

Assessing the Associations among Facility Design and Management Practices and Antimicrobial Drug Use in Ontario Free-Stall Dairy Herds

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Introduction

This study describes drug use in lactating cattle on Ontario free-stall dairy farms and investigates factors specifically associated with antimicrobial drug use.

Materials and Methods

In June 2001, a short survey was mailed to all 849 Ontario producers with free-stall facilities for their milking herds. Questions focused on aspects of barn design and antimicrobial drug use, including two clinical case scenarios.

In July 2001, a more extensive survey was mailed to food animal veterinarians (n=331). This survey contained questions regarding practice demographics, veterinary-client-patient-relationship, frequency of specific antimicrobial drug use, record keeping and opinions regarding antimicrobial resistance. Veterinarians were given four clinical case scenario questions, two of which mirrored those in the producer survey.

From the 352 producers who returned complete questionnaires, 25 herds were randomly selected for enrollment in a longitudinal on-farm study. Study herds were enrolled to follow individual and herd-level drug use for a full calendar year. Each farm is recording individual and group drug treatments using a paper-based Livestock Treatment Log. Drug use data will be validated using a garbage can auditing (GCA) system that has been set up on each study farm. GCA data will be collected quarterly so that seasonal variation can be assessed. Data regarding the reason for treatment is also being recorded for each drug use.

From these data, descriptive statistics will be used to compare herd-level antimicrobial drug use among

study herds in different risk factor strata. Overall drug use will be sub-categorized by antimicrobial drug class and treatment reason. The list of antimicrobial drugs used in study herds will be categorized further into one of three classes according to their level of use and importance in human medicine (Framework Document, FDA-CVM).

Results

Response rate for the producer survey was 52% (n=440). Producers ranked veterinarians number one as their source of antimicrobial drugs and advice. Response rate for the veterinary survey was 46.7% (n=122) overall, excluding those who do not practice dairy medicine. Of those practices identified as Key Dairy Practices, 73.3% (n=33) of the practices had at least one veterinarian respond; response rate for veterinarians in those practices was 55.7% (n=64).

Respondents generally agreed to the initial management approach for the two clinical case scenario questions shared by the producer and veterinary surveys. Veterinarians over-predicted the use of intramammary antibiotics and antimicrobial foot sprays for the mild mastitis case and lameness case, respectively. Both groups of respondents gave identical rankings for reason for antimicrobial drug use: 1-mastitis, 2-uterine/vaginal infection, 3-lameness and 4-respiratory infections. The most frequently dispensed injectable antimicrobials by veterinarians were ceftiofur, penicillin and trimethoprim-sulfadoxine, while penicillin G/dihydrostrep/novobicin/polymixin B combination and cephalprin sodium and benzathine were the most frequently dispensed intramammary antimicrobials.