

# Integration of anthropology and veterinary medicine to address antimicrobial resistance in the dairy industry

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*Abstract.* Antimicrobial resistance (AMR) has been identified as a quintessential One Health issue due to its emergence at the human-animal-environmental nexus. It is one of the greatest threats to public health in the 21<sup>st</sup> century. By 2050, an estimated 10 million deaths per year globally will be attributable to AMR, with a cumulative economic cost of \$100 trillion US. Not only can the use of antibiotics in animals result in the development of AMR in animals (e.g. dairy cattle), there is increasing recognition that widespread use of antibiotics in production animals contributes to the development of resistance to antibiotics commonly used in human medicine. Moreover, bacteria carrying resistance genes can be transmitted from animals to humans. Reduced antimicrobial use (AMU) in animal production is therefore essential to decrease AMR in animal and human pathogens. The objectives of this study are 1) to analyze the cultural practices and sociopolitical belief systems of dairy farmers, researchers, and veterinarians as they pertain to AMU in Alberta, Canada; 2) to identify and describe the perspectives of key stakeholders (i.e. pharmaceutical companies, veterinary institutions, media, non-profit organizations, and governmental agencies) and their influence on veterinarians' and dairy farmers' decision-making processes; 3) to develop a locally-specific, sustainable mechanism for reducing AMU that could be fostered by the veterinarian-farmer relationship. To do so, participant observation will be employed to gain an in-depth understanding of dairy culture. Open-ended, semi-structured interviews will then be conducted with dairy farmers, veterinarians, researchers and other relevant stakeholders to gain insight into determinants of AMU. Sociopolitical and economic linkages between stakeholders will be mapped. Cultural consensus modeling will be used to determine the extent to which risk perceptions and beliefs overlap or deviate.

*Implications.* This research will make a significant contribution to the larger body of knowledge on AMU and play a direct role in the reduction of AMR in the dairy industry. By integrating existing clinical literature with novel social science insights, we will be better equipped to inform public debate. It will not only transform public understanding of the factors driving AMR, but also stimulate fruitful collaboration between research scientists, veterinarians, and farmers.