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Comparison of the Efficacy of a Sulfuric Acid-Sodium Sulfate Blend and Lactic Acid for the Reduction of *Salmonella* on Prerigor Beef Carcass Surface Tissue

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Abstract

A study was conducted to compare the efficacy of a commercially available sulfuric acid-sodium sulfate blend (SSS) and lactic acid (LA) in reducing inoculated *Salmonella* populations on beef. Sixty pieces of prerigor beef carcass surface brisket tissue, collected directly from the processing line of a commercial beef processing plant, were cut into two sections (10 by 10 cm each) and spot inoculated (6 to 7 log CFU/cm²) on the adipose side with a six-strain mixture of *Salmonella*. One section per piece of brisket tissue was left untreated (control), while the second section was spray treated (5 s, 15 lb/in², and 33 mL/s flow rate) with unheated (21°C) or heated (52°C) solutions of SSS (pH 1.1) or LA (4%). Unheated and heated SSS lowered ($P < 0.05$) total bacterial counts from 6.3 to 4.6 and 4.3 log CFU/cm², respectively. Likewise, unheated and heated LA reduced ($P < 0.05$) total bacterial counts from 6.3 to 4.7 and 4.4 log CFU/cm², respectively. Initial counts of inoculated *Salmonella* populations (6.1 to 6.2 log CFU/cm²) were reduced ($P < 0.05$) to 4.2 and 3.9 log CFU/cm² following treatment with unheated and heated SSS, respectively, and to 3.7 and 3.8 log CFU/cm² after treatment with unheated and heated LA, respectively. Overall, the temperature of the chemical solutions had a small (0.3 log CFU/cm²), but significant ($P < 0.05$), effect on total bacterial counts but not ($P > 0.05$) on *Salmonella* counts. Regardless of solution temperature, *Salmonella* counts for LA-treated samples were 0.3 log CFU/cm² lower ($P < 0.05$) than those of samples treated with SSS. These results indicate that both unheated and heated solutions of SSS and LA are effective interventions for reducing *Salmonella* contamination on prerigor beef carcass surface tissue.

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