



# The Facts About Antibiotics in Livestock & Poultry Production

**Sort fact from fiction.**



# The Facts About Antibiotics in Livestock & Poultry Production

Consumers are rightfully asking many questions about how livestock and poultry are raised and we want to answer those questions. Few issues are as complex, however, as the issue of antibiotic use in livestock and poultry production. Meat and poultry companies recognize – and share – consumers’ desire for safe meat and poultry products that will nourish their families. While antibiotics are as necessary for livestock and poultry health as they are for human health, meat and poultry producers realize the importance of using antibiotics judiciously to ensure their continued effectiveness in animals and people.

**Meat and poultry producers realize the importance of using antibiotics judiciously to ensure their continued effectiveness.**

This brochure provides well-referenced information to help you sort fact from fiction, to learn about changes under way in the meat and poultry industry and to help you make the best choices from the diverse options in America’s abundant meat case.



## History

Antibiotics are substances that can destroy bacteria. They are widely used for the prevention, control and treatment of diseases and infections. While our understanding of how antibiotics work has expanded in recent decades, antibiotics are not new. Centuries ago, ancient Egyptians, Chinese and Central American Indians used molds to treat infected wounds, though they did not understand how or why these molds were effective.

In the late 1880s, scientists began to identify antibiotics derived from molds and set in motion a new chapter in medical treatment. It wasn't until the 1940s, however, that penicillin, which is derived from a mold, became commercially available. Its widespread use to treat infections saved many military personnel injured or wounded during World War II.

In the 20th century, livestock and poultry producers also incorporated antibiotics into their comprehensive animal husbandry practices that also include clean water and nutritious food for their animals, shelter from heat and cold, vaccinations and medical treatment when needed.

But some have raised concerns that antibiotics may be used too often.<sup>1</sup> An analysis<sup>2</sup> published as a letter to the *New England Journal of Medicine* by officials from the



Centers for Disease Control and Prevention (CDC) and IMS Health shows that U.S. doctors are prescribing enough antibiotics to treat four out of five Americans every year, and the authors say the data suggests they are being overused in humans. Health care providers prescribed 266.1 million courses of antibiotics in 2014. A 2016 CDC report<sup>3</sup> found at least one third of prescriptions given to people are unnecessary.

<sup>1</sup> "The spread of superbugs," *The Economist*, March 31, 2011, accessed at <http://www.economist.com/node/18483671>.

<sup>2</sup> U.S. Outpatient Antibiotic Prescribing, 2010, *New England Journal of Medicine*, April 11, 2013, <http://www.nejm.org/doi/full/10.1056/NEJMc1212055>.

<sup>3</sup> Fleming-Dutra, K., et al. (2016). "Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011." *JAMA: the Journal of the American Medical Association* 315(17): 1864-1873

## Why Do Antibiotics Require Caution?

Like the rest of the animal kingdom, species of bacteria have many different characteristics that vary widely. Some antibiotics can be extremely effective against certain bacteria but may not work to treat other bacteria. That's why it is important to treat problem bacteria with the correct antibiotic.

**In general, the ability of bacteria to develop defenses against assaults from antibiotics makes ongoing research critical.**

Experts say that giving high doses of antibiotics to treat infections – an approach long thought to be the best strategy to “knock out” an infection – may actually trigger some bacteria to become resistant. In simple terms, in the face of a threat to survival, some bacteria put up their best defenses. Other bacteria are naturally resistant to certain antibiotics.

Another reason for caution: when an antibiotic is administered, it impacts the entire population of bacteria in the body. When some bacteria that are susceptible to the antibiotic are destroyed, other bacteria may thrive because there is less competition and they begin to multiply. Sometimes, these remaining bacteria are resistant to one or more antibiotics and a larger problem can develop.

Resistance develops in bacteria when they are challenged, but not destroyed, as they might be with the wrong antibiotic, with too low a dose or too short a course of treatment, which is why antibiotic prescription bottles often say, “Finish all medications.”



## Veterinary Use and Oversight

Like people, animals become ill and can develop conditions similar to common human infections like pneumonia, skin infections and others. Most pet owners have experienced the need to give their cats and dogs antibiotics to treat infections. Livestock and poultry are no different. Not providing antibiotics when needed would harm a sick animal's well-being and could cause a more widespread infection in other animals in a home, herd or flock.

