
Abstract

This study was undertaken to evaluate the efficacy of electrolyzed oxidizing (EO) and chemically modified water with properties similar to the EO water for inactivation of different types of foodborne pathogens (Escherichia coli O157:H7, Listeria monocytogenes and Bacillus cereus). A five-strain cocktail of each microorganism was exposed to deionized water (control), EO water and chemically modified water. To evaluate the effect of individual properties (pH, oxidation–reduction potential (ORP) and residual chlorine) of treatment solutions on microbial inactivation, iron was added to reduce ORP readings and neutralizing buffer was added to neutralize chlorine. Inactivation of E. coli O157:H7 occurred within 30 s after application of JAW EO water with 10 mg/l residual chlorine and chemically modified solutions containing 13 mg/l residual chlorine. Inactivation of Gram-positive and -negative microorganisms occurred within 10 s after application of ROX EO water with 56 mg/l residual chlorine and chemically modified solutions containing 60 mg/l residual chlorine. B. cereus was more resistant to the treatments than E. coli O157:H7 and L. monocytogenes and only 3 log10 reductions were achieved after 10 s of ROX EO water treatment. B. cereusspores were the most resistant pathogen. However, more than 3 log10 reductions were achieved with 120-s EO water treatment.