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EFFECT OF CONTAINERS, CULTURES AND INCUBATION ON MICROBIOLOGICAL QUALITY OF DAHI

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ABSTRACT

The Dahi was prepared from cow milk using different type of pots and starter cultures of different incubation temperature and period. It was analyzed for microbial quality and overall minimum standard plate counts coliform count , yeast and mould count , staphylococci count were observed, Best quality Dahi was prepared in stainless steel pot with pure culture (Lactococus lactis sub Sp, Lactis) with 2% inoculums level at 30^{0}C inoculation temperature with in 10hrs incubation periods. Which did not contain salmonella and shigella.

It is however suggested that for preparation of Dahi in earthern pots(Kullars)it is very essential to treat them with boiled water for 5 min to density all contaminates and Dahi prepared after this treatment would be safe for public health.

Key words : **Dahi , yoghurt , containers , S.P.C. coliform, Y.M.C, etc.**

Dahi is most the popular and oldest fermented milk product of our country , prepared and utilized in various forms in almost all homes , it is indigenous milk product of considerable economic and nutritional importance .

The conversion of milk into Dahi provides a ideal means of utilizing surplus production , Dahi is consumed either as such or other forms such a Lassi in Villages . It is also used as an intermediary for preparation of desi butter , ghee , shrikhand and cottage cheese etc.

According to PFA (1976) , Dahi or curd is the product obtained from pasteurized or boiled milk by souring nature or otherwise , by a harmless lactic acid or other bacterial culture . Dahi may contain additional cane sugar , The microbial quality of all the Indian milk products are deplorable poor and the same situation is with Dahi , Therefore , the study of fundamental facts of all enormous from economics, health and nutrition aspects , it is very essential to study the different type of microbial contamination of Dahi.

Materials and Methods

Materials :-

Material required for the present study in as follows:-

1- Cow Milk -

Cow milk was obtained from dairy farm of C.S.A University of agriculture and technology Kanpur.

2- Type of Containers

a- Earthen pots

b- Plastic pots

c- Stainless steel pots

3- Type of Culture

a- Market culture with 2% of inoculums

b- Pure culture (*Lactococcus lactis sub sp. lactis*) with 2% of inoculom.

4- Incubation period

a- 10 hrs

b- 12 hrs

5- Incubation temperature

a- 30^0C

b- 35^0C

These are use 24 treatment replication these in CRD.

Method :

Milk

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Preheating (35^0 - 40^0C)

↓

Filtration /Clarification

↓

Standardization

↓

Pre heating (60^0C)

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Homogenization (176kg/sq.)

↓

Pasteurization (80-90^0C for 15-30 minute)

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Cooling (20-25^0C)

↓

Incubation (market/pure culture)

↓

Packaging

↓

Dahi

↓

Cooling and storage (5^0C)

Factors Studies :

Microbiological qulity analysis was done according to standard methods for the examination of the dairy products (Ghos and Rajorhia, 1987).

i- Standard plate counts /gm.

ii- Coliform count/gm

iii- Yeast and mould count/gm

Result and discussion:

The maximum standard plate(6.25×10^5/gm) was noted in earthen pot (A_1) and minimum standard plate count (5.78×10^5gm) was noted in stainless steel pot (A_3) samples. The maximum standard plate count (6.57×10^5gm) was noted market culture with 2% inoculums level (B_1) and minimum standard plate count ($5.52\ 10^5$/gm) was noted in pure culture with 2% inoculums level. However higher standard plate (6.09×10^5/gm) was recorded at 35^0c incubation temperature (C_2) and lower standard plate count ($6.00\ 10^5$/gm) was noted in 30^0c incubation temperature (C_1) samples. The result varied significantly . Numerically higher standard plate count (6.70×10^5/gm) was noted in 12 hrs incubation period (D_2) where as lower standard plate count (6.02×10^5/gm) was observed in 10hrs incubation period (D1) similar results were reported by delia Mauro (1980) and Jayram and Gandhi (1987).

