

Antimicrobial Resistance of Pathogens in Lactating Dairy Cattle

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Antimicrobial resistance (AMR) has increased in recent years and is posing a concern to human, animal, and environmental health. Mastitis is one of the main reasons for antimicrobial use (AMU) and is the most significant contributor to reduced milk quality in the Canadian dairy industry. We hypothesize that farms with more AMU and farms with free-stall management systems will have higher proportions of AMR in milk pathogens. Therefore, the objective of this study was to describe the relative proportion of pathogens resistant to frequently used antimicrobials (AM) during the first month after calving. This was attained by determining AMR in pathogens isolated from composite milk samples collected during the first month of lactation. AMU was acquired using veterinary clinic dispensing records and articulated as antimicrobial drug use rate (ADUR), expressed as doses per 100 cows per year as described by Saini *et al.* (2012). Bacterial strains were identified with Columbia agar with 5% sheep blood culture plates, Gram stains, and MALDI-ToF mass spectrometry. Antimicrobial susceptibility was determined using the Sensititre microdilution system and mastitis plate format CMV1AMAF. From July to December 2020, a total of 133 milk samples were obtained from 28 farms in Prince Edward Island (18 free-stall; 10 tie-stall) within two weeks after calving. The average parity was 2.6 (range: 1-8). Farms used on average 38.5 daily doses per 100 cows per year and ranged from 3.02 to 76.8. A total of 62 samples reported a positive culture including: *E. coli* (3.23%), *Staph. aureus* (4.46%), and coagulase-negative staphylococci (CNS)(67.75%). Proportions of resistant bacteria will be compared across AMU categories and farm characteristics.

Research Grant: Dairy Farmers of Canada (Dairy Research Cluster 3); University of Prince Edward Island; Public Health Agency of Canada.

Student Support: Atlantic Veterinary College Summer Research and Leadership Program