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Sensory evaluation of low fat lassi prepared by incorporation of lemon grass (*Cymbopogon citratus* L.) extract

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Abstract

Presently herbal products in the form of cosmetics or food have become more popular in the world market. Herbal sweet preparation is new concept in dairy industry. Herbal such as lemon grass is being used in limited extent as flavoring agent in tea by household, besides it has medicinal properties against cough, cold etc. and is used extensively in Ayurvedic medicine. Lemon grass flavored skim milk lassi can be considered as herbal lassi. It was therefore, thought to evaluate the suitability of lemon grass extract as flavoring agent in developing lemon grass lassi.

In the present study the lassi was prepared from buffalo skim milk by using lemon grass extract at different levels viz. 2.5 percent (T₁), 5.0 percent (T₂), 7.5 percent (T₃) and 10 percent (T₄) of the content. This prepared lassi was compared with control lassi (T₀) i.e. without addition of lemon grass extract. From the result of present investigation it may be concluded that lemon grass extract could be successfully utilized for preparation of herbal lassi. The most acceptable quality lassi can be prepared by using 5.0 percent lemon grass extract. Such flavoring did not appreciably affect the composition of lassi.

Keywords: Low fat, lassi, sensory, lemon grass

Introduction

Milk is considered to be divine, holy and a symbol of purity. In ancient times, a country was said to be prosperous based on its cattle population and milk production. "Land of milk and honey" was always symbol of richness and prosperity so much, so that availability of milk and milk products in a house was an indicator of its flourishing prosperity. Indigenous milk products have been woven into the fabric of our culture and therefore, they must be listed in the priorities. This would add additional dimensions to the planning as it calls for application of appropriate technology for large scale production of traditional products. Among the traditional milk products fermented milk products occupy most important place in our diet.

Dahi, the curd, obtained by lactic fermentation of milk is one of the components of "panchamritam" the pious drink in Hindu religion. Fermented milks were probably the earliest form in which the milk was used to be converted to retain all its nutritional values. Dahi is one of the oldest and well known fermented products consumed by the larger section of population throughout the country as a part of daily diet.

Lassi a product prepared from dahi is an ancient refreshing beverage for quenching thirst. There is a large variation in the quality. In rural India lassi is also known as buttermilk. Lassi is creamy viscous fluid with rich aroma and mildly acidic in taste. Lassi contains 79 percent water, 3 percent fat, 2.8 percent protein, 4.5 percent lactose and 12 percent sugar (Sharma, 2006) [7].

Milk fat is composed of higher concentration of saturated fat and cholesterol to add the problems of calorie conscious people. Hence preparing low fat lassi from buffalo skim milk will help in greatly restricting the calorie intake. Milk fat is the main contributor to the rich flavour and mouthful. Low fat lassi will affect the rich taste and pleasant flavour of milk fat, but addition of natural herbal flavour may suppress this drawback.

Herbal sweet preparation is a new concept in dairy industry. Herbal sweets are the sweets that are prepared with the herbs that have been used as a food and medicinal purpose of centuries. Recently there has been an increasing trend to fortify the product with fruit or herbal juice. Herbs are having good medicinal property and hence supplementation of lassi with herbs

will not only improve its flavor, but also its overall nutritional quality, taste and appeal. It becomes more refreshing and it increases the acceptability more and more.

Lemon grass is also known as *Gavaticaha* in marathi language and is used as an addition to tea and in preparations such as *kadha* which is traditional herbal soup used against cough, colds, etc. It has medicinal properties and is used extensively in Ayurvedic medicine. It is supposed to help with relieving cough and normal congestion.

Hence, considering the medicinal properties of lemon grass and use of skim milk in restricting the caloric intake, the present research project entitled "Low fat lassi by incorporation of lemon grass (*Cymbopogon citratus* L.) extract" was conducted.

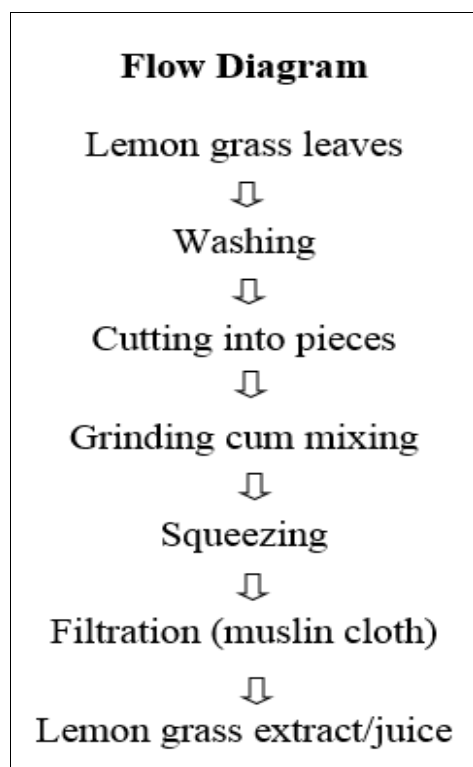
Material and Methods

For preparation of lassi, buffalo milk was collected from dairy farm of College of Agriculture, Dapoli and skim milk was obtained by centrifugal cream separation method.

