

Worried about antibiotic use and resistance in cattle?



It's important to us too.

WHERE DOES ANTIBIOTIC RESISTANCE COME FROM?

When antibiotics are used, bacteria that are responsive to the drug are killed, and bacteria that aren't responsive (are resistant) survive and reproduce.

1



1 Some bacteria cause disease. A few are drug resistant.

2



2 Antibiotics kill disease-causing bacteria, as well as some good bacteria that protect the body from infection.

3



3 The antibiotic resistant bacteria survive and reproduce.

4



4 Some bacteria share their drug-resistance with other bacteria.

ANTIBIOTIC RESISTANCE HAPPENS NATURALLY

The Lechuguilla Cave in New Mexico has bacteria that have lived in complete isolation for more than four million years. When treated with a variety of antibiotics, many of these bacteria were naturally resistant.¹

ALL BEEF IS ANTIBIOTIC FREE

A specified withdrawal time must pass after the last treatment to ensure that there are no antibiotic residues left in the beef. The Canadian Food Inspection Agency regularly tests for residues. In 2013, over 99.9% of both domestic and imported beef products were free from residues. If residues are found, the beef is not allowed to enter the food chain.¹¹

WHY ARE ANTIBIOTICS USED IN CATTLE?



Ensuring animal welfare: providing care to sick cattle, including using antibiotics when appropriate, is the humane thing to do.

ANTIBIOTICS IN FEED

Just because an antibiotic is used in feed does not mean it is being used to promote growth. It is often better for sick animals to be treated through feed rather than aggravating their illness with stress from multiple injections.

"It is our privilege, not our right to be able to use antibiotics in the animals that we take care of."⁵
- Dr. Craig Dorin, Veterinarian



GROWTH PROMOTION

A category of antibiotics called ionophores help boost growth in cattle. Ionophores are not used in human medicine, and work differently than medically important antibiotics. **There is no evidence that use of ionophores causes increased resistance to antibiotics used in human medicine.**^{3,4}



PREVENTION

Preventing infection can reduce the need to use more powerful antibiotics if the disease becomes more serious. Preventive antibiotics are also used in human medicine, like with people who are exposed to bacterial meningitis.



TREATMENT AND CONTROL OF DISEASE

Cattle sometimes get sick, just like people, pets, and other livestock. Antibiotics can help protect animal health by limiting the spread of disease.



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ARE ALL ANTIBIOTICS CREATED EQUAL?

NO. In Canada there are four categories⁶



Not all antibiotics are the same. Some antibiotics are more powerful than others, and some categories of antibiotics that are often used in cattle are not medically important to humans.

MOST IMPORTANT IN HUMAN MEDICINE



LEAST IMPORTANT IN HUMAN MEDICINE

Category	1. VERY HIGH IMPORTANCE	2. HIGH IMPORTANCE	3. MEDIUM IMPORTANCE	4. LOW IMPORTANCE
Used in treating humans?	Yes – limited or no alternatives available Drugs of last resort	Yes – alternatives available	Not often – many more effective alternatives available	Not used in human medicine
Used in beef cattle?	Rarely used	Sometimes used for treatment, control and prevention of disease	Commonly used for treatment, control and prevention of disease	Commonly used for growth promotion and prevention of disease
Brand name examples	Human: Cipro, Omnicef Cattle: Excede, Baytril	Human: Amoxil, Zithromax Cattle: Draxxin, Tylan	Humans: Bactrim, Vibramycin Cattle: Resflor, Liquamycin	Humans: n/a Cattle: Ionophores such as Rumensin, Bovatec

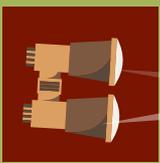
Most of these products require a veterinary prescription, just like you need a prescription from your doctor before the pharmacist will give you most antibiotics.



of the antibiotics used in people are of **High and Very High importance.**¹⁰



of the antibiotics used in animals (livestock and pets) are of **Low and Medium importance.**¹⁰

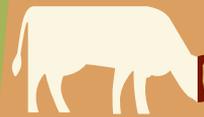


ANTIBIOTIC RESISTANCE SURVEILLANCE

Canada has several surveillance programs in place to monitor trends in antibiotic resistance. Examples include the Canadian Integrated Program for Antimicrobial Resistance Surveillance,⁷ FoodNet Canada,⁸ and the newly announced Canadian Antimicrobial Resistance Surveillance System.⁹

Resistance of E. coli in retail beef to any of the drugs in the **VERY HIGH IMPORTANCE** category is

less than **2.5%.**⁷



DRUG RESISTANCE LEVELS ARE LOW IN BEEF

“Producers understand the concept of antibiotic stewardship. We understand the concept of leaving something in a better situation than we inherited it.”⁵
-Dr. Leigh Rosengren, Veterinarian and Producer



Bacteria (E. coli) found in retail beef are rarely resistant to more than one drug. Over 74% of E. coli samples were not resistant to any of the drugs tested.⁷

RESPONDED TO ALL DRUGS
74.4%



RESISTANT TO ALL DRUGS TESTED
0.003%



This means that there are lots of options to treat most drug resistant bacteria.

HOW DIFFICULT IS IT TO GET A RESISTANT INFECTION?

For a person to get an antibiotic resistant infection from eating beef, a number of **unlikely** things must happen:

- 1 animal gets an antibiotic
- 2 antibiotic resistant bacteria develops in animal
- 3 bacteria survives multiple food safety controls during processing
- 4 bacteria survives cooking
- 5 bacteria causes illness in person
- 6 illness is severe enough to warrant medical attention
- 7 Doctor prescribes antibiotic
- 8 illness fails to respond to treatment because bacteria is resistant to prescribed antibiotic¹²

If beef is cooked properly, the antibiotic resistant bacteria die – breaking the chain of unlikely events. The probability of human illness in the U.S. due to drug resistant food poisoning (campylobacteriosis) is about one in 236 million.¹² Being killed by an asteroid is 1000 times more likely.¹⁸

Whether you choose conventional or organic, beef is an important part of a nutritious diet.



Producers take their ethical responsibility to protect the health and welfare of their families and animals very seriously, which includes using antibiotics when appropriate.

Producers also have a responsibility to use antibiotics with good judgment. Surveillance⁷ indicating low resistance in cattle to antibiotics of importance in human medicine shows they are doing just that. Canada's Verified Beef Production™ program outlines responsible practices for producers, and provides training on how to use antibiotics properly.¹³

Previous research showed no predictable or uniform increase in resistance between cattle raised with the use of antibiotics and those raised without.¹⁴ Antibiotic use in agriculture is just one small part of the whole antibiotic resistance picture that also includes humans and pets.^{15,16,17}

Manitoba Beef Producers would like to acknowledge the work and research of Alberta Beef Producers in the creation of this brochure. For more information on Manitoba's beef industry please visit www.mbbeef.ca



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