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Presentation Title: Comparison of Decontamination Efficacy of AFTEC 3000 and Lactic Acid at Different Temperature as a Spray Solution for Hot Beef Carcasses against Rifampicin-Resistant *Salmonella*

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Category: Post-harvest pathogen reduction

A study was conducted to compare decontamination efficacy of both cold and heated 1.5% AFTEC 3000 or 4% lactic acid against rifampicin-resistant *Salmonella* on the surface of hot beef carcasses. A total of 60 pieces of beef briskets, obtained directly from unchilled beef carcasses, were cut into two sections (10 x 10 x 1 cm) and spot-inoculated with 200 μ l of inoculum, comprised of six-strain mixtures of rifampin-resistant *Salmonella*, and allowed 15 minutes for pathogenic attachment to reach a target level of approximately 6 to 7 log CFU/cm². One brisket section (of the pair) remained untreated while the other section was treated with the compounds using a custom-built spray cabinet that sprays either AFTEC 3000 (21°C and 52°C) or lactic acid (21°C and 52°C) at pressure of 15 psi for 5 seconds (CHAD Equipment, LLC, Olathe, KS). Treated samples were transferred into Whirl-Pak filter bags and were held for 10 minutes, allowing pathogen bactericidal activity before sampling, plating, and counting. Cold and heated AFTEC 3000 lowered ($P < 0.05$) means of the total bacterial counts on Tryptic Soy Agar (TSA) from 6.3 Log CFU/cm² to 4.6 and 4.3 Log CFU/cm², respectively. Likewise, cold and heated lactic acid reduced ($P < 0.05$) means of the total bacterial counts on TSA from 6.3 Log CFU/cm² to 4.7 and 4.4 Log CFU/cm², respectively. On xylose lysine deoxycholate agar (XLD), initial counts (6.1 to 6.2 Log CFU/cm²) were reduced ($P < 0.05$) by 2.0 to 4.2 Log CFU/cm² due to treatment with cold AFTEC 3000, by 2.3 to 3.9 Log CFU/cm² due to treatment with heated AFTEC 3000, by ($P < 0.05$) 2.4 to 3.7 Log CFU/cm² and 3.8 Log CFU/cm² after treatment with cold and heated lactic acid, respectively. Overall, no ($P > 0.05$) chemicals X temperature interactive effects on microbial reductions on TSA or XLD agars were detected. Cold solutions caused lower microbial reductions (from 6.3 to 4.6 Log CFU/cm²) compared to the heated solutions (from 6.3 to 4.3 Log CFU/cm²) on TSA. These results indicated that both cold and heated AFTEC and lactic acid are effective interventions to reduce *Salmonella* inoculated onto hot beef carcass surface tissue.

Key words: AFTEC 3000, lactic acid, *salmonella*, hot beef carcasses, cold, heated