

The effects of a 24-hour delay on the recovery of E.coli O157:H7 from fecal samples

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Introduction and Objectives

E. coli O157:H7 is an important food safety pathogen. An association between E. coli O157:H7 contamination of ground beef and severe bloody diarrhea exists when humans ingest undercooked hamburger. The incidence of outbreaks due to E. coli O157:H7 contaminated beef has increased considerably since it was first identified in the United States.

A major E. coli O157:H7 research project is taking place at Animal Population Health Institute of Colorado State University concerning the relationship between E. coli O157:H7 prevalence in feedlots and carcass contamination at the slaughter plant. This study, which is a subset of a larger E. coli O157:H7 project, will determine if samples obtained from feedlots located in other states can be shipped overnight. Our objective from this study is to determine if E. coli O157 numbers in a sample remained the same or were different within a twenty-four hour time period.

Materials and Methods

Samples were collected from fecal pats on the ground in a feedlot pen in Eastern Colorado. The pen consisted of 218 finished beef steers that were going to slaughter the next day. Thirty different pats in the pen were chosen randomly and two samples were taken from each pat. Both sets of samples were sent directly to the Rocky Mountain Animal Health Laboratory in Denver. One set was processed immediately and tested for E. coli O157, the other set was kept overnight on ice and was processed twenty-four hours after arrival to the lab. The fecals were enriched in GN broth with vancomycin, cefixime and cefsuludin and incubated in the laboratory. Enrichment was followed by IMS, which consists of incubation with anti-O157 immunomagnetic beads. Half of the bead suspension was plated onto sorbitol MacConkey plates containing cefixime and potassium tellurite. The remaining half was plated onto CHROMagar O157 containing potassium tellurite. ELISA and PCR were used to identify positive samples. Results were sent back as positive or negative for E. coli O157.

Results

The samples processed immediately had a shedding rate of fifty percent; 15 out of 30 tested positive. The samples processed the next day had a shedding rate of thirty three percent; 10 out of 30 tested positive.

Discussion

This preliminary study investigating the potential for delayed culture of fecal samples for the presence of *E. coli* O157 revealed that there was a twelve percent loss over time. Due to the large geographical spread of feedlots in this country, a better understanding of *E. coli* O157:H7 sample handling and shipping protocol is needed to escalate food safety research. The results of the project have induced further studies to develop proper protocols for *E. coli* O157 investigations. This type of study needs to be repeated with more groups of animals and more samples.