

## Antimicrobial Efficacy of a Citric Acid / Hydrochloric Acid Blend, Peroxyacetic Acid, and Sulfuric Acid against *Salmonella* and Background Microbiota on Chicken Hearts and Livers

### Emma Nakimera

Department of Food Science and Technology, University of Nebraska-Lincoln, Lincoln, Nebraska, USA

### Leslie Pearl M. Cancio

Department of Science and Technology (DOST) XI, Technical Services Division, Davao, Philippines

### Gary A. Sullivan

Department of Animal Science, University of Nebraska-Lincoln, Lincoln, Nebraska, USA

### Raziya Sadat

Department of Food Science and Technology, University of Nebraska-Lincoln, Lincoln, Nebraska, USA

### Byron D. Chaves

Department of Food Science and Technology, University of Nebraska-Lincoln, Lincoln, Nebraska, USA

### Abstract

This study aimed at evaluating the efficacy of a blend of citric acid and hydrochloric acid (CP), peroxyacetic acid (PAA), and sulfuric acid (SA) against *Salmonella* and mesophilic aerobic plate counts (APC) on chicken hearts and livers. Samples were inoculated with a five-serovar cocktail of *Salmonella* at ca. 4.8 log CFU/g and treated by immersion with a water control (90 s), CP (5% v/v, 30 s), PAA (0.05% v/v or 500 ppm, 90 s), or SA (2% v/v, 30 s), all at 4°C and with mechanical agitation. Samples were vacuum packed and stored for up to 3 days at 4°C. Three independent replications were performed for each product, treatment, and time combination. The average *Salmonella* reductions in chicken hearts after 3 days were 1.33 ± 0.25, 1.40 ± 0.04, and 1.32 ± 0.12 log CFU/g for PAA, SA, and CP, respectively. For chicken livers, the values were 1.10 ± 0.12, 1.09 ± 0.19, and 0.96 ± 0.27 for PAA, SA, and CP, respectively. All antimicrobials reduced *Salmonella* counts in both chicken hearts and livers by more than one log, in contrast to the water control. All treatments effectively minimized the growth of APC for up to 3 days of refrigerated storage, and no differences in objective color values (L, a, or b) were observed. The poultry industry may use these antimicrobials as components of a multifaceted approach to mitigate *Salmonella* in nonconventional chicken parts.

### Keywords

Antimicrobials, chicken, offal, *Salmonella*, variety meats.