54 Reduction of *Escherichia coli* O157:H7 and *Salmonella* using dry chilling in small processing plant environments. A. W. Tittor*, M. G. Tittor, M. M. Brashears, J. C. Brooks, and M. F. Miller, *Texas Tech University*, *Lubbock*.

Contamination of beef carcasses during the slaughter process is inevitable. The objective of this study was to verify the use of dry chilling up to 28 d as an effective means of reducing *E. coli* O157:H7 and *Salmonella* on beef lean and adipose tissues compared to conventional spray chilling/wet aging. Hot adipose and lean tissue samples were obtained before interventions from a harvest facility and transported back to TTU Pathogen Laboratory. Samples were then inoculated with a cocktail of either three strains of *E. coli* O157:H7 or three strain cocktail of *Salmonella* with a concentration of 10^7 . The samples were then suspended on racks and subjected to spray chilling/wet aging or dry chilling for 28 days. A Spray chilling system was developed to mimic the industry in which water was sprayed on samples for the first 15 minutes and 1 minute every 17 minutes for 17 hours. Following a 48 h samples were vacuum packaged to mimic current industry standards. Dry chilling samples were inoculated and suspend in an open air chill cooler with a temperature of 3° C, an air velocity of 0.0 to 0.25 m/s with a relative humidity of 80%, until sampling. 5 cm by 5 cm samples were aseptically excised and plated for enumeration using the thin-agar overlay method at 0d, 24 h, 36 h, 48 h, 7d, 14d, 21 d, and 28 d. When enumeration was not possible, a detection process was conducted to verify the presence or absence of pathogenic bacteria. All counts were transformed into log cfu/ cm^2 for statistical analyzation. Least square means were calculated using the analysis of variance in the general linear model of SAS for mean separation. Dry chilling of lean and fat tissue samples significantly decreased the amount of *E. coli* O157:H7 and *Salmonella*. A significant ($P< 0.05$) advantage is shown for dry chilling over spray chilling on lean and fat tissue occurring at 14 d and 7 d, respectively on *E. coli* inoculated samples. Furthermore, a significant ($P<0.05$) decrease in recovery of *Salmonella* was observed for dry chilling samples over spray chilling/wet aging at 14 d and continued through 28 d. Pathogen reduction on dry chilled lean and fat tissue samples was determined to be due to surface desiccation. Surfaces of dry chilled samples become increasingly drier as storage time increased resulting in much lower water activity on the surface. Spray chilled tissue displayed a significant washing effect during the initial 17 h. Nonetheless, little reduction of *E. coli* O157:H7 or *Salmonella* occurred throughout remaining 28 d. Vacuum packaging of the samples at 48 h demonstrated that removing oxygen had a bacteriostatic affect on pathogenic bacteria, as shown by steady populations of pathogens from 48 h to 28 d. Therefore, dry chilling is a superior method of chilling for the reduction of *E. coli* O157:H7 on fat and lean tissue samples having a range in reduction of bacteria of 4.5 to 4.95 logs cfu/cm^2, respectively at 28 d. In addition, *Salmonella* had a reduction on fat and lean tissue of 4.79 and 4.5 logs cfu/cm^2 , respectively. Dry Chilling can be a cost effective means of controlling pathogens of dry chilled carcasses for small processors.