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E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Effect of Type of Milk, Starter Culture with Inoculation Levels, Incubation Temperature and Incubation Periods on Body and Texture of Dahi

Abstract

The body and texture of Dahi was influenced significantly by the combined effect of different type of milk, starter culture with inoculation levels, incubation temperature and incubation periods. The maximum liking score (9.00) was for Dahi which prepared from the combination of Sahiwal X Jursey cross-bred cow milk, S. lactis starter culture with 1% inoculum, 25^0C incubation temperature and 8 hours incubation periods and found to be the most suitable combination for obtaining better quality product. The minimum liking score (1.00) was noted in case of Dahi prepared from the combination of Bhadawari buffalo milk, S. lactis starter culture with 3% inoculum, 37^0C incubation temperature and 12h incubation period.

Keywords: Buffalo, Dahi, Incubation Period, Starter Culture, Temperature, Texture.

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Introduction

Dahi is a fermented milk product prepared from milk after boiling, cooling, mixing of starter culture and incubation. Clean fresh milk obtained from healthy animals (or skim milk) having acidity below 0.17% be selected. It should be strained through clean muslin cloth to remove visible dirt, hair and other foreign matter.

Indian curd, known as Dahi, is one of the oldest Indian fermented milk products (Sarkar 2008) and is consumed by large sections of the population throughout the country, either as a part of the daily diet or as a refreshing beverage (Caballero et. al, 2003). Since conversion of milk into Dahi is an important intermediary step in the manufacture of indigenous butter and ghee. It can be said that over 40 percent of the total milk production in India today is converted into Dahi.

Dahi is a semisolid sourish food formed by the process of lactic acid fermentation, by some of the micro-organism involved in the preparation of Dahi. The product has been prepared in every household of the country, by back sloping i.e. mixing a small amount of already fermented-curd to the boiled and cooled milk. (Selvan and Bharath, 2018).

It has been established that fermented milk products including Dahi increase in food and nutritive value as compared to the original milk. It is more palatabls and those who usually do not like drinking milk would consume it readily. It is more easily digested and assimilated than milk and seems to exert a possible therapeutic value in the stomach and during intestinal disorders, due to its content of antibiotics. The desirable quality Dahi contain 0.75 to 0.85 percent acidity, soft and firm body, mild, pleasant smell, smoth and glossy surface and yellowish creamy-white for cow and creamy-white for buffalo milk Dahi. It has a short keeping quality at room temperature but under refrigerated storage (5-10^0C), it usually keeps well for a maximum period of one week.

Aim of the Study

1. Study the effect of type of milk on the body and texture of Dahi.
2. Study the effect of different type of starter culture on the body and texture of Dahi.
3. Study the effect of different incubation temperature and periods on the body and texture of Dahi.

Material and Methods

Raw milk of different breeds of cow (Sahiwal, (A_1), Sahiwal X Jursey (A_2), Sahiwal X Frisian (A_3), Buffalo Bhadawari (A_4) and Murrah

(A_5) was obtained for Dahi making. 100 ml capacity of plastic cups were used for Dahi making during the investigation. The cups are manufactured by the century ultra pack, New Delhi and Dairy tops, division of KFF Ltd., Bombay, Pune with the trade names Volga and Yankee Doodle, respectively. These were purchased from local market of Kanpur city. Freeze dried pure cultures namely streptococcus lactis and streptococcus diacetilactes were obtained from National collection centre of Dairy cultures, Dairy microbiology division, N.D.R.I (I.C.A.R.), Karnal. Both cultures with 1%, 2% and 3% inoculum as B_1,B_2, B_3, B_4, B_5 and B_6 were used for Dahi making. Incubation temperature were 25^0C, 30^0C and 37^0C (C_1,C_2 and C_3) with incubation period 8h, 10h and 12h (D_1, D_2 and D_3) were adopted. The milk was warmed upto 38^0C and cool down to 15-20^0C before samplying. The sampled raw milk was boiled for 3 to 5 minutes and cool to 40^0C. The physical diagnosis of Dahi prepared in 100 ml capacity plastic cups which was free from any contamination was done to know the effect of different factors. The score evaluation of Dahi samples (100 ml) were served for judging to panel comprising of five most experienced members from the department of A.H. & Dairying for its score assessment by nine point hedonic scale. The scores of different judges were assembled and average score was estimated as excellent 8 to 9, very good 7 to 8, good 6 to 7, fair 5 to 6 and poor less than 5. The acceptability of the product were evaluated as liked extremely-9, like very much-8, like moderately-7, liked slightly-6, Neither liked nor disliked-5, Disliked moderately-4, Disliked slightly-3, Disliked very much-2 and disliked extremely-1.

