

Antibacterial Activity of Milk Samples under Different Conditions

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Milk is considered as the most valuable and nutritious product for the human consumption. It is the best nutrient medium for the growth of various organisms from microbes to large animals. Nearly all the changes which take place in the flavour and appearance of milk, after it is drawn, are the result of the activities of micro-organisms. In the present paper antibacterial activity of different milk samples i.e. buffalo milk, camel milk, cow milk and soya milk have been carried out on *Staphylococcus aureus*. Milk samples were subjected for various treatments. Comparable studies between direct milk, ordinary solution of milk and micellar solutions of milk have been carried out. Micellar system of milk shows highest antibacterial activity as compared to other treatments.

Key words : Antibacterial activity, Milk, Micellar medium, *Staphylococcus aureus*.

Biologically milk is the normal secretion of mammary glands, dieticians considered it as a complete food and also considered as a mine of nutritive chemicals¹⁻⁵. It is the best nutrient medium for the growth of various organisms from microbes to large animals. Nearly all the changes which take place in the flavour and appearance of milk, after it is drawn, are the result of the activities of micro-organisms. In the dairy industry considerable effort is expended in controlling micro-organisms which cause spoilage. The greater the bacterial count in milk, i.e. the greater the number of bacteria per ml of milk, the lower is its bacteriological quality. There are many sources of micro-organisms in milk.

Unless the producing animal is clean and her flanks, udder, and teats given special sanitary care just before milking, her body can be a source of considerable contamination. The probability of diseases of the udder contaminating the milk is very high. Mastitis is a disease of the mammary tissues. Mastitis results from infections by *Staphylococcus aureus*, *Streptococcus*, *Escherichia coli* etc and mycobacterium⁶.

The sanitary condition of hands and clothing and the personal habits of employees must always be suspected as potential sources of contamination.

Utensils and equipments are known to be the source of the greatest proportion of the microflora contaminating milk^{2,3}.

Contaminated air may carry micro-organisms directly to the milk or milk product, or to other elements of the environment such as equipment, making them sources of direct contamination of the product.

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EXPERIMENTAL

In order to investigate the antibacterial activity of different milk samples i.e. buffalo milk, camel milk, cow milk, goat milk, powdered milk and soya milk following sample solutions were prepared for each case:

- A. Direct milk : Fresh milk which was collected immediately from the animal and investigated with in half an hour.
- B. Pasteurised direct milk : Fresh milk used after pasteurization.
- C. Boiled direct milk : Fresh milk used after just boiled.
- D. Ordinary solution of milk : One drop of direct milk was diluted upto 10 ml with distilled water and immediately used for antibacterial activity.
- E. Pasteurised ordinary solution : Ordinary solution used after pasteurisation.
- F. Boiled ordinary solution : Ordinary solution used after just boiled.
- G. Micellar solution of milk : One drop of direct milk was diluted upto 10 ml with 1% Triton-X- 100 and immediately used for antibacterial activity.
- H. Pasteurised micellar solution : Micellar solution used after pasteurisation.
- I. Boiled Micellar solution : Micellar solution used after just boiled.

Antibacterial activity

Antimicrobial activity of various samples of milk have been evaluated by disc diffusion method. A saturated solution of Nutrient agar was prepared in double distilled water and it was autoclaved for 15 min, than poured in petriplates in the laminar. After its solidification loan of bacteria (i.e *Staphylococcus aureus*) against which antimicrobial activity is to be investigated was applied. A separate paper disc was soaked in each solution for 10 minutes. Thus prepared paper disc was placed into petriplate and finally prepared petriplates were kept in incubator at 37°C for 24 hour. After 24 hour, petriplates were removed and checked for measuring zone of inhibition in mm.

RESULTS AND DISCUSSION

Antibacterial activity of different milk samples i.e. buffalo milk, camel milk, cow milk, goat milk, powdered milk and soya milk have been carried out on *Staphylococcus aureus*. The results of antibacterial activity have given in fig 1.

In order to get correct informations about antibacterial activity of buffalo milk, it was subjected for various treatments and each type of treated milk was tested for antibacterial activity against *Staphylococcus aureus*. Micellar system of camel milk show highest antibacterial activity as compared to other milk. The investigations using micellar systems for biological activity of milk samples have been reported first time.

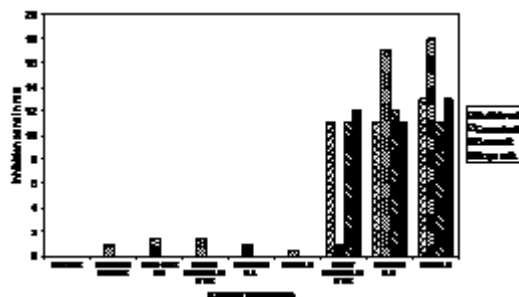


Fig. 1. Antibacterial activity of various milk sample against *Staphylococcus aureus*

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