Layman’s Summary:

To target pathogen reduction, the Food Safety Inspection Service (FSIS) recommended that all beef, pork and lamb slaughter establishments apply at least one antimicrobial treatment to carcasses before chilling. This study compared the effectiveness of current decontamination technologies with some chemicals that are not presently in use in pathogen reduction systems to determine their effectiveness in reducing *Escherichia coli* O157:H7 counts on beef tissue. Presently used by the industry for decontamination of beef carcasses/cuts are thermal (hot-water) pasteurization, steam/hot water vacuuming, steam pasteurization and organic acid solution rinsing. Lactoferricin B, for preventing attachment and growth of pathogens on carcass surfaces, as well as peroxyacetic acid, acidified chlorine, acidified sodium chlorite and cetylpyridinium chloride (CPC), which is used for wounding or killing bacteria, are microbiological intervention technologies that have recently received attention for their antimicrobial properties.

CPC proved to be most effective at reducing the level of *E. coli* O157:H7 on beef carcass tissue, beef short plate and small pieces of beef. CPC reduced *E. coli* O157:H7 counts by 4.83 log CFU/cm² when applied to beef carcass tissue. Additionally, CPC reduced *E. coli* O157:H7 counts on beef short plates and small pieces of beef by more than 2 log CFU/g. Unfortunately, CPC is not approved by FDA as a chemical that can be used to reduce the incidence of pathogens on meat contact surfaces. In the present study, heated (55º C) lactic acid was the most efficacious chemical intervention for use in decontaminating beef carcass/cuts and simulated beef trimmings. Lactic acid (2% at 55º C) reduced *E. coli* O157:H7 counts on the surface of beef by as much as 3.28 log CFU/cm². Acidified sodium chlorite and acetic acid effectively lowered *E. coli* 0157:H counts by 2.06 and 1.61 log CFU/cm², respectively. This study demonstrated the use of water at 25º C as a decontamination technology reduced the microbial load by as much as 1.00 log CFU/cm². As used in this study, acidified chloride and lactoferrin B were not effective in reducing the presence of *E. coli* O157:H7 by more than 0.68 log CFU/cm².