



What Consumers Need to Know about the Use of Antibiotics in Food Animal Production

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When reading the headlines of many press articles, you might get the impression that U.S. meat, poultry and dairy products are routinely contaminated with antibiotics. The truth is that many of these headlines are misleading. For example, the U.S. Food and Drug Administration recently conducted a study of antibiotic contamination in milk from dairy cows. The study targeted producers that had a past failed residue test in meat from their cull cows (cows no longer producing milk, so are sold for meat) in comparison to a group of producers without a history of a failed residue test. The result showed that 99.22 percent of the combined samples had no residues. However, after the FDA released the results, headlines contained misleading information implying that almost 1 percent of U.S. milk supplies were tainted with antibiotics. The problem is that the FDA targeted farms with a history of non-compliance, so it was not a random sample. In short, non-compliant farms were over-represented in the study (about 50 percent of the samples), meaning actual percentage of milk produced with residues is far lower than the study's 0.78 percent rate. The complete study can be found at <http://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/ComplianceEnforcement/UCM435759.pdf>.

The goal here is to provide answers to common questions regarding the use of antibiotics in animal agriculture. The focus is on why antibiotics are used in meat animal production and the potential to contribute to antibiotic-resistant bacterial infections in humans.

1. Why do farmers use antibiotics in livestock production?

First, antibiotics are used to prevent, treat and control bacterial infections in livestock. Just like humans, animals can contract infections, such as pneumonia. Antibiotics are used to humanely and economically treat and prevent these diseases. While often portrayed as cruel and uncaring by some in the media, the vast majority of livestock producers are very concerned about the welfare of animals under their care. Leaving sick animals to suffer from infections that are easily treated with antibiotics is cruel and inhumane. In addition to their humanity, farmers stay in business and feed their own families by earning profits through livestock and milk production. Unhealthy animals are unprofitable, can infect other animals in the herd and may die. In short, it is in farmers' best interest to provide appropriate veterinary care for sick and injured animals.

Secondly, antibiotics can increase animal performance. By using antibiotics, farmers can produce more meat with less feed input. Some antibiotics change the colony of bacteria in the rumen (one of four stomachs in cattle) to produce more of the compounds needed by cattle for growth. Some are used prophylactically to prevent diseases that are very difficult to control once the animal is infected. Importantly, the antibiotics used to increase production (a class of products referred to as "ionophores") are not used to treat people, nor do they leave residues in meat if properly used. Antibiotics used to treat diseases in humans can no longer be used in livestock to improve production—they are strictly used for the prevention, control and treatment of disease.

2. Why has the use of some antibiotics in U.S. animal agriculture been discontinued or regulated?

The pharmaceutical industry voluntarily agreed to eliminate non-therapeutic uses of some classes of antibiotics to reduce the likelihood that resistant bacteria develop and threaten human health. There are several classes of antibiotics that are used in both humans and livestock production. There is some probability that the continued use of these antibiotics to improve performance of livestock would have sped up resistance in bacteria that infect people. To our knowledge, there have been no documented cases of infections in people attributed to antibiotic-resistant bacteria originating from livestock. However, cases of individuals being colonized (the presence of bacteria without illness) by antibiotic-resistant bacterial strains have been documented. These strains are believed to have originated in livestock and the colonized individuals often have been in contact with livestock (Lander et al.). So, there are reasons to be concerned about the potential for impacting human health. Out of an abundance of precaution, classes of antibiotic drugs used in human medical care cannot be used in animals except for purposes of disease prevention, control and treatment.

Sources:

Lander, T.F., B. Cohen, T.E. Wittum, E.L. Larson. "A Review of Antibiotic Use in Food Animals: Perspective, Policy, and Potential," *Public Health Reports* 127 (Jan-Feb 2012):4-22.

3. Why not eliminate all antibiotics in animal agriculture?

There are three reasons not to eliminate antibiotics in animal agriculture. First, it would be inhumane to allow animals to suffer when they contract diseases that can be treated or prevented with antibiotics. Second, it is unclear what the public health benefits would be from eliminating usage for prevention, control and treatment of disease in animals. Further study is warranted, but it is likely that the animal welfare and economic impacts would far outweigh the limited benefits derived from a complete ban. Lastly, it is not economically feasible to allow animals to suffer and/or die from treatable and/or preventable diseases. The agricultural and food sector contributes about \$1 trillion to the U.S. economy and provides about 11 million jobs, 21 percent of all jobs in the U.S. If antibiotics were totally eliminated, far fewer meat and milk animals would be produced in the U.S., making food far more expensive and eliminating many jobs. The poorest of U.S. citizens would suffer the most from increased food prices. Given the U.S. exported over 3.5 million metric tons of meat products worth over \$12.3 billion in 2016, foreign consumers would also be impacted, with the poor the most significantly harmed.

Sources:

<https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy.aspx>
<https://www.usmef.org/>

4. How do we know that meat, eggs and milk do not contain potentially dangerous antibiotic residue levels?

When antibiotics are used to prevent, control or treat disease, livestock producers are required to stop using the antibiotic for a specified length of time (called a withdrawal period) before selling animals for processing. The withdrawal period assures residues in excess of allowable limits will not be present in carcasses, if the producer follows protocols.

The USDA inspects animal carcasses to reduce the likelihood that meat is sold with antibiotic residues in excess of allowable limits. Producers selling animals that test positive for antibiotic residues face regulatory action, destruction of carcasses and increased testing of future animals sold for slaughter.

Antibiotics used in animal agriculture are labeled with instructions limiting the amount of the product injected, fed or consumed through water and mandatory withdrawal period.

They also include instructions on method of injection for injectable drugs. These instructions, if followed, greatly reduce the likelihood of a positive test for antibiotic residues.

The USDA and Food and Drug Administration test for antibiotic residues in carcasses and food products. Carcasses testing positive for residues are condemned and are not used for human consumption. Despite all precautions, there are very isolated cases of meat with antibiotic residues reaching consumers. In a very small percentage of those cases, there were adverse effects, such as allergic reactions. A 2006 study (Doyle) reported two cases, one from 1972 and another from 1984.

Sources:

<https://www.fda.gov/downloads/animalveterinary/guidance/complianceenforcement/complianceenforcement/ucm113433.pdf>
http://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/chemistry/blue-books/ct_index
<https://www.fda.gov/AnimalVeterinary/GuidanceComplianceEnforcement/ComplianceEnforcement/ucm264049.htm>

Doyle, M.E. "Veterinary Drug Residues in Processed Meats—Potential Health Risk: A Review of the Scientific Literature," Food Research Institute Briefings, University of Wisconsin—Madison, March 2006.

5. Are more antibiotics used in veterinary medicine than in human medicine?

If we just look at the quantity used, then yes. However, there are far more farm animals, including beef and dairy cattle, sheep, goats and poultry, than humans in the U.S. According to an article in the *Journal of the American Veterinary Medical Association*, humans and their pets use at least ten times more antibiotics per year than is used for food-producing animals when adjusted for the weight of people and their pets versus the weight of animals used for food production (Barber). This suggests, according to Barber, that human and pet use of antibiotics is a more likely source of antibiotic resistance.

Source:

Barber, D.A. "New perspectives on transmission of foodborne pathogens and antimicrobial resistance," *Journal of the American Veterinary Medical Association* 218, n. 10 (May 2001): 1559-1561.

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