

Summary

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Resistance to antibiotics and quaternary ammonium compounds of *Escherichia coli* from calves at the beginning of the rearing period in Switzerland

Summary

In the Swiss rearing calf production, antibiotics and disinfectants are frequently used to control bacterial infectious diseases posing the risk of selecting for a resistant bacterial population. Susceptibility to antibiotics and quaternary ammonium compounds (QAC) was determined for 100 *E. coli* from calves entering rearing in Switzerland, revealing that 34% of the isolates were susceptible to the antimicrobials tested and 48% were susceptible to QAC. All isolates were susceptible to colistin, tigecycline and meropenem. Resistance to more than 3 antibiotics was found in 59% of the isolates. Isolates exhibited resistance to tetracycline (59%) associated with the presence of *tet* genes (*tet*(A), (B), (E), (G)), to sulfonamides (63%) (*sul1*, *sul2*, *sul3*), β -lactams (58%) (*bla*_{TEM-1}), trimethoprim (34%) (*dfrA*), gentamicin (29%) (*ant*(2'')-Ia; *aac*(3)-VIa, *aac*(3)IV; *aac*(3)-IV; *aac*(3)-IIc), streptomycin (46%) (*strA*; *strB*; *aadA*) and ceftazidime (1%) (*bla*_{CTX-M-9} (ESBL)). Mutations in GyrA (S83L) and ParC (S80I) were found in fluoroquinolone resistant isolates (8%). All isolates were susceptible to colistin, tigecycline and meropenem. No association between the presence of decreased susceptibility to ADBAC and *qac* genes was observed. Genetic diversity between isolates was determined using repetitive palindromic PCR (*rep*-PCR) revealing a genetically diverse *E. coli* population. In conclusion, antibiotic and QAC resistant *E. coli* are present in the gut of young calves at the beginning of the rearing period, emphasizing the need of appropriate and reduced use of antibiotics and QAC-containing disinfectants in order to limit further selection and maintenance of these bacteria during rearing period.

Keywords: Enterobacteriaceae, antibiotic resistance, qac, disinfectants, cattle