

Application of Real-Time PCR for Detection of Antibiotic Resistant Pathogens and
Shiga-Toxin Producing *Escherichia coli*

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ABSTRACT

Salmonella and Shiga toxin producing *Escherichia coli* (STEC) are among the most important food pathogens. Increasing use of antibiotics for treatment and as a therapeutic agent on food animals has been proposed as a reason for the emergence of multiple drug resistant (MDR) strains of food pathogens. In this study real-time PCR methods were developed for the detection antibiotic resistant strains of *Salmonella*, extended-spectrum β -lactam (ESBL) and carbapenem resistant pathogens. The United States Department of Agriculture Food Safety and Inspection Service (USDA-FSIS) declared seven STEC serogroups O157, O26, O45, O103, O111, O121 and O145 as adulterants in ground beef and beef trims. Multiplex real-time PCR melt curve assays with IAC were standardized for the detection of seven STEC serogroups with their virulence genes and *Salmonella*. The assay was able to detect all STEC strains in 325 g of ground beef and beef trims spiked with 10 CFU.