Results and Discussion

The body and texture is the most sensory attribute of Dahi. The body and texture of Dahi affected by different factors as type of milk, starter culture with inoculum level, incubation temperature and levels.

The average values of body and texture of Dahi affected by types of milk were found to be 6.73, 6.91, 6.59, 6.64 and 6.49 for A_1, A_2, A_3, A_4 and A_5 milks, respectively which indicates that all the samples of Dahi were graded good and liked moderately. The maximum (6.91) and the minimum (6.49) likings were in case of Dahi prepared from Sahiwal X Jursey cross-bred cow's milk (A_2) and Murrah buffalo milk (A_5) respectively. Statistically mean values for all the treatments differ significantly to each other. Mean scores for Dahi prepared from cow and buffalo milk were 6.74 and 6.57, respectively. It indicates that cow milk was found most suitable for Dahi making followed by buffalo milk.

Table- 1 : Means of body and texture score of Dahi as affected by different types of milk (A), starter cultures and their levels (B), incubation temperatures (C) and incubation periods (D).

Factors	Levels and Means						S.E.	C.D. at5%
A	**A_1**	**A_2**	**A_3**	**A_4**	**A_5**			
	6.73	6.91	6.59	6.64	6.49	-	0.024	0.047
	Cows			Buffalo				
	-	6.74	-	-	6.57		0.015	0.030
B	B_1	B_2	B_3	B_4	B_5	B_6		
	7.06	6.65	6.28	7.04	6.77	6.23	0.026	0.052
	S_1			S_2				
	6.67	-	-	-	6.68	-	0.015	0.030
	I_1		I_2		I_3			
	7.05	-	6.71	-	6.25	-	0.018	0.037
C	C_1		C_2		C_3			
	8.49	-	8.39	-	3.14	-	0.018	0.037
D	D_1		D_2		D_3			
	7.04	-	6.67	-	6.31	-	0.018	0.037

The means of body and texture of Dahi as affected by different starter cultures with different inoculation levels score were found to be 7.06, 6.65, 6.28, 7.04, 6.77 and 6.23 for B_1, B_2, B_3, B_4, B_5 and B_6, respectively. It is clear from the data that maximum liking (7.06) was for Dahi prepared by the use of S. lactis starter culture with 1% inoculum (B_1) followed by Dahi prepared by the use of S. Diacetilactis starter culture with 1% inoculum (B_4) scored 7.04, which were graded very good and liked very much while the minimum liking (6.23) was recorded in case of Dahi prepared by the use of S. Diacetilactis starter culture with 3% inoculation level and categorised as good quality and liked moderately. Statistically the higher and lower values differed significantly. The means of overall acceptability score of Dahi as affected by starter culture were 6.67 and 6.68 for S_1 and S_2, respectively, and graded good and liked moderately which differ insignificantly. The overall acceptability score affected by different inoculation levels were found to be 7.05, 6.71 and 6.25 for I_1, I_2 and I_3 inoculation levels, respectively. It indicates that 1% inoculum (I_1) found most suitable for Dahi making followed by 2% (I_2) and 3% (I_3) inoculum.

The means of body and texture of Dahi as affected by different incubation temperature were found to be 8.49, 8.39 and 3.14 for C_1, C_2 and C_3, respectively. It indicates that 25^0C incubation temperature (C_1) was found most suitable for Dahi preparation and the product was categorised as excellent quality and liked extremely followed by 30^0C (C_2) and 37^0C (C_3) incubation temperature. Dahi prepared at 37^0C incubation temperature scored minimum 3.14 and graded poor quality and disliked slightly. It is obvious from present findings that as the incubation temperature increased, there was decreased in the liking of Dahi.

The means of body and texture of Dahi as affected by different incubation periods were found to be 7.04, 6.67 and 6.31 for D_1, D_2 and D_3, respectively. It indicate that 8h incubation period (D_1) was found most suitable for the preparation of Dahi scoring 7.04 which was categorised very good quality and liked very much followed by Dahi prepared with 10h (D_2) and 12h (D_3) incubation periods which were graded good and liked moderately. It is obvious from our findings that as the incubation period increased, there was decrease in acceptability of Dahi.

Conclusion

It is concluded that body and texture of Dahi was affected significantly by the combined effect. The excellent Dahi which liked extremely was found/prepared by the combination of Sahiwal x Jursey cross-bred cow milk, S.lactis starter culture with 1% inoculums, 25^0C incubation temperature and 8 hours incubation periods.

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