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Probiotic shrikhand prepared by using yoghurt culture and incorporation of ginger (*Zingiber officinale* L) Juice

Nikhil Chorage, Shamika Surve, Sachin Mule, Snehal Kadam and VS Dandekar

Abstract

Shrikhand is an indigenous fermented milk product prepared by the fermentation of milk by using known strain of lactic acid bacteria. Fermented dairy products with active bacterial cultures are one of the most common sources of probiotic. Yoghurt is fermented milk product obtained by lactic acid fermentation by *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. In the present study the shrikhand was prepared from buffalo milk by using yoghurt culture. Ginger juice was used as flavouring agent at different levels viz. 5 per cent (T₁), 10 per cent (T₂), 15 per cent (T₃) and 20 per cent (T₄) of the chakka. This prepared shrikhand was compared with control shrikhand (T₀) i.e. without addition of ginger juice.

From the results of present investigation it may be concluded that ginger juice could be successfully utilized for preparation of shrikhand. The most acceptable quality shrikhand can be prepared by using 5 per cent ginger juice which contained on an average 59.18, 6.93, 7.19, 0.51 and 1.27 per cent total solids, fat, protein, ash and titratable acidity, respectively.

Keywords: shrikhand, ginger juice, chemical quality

Introduction

The demand for functional foods is growing rapidly all over the world due to the increased awareness of consumers on the impact of food on health. Functional foods, design foods, pharma foods, nutraceuticals etc. are synonyms for foods with ingredients that can prevent and treat diseases (Scheinbach, 1998) [11]. A number of health benefits have been claimed for probiotic bacteria and more than 90 probiotic products containing one or more groups of probiotic organisms are available worldwide (Tharmaraj and Shah, 2003) [14].

Shrikhand is an indigenous fermented milk product prepared by the fermentation of milk by using known strain of lactic acid bacteria. Other natural additives like dried fruits, fruit juices/pulp etc. are added to the shrikhand to enhance the flavour.

Yoghurt is fermented milk product obtained by lactic acid fermentation by *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Yoghurt has been found nutritious over milk due to higher concentration, better digestibility and absorption of fat, lactose, protein and minerals.

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 spice pulp/juice. Spices are considered as a good source of minerals with medicinal property and hence supplementation of shrikhand with spice will not only improve its flavour but also its overall nutritional quality, taste and appeal. It becomes more refreshing and increases the acceptability more and more.

Ginger, being a major spice, has many uses in the food as flavouring and medicinal product. The aroma of ginger is pleasant with flavour slightly biting due to antiseptic or pungent compounds present in it, which make it indispensable in the manufacture of number of food products. It is common ingredient in Asian cooking. Ginger has a several medicinal properties. Looking to diversified benefits of yoghurt culture and medicinal value of ginger the present research project entitled "Preparation of probiotic shrikhand using yoghurt culture by incorporation of ginger (*Zingiber officinale* L.) juice" was selected for study.

The research work was carried out at the Department of Animal Husbandry and Dairy Science, College of Agriculture, Dapoli, Dist- Ratnagiri during the year 2015-2016. Fresh buffalo milk

was procured from the Dairy unit of this college. Ingredients like sugar, ginger were purchased from the local market. Yoghurt culture (*Streptococcus thermophilus* and *Lactobacillus bulgaricus*) was brought from S. M. Seth College of Dairy Science, Anand.

