PROJECT SNAPSHOT

3B: Human Exposure to and Risk from Antimicrobial Resistant Campylobacter, Enterococcus and ESBL E. coli: A Farm-to-Fork Assessment

Pillar: Surveillance
Theme: Innovation and Commercialization
Keywords: Campylobacter, Enterococci; E. coli; Risk Assessment; Integrated Assessment Model

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AIM

The focus of this project is on quantitative modeling strategies to understand the risk of AMR transmission through the food chain to people.

WHY IS THIS IMPORTANT?

We must understand the magnitude of exposure for these foodborne AMR risks (Fluoroquinolone-resistant *Campylobacter* and ESBL *E. coli*) to design One Health antimicrobial stewardship approaches for veterinary and human medicine.

OUTCOMES

1. New quantitative modeling tools to understand the exposure and risk of AMR transmission through the food chain to humans.
2. Understanding of the farm-to-fork pathway for AMR transmission, including potential interventions to reduce this transmission.

RESEARCH QUESTIONS

1. What is the human exposure to and risk of foodborne transmission of AMR from *Campylobacter*? (Fluoroquinolone, macrolide or tetracycline-resistance in poultry, swine, and beef cattle)
2. What is the human exposure to foodborne transmission of other AMR from beef cattle? (Macrolide-resistant *Enterococcus* spp. & ESBL *E. coli*)

OUR APPROACH

We will first conduct a scoping review on the risk factors for human infection with AMR *Campylobacter*. Integrative Assessment Models will be utilized as they are designed to deal with complex issues, providing a comprehensive mechanism for organising, and processing evidence and uncertainty. We will also use QMRAs as they can assess the effects of factors and interventions influencing the public health impacts of exposure to AMR *Campylobacter* from poultry.

ALIGNMENT WITH THE AMR - ONE HEALTH CONSORTIUM

LEVERAGED SOURCES OF SUPPORT

Canadian Integrated Program for Antimicrobial Resistance Surveillance • Genomics Research and Development Initiative NRC1 + NRC2 • Agriculture and Agri-Food Canada • Ontario Ministry of Agriculture, Food and Rural Affairs • Public Health Agency of Canada • University of Alberta School of Public Health

KNOWLEDGE & TECHNOLOGY EXCHANGE AND EXPLOITATION

- Identification of risk management interventions to curb the transmission of AMR through the foodchain.
- Changes in veterinary antimicrobial prescribing practices.

HIGHLY QUALIFIED PERSONNEL

- 2MSc
- 5 Research Assistants

AFFILIATIONS: University of Alberta • Public Health Agency of Canada • University of Calgary • Agriculture and Agri-Food Canada

Alberta Government

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