Because livestock and poultry are consumed for food, regulatory and veterinary oversight of the use of antibiotics is particularly strict.

Because livestock and poultry are consumed for food, regulatory and veterinary oversight of the use of antibiotics is particularly strict. The Food and Drug Administration's (FDA) Center for Veterinary Medicine must approve all antibiotics used for food producing animals. There are four broad categories of antibiotic use:

**Treatment** – antibiotics are given to **treat** an animal with a diagnosed illness.

**Control** – antibiotics can be given to **control** the spread of an illness on a farm or ranch in the face of an outbreak.

**Prevention** – because livestock and poultry share water and feed troughs and seek close contact with one another by licking, laying on each other and even rubbing snouts and noses, illnesses can spread rapidly. Sometimes, veterinarians recommend using antibiotics to **prevent** diseases at times when livestock are particularly at risk, like during weaning from the mother. Swift, preventive actions often mean livestock will receive fewer antibiotics than they would have if they had not received a preventive dose.

**Growth Promotion** – The use of some antibiotics can destroy certain bacteria in the gut and help livestock and poultry convert feed to muscle more quickly causing more rapid **growth**. As of January 2017, this class of use is no longer permitted by the FDA. All drug manufacturers have agreed to this guidance and are no longer selling medically important antibiotics for growth promotion purposes. The North American Meat Institute and its members support this move.

<sup>4</sup> <http://www.fda.gov/AnimalVeterinary/NewsEvents/CVMUpdates/ucm535154.htm>.



## Medical, Veterinary and Regulatory Oversight

Antibiotics, whether used in humans, livestock or poultry, are overseen by physicians and veterinarians to ensure that they are used appropriately. While many in the public health community urge doctors to use restraint in prescribing antibiotics, many physicians report that patients demand them even when they are not warranted and they feel pressured to satisfy their patients.<sup>5</sup>

According to the Centers for Disease Control and Prevention (CDC), “Every time a person takes antibiotics, sensitive bacteria are killed, but resistant germs may be left to grow and multiply. Repeated and improper uses of antibiotics are primary causes of the increase in drug-resistant bacteria.”<sup>6</sup>

**As of January 2017, the use of medically important antibiotics for growth promotion is no longer permitted by the FDA. The North American Meat Institute and its members support FDA’s decision.**

In September 2013, the CDC released a new report called *Antibiotic Resistance Threats* in the United States. According to the report, 50 percent of all the antibiotics prescribed for people are not needed or are not optimally effective. In releasing the report, CDC Director Thomas Frieden, MD, said, “Right now the most acute problem is in hospitals. And the most

<sup>5</sup> Injudicious antibiotic use: An unforeseen consequence of the emphasis on patient satisfaction, <http://www.sciencedirect.com/science/article/pii/S0149291802850159>

<sup>6</sup> Centers for Disease Control Web site, downloaded at <http://www.cdc.gov/getsmart/antibiotic-use/fast-facts.html>



resistant organisms in hospitals are emerging in those settings, because of poor antimicrobial stewardship among humans.”

The report expressed concern about the use of medically important antibiotics for growth promotion in animal production and said they should be phased out, an effort that has now been completed by the FDA and drug manufacturers and that the meat industry supports.

Clearly, it is essential that veterinarians exercise their medical judgment and careful oversight of antibiotic use in livestock and poultry production. FDA has taken steps to expand the role of the veterinarian in managing antibiotics given to food-producing animals. In addition, antibiotic use for growth promotion is being discontinued. As of January 2017, all medically important antibiotics must be prescribed by a veterinarian. NAMI and its members support FDA's efforts to increase veterinary oversight of all antibiotic use.

Despite claims to the contrary, data show limited overlap in antibiotics given to humans and animals, which offers additional protection.

**“Right now the most acute problem is in hospitals. And the most resistant organisms in hospitals are emerging in those settings, because of poor antimicrobial stewardship among humans.”**

**Thomas Frieden, MD, director,  
Centers for Disease Control and  
Prevention**



## Antibiotics Used in Humans and Animals

The vast majority of antibiotics are used either in people or in animals – not both.