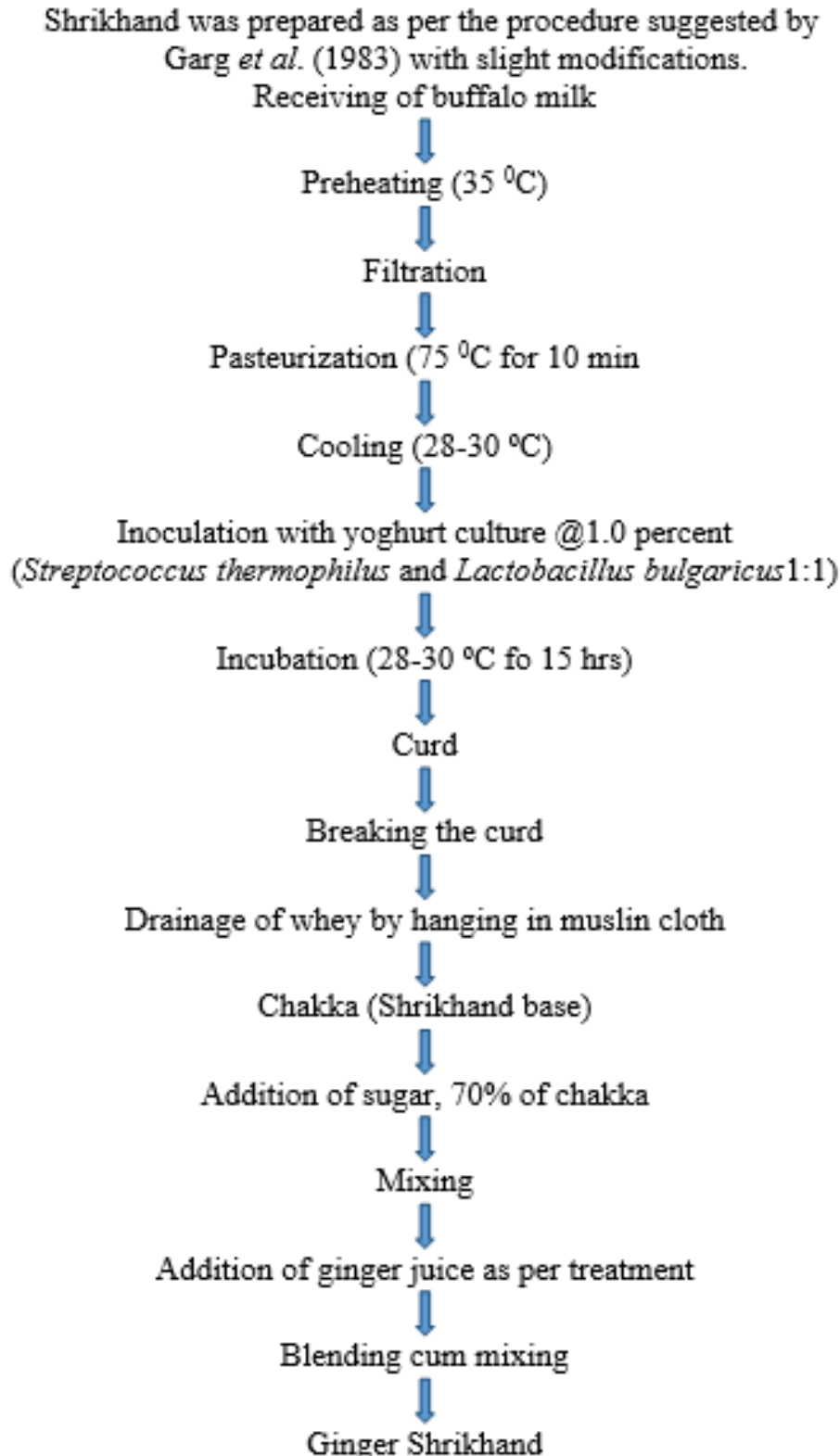
Materials and Method

Extraction of ginger juice

Fresh ginger was selected. The ginger was washed with

running tap water to remove dirt and dust. For extraction of juice it was cut into small pieces and then taken into electrically operated grinder cum mixer to make extract. During extraction small quantity of fresh clean water was added for proper grinding and mixing. Extract was filtered through 4 fold muslin cloth and obtained extract was used to mix at different levels during shrikhand preparation.

Shrikhand preparation



Probiotic ginger shrikhand was prepared with treatments viz. T₀ – control (No ginger juice) as well T₁, T₂, T₃ and T₄ with 5, 10, 15 and 20 per cent ginger juice, respectively on

replacement basis. The sugar was used @ 50 per cent of chakka for all the treatments. The trial was conducted with six replications.

Treatment details

The chakka and ginger juice were mixed (w/w) to prepare shrikhand in the following proportions.

Treatments	Chakka	Ginger juice
T ₀	100	00
T ₁	95	5
T ₂	90	10
T ₃	85	15
T ₄	80	20

The sugar was used @ 50 percent of chakka for all the treatments.

Results and Discussion

The product was analyzed for chemical constituents like total solids, fat, protein, ash and titratable acidity by adopting ISI procedures.

