

Monitoring the use of antimicrobials in Swiss dairy farms

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Introduction

Monitoring antimicrobial consumption is crucial for the interpretation of data on the situation of antimicrobial resistance in bacteria from farm animals. WHO and OIE recommend its implementation at the farm, veterinary practice and industry levels (FAO/OIE/WHO, 2003). Since a new Swiss legislation on animal drugs is in force (Anonymous, 2004), data collection at these levels became possible. Before routine monitoring can be established, scientific and practical aspects of data collection and analysis need to be elaborated. In a first step, our aim was to evaluate data quality of farm records on antimicrobial use in dairy farms and to compare different recording systems.

Material and methods

During the year 2005, treatment data (product, quantity, indication, animal-age group) were collected from 97 dairy farms with an average herd size of 26 cows. Participation in the study was voluntary. Each farm was visited once at the beginning of the study and instructions for recording of data were provided. Farmers were given the choice of using either a paper journal (36 farms), an Excel® sheet (29), a management software available on the internet (bovinet®, 27) or farmer's own recording systems (5). Data quality was evaluated by describing completeness and checking plausibility of the recorded information. In addition, the veterinarians of 15 participating farms were visited and their records on treatments and sales of antimicrobials compared to the farmers' records. Information on antimicrobial use was classified according to the anatomical-therapeutic-chemical code (ATCvet) (Stege et al., 2003), and analyzed by calculating the mean daily dose administered (Jensen et al., 2004) and treatment incidence for each antimicrobial class and animal category. These results will be compared to antimicrobial usage data obtained at the veterinarian and wholesale levels.

Results and discussion

According to preliminary results, 3182 antimicrobial treatments were performed: 82% in cows (1 treatment/cow/year), 16% in calves (0.22 treatments/calf born/year) and 1.5% in heifers (0.07 treatments/heifer/year). The most important indications for antimicrobial treatment in cows were dry-cow therapy and mastitis (72%), followed by reproductive disorders (18%). In calves, respiratory and digestive disorders (40% each) were the most frequent indications. These results are in agreement with previous studies performed in Switzerland (Frei et al., 1997; Genoud, 2002; Regula et al., 2004; Schären, 2006).

Within the antimicrobial drugs for intramammary use (QJ51), penicillins were the most frequently administered, either as single substance (27%) or in combination with other antimicrobials, mostly gentamicin and neomycin (57%). This is consistent with sales data reported recently in Switzerland (Swissmedic, 2006), where 68% of the total amount of antimicrobials marketed for intramammary treatment in 2004 were penicillins and 27% aminoglycosides. For systemic (QJ01), intrauterine (QG51)

and intestinal use (QA07), tetracyclines (18%), penicillins (19%+17% in combination with other antimicrobials), cephalosporines (13%), sulfonamides (10%+4% combined with other antimicrobials), quinolones (9%), aminoglycosides (6%) and macrolides (4%) were regularly administered.

All three recording systems (paper records, Excel® sheet or internet application) provided data of a high quality and 90% of the records on antimicrobial treatment could be analyzed. Agreement between farm and veterinarian's records mounted up to 50%, although it varied among farms. Veterinarians tended to register more treatments than farmers, as well as more detailed information on drug name and doses.

Although data quality varied among farms, farmers' records provided valuable information on patterns of antimicrobial usage. This information must be complemented with data from other sources, such as veterinarians' records or industry sales figures. In the future, antimicrobial use monitoring will be integrated in the national program on antimicrobial resistance in bacteria from farm animals.

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