Cane sugar, salt and lemon grass was purchased from local market. Local starter culture i.e. previous days good quality curd was used as culture. The starter culture selected for use was not having any defects in the curd produced from it.

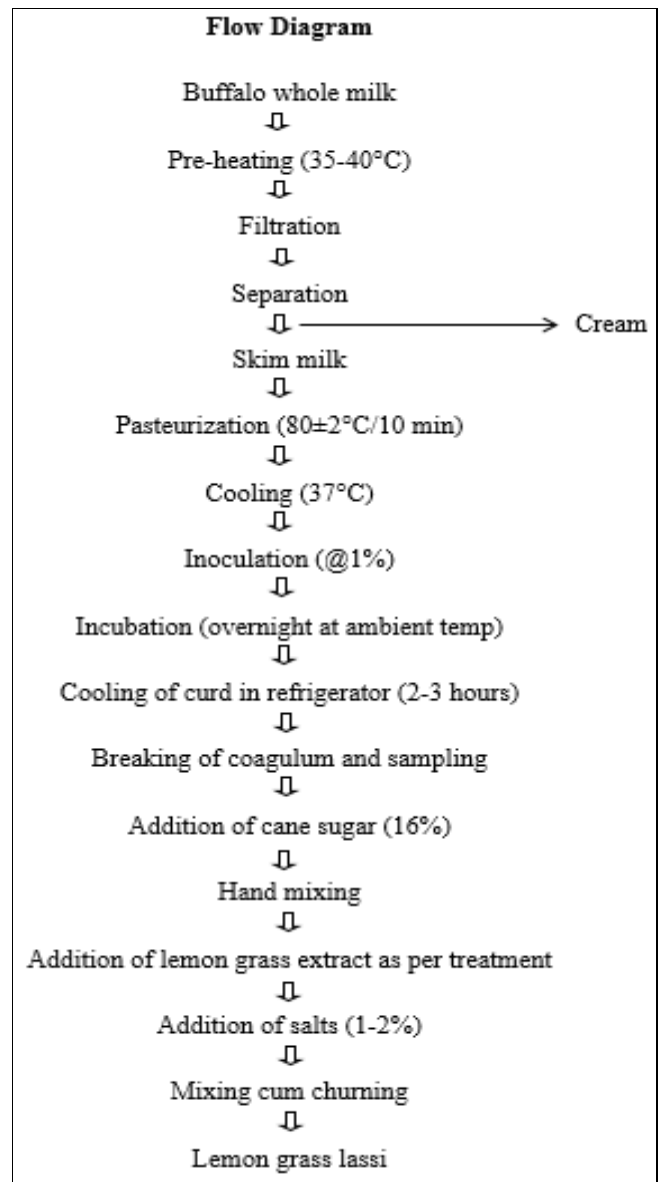
Preparation of lemon grass extract/Juice

Green, fresh lemon grass leaves were selected. The leaves of lemon grass were washed with running tap water to remove dirt and dust. For extraction, leaves were cut into small pieces and then taken into electrically operated grinder cum mixer to make homogenous mixture of leaves. Small quantity of fresh clean water was added for proper grinding and mixing. Extract was obtained by squeezing and then filtering through four fold muslin cloth. Extract obtained was used to mix at different levels during lassi preparation.



Lassi preparation

Lassi was prepared as per the procedure described by Kadlag (1982) ^[5] with partial modifications while mixing lemon grass extract.



The sensory evaluation of product was carried out by using nine point hedonic scale as per IS: 6273 (part-II), 1971. The data were statistically analyzed according to Snedecor and Cochran (1994) ^[8] using randomized block design.

Treatment Details

T₀ - No lemon grass extract (Control)

T₁ - Addition of lemon grass extract @ 2.5 percent of plain lassi (W/w)

T₂ - Addition of lemon grass extract @ 5.0 percent of plain lassi (W/w)

T₃ - Addition of lemon grass extract @ 7.5 percent of plain lassi (W/w)

T₄ - Addition of lemon grass extract @ 10.0 percent of plain lassi (W/w)

The trial was conducted with six replications.

Results and Discussion

Sensory evaluation of any consumable product is the best method of judging its acceptability by the consumers. The assessment was done by studying the characters like colour and appearance, flavour, body and texture and overall acceptability of product by the panel of judges by using "Nine Point Hedonic Scale" score card. Each sample was bearing a code number so as to avoid its identity and have impartial results.

