Microbial Examination of Raw Milk in Rural and Urban Areas of Durg (C.G.)

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ABSTRACT

In the present study, 80 raw milk samples were collected from rural (40 samples) and urban (40 samples) areas for the evaluation of bacteriological quality of milk by methylene blue reduction test (MBRT) and standard plate count (SPC). On the basis of MBRT, 22 rural milk samples were graded as of poor quality, while 18 urban milk samples were of good quality. Higher contamination levels i.e. 5-7.5 x 10^6 cfu/ml were observed in 18 rural milk samples, whereas lower number of microbes (1-1.1 x 10^4 cfu/ml) in urban milk samples. Escherichia coli were found in 28 rural milk samples and Enterobacter aerogenes were noticed in 15 rural milk sample. The results of this study indicated that the quality of milk of urban area was better than milk of rural area.

Keywords: Methylene blue reduction test, rural area, standard plate count, urban area.

Milk, an important food due to its high nutritional value for human beings, may be contaminated during production, handling, transportation, storage, etc. Man may get infected through the consumption of contaminated milk. Therefore, microbial quality of milk must be assessed for safe and wholesome supply to public (Prajapati, 1995, Hussain et al., 2005). The present investigation was envisaged to evaluate the bacteriological quality of raw milk of rural and urban areas.

In present study, 40 (10 ml each) raw milk samples from rural and urban areas were collected from local market and commercial dairy farm at normal room temperature into sterile screw cap vials and processed within 3 hr. Microbiological quality of milk was examined by methylene blue reduction test and standard plate count (Sherikar et al., 2004). Eosin methylene blue (EMB) agar was used to grow and differentiate the Escherichia coli and Enterobacter aerogenes on the basis of greenish metallic sheen (Atlas et al., 1995).

Examination of 40 rural milk samples by MBRT revealed 22 samples to be of poor category as samples were decolorized within 0.5 to 1.75 h, eight samples were categorized as fair, seven samples were of good quality and only three samples were graded in excellent category.

SPC of the samples showed higher counts in 18 samples (5-7.5 x 10^6 cfu/ml) i.e. poor quality, eleven milk samples were fair (1-3.4 x 10^6 cfu/ml), nine milk samples were of good (2-8 x 10^5 cfu/ml) quality and only two samples were of excellent (2-2.5x10^4 cfu/ml) quality. E. coli were observed in 28 (70%) samples and Enterobacter aerogenes were noticed in 15 (37.5%) samples of milk.

Out of 40 urban samples, MBRT showed only three samples of poor quality milk, 14 samples to be of fair category, whereas 18 and 5 samples were of good quality and excellent in quality, respectively.
SPC of 40 samples revealed 4 samples with maximum number of microbes (4.2-6.1x 10^6 cfu/ml) and hence those were recognized as poor quality, twelve samples were fair (8-9x10^5 cfu/ml) in quality, twenty samples were of good quality (10-15x10^4 cfu/ml) and four milk samples were graded as excellent (1-1.1 x10^4 cfu/ml).

E. coli were observed in 21 (52.50%) milk samples, while Enterobacter aerogenes were observed in 8 (20 %) urban milk samples.

The study indicated that rural milk was of lower quality than urban milk. Probable reasons observed in our study were unhygienic conditions prevailing in rural area with cows reared on mud floor, improper sanitary conditions and lack of refrigerator and transport facilities, which play a significant role in quality of milk. Yadav et al. (1993) and Chatterjee et al. (2006) also reported that milk may get contamination from unclean animal especially during milking, unclean milker, equipment, buckets, cans, plungers, dippers etc.

References