



P-ISSN: 2349-8528
 E-ISSN: 2321-4902
 IJCS 2018; 6(6): 356-357
 © 2018 IJCS
 Received: 12-09-2018
 Accepted: 14-10-2018

B Suresh Subramonian
 Professors, Post Graduate
 Research Institute in Animal
 Sciences, Tamil Nadu Veterinary
 and Animal Sciences University,
 Kattupakkam, Kanchipura,
 Tamil Nadu, India

S Sudha
 Veterinary Assistant Surgeon,
 A.H. Department Govt. of Tamil
 Nadu, Chennai, Tamil Nadu,
 India

A Elango
 Professors, Post Graduate
 Research Institute in Animal
 Sciences, Tamil Nadu Veterinary
 and Animal Sciences University,
 Kattupakkam, Kanchipura,
 Tamil Nadu, India

A Poorani
 Assistant Professor, Veterinary
 College and Research Institute,
 Namakkal, Tamil Nadu, India

Correspondence

B Suresh Subramonian
 Professors, Post Graduate
 Research Institute in Animal
 Sciences, Tamil Nadu Veterinary
 and Animal Sciences University,
 Kattupakkam, Kanchipura,
 Tamil Nadu, India

International Journal of Chemical Studies

Effect of probiotic cultures on physicochemical and sensory attributes of probiotic Shrikhand

B Suresh Subramonian, S Sudha, A Elango and A Poorani

Abstract

A study was undertaken to prepare shrikhand using low fat milk with probiotic cultures. Following Six different combinations of probiotic cultures using three probiotic bacteria viz. *Bifidobacterium longum*, *Lactobacillus acidophilus*, *Lactobacillus helveticus* (Bl, La, Lh) at 2 per cent level and three combined cultures viz. (*Bifidobacterium longum* with *Lactobacillus acidophilus*), (*Bifidobacterium longum* with *Lactobacillus helveticus*) and (*Lactobacillus acidophilus* with *Lactobacillus helveticus*) (BILa, BILh, LaLh) at 2 per cent (1:1 ratio) were used. The optimum acidity of 0.9 to 1 per cent was reached by La, Bl, BILa cultures in 12 hours. Based on the acidity development, pH and sensory scores, the probiotic shrikhand prepared by employing *Bifidobacterium longum* and *Lactobacillus helveticus* was adjudged as the best among all the treatments.

Keywords: Probiotics, *Bifidobacterium longum* and *Lactobacillus helveticus* shrikhand, physicochemical properties

Introduction

Fermented milk products represent an increasing and considerable percentage of milk products purchased by the consumer. The organoleptic, nutritional and probiotic characteristics of fermented milk meet the expectations and requirement of all classes of consumers. Hence, fermented milk products are catching up the market of health-conscious consumers. Of the various fermented milk products produced in India, shrikhand is one receiving more popularity in the recent times due to its better palatability.

Shrikhand is a sweetened indigenous milk product of pasty consistency with slight sour taste, made from chakka. To, make it more dietetic, low fat (2%) milk and probiotic cultures were used for the preparation. According to Fuller (1989) ^[1], the probiotic could be designated as a live microbial feed supplement, which beneficially affects the host animal by improving its intestinal balance. Addition of probiotics imparts many potential health benefits like alleviation of lactose intolerance, hypocholesterolemic effect, immunostimulatory effect and anti-carcinogenic effect.

Materials and Methods

Probiotic cultures

Six different combinations of probiotic cultures using three probiotic bacteria viz. *Bifidobacterium longum*, *Lactobacillus acidophilus*, *Lactobacillus helveticus* (designated as Bl, La and Lh respectively) at 2 per cent level and three combined cultures viz. (*Bifidobacterium longum* with *Lactobacillus acidophilus*), (*Bifidobacterium longum* with *Lactobacillus helveticus*) and (*Lactobacillus acidophilus* with *Lactobacillus helveticus*) (designated as BILa, BILh and LaLh respectively) at 2 per cent (1:1 ratio) were used.

Preparation of probiotic shrikhand (Suresh Subramonian, 1992) ^[4].

Fresh milk was obtained from University Research Farm, Madhavaram and subjected to cream separation and the fat percentage was adjusted to 2 per cent. Then, low fat milk was heated to 85°C for 30 min and cooled to 37°C inoculated with 2 per cent single culture and 2 per cent combined culture separately. Incubation of culture was done at 40°C to 10 to 12 hours. The whey was drained using a basket centrifuge with specially designed bag in Department of Dairy Science and Chakka obtained was kneaded with 80 per cent sugar, 0.4 per cent cleaned powdered cardamom and 0.1 per cent saffron (Sukumar De, 1980) ^[3]. The product was stored at 5°C. pH was estimated by using digital pH meter and acidity expressed as per cent lactic acid. Statistical analysis was done by SPS Duncan Multiple Range System.

