 and 7.0, respectively. The flavour score for treatment T₁R was observed to be highest almost all the blended milk *Lassi* under study. Treatment T₁R was found to be significantly superior over T₃M, T₃O, T₃R, T₂M, T₂O, T₁M, T₁O, T₀M and at par with T₂R,

Table 1 : Flavour score of *Lassi*

Treatments	Replications					Mean
	RI	RII	RIII	RIV	RV	
T ₀ R	9	9	9	9	9	9.0
T ₀ O	8	8	8	8	9	8.2
T ₀ M	7	9	7	7	9	7.8
T ₁ R	9	9	9	9	8	8.8
T ₁ O	8	7	8	8	8	7.4
T ₁ M	7	9	7	7	9	7.8
T ₂ R	8	9	8	9	8	8.2
T ₂ O	8	7	8	7	8	7.6
T ₂ M	7	8	7	6	9	7.4
T ₃ R	7	9	7	9	7	7.8
T ₃ O	8	7	7	7	7	7.2
T ₃ M	7	7	7	6	8	7.0
S.E. ± 0.32			C.D. (P=0.090)			

Table 2 : Body and texture score of *Lassi*

Treatments	Replications					Mean
	RI	RII	RIII	RIV	RV	
T ₀ R	9	9	9	9	9	9.0
T ₀ O	8	9	9	9	9	8.8
T ₀ M	9	9	9	8	9	8.8
T ₁ R	9	9	9	9	9	9.0
T ₁ O	9	9	9	9	8	8.8
T ₁ M	8	8	8	8	8	8.0
T ₂ R	9	8	8	9	9	8.6
T ₂ O	8	9	8	8	8	8.2
T ₂ M	8	8	8	8	8	8.0
T ₃ R	9	8	8	8	8	8.2
T ₃ O	8	9	8	8	8	8.2
T ₃ M	8	8	8	8	8	8.0
SE ± 0.17			C.D. (P=0.48)			

T₀O, T₀R. These observation indicated that rose flavour was most acceptable compared to orange and mango. Narwade *et al.* (2003) while studying the kheer, the proportion of safflower milk increased in the kheer, the flavour scores decreased significantly. Andhare *et al.* (2010) reported that the proportion of safflower milk in increased in the ice-cream the overall acceptability score decreased significantly.

Table 3 : Colour and appearance score of Lassi

Treatments	Replications					Mean
	RI	RII	RIII	RIV	RV	
T ₀ R	9	9	9	9	9	9.0
T ₀ O	9	9	9	9	9	9.0
T ₀ M	9	9	9	9	9	9.0
T ₁ R	9	9	9	9	9	9.0
T ₁ O	9	9	8	9	9	8.8
T ₁ M	9	8	9	9	9	8.8
T ₂ R	9	8	9	9	8	8.6
T ₂ O	9	9	8	8	9	8.6
T ₂ M	9	9	8	7	8	8.2
T ₃ R	9	8	9	9	8	8.6
T ₃ O	8	9	8	8	9	8.4
T ₃ M	9	9	7	7	7	7.8
S.E. ± 0.22		C.D. (P=0.61)				

Table 4 : Overall acceptability score of Lassi

Treatments	Character			Mean
	Colour and appearance	Flavour	Body and texture	
T ₀ R	9.0	9.0	9.0	9.0
T ₀ O	9.0	8.2	8.8	8.6
T ₀ M	9.0	7.8	8.8	8.5
T ₁ R	9.0	8.8	9.0	8.9
T ₁ O	8.8	7.4	8.8	8.3
T ₁ M	8.8	7.8	8.0	8.0
T ₂ R	8.6	8.2	8.6	8.4
T ₂ O	8.6	7.6	8.2	7.8
T ₂ M	8.2	7.4	8.0	7.8
T ₃ R	8.6	7.8	8.2	8.2
T ₃ O	8.4	7.2	8.2	7.8
T ₃ M	7.8	7.0	8.0	7.6

Table 5 : Chemical composition of Lassi

Particulars	Treatment	
	T ₀ R	T ₃ R
Water %	76.40	78.00
Fat %	3.50	2.80
Protein %	1.91	1.54
Carbohydrate %	1.75	1.38
Sucrose %	16.00	16.00
Ash %	0.44	0.28
Total solids %	23.60	22.00

Body texture score of *Lassi* :

From Table 2, shows body and texture score and *Lassi*. In control the mean score of body and texture for treatment TOR, T₀O, T₀M was 9.0, 8.8 and 8.8, respectively. The highest score *i.e.*, 9.0 was found for treatment T₀R.

