
Abstract:

The efficacy of acidic electrolyzed (EO) water produced at three levels of total available chlorine (16, 41, and 77 mg/liter) and chlorinated water with 45 and 200 mg/liter of residual chlorine was investigated for inactivating *Salmonella* Enteritidis and *Listeria monocytogenes* on shell eggs. An increasing reduction in *Listeria* population was observed with increasing chlorine concentration from 16 to 77 mg/liter and treatment time from 1 to 5 min, resulting in a maximal reduction of 3.70 log CFU per shell egg compared with a deionized water wash for 5 min. There was no significant difference in antibacterial activities against *Salmonella* and *Listeria* at the same treatment time between 45 mg/liter of chlorinated water and 14-A acidic EO water treatment (*P* ≥ 0.05). Chlorinated water (200 mg/liter) wash for 3 and 5 min was the most effective treatment; it reduced mean populations of *Listeria* and *Salmonella* on inoculated eggs by 4.89 and 3.83 log CFU/shell egg, respectively. However, reductions (log CFU/shell egg) of *Listeria* (4.39) and *Salmonella* (3.66) by 1-min alkaline EO water treatment followed by another 1 min of 14-A acidic EO water (41 mg/liter chlorine) treatment had a similar reduction to the 1-min 200 mg/liter chlorinated water treatment for *Listeria* (4.01) and *Salmonella* (3.81). This study demonstrated that a combination of alkaline and acidic EO water wash is equivalent to 200 mg/liter of chlorinated water wash for reducing populations of *Salmonella* Enteritidis and *L. monocytogenes* on shell eggs.