
ABSTRACT

The ability of electrolyzed (EO) water to inactivate Listeria monocytogenes in suspension and biofilms on stainless steel in the presence of organic matter (sterile filtered chicken serum) was investigated. A five-strain mixture of L. monocytogenes was treated with deionized, alkaline EO, and acidic EO water containing chicken serum (0, 5, and 10 ml/liter) for 1 and 5 min. Coupons containing L. monocytogenes biofilms were also overlaid with chicken serum (0, 2.5, 5.0, and 7.5 ml/liter) and then treated with deionized water, alkaline EO water, acidic EO water, alkaline EO water followed by acidic EO water, and a sodium hypochlorite solution for 30 and 60 s. Chicken serum decreased the oxidation-reduction potential and chlorine concentration of acidic EO water but did not significantly affect its pH. In the absence of serum, acidic EO water containing chlorine at a concentration of 44 mg/liter produced a > 6-log reduction in L. monocytogenes in suspension, but its bactericidal activity decreased with increasing serum concentration. Acidic EO water and acidified sodium hypochlorite solution inactivated L. monocytogenes biofilms to similar levels, and their bactericidal effect decreased with increasing serum concentration and increased with increasing time of exposure. The sequential 30-s treatment of alkaline EO water followed by acidic EO water produced 4- to 5-log reductions in L. monocytogenes biofilms, even in the presence of organic matter.