Use By Volume	Humans	Animals
Penicillins	44%	6%
Cephalosporins	15%	Less than 1%
Sulfa	14%	2%
Quinolones	9%	Less than 1%
Macrolides	5%	4%
Tetracyclines	4%	44%
Ionophores*	0%	30%

Sources: 2015 Summary Report on Antibiotics Sold or Distributed for Use in Food Producing Animals, downloaded at <http://www.fda.gov/downloads/ForIndustry/UserFees/AnimalDrugUserFeeActADUFA/UCM534243.pdf> and Drug Use Review, Food and Drug Administration, Center for Drug Evaluation and Research, Office of Surveillance and Epidemiology, April 5, 2012, downloaded at <http://www.fda.gov/downloads/Drugs/DrugSafety/InformationbyDrugClass/UCM319435.pdf>

\*Ionophores are never used in human medicine

## Residues Monitored by USDA

Whenever an antibiotic is given to a food animal, a strict waiting or “withdrawal” period is required before that animal can be processed into meat or poultry. USDA’s Food Safety and Inspection Service (FSIS) conducts a monitoring program to ensure that antibiotics are effectively eliminated from animals’ systems and that no unsafe residues are detected in meat and poultry.<sup>7</sup>

When illegal antibiotic residues are detected, NAMI and its members support rapid trace back and corrective actions, like removing that product from the food supply and providing immediate feedback to producers, to correct the problem.

## Overall Trends in Use

Media reports often cite the total amount of antibiotics used in animals in a given year and sound alarms if it reflects an increase over the previous year. However, looking at the total volume used is a poor measure of appropriate use because livestock herds and poultry flocks shrink and expand with feed costs and other marketplace factors. Larger herds and flocks will, inevitably, require more medical treatment. In addition, if a contagious disease has impacted our herds and flocks, more antibiotics may be required that year.

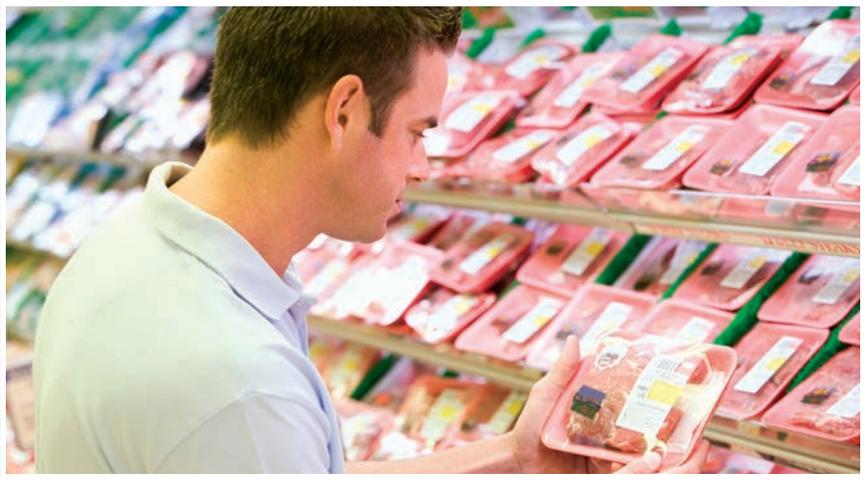
**Meat and poultry producers recognize the confusion and concern that exists around antibiotic use in meat and poultry production.**

## Choices in the Marketplace

All meat and poultry products are inspected before they are sold. This should provide assurance that products are safe. However, some consumers with concerns prefer to buy other products derived from animals never given antibiotics.

<sup>6</sup> USDA National Residue Monitoring Program, <http://www.fsis.usda.gov/Science/Chemistry/index.asp>

<sup>\*</sup> 2010 and 2011 Summary Report on Antimicrobials Sold or Distributed for Use in Food Producing Animals, U.S. Food and Drug Administration; U.S. Department of Agriculture livestock herd and poultry flock data. Trend calculated by dividing total antibiotic use in livestock and poultry in 2010 by combined herd and flock inventories in 2010 and repeating the calculation using 2011 data. Data show a decline from 2010 to 2011.



## Common choices in the marketplace include:

**Organic** — the National Organic Program (NOP) requires that livestock or poultry are never given antibiotics. When an animal becomes ill on an organic farm and requires antibiotics – an event that is not unusual – that animal is treated and sent into a conventional production system and will not bear an organic label.

