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Impact on microbial viability of soy enriched probiotic shrikhand stored at 4 °C

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Abstract

The impact on microbial viability of soy enriched probiotic shrikhand stored at 4 °C was studied. Standard plate count, Yeast and mould count, Bifidobacterial count were analyzed on 0 day, 3rd day and 7th day respectively. There was no significant difference within days in total plate count between the control, Shrikhand prepared from synbiotic milk by substitution of enzymatically modified soymilk to bifidogenic milk at 10 per cent level and 1.5 per cent starter culture (SSyM₁₀), Shrikhand prepared from synbiotic milk by substitution of enzymatically modified soymilk to bifidogenic milk at 15 per cent level and 1.5 per cent starter culture (SSyM₁₅) and Shrikhand prepared from synbiotic milk by substitution of enzymatically modified soymilk to bifidogenic milk at 20 per cent level and 1.5 per cent starter culture (SSyM₂₀) at 0, 3 and 7 days intervals. The yeast and mould were found to be absent in control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ at 0 and 3 days interval. Yeast and mould count at 7 days interval for control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ were 1.12, 1.30, 1.44 and 1.61 respectively. There was no significant difference in yeast and mould count between at different intervals. The number of *Bifidobacterium longum* counts in selective media for control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ at 0, 3 and 7 days intervals revealed no significant difference at ($P < 0.05$) between the different levels.

Keywords: Soy enriched probiotic Shrikhand, standard plate count, yeast and mould count, *Bifidobacterium longum* count

Introduction

Shrikhand is a famous traditional fermented and sweetened milk product of Indian origin. Shrikhand with its distinct taste, richness, delicacy, diversity has good market value. Shrikhand is a semi-soft, sweetish-sour milk product prepared from lactic fermented curd (Singh *et al.*, 2014)^[2] The name shrikhand is derived name from the Sanskrit word “Shikharani” meaning a curd prepared with added sugar, flavouring agents like saffron, fruits and nuts. It is popular in western India and is very refreshing particularly during summer months and is recommended for people with as it have (Swapna and Chavannavar, 2013)^[3].

Material and Methods

Soy milk was prepared with the help of soy flour. It was treated with proteolytic enzyme, Neutrase for the preparation of Enzymatically Modified Soy Milk and subsequent addition to synbiotic milk (SyM) at 10, 15, 20 per cent levels. *Bifidobacterium longum* culture was activated by propagation in reconstituted sterile skim milk. Enzymatically modified synbiotic soy milk was treated with 1.5% starter culture and incubated at 37 °C for about 10 hours to reach acidity of 1%. (Boghra *et al.*, 2000)^[1].

The whey was drained and chakka that was collected was kneaded with sugar and cardamom to make delicious soy enriched enzymatically modified probiotic shrikhand. The microbial viability of soy enriched probiotic shrikhand stored at 4 °C was studied.

Suitable dilutions were selected based on preliminary trials. Phosphate buffer solution used for serial dilution was prepared as described in BIS (IS: 5401 - 1969)^[9].

The Standard Plate count and Yeast and mould count counts were determined using the procedure described in BIS Handbook, BIS Part XI: 1981, IS:5401 (1969)^[9] respectively.

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Results

Table 1: Microbial quality of soy enriched probiotic shrikhand stored at 4 °C (log 10 cfu/g)

Days	Type of Count	Control	SSyM ₁₀	SSyM ₁₅	SSyM ₂₀
0 day	Standard plate Count	7.79 ± 0.48	7.91 ± 0.34	8.21 ± 0.83	8.14 ± 0.42
	Yeast and mould	0	0	0	0
	<i>Bifidobacterium longum</i>	7.82 ± 0.64	7.81 ± 0.13	8.32 ± 0.17	8.15 ± 0.39
3 rd day	Standard plate Count	8.63 ± 0.28	8.59 ± 0.32	8.48 ± 0.22	8.65 ± 0.23
	Yeast and mould	0	0	0	0
	<i>Bifidobacterium longum</i>	6.05 ± 0.21	6.14 ± 0.24	6.15 ± 0.11	6.26 ± 0.28
7 th day	Standard plate Count	7.89 ± 0.34	8.17 ± 0.29	8.21 ± 0.19	7.95 ± 0.19
	Yeast and mould	1.12 ± 0.43	1.30 ± 0.20	1.44 ± 0.03	1.61 ± 0.05
	<i>Bifidobacterium longum</i>	5.54 ± 0.16	5.52 ± 0.14	5.33 ± 0.15	5.27 ± 0.33

Percentages (Mean ± SE). Average of six trials. Mean values bearing different superscripts in a column differ significantly

** ($P < 0.01$)

Control	Shrikhand from Synbiotic milk, 1.5% starter culture
SSyM ₁₀	Shrikhand prepared from Synbiotic Milk by substitution of enzymatically modified soymilk to bifidogenic milk at 10 per cent level, 1.5 per cent starter culture
SSyM ₁₅	Shrikhand prepared from Synbiotic Milk by substitution of enzymatically modified soymilk to bifidogenic milk at 15 per cent level, 1.5 per cent starter culture
SSyM ₂₀	Shrikhand prepared from Synbiotic Milk by substitution of enzymatically modified soymilk to bifidogenic milk at 20 per cent level, 1.5 per cent starter culture

Discussion

Table 1 above represents the microbial quality of soy enriched probiotic shrikhand stored at 4 °C. There is no significant difference ($P > 0.05$) in Bifidobacterial count, total count and yeast count between control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ at 0, 3 and 7 days interval.

The yeast and mould were found to be absent in control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ at 0 and 3 days interval. Yeast and mould count at 7 days interval for control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ were 1.12, 1.30, 1.44 and 1.61 respectively [4, 5, 6]. There was no significant difference in yeast and mould count between at different intervals. The number of *Bifidobacterium longum* counts in selective media for control, SSyM₁₀, SSyM₁₅ and SSyM₂₀ at 0, 3 and 7 days intervals revealed no significant difference at ($P < 0.05$) between the different levels.

The number of bacterial count expressed in log₁₀ cfu/gm increased slightly with increasing level of enzymatically modified soymilk to bifidogenic milk but there was no significant difference. This indicated that lactic acid bacteria are able to survive at low temperature as reported by Okereke [1].

Yeast and mould as well coliforms count were found nil at the 0th day and after 5 days. However, no significant difference were observed on bifidobacterial count on all the day [7].

Bifidobacterial count got decreased as well as total count also got decreased in the stored samples which were stored for 7 days and there was no significant difference of the yeast and mould count was noticed on 7th day indicates spoilage.

Considering microbial evaluation, the SSyM₁₅ sample was judged as the best product with good consistency and acceptability.

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