INACTIVATION OF *ESCHERICHIA COLI* O157:H7 AND *LISTERIA MONOCYTOGENES* IN BROTH BY SLIGHTLY ACIDIC ELECTROLYZED WATER GENERATED USING DIFFERENT TOTAL DISSOLVED SOLID (TDS) MATERIALS

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Recently, the electrochemical disinfection has gained a great interest as an alternative to conventional chlorine disinfectants due to its high effectiveness and environmental compatibility. The most common method for electrochemical disinfection is the use of electro-generated compounds, such as available chlorine concentration (ACC; Cl₂, HOCl and OCl⁻) and reactive oxygen species, as disinfectants. Despite the extensive reports on inhibitory effect of slightly acidic electrolyzed water (SAEW), there is little information available on the effect of total dissolved solid (TDS) materials on decontamination ability of SAEW. This study examined the role of TDS materials on physical properties of SAEW and its inactivation effect on *Escherichia coli* O157:H7 and *Listeria monocytogenes* as indicator microorganisms. SAEW was generated using 4% HCl with different concentrations (0, 0.1, 0.5 M) of TDS materials (CaCl₂, MgCl₂) at 5 and 10 A current, respectively. Generation of SAEW using 4% HCl and 10A current without TDS materials resulted in ACC and pH of 8 mg/L, and 6.2, respectively. Application of the produced SAEW on indicator strains resulted in 2.88 ± 0.05 and 5.34 ± 0.15 log cfu/mL reduction in *E. coli* O157:H7 and *L. monocytogenes*, respectively. To investigate the effect of TDS materials on the enhancement of sanitizing efficacy, 0.5 M CaCl₂ and 0.5 M MgCl₂ were separately added to the electrolyzation cell which resulted in ACC increase up to 21 mg/L. The pH was increased to 6.7 for both TDS material containing SAEWs as well. Finally, the log reduction in microbial population was higher than 6.8 and 7.9 log cfu/mL for CaCl₂ and MgCl₂ respectively. This study provides basic information on the addition of TDS materials to SAEW to enhance the antimicrobial effect. The results demonstrate that TDS materials can effectively increase the sanitizing effect of SAEW by increasing ACC.

Keywords: slightly acidic electrolyzed water (SAEW), total dissolved solid (TDS), electrochemical disinfection, *Escherichia coli* O157:H7, *Listeria monocytogenes*