

Antimicrobial Resistance in Common Mastitis Pathogens on Canadian Dairy Farms

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Antimicrobial therapy is an important tool in mastitis prevention and control. However, bacteriological cure rates (e.g. of *Staphylococcus aureus* mastitis) seldom exceed 50%, and antimicrobial resistance (AMR) is one of the reasons for low cure rates. Hence antimicrobial susceptibility testing of udder pathogens is necessary to rule out antimicrobial therapy for resistant mastitis pathogens. The present study was therefore conducted to determine AMR in bovine mastitis pathogens on Canadian dairy farms.

Milk samples were collected for two years on 89 dairy farms across 6 Canadian provinces (AB, ON, QC, NB, NS and PEI). *S. aureus* (n=570), *Escherichia coli* (n=399) and *Klebsiella* isolates (n=149) were collected from udder infections, subclinical mastitis and clinical mastitis cases. These isolates were tested for minimum inhibitory concentrations and AMR profiles using Sensititre[®] for antimicrobials commonly employed for mastitis treatment and control.

Overall, 2.6%, 4.0% and 4.7% of *S. aureus*, *E. coli* and *Klebsiella* species isolates were resistant to antimicrobials tested, respectively. *Staphylococcus aureus* isolates from QC and Maritimes provinces had the highest proportion of tetracycline and pirlimycin resistance (5.5 and 7.9%, respectively), whereas AB isolates exhibited no resistance to these antimicrobials. *E. coli* isolates from AB had the highest proportion of resistance (23.6%) to tetracyclines in comparison to ON (9.5%) and QC (10.4%). *Klebsiella* isolates from AB had the highest proportions of resistance to amoxicillin-CLA combination (10.6%), streptomycin (25.0%), sulfisoxazole (19.1%) and tetracycline (34.3%), whereas isolates from ON had the highest proportion of resistance to ceftiofur (20.0%).

Implications: Overall, levels of resistance in bovine mastitis pathogens on Canadian dairy farms were low. Differences in resistance proportions in isolates from various regions were seen.