Title Reductions of *Salmonella enterica* on chicken breast by thymol, acetic acid, sodium dodecyl sulfate or hydrogen peroxide combinations as compared to chlorine wash

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Abstract

Poultry products are important vehicles for *Salmonella* transmission to humans and have been incriminated in several *Salmonella* outbreaks. Thymol (THY) from thyme oil has wide inhibitory effects against foodborne pathogens including *Salmonella*, and has shown great potential as a natural alternative to chlorine. In order to improve the cost-effectiveness of thymol-based washing solutions, formulas of THY with combination of organic acid or surfactant were developed and their efficacies to reduce *Salmonella* on chicken breast were investigated in the current study. Surface-inoculated chicken breasts were washed with the two thymol-based washing solutions: 0.2 mg/mL THY + 5% (w/v) sodium dodecyl sulfate (SDS) + 2 mg/mL acetic acid (AA) or 0.2 mg/mL THY + 2 mg/mL AA for 2 min. Both solutions achieved around 2.2 log reductions of *Salmonella* on chicken breast and their efficacy was comparable to log reduction obtained by 200 ppm chlorine washing. Addition of SDS did not result in more log reduction of *Salmonella* on chicken meat samples. More than 3.3 log reduction in the used THY washing solutions was determined and it was similar to log reduction from the spent chlorine solution. None of these antimicrobial agents changed the pH and texture values of chicken breasts. Therefore, 0.2 mg/mL THY + 2 mg/mL AA has great potential to be a natural alternative to chlorine-based washing solution for reducing *Salmonella* contamination on chicken breast meat.