Table 1: Chemical quality of shrikhand (%)

Constituents	Levels of ginger (%) of chakka					SE ±	CD (At 1%)
	0 (T ₀)	5 (T ₁)	10 (T ₂)	15 (T ₃)	20 (T ₄)		
Total solids	61.72	59.18	58.77	56.92	55.22	0.3797	1.1170
Fat	7.23	6.93	6.59	6.27	6.08	0.1202	0.3536
Protein	7.43	7.19	6.96	6.73	6.50	0.0767	0.2256
Ash	0.53	0.51	0.47	0.47	0.45	0.0680	0.0231
Titratable acidity	1.29	1.27	1.26	1.26	1.25	0.0039	0.0116

1. Total Solids

Total solid content of shrikhand decreased with an increase in the level of ginger juice (Table-1). The maximum total solids content (61.72%) was noticed in shrikhand without ginger juice i.e. T₀, whereas the lowest (55.22%) was recorded in shrikhand with 20 per cent ginger juice i.e. T₄.

This simultaneous decrease from T₀ to T₄ may be due to lower amount of total solids content in ginger juice (13.18 %). The finding of present investigation are in close agreement with the figures reported by Jain (1996) [6], Aneja (1997) [2], Ghatak and Dutta (1998) [5], Tale (2013) [13] and Pendawale (2014) [9] who stated the total solids content of shrikhand as 57.30-69.67, 55-60, 68.4, 58.04-58.17 and 52.32 per cent, respectively.

2. Fat

The mean value of fat decreased significantly from T₁ to T₄. The highest fat content (7.23 %) was observed in shrikhand prepared without ginger juice (T₀), whereas the lowest fat content (6.08 %) was found in shrikhand with 20 per cent ginger juice i.e. (T₄).

The declining trend of fat content of *shrikhand* can be attributed to the fact that the fat content of ginger juice is much lower (1.18 per cent) than that of chakka. Besides, obvious reason is that as the level of ginger juice increased, there was reduction in amount of chakka on added percentage basis.

The results are in accordance with those of Kartikeyan (1993), Jain (1996) [6], Aneja (1997) [2] and Tale (2013) [13] who observed 6.03, 1.57- 22.49, 3.04-8.88, 5-6 and 5.05-5.9 per cent fat in shrikhand samples, respectively.

3. Protein

There was significant decrease in protein content of shrikhand with increase in the level of ginger juice. The highest protein content (7.43%) was observed in shrikhand prepared without no ginger juice (T₀), whereas the lowest protein (6.5%) in shrikhand with 20 per cent ginger juices (T₄).

The declining trend of protein content of *shrikhand* can be attributed to the fact that the protein content of ginger juice is much lower (1.83 per cent) than that of chakka (10.82 per

cent). Besides, obvious reason is that as the level of ginger juice increased, there was reduction in amount of chakka on added percentage basis.

The results of present research work corroborate well with the findings of various research workers like Jain (1996) [6], Aneja (1997) [2], Ghatak and Dutta (1998) [5], Tale (2013) [13] and Pendawale (2014) [9] as 7.72-11.53, 4.63-7.45, 7-8, 6.89, 5.32-5.39 and 6.83 per cent, respectively.

4. Ash

The increase in level of ginger juice resulted in significant decrease in ash content of shrikhand. The highest ash content (0.53%) was observed in shrikhand prepared without ginger juice (T₀), whereas the lowest percentage (0.45%) in shrikhand with 20 per cent no ginger juices (T₄).

Boghra and Mathur (1992) [3], Jain (1996) [6], Aneja (1997) [2] and Tale (2013) [13] reported 0.39, 0.417-0.683, 0.32-0.45, 0.45-0.55 and 0.51-9.61 per cent ash, respectively.

5. Acidity

The mean value of acidity negligibly decreased with increase in the level of ginger juice. The highest acidity (1.29 %) was observed in shrikhand prepared without ginger juice (T₀), whereas the lowest acidity (1.25 %) in case of shrikhand with 20 per cent ginger juice (T₄).

The values of titratable acidity of present investigation are corroborate well with the values mentioned by Shinde (1994), Ghatak and Dutta, Tale (2013) [5] and Pendawale (2014) [9] who reported 1.31, 1.035-1.535, 1.06, 1.36-1.40, 1.63 per cent acidity, respectively.

Conclusion

From the results of the present investigation, it may be concluded that ginger juice could be successfully utilized for preparation of shrikhand. Addition of ginger juice in shrikhand 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 shrikhand. The most acceptable quality shrikhand can be prepared by using 5.0 per cent ginger juice followed by shrikhand with 10 per cent ginger juice.

Being a probiotic such type of shrikhand will be beneficial to the health conscious people. The production cost of most acceptable quality shrikhand (T₁) was ₹ 138.70 per kg.

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