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Assessment of Quality of Raw Camel Milk and Increase of Shelf Life

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Abstract

Camel milk is important to the human diet in many parts of the world. Fifty samples of raw camel milk were collected from different zones of eastern area of KSA, analysed to evaluate their microbiological quality and the data were confirmed by PCR based methods. Furthermore, the presence of selected pathogens such as *Staphylococcus aureus*, *Salmonella*, *Bacillus cereus*, *E. coli* 0157:H7 and *Listeria monocytogenus* was detected. The following mean average of LAB and total viable counts were 1.1 and 2.6×10^6 cfu ml⁻¹, respectively. Thirty-two LAB isolated species were identified. While yeast and mould counts were relatively lower (1.8×10^2 cfu ml⁻¹). Low coliform numbers were encountered of (0.2×10^2 cfu ml⁻¹). *Staphylococcus aureus* was found in 30 % of samples while 0.4 % of samples were *Salmonella* positive. The detection rate of positive samples by using PCR was 35.6, 2.0 and 64.2 % for *Staphylococcus aureus*, *Salmonella typhimurium* and *E. coli*, respectively. All samples tested were negative for *E. coli* 0157:H7 and *Listeria monocytogenus*. Lactoperoxidase system (LPS), essential oils (EOs) and isolated lactoferrin (LF), lysozyme (Lyz) were used for improving the keeping quality of camel milk. Cold treated camel milk samples at (4°C) with LPS 15 ppm and 0.2 ppm of Marjoram or Sage found to show an increase in the shelf life to 21 days. Use of 5 mg ml⁻¹ concentration from LF and Lyz, presented a higher antibacterial effect against pathogenic bacteria and improved the keeping quality of camel milk. The high content of antimicrobial agents in camel milk may explain its potential as an antiviral activity specially against many other diseases. Data also showed that pasteurisation and refrigeration of raw camel milk improved the keeping quality and extending the shelf life for 21 days, which could be of beneficial uses as future industry. The present study recommended further research on identification and molecular characterisation on the isolates from milk of camel and its products.

Keywords: Camel milk, keeping quality, microbiological quality