Associations between antimicrobial resistance in porcine *E. coli* and antimicrobial use

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Antimicrobial resistance (AMR) is a growing concern due to treatment failures in pigs and the potential spread of resistance genes to human pathogens. Risk factors for the development and persistence of resistance on swine farms are poorly understood. This study examined the AMR profiles of *E. coli* from grow-finish pigs and the association between resistance to tetracycline and sulfamethoxazole and antimicrobial usage in the previous twelve months.

405 fecal samples were collected from 20 herds and cultured for *E. coli*. 1439 isolates were tested for their sensitivity to 16 antimicrobials using microbroth dilution. 66.7% of the isolates were resistant to tetracycline and 46.0% were resistant to sulfamethoxazole. Feed antimicrobials accounted for 88% of the treatment incidence. The reported incidence of treatment through water (9.1%) and injection (2.9%) was much lower. Treatment incidence was highest in nursery pigs (mean, 776 treatments per 1000 pig-days) and lowest in sows (mean, 34 per 1000 pig-days).

Multilevel analysis identified associations between increasing antimicrobial use and increasing resistance. These results provide information to the pork industry on the amount and reasons for AMU in western Canada and potential implications of this use on the development and persistence of resistance.