

THE EFFICACY OF ELECTROLYSED OXIDIZING WATER AS A DISINFECTANT IN THE DAIRY INDUSTRY

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Abstract

Consumers' growing demands for safe, minimally processed, fresh-like food as well as the disadvantages of traditional methods of microbial decontamination have led to the necessity of introducing innovative technologies for effective decontamination of food. In that way, a possible solution could be disinfectants based on electrolyzed oxidizing (EO) water, which are user- and environmentally-friendly, with a convenient price. However, some milk producers and processors consider that disinfectants based on EO water are not effective enough in reducing the number of microorganisms on surfaces of equipment and utensils, in comparison to the other disinfectants which require rinsing. Therefore, the aim of this study was to investigate the efficacy of EO water as a disinfectant in the dairy industry.

A commercial disinfectant based on EO water was used, and as a material for disinfecting milk sample with a known initial number of microorganisms. Disinfectant, taken from the original factory-sealed bottles, was diluted with double-distilled water in the three ratios, 1 : 10, 1 : 20 and 1 : 30. In the previously prepared dilutions of milk (10^{-1} - 10^{-6}), control agents (double-distilled water and 0.1% NaCl solution) and three dilutions of disinfectant were added in the three ratios: 1 : 1, 1 : 10; 1 : 100. After incubation, the number of colonies of aerobic mesophilic bacteria was counted (cfu/mL) and the analysis of variance of its logarithmic values was performed. It is found that disinfection done by the agent based on EO water is an effective method for microbial decontamination in milk samples. The significant decrease ($P < 0.05$) of the number of aerobic mesophilic bacteria was observed in the cases of disinfectant's stronger concentration (1 : 10). Weaker concentration of disinfectant (1 : 20 and 1 : 30) showed less antibacterial activity, and in that case it is necessary to carry out rinsing of the equipment before using disinfectant, to remove organic milk matter which decreases the disinfection effect of free chlorine.

The results confirmed that EO disinfectant is acceptable and sufficiently effective in the dairy industry, but it is recommended to use higher concentration, especially if traces of organic compounds retain on the treated surface.

Key words: Milk, Electrolyzed oxidizing water, Disinfection, Aerobic mesophilic bacteria.