Characteristics	Levels of lemon grass (%)					SE ±	CD At 1%
	0	2.5	5.0	7.5	10		
Colour and general appearance	7.33	7.56	7.78	7.55	7.01	0.15091	0.60546
Flavour	7.33	7.46	7.58	7.35	7.31	0.16501	0.662
Body and texture (Consistency)	7.36	7.61	7.66	7.43	7.34	0.11743	0.47111
Overall acceptability	7.34	7.54	7.67	7.44	7.21	0.09521	0.38197

Colour and general appearance

The colour of lassi should be pleasing, attractive and uniform. There shall not be any abnormality in the colour. Normally it varies from light yellow to whitish. The product should not show any signs of visible foreign matter (Pal and Gupta, 1985) [6].

The perusal of data from Table 1 showed that the score for colour and appearance was increased upto T₂ i.e. 5.0 percent addition of lemon grass extract, thereafter score was declined simultaneously. The highest score (7.78) was obtained by the treatment T₂ i.e. lassi incorporated with 5.0 percent lemon grass extract. In colour and appearance scores very marginal and inconsistent changes were observed. All the samples scored were less than 7.78 as per hedonic scale. Very negligible differences were observed in between all the treatments. Addition of very small amount of lemon grass extract did not affect the change in colour and appearance was also very clean with homogenous, slightly thin consistency.

Flavour

In general the good, clean, pleasant diacetyl flavour of a culture is desired in lassi. If a synthetic flavour is added it must be just enough. The sweetness should be optimum. Flavour should be neither flat nor too sour. The natural flavour may be enhanced or enriched by the presence of milk fat or made from fresh "dahi" a layer of malai may be added to enhance the appeal (Pal and Gupta, 1985) [6].

The perusal of data from Table 1 showed that the lassi prepared with 5.0 percent lemon grass extract possessed highest score for flavor (7.58) as it was liked much by the judges which may be due to its sweet and typical acceptable lemon grass flavour. Further addition of lemon grass extract i.e. 7.5 and 10 percent disliked by the judges due to its deep pungent flavor. Next to treatment T₂, judges preferred lassi with 2.5 percent lemon grass extract i.e. T₁ as it possessed mild lemon grass flavour. Lowest score was observed for lassi at treatment (T₄) with 10 percent lemon grass extract.

Bhatale and Rojorhia (1982) [2] reported that in general, good, clean, pleasant diacetyl flavour is desirable in lassi.

Body and Texture (Consistency)

The demand of trade varies as to the body of lassi. Some consumers prefer a heavy viscous body while the other like a rather thin body. Consequently no uniform standard can be fixed with regard to the body of lassi. However, a medium bodied lassi pouring similar to a thin gravy, seems to be most appropriate. The texture should be homogenous showing no signs of wheying off or grains or curd particles. When left undisturbed for some time, the tendency of sedimentation should not be noticed in good quality lassi (Pal and Gupta, 1985) [6].

The perusal of data from Table 4.10 showed that, the lassi prepared with 5.0 percent level of lemon grass extract (T₂) recorded highest score for consistency (7.66) followed by T₁ (7.61). The descending order in score was observed like T₂, T₁, T₃, T₀ and T₄. Lowest score was observed at treatment T₄ i.e. lassi with addition of 10 percent lemon grass extract. Medium bodied lassi pouring similar to this gravy which

seems most appropriate was observed at treatment T₂ i.e. lassi with 5.0 percent lemon grass extract.

Ebenezer and Vedamutha (1978) [3] reported that desirable sensory characteristics of fermented milk should not have slimy or wavy texture.

Overall acceptability

The effect of different levels of lemon grass extract on overall acceptability of lassi is tabulated in Table 1. For overall acceptability, average score obtained for colour and appearance, body and texture and flavour was considered.

From average figures of overall acceptability, it is clear that lassi prepared from 5.0 percent lemon grass extract scored highest point (7.67), followed by 2.5 percent lemon grass extract lassi (7.54). The score was declined simultaneously as 7.44, 7.34 and 7.21 at T₃, T₀ and T₄, respectively.

On basis of results obtained we can affirmatively state that amongst different levels of lemon grass extract, T₂ (5.0% lemon grass extract) treatment was found more acceptable by the judges i.e. good quality lassi was obtained with 5.0 percent lemon grass extract.

From the results of overall acceptability scores, thus indicates that lassi incorporated with 5.0 percent lemon grass extract is superior over rest of treatments. However, lemon grass extract @ 2.5 percent can produce good quality lassi. Higher level of lemon grass extract (7.5 and 10%) showed reduction in sensory quality score for lassi.

Conclusion

From the results of the present investigation, it may be concluded that lemon grass extract could be successfully utilized for preparation of lassi. Addition of lemon grass extract in lassi improved the sensory quality and acceptability of the product. Besides typical flavour, it also adds medicinal properties to the product. Such flavouring did not appreciably affect the composition of lassi. The most acceptable quality lassi can be prepared by using 5.0 percent lemon grass extract. Being a low fat, such type of lassi will be beneficial to the health conscious people.

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