

TITLE: Presence of acquired antimicrobial resistance genes and replicon typing of plasmids in feces of dairy cows and dairy calves

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ABSTRACT:

Bacterial resistance to antimicrobials is considered a global public health problem and dairy farming involves the overuse of antimicrobials (i.e. growth promoters and prophylactic agents). The excessive use of antimicrobials selects multidrug-resistant (MDR) bacteria, which may spread to different sources, such as humans and the environment. MDR bacteria carrying antimicrobial resistance genes (ARGs) have been reported in animal sampling, including dairy cows and dairy calves. This study aimed to verify the presence of ARGs and plasmids in feces of dairy cows and dairy calves in a Brazilian farm. Fecal samples were collected and, then, genomic DNA of cultivable bacteria was extracted. ARGs to Beta-lactams, tetracyclines, aminoglycosides, quinolone and fluoroquinolones, sulfonamides, phenicols and polymyxins, and replicon typing of plasmids were researched by PCR. In this study, 12 fecal samples of dairy cows and nine of dairy calves were collected to be analyzed and a total of 56 ARGs and 20 plasmids were investigated, being detected 298 amplicons (154 ARGs and 144 plasmids). Among the detected ARGs, *tetC* (19) was the most prevalent, followed by *qnrS* (17), *tetA* (16), *bla_{SHV}* (16), *tetB* (15), *aadA* (15), *oqx_B* (13), *sul2* (13), *qepA* (7), *bla_{CMY}* (6), *floR* (4), *sul3* (3), *bla_{CTX-M-Gp2}* (2), *aac(6')-Ib* (2), *sul1* (2), *cmlA* (2), *qnrB* (1) and *oqx_A* (1). Different incompatibility groups (Inc) of plasmids were detected, being that all samples presented IncF, IncFIA and IncFIB, followed by ColE-like (20), IncII (16), IncY (14), IncU (13), IncHI1 (5), IncR (5), IncK (5) and IncN (3). These results indicate that fecal samples of dairy cows and dairy calves are acting as reservoir of ARGs related to several antimicrobials as well as plasmids associated with spreading of ARGs, which, consequently, may spread for humans and environment (e.g. soil and water), which is worrying.

Keywords: ARGs; Dairy calves; Dairy cows; Feces; Plasmids.

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