**'Raised Without Antibiotics' or Similar Claim** — these products are derived from animals raised without antibiotics. While this parallels organic production, these products may be derived from animals raised on farms that are not certified organic or that would not meet the NOP standards for other reasons.

**Conventional (no special claims)** — may be derived from livestock or poultry given antibiotics for treatment, control, or prevention of disease, but a waiting period must pass before that animal is processed.

## Concluding Thoughts

Meat and poultry producers recognize the questions that exist around antibiotic use in raising animals for food. While antibiotics are a critical health care tool that should be administered under veterinary oversight, we also know that using antibiotics judiciously is our responsibility...and your expectation. We take our responsibility seriously.

## Commonly Cited Myths About Antibiotic Use

### **“Antibiotics wouldn’t be required if animals were raised differently in conditions that were less crowded or more sanitary.”**

Livestock and poultry farmers aim to raise all animals in conditions that promote their health, from fresh water and nutritious feed to clean living conditions. While some products, like organic products and those that make a ‘no antibiotics’ claim, may create the impression that antibiotics were not needed, the fact is, animals in all production systems become sick at some time, just like all people do. Some labeling or certification programs specify only animals that were never treated with antibiotics will qualify.

Organic meat and poultry products are good options that some consumers choose, but organic systems do not make antibiotics unnecessary. Animals do become ill in these operations; they are simply no longer organic once they are treated with antibiotics.

Once well again, and after the required post treatment waiting period has passed, they must be processed as part of the “conventional” meat supply.

### **“80 percent of antibiotics are used in animals.”**

This is one of the most common claims cited by media and by some activists and it lacks context. The number was created by comparing human and animal numbers that FDA cautioned against comparing.<sup>8</sup> If you choose to accept the numbers, consider these facts:<sup>9</sup>

Each year, more than 30 million cattle, 100 million hogs, 200 million turkeys and eight billion chickens are processed in the U.S. The combined weight of livestock and poultry in the U.S. is more than triple the combined weight of American men and women. A 1,200 pound steer is equal to roughly six men, for example. If a steer needs treatment for pneumonia, common sense will tell you that it will require a larger dose. Similarly, it is logical that our combined U.S. livestock and poultry herds and flocks will require more antibiotics by volume than our combined human population. While these are crude calculations about antibiotic use and dosing, they reveal the misleading nature of the “80 percent of antibiotics are used in animals” claim. It’s notable that the CDC in 2013 said overuse of antibiotics in humans is the leading contributor to resistance.

**The fact is, animals in all production systems become sick at some time, just like all people do.**

<sup>8</sup> Food and Drug Administration Web site, accessed February 24, 2014, <http://www.fda.gov/AnimalVeterinary/NewsEvents/CVMUpdates/ucm338178.htm>

<sup>9</sup> Food and Drug Administration Summary Report on Antimicrobials Sold or Produced for Use in Food Producing Animals, 2010 <http://www.fda.gov/downloads/ForIndustry/UserFees/AnimalDrugUserFeeActADUFA/ucm277657.pdf>

## Commonly Cited Myths About Antibiotic Use

### **“Antibiotics may become ineffective in humans if they are given to food producing livestock and poultry.”**

When used judiciously, antibiotics are part of a farmer’s and veterinarian’s toolbox to maintain animal health. The vast majority of antibiotics are used either in people, or in animals, but not both.

According to FDA, the largest category of sales in animals is tetracycline at 43 percent of the total volume, and ionophores, at 29 percent of the total volume. Ionophores are never used in human medicine and cannot contribute to human antibiotic resistance. Tetracyclines comprise only four percent of the total volume of sales for humans.

Three compounds—penicillin, fluoroquinolones and cephalosporins—comprise 70 percent of the total sales for humans, while two different compounds—tetracyclines and ionophores—comprise 70 percent of the total volume sold for animals. The claim that the vast majority of the most “medically important” antibiotics are used in animals is not supported by the data.

### **“Antibiotic resistant infections in humans like MRSA often come from meat and poultry products.”**

Actually, most human antibiotic resistant infections are acquired in hospitals and other residential health care facilities. The common use of antibiotics in hospitals, by necessity, means that more antibiotic resistant bacteria are present in the environment. In the hospital setting, people are often immune-compromised making them more susceptible to bacteria in the environment.

