

A Longitudinal Study to Describe the Presence of *Escherichia coli* O157:H7 and *Salmonella* spp in Feedlot Cattle Pens

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Introduction

The objective of this study was to use a novel diagnostic strategy to describe the presence of *Escherichia coli* O157:H7 and *Salmonella* spp in pens of feedlot cattle over the course of the feeding period.

Materials and Methods

Thirty-one pens of cattle from five commercial feedyards were monitored for the presence of *E. coli* O157:H7 and *Salmonella* spp each week of their summer feeding period. Thirty-five pens were marketed because two pens of cattle were split into smaller groups before being sold. Pens were tested for the presence of the organisms by bacterial culture of 1) a composite of 20 fresh fecal pats from the pen floor, and 2) seven devices prepared from rope available overnight for cattle to rub or chew. The difference in the proportion of positive pens was tested by chi-square analysis.

Results and Conclusions

The mean population of the pens was 157 cattle (59-282) and the mean feeding period was 20 weeks (15-26). The pens were monitored for a total of 627 pen-weeks. Of these, 95 pen-weeks (15%) were positive for *E. coli* O157:H7 by culture of composite feces, and 274

pen-weeks (44%) were positive by culture of the rope devices. *Escherichia coli* O157:H7 was recovered at least once from the composite feces of 27 pens (87%) and at least once from the ropes of all 31 pens (100%). Twenty-four of 31 pens (77%) were positive for *E. coli* O157:H7 the first week the pen was sampled, however, only 14 of 35 pens (40%) were positive the week of marketing ($p < 0.005$). A similar (but non-significant) trend was observed by testing composite feces for *E. coli* O157:H7, with 7 of 31 pens (23%) and 3 of 35 pens (9%) positive at first and last weeks of testing, respectively. *Salmonella* spp was recovered from the composite fecal samples of 21 pens-weeks (3%), and 142 pen-weeks (23%) were positive for *Salmonella* spp by culture of the rope devices. *Salmonella* spp was recovered at least once from the composite feces of 18 pens (58%) and at least once from the ropes of 27 pens (87%). Two of 31 pens (6%) were positive for *Salmonella* spp the first week the pen was sampled, however, 11 of 35 pens (31%) were positive the week of marketing ($p < 0.05$). A similar (but non-significant) trend was observed by testing composite feces for *Salmonella* spp, with 1 of 31 pens (3%) and 2 of 35 pens (6%) positive at the first and last weeks of testing, respectively. Culture of the rope devices identified both organisms in a greater proportion of pens than culture of the composite feces. The pattern of appearance of the two human food safety pathogens over the course of the feeding period was not similar.