Antimicrobials in swine production, antimicrobial resistance, alternative strategies to antimicrobial use

Quantification of antimicrobial use in Swiss pigs: comparison with other Swiss livestock species and with Danish pigs

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Few countries have introduced monitoring of antimicrobial usage (AMU) per animal species. Such an achievement is an objective of the ESVAC project (European Surveillance of Veterinary Antimicrobial Consumption). Implementing these monitoring systems would allow detailed AMU comparisons between countries enabling an evaluation of interventions to reduce antimicrobial consumption effectively.

In line with the abovementioned, a Monte-Carlo simulation model (MCSM) was developed to estimate AMU per species in Switzerland in the period 2006-2012. PERT distributions were generated by combining sales data, information collected from the Swiss Veterinary Drug Compendium and data derived from a field study on Swiss prescription patterns. Obtained outputs allowed extrapolating from sales data to the proportion of AMU by each species, at antimicrobial class level.

AMU in Danish pigs was calculated as mg/Population Correction Unit (PCU) using the Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP) and ESVAC as data sources. Pig AMU was compared between the two countries.

In general, MCSM results indicated a decreasing trend in Swiss AMU for all species. Pigs dominated AMU in Switzerland (varying between 111 mg/PCU in 2008 and 78 mg/PCU in 2012), over cattle (from 89 mg/PCU in 2008 to 73 mg/PCU in 2012) and poultry (from 21 mg/PCU in 2006 to 9 mg/PCU in 2012). Danish pig AMU was lower than Swiss pig AMU with values ranging between 44 and 57 mg/PCU. Additionally, the use of different antimicrobial classes in pigs varied between the countries.

Comparisons should be assessed with caution as different data collection strategies and methodologies were used to quantify AMU. Moreover, antimicrobial potency was not considered in these AMU estimates. Nevertheless, results suggest that there is still room for an AMU reduction in the Swiss pig sector. Further efforts should be made to understand what drives AMU and consumption patterns in Switzerland and other countries.

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Figure 1: Number of pig herds with reported use of specific active antimicrobial ingredients by route of administration; CIPARS Farm-Swine Surveillance 2013 (n = 89).

Figure 2: Reported antimicrobial use for treatment or control of specific diseases in CIPARS grower-finisher herds, by disease status; CIPARS Farm Swine Surveillance 2013

Positive = “confirmed positive” or “likely positive”
Negative = “confirmed negative” or “likely negative”.
Positive & Antibiotics = Positive for a disease and used an antibiotic to control that disease
Positive & No Antibiotics = Positive for a disease and did not use antibiotics to control that disease
Negative & Antibiotics = Negative for a disease and used antibiotics to control that disease
Negative & No Antibiotics = Negative for a disease and did not use antibiotics to control that disease

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