

Surveillance of antimicrobial use and resistance to improve stewardship practices and animal health on dairy farms

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National Dairy Research Strategy investment priorities targeted:

- Assessment of antimicrobial use in Canadian dairy herds
- Development of alternative tools and practices to antimicrobials use and management

PERIOD: 2018-2022

TOTAL BUDGET: \$1,582,087

Why this research is important:

There are very few evidence-based studies evaluating antimicrobial stewardship practices in animals, including the dairy sector. It is now widely accepted that drug-resistant infections, and particularly infections with pathogens resistant to antimicrobials, are a major threat in both human and animal health. Most antibiotic treatments on dairy farms are to treat mastitis, however, the levels of antimicrobial resistance (AMR) remain relatively low in mastitis pathogens.

Conversely, a major concern is selection pressure imposed by the use of antimicrobials in dairy cows and young stock, which could result in the emergence, maintenance, and horizontal transfer of AMR in bacteria other than the mastitis pathogens. The increase in AMR in dairy cattle could have an adverse effect on animal health and welfare and on the profitability of dairy farms.

Research objectives:

- Develop a surveillance program and research platform, the Canadian Dairy Network of Antimicrobial Stewardship and Resistance (CaDNetASR);
- Measure antimicrobial use, its relation to animal health and antimicrobial resistance on Canadian dairy farms; and,
- Provide effective antimicrobial stewardship practices for farmers.

Project overview:

The Public Health Agency of Canada (PHAC) currently leads the farm surveillance program called the Canadian Integrated Program for Antimicrobial Resistance and Surveillance (CIPARS) for swine, broiler chickens and turkeys. Working closely with PHAC and CIPARS, the research team will develop a research platform and establish the infrastructure required to support a national surveillance system for the ongoing collection of data regarding antimicrobial use (AMU), AMR trends and the effectiveness of stewardship practices on Canadian dairy farms. Data on AMU, AMR and dairy animal health will be collected on farms in five regions. To provide AMU data estimates, treatment records logged as part of the Food Safety and Biosecurity modules of proAction®, and the retrieval of receptacles placed on farms for the deposit of empty drug bottles and containers will be used. To measure AMR on dairy farms, fecal, environmental and bulk tank milk samples will be taken and analyzed. The information will serve as a base for the development and testing of evidence-based and effective tools for farmers and their veterinarians (i.e. standard operating protocols or SOPs).

Expected outcomes:

Development of an evidence-based surveillance system in support of the ongoing responsible use of antimicrobials on Canadian dairy farms and the development of efficient antimicrobial stewardship practices for farmers in line with the federal action plan on antimicrobial resistance and use in Canada and the Food Safety and Biosecurity modules of proAction to assure the health and welfare of dairy animals and the safety of food for consumers.

The participation of 150 Canadian dairy farms will contribute to the successful completion of the project.

FUNDING PARTNERS:



NOTE: As per the research agreement, aside from providing financial support, the funders have no decision-making role in the design and conduct of the studies, data collection and analysis or interpretation of the data. Researchers maintain independence in conducting their studies, own their data, and report the outcomes regardless of the results. The decision to publish the findings rests solely with the researchers.