Title The improved efficiency of selected antimicrobials on chicken by sequential treatments prior to chilling

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Abstract

Salmonella spp. are responsible for the second largest number of food-borne illnesses related to poultry and poultry products after *Campylobacter jejuni.* So far, in our work, *Salmonella* showed higher resistance to tested antimicrobials than *Campylobacter,* so resistance of *Salmonella* was used as an indicator of their efficiency. It was hypothesized that use of antimicrobials prior to carcass chilling will "charge" pores and feather follicles and reduce bacterial cell survival should contamination occur later in processing. If this were followed by a second treatment it should increase the lethal effect. The objective of this study was to compare *Salmonella* reductions obtained by single (before inoculation) and double (before and after inoculation) treatments on chicken prior to chilling to those of single treatment (after inoculation) and after chilling. Fresh chicken drumettes were obtained from a processing plant and within 1 h the drumettes were divided into 3 sets and used in the experiment. The first set (pre-chilled) was immersed in antimicrobial (1 min), inoculated with a 2 serovar *Salmonella* cocktail then immersed (1 min) in water. The second (pre-chilled) was immersed (1 min) before and after inoculation in the same antimicrobial. The third set (post-chilled) was immersed in water, inoculated then immersed (1 min) in antimicrobial. The drumettes were then stored at 4°C for 2h before *Salmonella* survival was determined. The antimicrobials tested were TSP (10%), acidified sodium chloride (1200 ppm), acidified calcium sulphate and cetylpyridinium chloride (0.5 %). The reductions per gram of skin by the above four treatments were 1.32 to 1.87, 1.43 to 2.22, and 0.88 to 1.21 log10 for the first, second and the third sets, respectively. These results indicate that antimicrobial treatment of carcasses prior to chilling has potential to achieve greater reductions in contamination by *Salmonella* especially if 2 brief antimicrobial treatments are used.