

BOVINE ENTERIC PATHOGEN SUMMARY

ANTIMICROBIAL RESISTANCE (AMR) INFORMATION



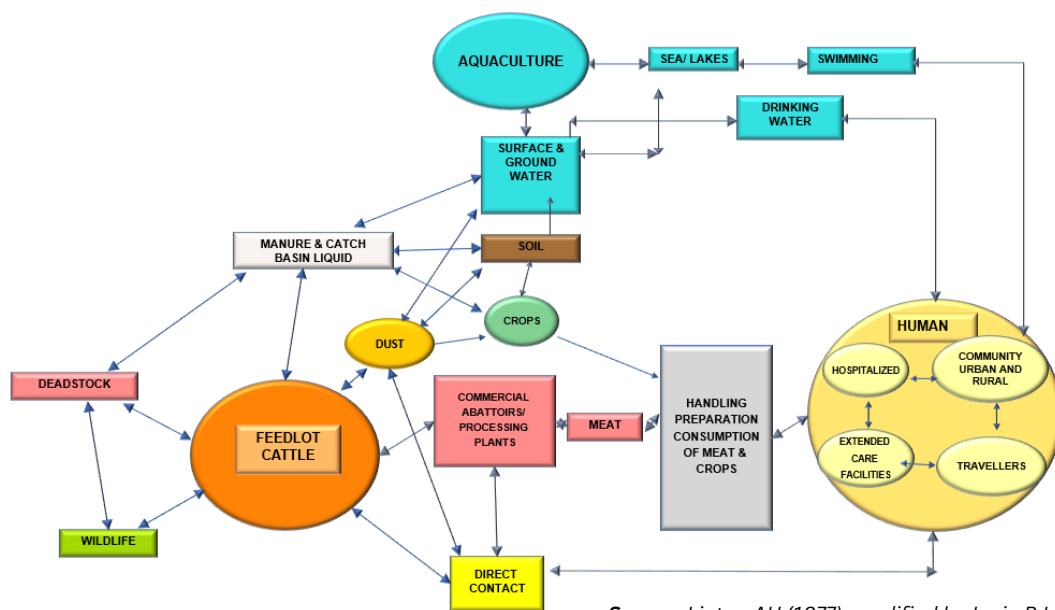
What are enteric pathogens?

- Enteric bacteria are bacteria found in the feces of animals and humans.
- Many different types of bacteria can cause **enteric disease** in cattle or humans, meaning that it could make cattle or humans sick with gastrointestinal illness.
- These bacteria include *Escherichia coli*, *Enterococci*, *Campylobacter*, and *Salmonella*.

Why are they of concern for AMR development?

- **Antimicrobial resistance (AMR)** happens when microbes, such as bacteria, have evolved so that antimicrobials are not able to control or kill them as effectively.
- Rising rates of AMR make it harder to treat bacterial infections with antimicrobials and increase the risk of illness, and death in people and animals.

Figure: Pathways for Spread Antimicrobial Resistance (AMR)



Source: Linton AH (1977), modified by Irwin RJ.

The figure describes how antimicrobials used in various sectors contribute to the emergence and spread of resistant micro-organisms in numerous settings.

USE OF ANTIMICROBIALS INCREASES RISK OF AMR DEVELOPMENT.

Did you know?

- Each and every time antimicrobials are used, including medicated feed additives (MFAs) like tylosin, tetracycline, and virginiamycin, there is an **increased risk for AMR development** in enteric bacteria
- Enteric bacteria in cattle manure are of concern to public health because of environmental contamination of water, soil, and the air, manure contamination of beef carcasses during processing viz. food safety, and direct contact of feedlot workers.



SOME BACTERIA IN THE MANURE OF FEEDLOT CATTLE CAN CAUSE DISEASE IN HUMANS.

- If the manure contains AMR bacteria that are pathogenic to cattle or humans, they can make them sick and treatment with antimicrobials will be difficult, increasing morbidity and mortality rates. As well, AMR enteric bacteria may spread their resistance genetically to other pathogenic bacteria of concern to cattle and human health.
- Generic ***E. coli*** bacteria isolated from feedlot cattle do not typically cause disease in cattle or humans.
- While ***Enterococci*** bacteria do not cause disease in cattle, certain strains can cause disease in humans.
- ***Campylobacter*** strains isolated here rarely cause disease in cattle, although they have been associated with occasional calf diarrhea or abortion outbreaks. Certain *Campylobacter* strains cause gastrointestinal disease in humans, including farm workers.
- ***Salmonella*** bacteria are of concern to cattle and human health, and they are associated with many different disease syndromes, but most notably, gastrointestinal disease. These bacteria often are inherently resistant to many different antimicrobials; thus, the disease is hard to treat.

WHAT CAN YOU DO AS A PRODUCER TO REDUCE ANIMAL AND HUMAN HEALTH RISKS FROM ENTERIC BACTERIA?



Talk to your Veterinarian!

Work with your veterinarian to reduce the risk of infectious disease; thus, the need for antimicrobials and risk of AMR development, by using good animal husbandry and on farm practices, such as: effective vaccination protocols, well-balanced rations, environmental management, health and performance monitoring, and staff training.



Practice good manure management practices as per provincial and federal regulations to prevent manure contamination of surface water bodies and leaching to groundwater.



Contain manure runoff from feedlot pens, stockpiled manure, and compost piles.



Do not apply catch basin liquid to crops grown for human consumption that are eaten uncooked.

WHAT CAN YOU DO AS A PRODUCER TO REDUCE ANIMAL AND HUMAN HEALTH RISKS FROM ENTERIC BACTERIA?



Follow provincial setback distances when applying catch basin water to land and when applying manure on land and incorporate in soil within 48 hours to reduce runoff.



Scrape, bed, and clean feedlot pens regularly to reduce tag build-up on cattle hides.



Monitor groundwater bacterial contamination with regular water testing.



Contain and divert runoff from deadstock to prevent contamination of feeding pens, feed, and water bodies, and leaching to ground water.



Implement a dust control strategy.

- Scrape pens of loose dust and remove regularly.
- Water feed alleys and feeding pens as needed to reduce dust.
- Consider use of tree shelterbelts around feedlot to collect/contain feedlot dust.



Educate feedlot workers on good hygienic practices e.g., wash hands well with soap and water before eating, drinking, or smoking.

The Canadian beef industry and multiple other stakeholders are working with the Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) to implement and maintain a national feedlot antimicrobial use (AMU) and resistance (AMR) surveillance program in Canada. Collection of high-quality data over time will allow the feedlot industry to document appropriate information that ensures both animal and public health and welfare.



**QUESTIONS?
EMAIL US!**

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**CANADIAN FEEDLOT
ANTIMICROBIAL USE AND
ANTIMICROBIAL RESISTANCE
SURVEILLANCE PROGRAM
(CFAASP)**