Regarding Coliform count it was maximum ($28.96\times\ 10^2$/gm) in earthen pot (A_1) minimum (11.37×10^2/gm) in stainless steel pot (A3) samples . Relativity higher coliform count (37.80×10^2/gm) was noted in market culture with 2% inoculums level (B_1) and lower count (nil) was noted in pure culture with 2% inoculums level (B_2). The maximum coliform count (23.97×10^2/gm was noted in 35^0C incubation temperature (C_2) and minimum coliform count (13.83×10^2/gm) was noted in 30^0C incubation temperature (C_1) . The result in coliform count varied significantly. Twelve and ten hrs incubation

recorded higher (21.39 $\times 10^2$/gm) and lower (16.42 $\times 10^2$/gm coliform count respectively the two incubation periods , however did not differ significantly . These results are in accordance with the reports of Ghos and Rajorhia (1987) and Jayram and Gandhi (1987).

Earthen pots recorded maximum yeast and mould count (57.21 $\times 10^2$/gm) while the minimum (28.50 10^2/gm) was noted in stainless steel pot (A_3) samples. These was higher count (73.67× 10^2/gm) under market culture with 2% inoculums level (B_1) and lower (5.83× 10^2/gm) in pure culture with 2% inoculums level (B_2). Incubation at higher temperature recorded (43.67 $\times 10^2$/gm)count and lower temperature showed (53.83× 10^2/gm)count. The result is varied significantly . The maximum (41.75$\times 10^2$/gm and minimum 53.75× 10^2/gm) yeast and mould count were noted in 12 hrs and 10hrs incubation period respectively .The differences due to incubation period were not effective significantly the result are in line with the report of Gupta and Tiwari (1982).

Table -1.
Effect of container cultures inoculation and incubation on the microbiology of Dahi.

Treatment	S.P.C/gm×10^5	Coliform Count/gm×10^2	Yeast and Mould Count/gm×10^2	Staphylo cocci Count/gm	Salmonella and Shigella count/gm
Earthen pot-A_1	6.25	28.96	57.25	86.62	00.00
Plastic pot-A_2	6.10	16.37	33.50	69.75	00.00
Stainless steel pot-A_3	5.78	11.37	28.50	38.46	00.00
Market culture B_1	6.57	37.80	73.67	107.39	00.00
Pure culture B_2	5.52	00.00	05.83	22.50	00.00
30^0C-C_1	6.00	13.83	35.83	61.64	00.00
35^0C-C_2	6.09	23.97	43.76	68.25	00.00
10hrs -D_1	6.02	16.42	37.75	63.33	00.00
12hrs -D_2	6.07	21.39	41.75	66.56	00.00

As regards Staphylococci count it was maximum (86.62/gm) in erthen pot and minimum (38.46/gm) in stainless steel pot. Market culture recorded Staphylococci count of 107.30/gm with 2% inoculums level while(22.50/gm) was noted in the case of pure culture with 2% inoculums level. This count was noted higher (68.5/gm) in 35^Oc incubation and lower (61.64/gm) in 30^0C incubation temperature samples . Both the incubation temperature varied significantly. The higher Staphylococci count (66.56/gm) was noted in 12 hrs incubation period (D_2) and lower (63.33/gm) was observed in 10 hrs incubation period (D_1) samples. The differences were not significant.

The Salmonella and Shigella pathogenic bacteria were found absent in all samples of Dahi prepared from the combination of different types of container using different starter culture, incubation

temperature and incubation periods which indicated that Dahi was prepared in the laboratory under most hygienic and aseptic conditions . The findings are agreement with the reports of Prasad et. al, (1984) and Ghos and Rajorha (1987)

Conclusion :

On the basis fo reult obtained in the present investigation , it is stated that Dahi prepared in stainless steel pots using starter culture (Lactococcus lactis sub sp. Lactis) and incubation at 30^0C for 10 hrs contained very less number of standard plate count while coliform count , yeast and mould count, staphylococci count and salmonella and shigella count were found zero indicating no contamination of these microorganism fallowed by plastic container packed Dahi through the organoleptic quality of Dahi was not satisfactory. Dahi packed in earthen pots using pure starter culture , and incubated at 30^0C for 10 hrs contained higher number of micro organism including yeast and mould and staphylococci count , while coliform and salmonella and shigella count were found absent. Dahi prepared by use of market mixed culture irrespective of containers , incubation expressed poor quality containing higher number of all tested microorganism.

It is therefore concluded that earthen pots used for preparation of Dahi without proper treatment, might bring sour taste containing different type of micro organism , some of which might be harmful and pathogenic while the Dahi prepared in stainless steel containers properly washed and sanitized showed very less number of microbial harmful and pathogenic micro organism including microbial contamination.

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