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Effect on different levels of maltodextrin on microbial properties of synbiotic lassi by using buffalo milk

SG Jagadale, SH Terde, PD Chendge, SS Ramod and SY Waghmode

Abstract
A study on Preparation of synbiotic lassi from buffalo milk. Maltodextrin and probiotic culture (*Lb. acidophilus*) 1.5 per cent were carried out by using buffalo milk. The attempts have been made to study effect of different levels of maltodextrin (0, 1, 1.5 and 2 %) on microbial analysis of synbiotic lassi. Synbiotic lassi prepared with 1.5 per cent maltodextrin was found superior over rest of the treatments.

Keywords: Synbiotic, maltodextrin, *Lb. acidophilus*

Introduction
A newly born infant is unable to ingest and assimilate nutrient from any food source other than milk. Consequently, milk has to provide all the growth promoting nutrients in an easily acceptable form. For elderly peoples, children, pregnant and nursing mothers, milk play important role in meeting the requirement of many essential nutrients and hence milk is considered as protective food. Lassi is very well-known tradition cultured dairy product consumed usually as a summer drink in our country especially in northern region.
Probiotics are living micro- organisms, which upon ingestion in certain numbers exert health benefits beyond inherent basic nutrition (IDF, 2003). According to FAO (2007) prebiotics means non-viable food component that confer health benefit on the host associated with modulation of the microbiota. The symbiotic concept combines efficacious probiotic strains with specific prebiotic compound in a single product. Synbiotic is defined as a mixture of probiotics and prebiotics that favourably affects the host by improving the survival and implantation of live microbial dietary supplement in the GI tract.

Material and Methods
For preparation of synbiotic lassi buffalo milk was received from Dairy farm, College of Agriculture, Dapoli, whereas probiotic culture (*Lactobacillus acidophilus*) were purchased from NDRI, Karnal (Haryana), prebiotic (maltodextrin) purchased from Dodal Enterprises, Kolhapur and sugar were purchased from the local market. The synbiotic lassi was prepared as per the procedure given by Sukumar De (2008) with slight modification.
The fresh good quality buffalo milk was pre-heated to 35-40^{0}C and subjected to filtration. The milk was heated to 90^{0}C for 15 min. and then cooled to 35^{0}C. Milk was distributed into four different utensils, which were properly cleaned and sterilized. Then 1%, 1.5%, 2% of prebiotic (maltodextrin) were added into three utensils, separately and fourth container was a control. Then 1.5% culture of *Lb. acidophilus* were added in all utensils. The contain were properly mixed, distributed into tins and incubated at 37^{0}C for 8 hrs then synbiotic lassi is prepared by following process.
The fat content of milk and synbiotic lassi was determined by using standard Gerber method as per IS: 1224 (part-I), 1977 [7]. The acidity of milk and synbiotic lassi was estimated according to IS: 1479, (part–I), 1960 [5]. The total solids and protein content of milk and synbiotic lassi were determined as per IS: 1479 (part-II), 1961 [6]. The ash content of milk and synbiotic lassi was determined as per the procedure given in A.O.A.C. (1975) [1]. The lactose content of milk and synbiotic lassi was estimated by Lane Eyon method prescribed in ISI Handbook (1981). The data were statistically analysed according to Snedecor and Cochran (1994) [12] using randomized block design.

