

Prospects of Milk Protein as a Potential Alternative of Natural Antibiotic

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Abstract : Many new and promising treatments for reducing or diminishing the adverse effects of microorganisms are being discovered day by day. On the other hand, the dairy industry is accelerating the economic wheel of Bangladesh. Considering all these facts, new thoughts were developed to isolate milk proteins by the present experiment for opening up a new era of developing natural antibiotics from milk. Lactoferrin, an iron-binding glycoprotein with multifunctional properties, is crucial to strengthening the immune system and also useful for commercial applications. The protein's iron-binding capacity makes it undoubtedly advantageous to immune system modulation and different bacterial strains. For fulfilling the purpose, 4 of raw and 17 of commercially available milk samples were collected from different farms and stores in Bangladesh (Dhaka, Chittagong, and Cox's Bazar). Protein quantification by nanodrop technology has confirmed that raw milk samples have better quantities of protein than the commercial ones. All the samples were tested for their antimicrobial activity against 18 pathogens, where raw milk samples showed a higher percentage of antibacterial activity. In addition to this, SDS-PAGE (Sodium Dodecyl Sulfate-Polyacrylamide Gel Electrophoresis) was performed to identify lactoferrin in the milk samples. Lactoferrin was detected in 9 samples from which 4 were raw milk samples. Interestingly, *Streptococcus pyogenes*, *Klebsiella pneumoniae*, *Bacillus cereus*, *Pseudomonas aeruginosa*, *Vibrio cholera*, *Staphylococcus aureus*, and enterotoxigenic *E. coli* significantly displayed sensitivity against lactoferrin collected from raw milk. Only *Bacillus cereus*, *Pseudomonas aeruginosa*, *Streptococcus pneumoniae*, *Enterococcus faecalis*, and ETEC (Enterotoxigenic *Escherichia coli*) were susceptible to lactoferrin obtained from a commercial one. This study suggested that lactoferrin might be used as the potential alternative of antibiotics for many diseases and also can be used to reduce microbial deterioration in the food and feed industry.

Keywords : alternative of antibiotics, commercially available milk, lactoferrin, nanodrop technology, pathogens, raw milk

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