The *Lassi* prepared using blended milk the mean score for treatment T₁R, T₁O, T₁M, T₂R, T₂O, T₂M, T₃R, T₃O and T₃M were 9.0, 8.8, 8.0, 8.6, 8.2, 8.0, 8.2, 8.2 and 8.0, respectively.

Among all the treatment of blended milk, *Lassi*, treatment, T₁R, scored highest *i.e.*, 9.0 score was found to be significantly superior over T₃M, T₃O, T₃R, T₂M, T₂O, T₁M and at par with T₂R, T₁O, T₀M, T₀O and T₀R. It was observed that as the proportion of safflower milk increased there is decrease in the score of body and texture. This might be due to less total solid percentage in the safflower milk. Mhaske (1997) while studying cow milk safflower milk blend also reported decline in body and texture score with increasing proportion of safflower milk in the blend.

Colour and appearance score of *Lassi* :

Table 3 shows the acceptability of *Lassi* in terms of colour and appearance. The colour and appearance score for temperature T₀R, T₀O, T₀M were 9, 9, 9, respectively. In the experimental *Lassi i.e.*, *Lassi* prepared from blended milk treatment T₁R having highest score.

The mean score for various treatment of experimental *Lassi* T₁O, T₁M, T₂R, T₂O, T₂M, T₃R, T₃O, T₃M were 8.8, 8.8, 8.6, 8.6, 8.2, 8.6, 8.4 and 7.8, respectively. Among all treatments, T₁R showed highest score *i.e.*, 9.0. The statistical analysis revealed that the treatment T₁R was found to be significantly superior over T₃M, T₂M and at par with T₀R, T₀O, T₀M, T₁O, T₁M, T₂R, T₂O, T₃R and T₃O. Andhare *et al.* (2010) reported as the proportion of safflower milk in the blend increases the colour and appearance score of ice-cream decreases.

Overall acceptability score of *Lassi* :

The Table 4 shows the overall acceptability of *Lassi*. It was observed that mean score of *Lassi* for control treatment T₀R, T₀O, T₀M, were 9.0, 8.6 and 8.5, respectively.

In case of blended milk *Lassi*, the mean score, for treatment T₁R, T₁O, T₁M, T₂R, T₂O, T₂M, T₃R, T₃O and T₃M, was 8.9, 8.3, 8.0, 8.4, 7.8, 7.8, 8.2, 7.8 and 7.6, respectively. Amongst all the blended milk *Lassi*, the highest score 8.9 was observed for treatment T₁R. Treatment T₁R was found significantly superior over treatment T₃M, T₃O, T₃R, T₂M, T₂O, T₁M and at par with T₂R, T₁O, T₀M and T₀R.

There observations indicated that good quality *Lassi* can be prepared by using blended milk. This *Lassi* contained 16 per cent sugar and flavoured with rose, orange and mango. Form the present investigation, it is observed that good quality *Lassi* can be obtained by combination of 75 per cent safflower milk 25 per cent buffalo milk with rose flavour.

The chemical composition of *Lassi* :

The objective of the present investigation was to use the maximum level of safflower milk to prepare *Lassi*, the treatment consisting 75 : 25 safflower milk-buffalo milk with rose flavour was selected for chemical studies.

The chemical composition of *Lassi* prepared entirely from 75 : 25 safflower milk : buffalo milk with rose flavour was compared with control sample *i.e.*, 100 per cent buffalo milk with rose flavour and it is presented in Table 5.

Table 5 shows that chemical composition of *Lassi* for treatment T₀R, and T₃R. It was observed that *Lassi* prepared from control (T₀R) contained water 76.40 per cent, fat 3.5 per cent, protein 1.91 per cent, carbohydrate 1.75 per cent, sucrose 16.00 per cent, ash 0.44 per cent and total solids 23.60 per cent while *Lassi* prepared from treatment T₃R contained water 78.0 per cent, fat 2.80 per cent, protein 1.54 per cent, carbohydrate 1.38 per cent sucrose 16.00 per cent, ash 0.28 per cent and total solids 22.00 per cent.

Survase (1993) prepared *Lassi* from soybean and reported chemical composition as total solids 17.75 per cent, moisture 82.25 per cent, fat 1.02 per cent, protein 3.44 per cent, lactose 1.30 per cent, ash 0.90 per cent and sucrose 10 per cent.

Conclusion :

Based on the above results it may be concluded that *Lassi* prepared from 75 : 25 blend with rose flavour could be recommended as it was sensorily acceptable (8.2) scoring between like very much to like extremely.

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