



Studies on preparation of *Shrikhand* from safflower milk

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ABSTRACT : *Shrikhand* was prepared from buffalo milk blended with safflower milk in various proportions (T_0 - 100 % buffalo milk, T_1 - 70 % buffalo milk + 30 % safflower milk, T_2 - 60 % buffalo milk + 40 % safflower milk, T_3 - 50 % buffalo milk + 50 % safflower milk). The sensory score for overall acceptability of *Shrikhand* of treatments T_0 , T_1 , T_2 and T_3 were 8.72, 8.11, 7.50 and 7.03, respectively. The *Shrikhand* of treatments T_0 and T_1 were rated between like very much to like extremely whereas *Shrikhand* of treatments T_2 and T_3 were rated between like moderately to like very much. It was observed that the per kg cost of production of *Shrikhand* for treatment T_0 , T_1 , T_2 and T_3 was Rs. 41.38, 35.50, 34.25 and 32.24, respectively. The study revealed that low cost *Shrikhand* can be prepared by blending 50 % buffalo milk + 50 % safflower milk and it was acceptable to the consumer.

KEY WORDS : Cost of production, Safflower milk, Sensory evaluation, *Shrikhand*

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INTRODUCTION

Shrikhand is an indigenous fermented and sweetened milk product having typical pleasant sweet sour taste. It is served as a special delicacy on ceremonial occasion and festivals. The traditional technology of *Shrikhand* making involves the coagulation of milk by fermentation with starter culture to obtain *dahi*. Chakka, the *Shrikhand* base, is mixed with sugar, colour and flavouring agent to obtain *Shrikhand*.

Preparation of *Shrikhand* from safflower milk blended with buffalo milk seems to be a possible alternative to whole milk *Shrikhand*. The utilization of safflower milk in *Shrikhand* manufacturing will not only bring down cost of this product but will make it within the reach of vulnerable people. This product will also be useful for lactose intolerant people. Moreover, safflower milk is rich in polyunsaturated fatty acids and have been shown to prevent increase in serum cholesterol which leads to heart disease (Kumar *et al.*, 1993). The product based on safflower milk will be

particularly useful for the people suffering from the cardiovascular disease. So, looking to the diversified benefits of safflower milk, an attempt was made to manufacture a *Shrikhand* from safflower milk and buffalo milk blend.

MATERIAL AND METHODS

Buffalo milk required for study was procured from University Dairy Farm. A good quality safflower seed of Sharda variety was obtained from university central farm, Marathwada Krishi Vidyapeeth, Parbhani. Ampule of freeze dried L.F. 40 culture was obtained from Division of Dairy Microbiology, National Dairy Research Institute, Karnal and was used for preparation of *Shrikhand*.

Preparation of safflower milk:

The safflower milk was prepared as per the method given by Maske (1997). Two hundred grams of safflower seeds were weighed and washed with hot water and ground in domestic mixer with little amount of water and filtered through muslin cloth (seed:water ratio -1:5) so as to have consistency as that of cow milk. For better heat stability and taste, sodium hexmetaphosphate @ 0.2 per cent, common salt @ 0.05 per cent and sugar @ 0.2 per cent were added to enhance its acceptability. The milk so obtained was then boiled and cooled to room temperature.

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Treatments details:

For preparation of *Shrikhand* the following blends of buffalo milk and safflower milk were studied:

- T₀ - 100% parts of buffalo milk (control)
- T₁ - 70 parts of buffalo milk + 30 parts of safflower milk
- T₂ - 60 parts of buffalo milk + 40 parts of safflower milk
- T₃ - 50 parts of buffalo milk + 50 parts of safflower milk.

The standard method given by De (1982) was followed for preparation of *Shrikhand*. The product was evaluated for its sensory quality by the panel of 5 trained judges using 9 point hedonic scale as described by Amerine *et al.* (1967). Cost of *Shrikhand* was worked out. The results obtained during the course of investigation were subjected to the statistical analysis by using Completely Randomized Design as described by Corxton *et al.* (1975). In all five trials were conducted.

RESULTS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Sensory evaluation of *Shrikhand*:

The data on the effect of different safflower milk blends on sensory score of *Shrikhand* are presented in Table 1. The average score for colour and appearance of *Shrikhand* for treatment T₀, T₁, T₂ and T₃ was 8.82, 8.36, 7.80 and 7.46, respectively. These observations showed that as the proportion of safflower milk in *Shrikhand* increased, the colour and appearance score decreased. This may be due to the pale yellow colour of safflower milk which gave characteristic dullness or dark creamy shade to the product. The significant (P<0.05) differences were observed among the treatments.

