

**TITLE:** POPULATIONAL CHANGE IN BROAD-SPECTRUM CEPHALOSPORIN-RESISTANT *ESCHERICHIA COLI* IN LAMBS DURING FEEDLOT

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**ABSTRACT:**

Infections caused by antimicrobial resistant (AR) *Escherichia coli* and their isolation from food-producing animals are increasing worldwide. This is considered a result of the selective pressure exerted on the gastrointestinal tract of animals by the overuse of antimicrobials. Studies have attesting that such use increases the content of AR genes throughout animals' feedlotting. In Brazil, the ovine herd has risen in recent years, but studies about AR in sheep are still scarce. Thus, this study intended to assess the changes in genotypes regarding broad-spectrum cephalosporins (BSC)-resistance in *E. coli* isolated from lambs during feedlot. To this end, feces from 112 lambs were collected on the first day of the animals in the feedlot (day 0), and on the last day before slaughtering (day 42). Isolates were selected in MacConkey agar supplemented with 4 mg/L of ceftiofur and identified by biochemical essays. *E. coli* were submitted to antimicrobial susceptibility test by disc-diffusion, and to PCR to investigate genes coding for BSC-resistance. The genetic localization of *bla* genes was elucidated by S1-PFGE and Southern blot-hybridization. Isolates were typed by *Xba*I-PFGE and MLST. Eight *E. coli* were isolated from 7.1% of animals on day 0, and 70 from 49.1% of animals on day 42. The *bla*<sub>CTXM-8</sub>, *bla*<sub>CTXM-14</sub>, and *bla*<sub>CTXM-15</sub> genes were identified as responsible for BSC-resistance in 3, 4, and 1 isolates on day 0, respectively. *bla*<sub>CTXM-2</sub>, *bla*<sub>CTXM-8</sub>, *bla*<sub>CTXM-15</sub>, and *bla*<sub>CMY-2</sub> were identified in 5, 9, 3, and 53 isolates on day 42, respectively. *E. coli* of a new ST carrying a *bla*<sub>CTXM-8</sub>-IncI1 plasmid (97 kb) was present on both days 0 and 42, which shows its maintenance in the feedlot. The *bla*<sub>CMY-2</sub>-IncA/C plasmid of 170 kb corresponded to 71.4% of day 42-*E. coli* grouped into two major clusters and belonging to ST1727/CC446 or ST3994. Plasmids harboring *bla*<sub>CTXM-15</sub> changed from IncFII of 97 kb on day 0 to IncHI2 of 335 kb on day 42. *bla*<sub>CTXM-2</sub> and *bla*<sub>CTXM-14</sub> were detected on chromosomes. Hence, *E. coli* carrying plasmids with *bla* genes already reported associated to infections in humans were detected in the present study after selection under pressures exerted by feedlotting. This raises public health concerns since those animals represent a source and a potential way for dissemination of strains responsible failures in treatment of infections.

**Keywords:** *Escherichia coli*, sheep, resistance, cephalosporin, *bla*<sub>CMY-2</sub>

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