According to CDC, the most serious methicillin-resistant *Staphylococcus aureus* (MRSA) infections are associated with a healthcare exposure<sup>10</sup> and the remainder are typically community acquired through contact with an infected person. CDC’s web site notes, “Anyone can get MRSA through direct contact with an infected wound or by sharing personal items, such as towels or razors, that have touched infected skin. MRSA infection risk can be increased when a person is in activities or places that involve crowding, skin-to-skin contact, and shared equipment or supplies. This might include athletes, daycare and school students, military personnel in barracks, and those who recently received inpatient medical care.”

Bacteria on meat and poultry, whether antibiotic resistant or not, are destroyed through cooking. That means that basic safe handling practices in the kitchen, like hand washing, separating raw and ready to eat foods and thorough cooking, are your best line of defense.

<sup>10</sup> Centers for Disease Control and Prevention Web site, accessed February 24, 2014 at <http://www.cdc.gov/HAI/organisms/mrsa-infection.html>

## Commonly Cited Myths About Antibiotic Use

### **“Antibiotic resistant bacteria are increasing on U.S. meat and poultry products.”**

USDA Food Safety and Inspection Service (FSIS) sampling data show that bacteria on raw meat and poultry products are decreasing across the board – not increasing. The objective of every meat and poultry processor is to eliminate pathogenic bacteria on products before they are consumed.

The National Antibiotic Resistance Monitoring Program System (NARMS)<sup>11</sup> also shows that the bacteria found on some raw meat and poultry are declining in the wake of changes in meat and poultry production practices. A recently published scientific report found that among specific pathogens, resistance to several of the critical antibiotic classes has not expanded.<sup>12</sup>

It’s also worth noting that while bacteria may become resistant to one antibiotic, that does not mean they are resistant to all. It’s very rare in human medicine that any infection cannot be treated with an antibiotic. The rules of nature suggest that bacteria will always exist on fresh meat and poultry products at some low level and some of these bacteria will have become resistant to some antibiotics they have encountered. The most important questions to answer are 1) Are these bacteria causing illness, and 2) Can they be treated?

The FDA’s Center for Veterinary Medicine has been clear on this issue: “It is an oversimplification to conclude that resistance in any bacterium is problematic for human health. Some bacteria are naturally resistant to certain drugs...Describing certain bacteria that are resistant to one, or even a few, drugs as ‘superbugs’ is inappropriate. Rather, ‘superbugs’ are pathogens that can cause severe disease and are very difficult to treat.”<sup>13</sup>

<sup>11</sup> 2010 Retail Meat Report, National Antimicrobial Resistance Monitoring System, [www.fda.gov](http://www.fda.gov)

<sup>12</sup> Doyle, M.P, Loneragan, G.H., Scott, H.M., Singer, R.S., Antimicrobial Resistance: Challenges and Perspectives, Comprehensive Reviews in Food Science and Food Safety, Vol. 12, 2013.

<sup>13</sup> Dunham, DVM, Bernadette, Director, Center for Veterinary Medicine, Food and Drug Administration, Letter to the Editor, New York Times, April 23, 2013.

## Glossary of Terms

**Antimicrobial resistance** — the ability of bacteria or other microbes to resist the effects of a drug after being exposed to them. This means that the drug, and similar drugs, will no longer work against those bacteria. If resistant bacteria enter the food supply, and if they are not destroyed by proper cooking, drugs normally used to treat people infected with those bacteria may not work.

**Antibiotics** — any of a large group of chemical substances, as penicillin or streptomycin, produced by various microorganisms and fungi, having the capacity in dilute solutions to inhibit the growth of or to destroy bacteria and other microorganisms, used chiefly in the treatment of infectious diseases.

**Withdrawal period** — the period before slaughter and processing when an animal may receive no antibiotics or other medications to ensure time for antibiotics to be effectively eliminated from an animal's system.

**Antibiotic residue** — an antibiotic residue is a portion of antibiotics that remains in the body after antibiotic use has been discontinued. USDA operates a residue monitoring program to ensure that meat and poultry are safe and that residues are not a public health issue.



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