Results

The physicochemical properties of probiotic shrikhand

prepared by employing six different combinations of probiotic cultures using three probiotic bacteria are given hereunder.

Table 1: Physicochemical properties of different probiotic cultures

	Probiotic cultures						F-value
	Bl	La	Lh	BIa	BIh	LaLh	
Acidity (LA%)	0.92 ^d ± 0.042	0.98 ^d ± 0.025	1.51 ^a ± 0.047	0.95 ^d ± 0.043	1.24 ^c ± 0.088	1.42 ^b ± 0.021	12.240**
pH	5.34 ^a ± 0.032	5.06 ^b ± 0.02	4.65 ^d ± 0.024	5.20 ^b ± 0.101	4.88 ^c ± 0.013	4.82 ^c ± 0.014	115.04**

The sensorial attributes of probiotic shrikhand prepared by employing six different combinations of probiotic cultures using three probiotic bacteria are given hereunder.

Table 2: Sensory evaluation of different probiotic cultures

	Control	Probiotic Shrikhand						F-value
		PSBl	PSLa	PSLh	PSBIa	PSBIh	PSLaLh	
Flavour	7.00 ^b ± 0.025	7.00 ^b ± 0.025	7.16 ^b ± 0.307	7.16 ^b ± 0.307	6.66 ^c ± 0.210 ^c	8.16 ^a ± 0.307	7.33 ^b ± 0.210	3.456**
Consistency	7.16 ^{ab} ± 0.258	7.16 ^{ab} ± 0.307	7.00 ^b ± 0.258	7.00 ^b ± 0.25	7.00 ^b ± 0.258	7.16 ^a ± 0.258	7.16 ^{ab} ± 0.307	2.000**
Acceptability	8.00 ^a ± 0.245	6.83 ^c ± 0.307	7.00 ^c ± 0.258	7.00 ^c ± 0.25	7.16 ^{bc} ± 0.307	8.16 ^a ± 0.307	7.50 ^{ab} ± 0.223	3.095**
Total scores	22.16 ^b	20.99 ^d	21.16 ^c	21.16 ^c	20.83 ^e	24.38 ^a	21.99 ^b	4.68**

Discussion

After 12 hours of incubation, the Lh reached maximum acidity 1.51 and 0.92 by Bl. The Lh and Lh combinations reached maximum acidity because Lh is a high acid producers (IDF: 277) [2]. There was no significant difference noticed between La, BIa and Bl cultures. The pH development was high in Bl cultures and low in BIh, LaLh cultures after 12 hours. The acidity development of Bl and La cultures are concurrent with the findings of Ziden *et al.* (1990) [6] and Upadhayay (1982) [7].

After 12 hours of incubation the required pH of 5.4 to 4.6 was reached by Lh and Lh combinations in 10 hours itself. This was in agreement with the observations of Suryawanshi *et al.* (1993) [5].

The maximum total score of 24.38 and minimum total score of 20.99 were obtained by PSBIh and PSBl respectively. The total sensory scores were influenced by flavour, consistency and acceptability scores and significant differences ($P < 0.01$) were noticed.

The *Bifidobacterium longum* and *Lactobacillus helveticus* are capable of producing flavour compounds acetaldehyde, acetone and diacetyl. Thus enhancing the flavour (IDF: 277). PSBIh scored the maximum points to conclude it as the most accepted shrikhand sample and best probiotic combination.

References

- Fuller R. Probiotics in man and animals. J Appl. Bacteriol. 1989; 66:365-378.
- International Dairy Federation Bulletin, 1989, 277
- Sukumar De. Outlines of Dairy Technology, Oxford University Press: Delhi, India, 1980, 411.
- Suresh Subramonian B. Selection of level and type of LAB starter in the preparation of dietic shrikhand. J. Food Sci. Tech. 1992; 34(4):340-342.
- Suryawanshi SU, Lembhe AF, Khedkar CD, Karuwar HV. Study to evolve rapid method for shrikhand manufacture. Indian J Dairy Sci. 1993;46(9):269-273.
- Upadhayay, SM. Assessing the suitability of different microbiological and chemical tests on keeping quality of shrikhand. M.Sc. Thesis, Gujarat Agri. University, Gujarat India, 1982.
- Ziden ZA, Fayed AE, Shenany MAEI, Abovarab AAK. Susceptibility of some lactic acid bacteria to different insecticides. Egyptian J Dairy Sci. 1990; 18:11-22.