The flavour score of different blends of *Shrikhand*

ranged between 8.90 (T₀) and 7.26 (T₃). All the treatments were significant at 5 per cent level. Flavour score decreased as the proportion of safflower milk in *Shrikhand* increased. This may be due to slight oily flavour of safflower milk.

The average score for body and texture of *Shrikhand* for treatment T₀, T₁, T₂ and T₃ was 8.44, 7.66, 7.26 and 6.54, respectively. Highest body and texture score was observed for treatment T₀ (8.44) and lowest score was observed for treatment T₃ (6.54). Though there was decrease in the body and texture score of *Shrikhand* by increasing the proportion of safflower milk in the blend, even then the *Shrikhand* of all treatments was acceptable.

The average score for taste of *Shrikhand* for treatment T₀, T₁, T₂ and T₃ was 8.80, 8.13, 7.50 and 6.92, respectively. All the treatments showed significant difference for taste parameter at 5 per cent level. These observations indicated that type of milk has influence on taste of *Shrikhand*. This decrease in score was because safflower milk has slight bitter taste compared to buffalo milk.

The score of *Shrikhand* for various treatments in respect of colour and appearance, flavour, body and texture, taste was pooled and mean score for overall acceptability was worked out. The average score for overall acceptability of *Shrikhand* for treatment T₀, T₁, T₂ and T₃ was 8.72, 8.11, 7.50 and 7.03, respectively. The significant (P<0.05) differences were observed among the treatments.

The *Shrikhand* of treatment T₀ and T₁ were rated between like very much to like extremely whereas *Shrikhand* of treatments T₂ and T₃ were rated between like moderately to like very much. It was proved that blending of safflower milk with buffalo milk to the maximum extent of 50:50 was acceptable. These observations indicated that as the proportion

Table 1: Sensory evaluation of *Shrikhand* (score out of 9)

Sr. No.	Treatments	Colour and appearance	Flavour	Body and texture	Taste	Overall acceptability
1.	T ₀	8.82	8.90	8.44	8.80	8.72
2.	T ₁	8.36	8.30	7.66	8.13	8.11
3.	T ₂	7.80	7.50	7.26	7.50	7.50
4.	T ₃	7.46	7.26	6.54	6.92	7.03
	C.D. at 5%	0.10	0.10	0.37	0.40	0.06

Table 2: Cost of production of *Shrikhand* per kg

Sr. No.	Particulars	Rate (Rs./kg)	T ₀		T ₁		T ₂		T ₃	
			Qty. (kg)	Amt (Rs.)	Qty. (kg)	Amt (Rs.)	Qty. (kg)	Amt (Rs.)	Qty. (kg)	Amt (Rs.)
1.	Buffalo milk	14.00	1.95	27.38	1.45	20.27	1.32	18.49	1.14	15.96
2.	Safflower milk	2.00	--	--	0.62	1.23	0.88	1.76	1.14	2.28
3.	Sugar	14.00	0.29	4.00	0.29	4.00	0.29	4.00	0.29	4.00
4.	Colour and flavour	--	--	4.00	--	4.00	--	4.00	--	4.00
5.	Labour and fuel	--	--	6.00	--	6.00	-	6.00	--	6.00
	Total			41.38		35.50		34.25		32.24

of safflower milk in the blend increased, the overall acceptability score of the *Shrikhand* decreased.

Similar observations for overall acceptability were recorded by Dhanwade (2000) for Kalakand and Narwade (1999) for Kheer.

Cost of production:

The cost of production of *Shrikhand* prepared from different blends of buffalo milk and safflower milk was calculated and the same is presented in Table 2. The cost was calculated on the basis of market price of ingredients. The per kg cost of production of *Shrikhand* for treatments T₀, T₁, T₂ and T₃ was Rs. 41.38, 35.50, 34.25 and 32.24, respectively. It was observed that as the proportion of safflower milk in the blend increased there was decrease in the cost of production of *Shrikhand*. This was mostly due to low cost of safflower milk.

Conclusion:

Based on the above results, it may be concluded that the *Shrikhand* prepared from buffalo milk and safflower milk blend (50:50) was acceptable. It was observed that as the proportion of safflower milk in the blend increased, the overall acceptability score of the *Shrikhand* decreased. The cost of *Shrikhand* can be minimized by using safflower and buffalo milk blend. The blend of safflower milk in *Shrikhand* has good market potential particularly for the vulnerable people.

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