Flow chart for synbiotic lassi preparation

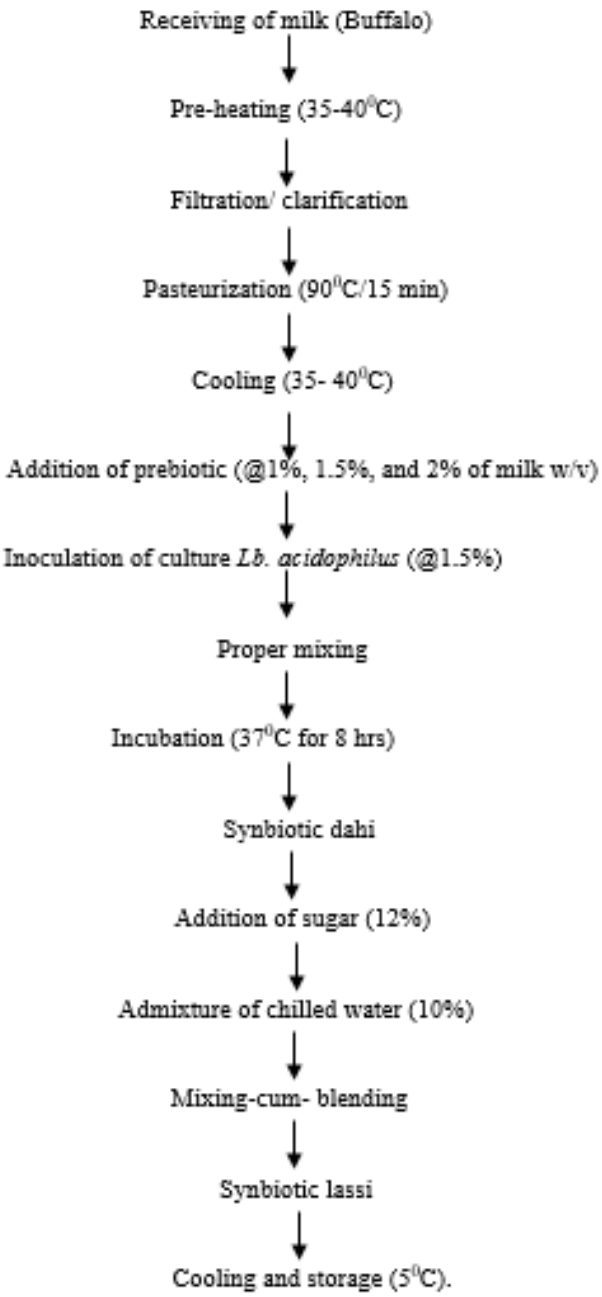


Fig 1: Flow diagram for preparation of synbiotic lassi

Results and Discussion

Microbial analysis of fresh and stored synbiotic lassi

The most optimum level found during research was subjected for shelf- life study up to 10 days under refrigerated (5 to 7^0 C) conditions. The microbial parameters studied were *Lactobacillus acidophilus* count, *E. coli* count and yeast and mould count.

This most optimum level was subjected to sensory evaluation also on 0, 5 and 10 days of storage.

The results pertaining to Microbial evaluation of most acceptable level synbiotic lassi at various time intervals are presented in Table 2.

Table 1: Microbial evaluation of most acceptable level of synbiotic lassi at various time intervals.

Microbial parameter	*Lactobacillus acidophilus* (10^6 cfu/ g)	Coliform count (10^1cfu/ g)	Yeast & Moulds count (10^1cfu/g)	Overall acceptability
D_0	130.50	Nil	0.13	8.36
D_5	108.83	Nil	0.15	7.8
D_{10}	86.83	Nil	0.55	5.5

From critical perusal of data of Table 2, it was observed that initial count of *L. acidophilus* i. e. count of synbiotic lassi (130.50 $\times 10^6$ cfu/g) was reduced to (86.83$\times 10^6$ cfu/g) on 10th day and Yeast and moulds count of lassi (0.13$\times 10^1$ cfu/g) was

increased to (0.55×10^1 cfu/g) at storage period.
In refrigerator condition (5-7ºC) synbiotic lassi edible upto 5 days after 5 days reduced synbiotic effect of lassi.

Conclusion

From the results of the present investigation, it may be concluded that maltodextrin could be successfully utilized for preparation of synbiotic lassi. Addition of maltodetxrin in synbiotic lassi improved the microbial quality and acceptability of the product. The most acceptable quality artificial colostrum cake can be prepared by using 1.5 per cent maltodextrin and 1.5 per cent *Lb. acidohilus*. Synbiotic lassi will be beneficial to the health conscious people.

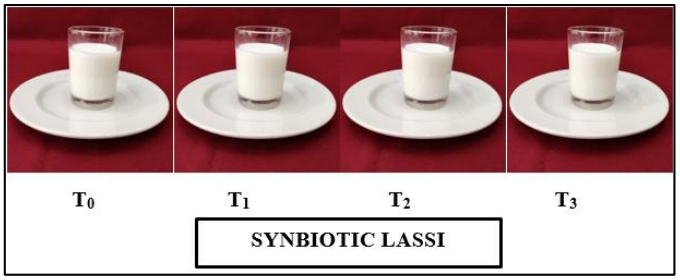
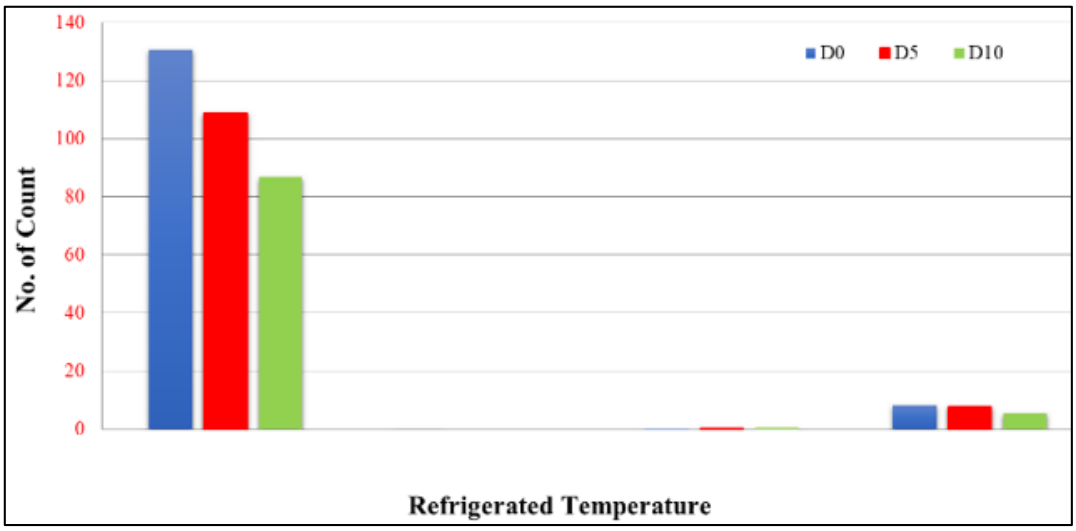


Plate 3: Synbiotic lassi with different levels of maltodextrin



Graph $: Standard coliform count yeast and mould

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