Journal of Applied Sciences Research, 4(1): 14-15, 2008

Improvement of Shelf Life of Raw Milk by Dry Heat Treatment of Milking Pail

K. Saravanakumar, G. Kumaresan, B. Murugan, R. Annal Villi and D. Ramasamy

Department of Dairy Science, Veterinary College and Research Institute, Namakkal-637002, India.

Abstract: Among the various sources, milking pail is the main source of bacterial contamination of raw milk. By dry heat treatment of the milking pail, the bacterial load in the pails could be reduced and the shelf life of raw milk could be prolonged. This simple practice can be recommended for small and marginal farmers for adoption in the tropical countries since it is easy and cheap. It can be concluded that heat treatment of the milking pail reduces the microbial load tremendously and improves the shelf life of raw milk.

Key words: Milking pail-dry heating-low bacterial load- good shelf life - raw milk

INTRODUCTION

Low microbial count milk is essential for the preparation of UHT milk and infant foods etc. At present bactofugation is practiced for the reduction of the bacterial load. But it is a costly method. The bacterial load of raw milk from Veterinary College and Research Institute, Farm was studied by[3,4]. They reported the total bacterial count of 6.44 $\log_{10}$cfu/ml. An attempt was made to reduce the bacterial load of raw milk by dry heat treatment of milking pails and comparing it with conventionally cleaned milking pails.

MATERIALS AND METHODS

The milking pails cleaned using the detergent and dried under sun was used as a control vessel. For the experimental trial the cleaned pail was exposed to direct fire until traces of fume appears from the inside of the pail and it was allowed to cool to room temperature. This pail was used for collecting the milk from cows during hand milking. The total viable count[1] of aseptically drawn milk, milk collected using washed pail and milk collected using heat treated pail was estimated as per the standard procedure. Methylene Blue Dye Reduction Test (MBRT) time[2] and shelf life of milk (Clot On Boiling (COB)) were studied. The data collected were analyzed statistically as per[6].

RESULTS AND DISCUSSIONS

The bacterial load ($\log_{10}$cfu/ml) of aseptically drawn milk, milk collected by using washed pail and heat treated milking pail are presented in the table-1. There was no significant difference in the total viable count of milk samples collected using heat treated milking pail and aseptically drawn milk. Milk samples collected in washed milk pails had the highest total viable count. The microbial load of the washed milking pail agreed well with the report of[5]. The count differed significantly ($P.<0.01$) between cleaned milking pail and dry heat treated milking pail.

The MBRT time of the aseptically drawn milk and milk collected using heat treated milk pails was more than 12 hrs and negative for COB whereas in the samples collected using the washed milking pail was 6 hrs and positive COB test at that time.

Table 1: Mean total viable count of milk samples

	Total bacterial count ($\log_{10}$cfu/ml)				
Type of milk	0 h	2 h	4 h	6 h	8 h
Aseptically drawn milk	4.26±0.02[a]	4.32±0.02[a]	4.62±0.11[a]	4.92±0.02[a]	5.09±0.13[a]
Washed Milk pail	4.70±0.01[b]	5.00±0.06[b]	5.34±0.12[b]	5.69±0.10[b]	5.83±0.19[b]
Heated milk pail	4.34±0.02[a]	4.43±0.01[a]	4.78±0.14[a]	5.04±0.08[a]	5.19±0.06[a]

Means bearing different superscripts across the column differ significantly ($P<0.01$).

Corresponding Author: K. Saravanakumar, Department of Dairy Science, Veterinary, College and Research Institute, Namakkal-637 002, India.
Tel: 91 04286 266239 E-mail : drsarava@yahoo.com

REFERENCES

1. APHA, 1978. American Public Health Association in Standard methods for examination of dairy products. (Ed. Elmer, H. Marth. Wasington, D.C)
2. Bureau of Indian standards 1960. Methods of test for dairy industry Part – I. Rapid Examination of milk. IS: 1479-1969.
3. Kumaresan, G., R. Annal villi, D. Chandrasekaran, N. Dorairajan, and P. Selvaraj, 2006. Proteolytic and lipolytic *Pseudomonas* species in raw milk. Indian Veterinary Journal, 83: 58-59.
4. Murugan, B., R. Annal Villi, D. Chandrasekaran, N. Dorairajan and R. Thangamani, 2006. Incidence and characterization of *Bacillus* species isolated from raw milk. Indian Veterinary Journal, 83: 81-2.
5. Prabha, R. and P.A. Shankar, 1994. Proteinase and lipase producing psychrotrophs in milk and dairy environment. Indian Journal of Dairy Science, 47: 880-884.
6. Snedecor, G.W and E.G. Cochran, 1989. Statistical Methods. 8th Ed. The Iowa State University Press, Ames, Iowa, USA.