Occurrence of Antimicrobial-Resistant *Escherichia coli* and *Salmonella enterica* in the Beef Cattle Production and Processing Continuum

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Abstract

Specific concerns have been raised that third-generation cephalosporin-resistant (3GC*) *Escherichia coli*, trimethoprim-sulfamethoxazole-resistant (COT*) *E. coli*, 3GC* *Salmonella enterica*, and nalidixic acid-resistant (NAL*) *S. enterica* may be present in cattle production environments, persist through beef processing, and contaminate final products. The prevalence and concentrations of these organisms were determined in feces and hides (at feedlot and processing plant), pre-evisceration carcasses, and final carcasses from three lots of fed cattle (n = 184). The prevalence and concentrations were further determined for strip loins from 103 of the carcasses. 3GC* *Salmonella* was detected on 7.6% of hides during processing and was not detected on the final carcasses or strip loins. NAL* *S. enterica* was detected on only one hide. 3GC* *E. coli* and COT* *E. coli* were detected on 100.0% of hides during processing. Concentrations of 3GC* *E. coli* and COT* *E. coli* on hides were correlated with pre-evisceration carcass contamination. 3GC* *E. coli* and COT* *E. coli* were each detected on only 0.5% of final carcasses and were not detected on strip loins. Five hundred and 42 isolates were screened for extraintestinal pathogenic *E. coli* (ExPEC) virulence-associated markers. Only two COT* *E. coli* isolates from hides were ExPEC, indicating that fed cattle products are not a significant source of ExPEC causing human urinary tract infections. The very low prevalence of these organisms on final carcasses and their absence on strip loins demonstrate that current sanitary dressing procedures and processing interventions are effective against antimicrobial-resistant bacteria.

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