

**Selected Points on Antimicrobial Resistance,  
Use of Antibiotics in Livestock and Poultry, and  
A New Antimicrobial Resistance Initiative at Iowa State**

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Iowa State University faculty have broad expertise and experience in the area of antibiotic use and antibiotic resistance in livestock and poultry, and work closely with stakeholders on addressing these issues. Recently, a new set of books, news articles and lay publications has brought these issues to the public's attention. The following are key points to consider from the perspective of Iowa State researchers, veterinarians and extension specialists, along with details on a new Iowa State-led initiative:

- **The U.S. meat supply is safe.** The USDA Food Safety Inspection Service oversees the safety of meat and assures that products contain no residues of antibiotics that would impact human health.
- **Veterinarians and livestock producers strive for prudent, judicious use of antibiotics.** The American Veterinary Medical Association, American Association of Bovine Practitioners, American Association of Swine Veterinarians, American Association of Small Ruminant Practitioners, American Association of Avian Pathologist and all livestock commodity groups have established guidelines and training materials to help ensure antimicrobials are only used when necessary and are administered appropriately. The issue of antimicrobial resistance is a key consideration in decision-making on the use of antibiotics.
- **Antibiotics remains an important option for reducing animal suffering.** Antibiotics continue to be a critical component of livestock care to reduce suffering and death from treatable illnesses. As part of their professional commitment and ethical obligation, veterinarians carry out proper treatment plans for animal health and animal welfare, including the use of antibiotics when warranted.
- **Approximately 30 percent of animal antibiotics are not used in human medicine.** This class of drugs, called ionophores, is used to prevent and control coccidia, a family of disease-causing parasites. Ionophores are not associated with the development of antibiotic resistance that would impact human health.
- **Comparing livestock antibiotic use to humans can be misleading.** The statement “80 percent of antibiotics are used in animals” often is a common claim cited in news media and by some organizations. That statistic lacks context, and the U.S. Food and Drug Administration has cautioned against comparing human and animal numbers. Differences in scale obviously exist between livestock and people. For example, treating one 1,200-pound steer would require a larger dose than what's required for a person. And logically,

the nation's combined herds and flocks — billions of animals and birds — would translate into more antibiotics by volume than the human population.

- **Antibiotics that are deemed medically important for humans have been restricted for use in animals to treat, prevent or control disease.** In 2013, the FDA called on animal drug manufacturers to stop labeling their products for promotion of animal growth and to change the labeling to require veterinary oversight when they are used for therapeutic purposes. All makers of these drugs voluntarily agreed, and have implemented these changes. Now, no antibiotics that are defined as medically important for use in humans are used for growth promotion; their use is limited to treatment, prevention and control of animal disease. Under regulations that went into effect in January 2017, the use of these drugs is under the direct supervision and monitoring of veterinarians. The impact of these changes on antimicrobial resistance and antibiotic use will be felt in coming years; they are not currently reflected in government reports on antibiotic use.
- **FDA rigorously evaluates new livestock antibiotics.** Before final approval, the FDA is required to assess the safety of animal drugs to ensure low risk for antimicrobial resistance transmission to humans. This measure also ensures the continued safety of meat products.
- **U.S. poultry farms have monitored antimicrobial resistance since 2014.** The poultry industry, in collaboration with the USDA National Antimicrobial Resistance Monitoring System, began collecting on-farm bacteria samples to monitor antimicrobial resistance. Participating farms represent 60 percent of the commercial chicken industry and 70 percent of the commercial turkey industry. The goal of this ongoing study is to monitor antimicrobial use and resistance over time. A similar program has been in place in Canada since 2013. Both efforts are part of the World Health Organization's global action plan on antimicrobial resistance.
- **New, research-based alternatives to antibiotics exist.** The implementation of research-based technologies — including improvements in the engineering of animal housing, the use of effective vaccinations, improved nutrition and genetic selection — is allowing the livestock and poultry industries to emphasize alternative approaches to improving efficiency that replace the use of antibiotics for growth promotion. These new approaches are important because the rapid growth in world population demands significant improvements in the quantity, quality and continued safety of food production in order to feed everyone.
- **Iowa State University takes on antimicrobial resistance.** Iowa State University, along with state and regional stakeholders, recognize antimicrobial resistance as a critically important and complex issue that impacts human, animal and environmental health. A university-wide initiative was established in 2015 involving more than 60 faculty members across colleges and scientists at the U.S. Department of Agriculture National Centers for Animal Health in Ames. The initiative:

- Takes a systems-oriented approach so the biology and ecology of organisms are understood within the context of crop and livestock production and social, economic, environmental and other factors.
  - Hopes to expand efforts with regional partners to form the Midwest Antimicrobial Resistance Consortium, with goals to become a national and international leader in combating antimicrobial resistance; contribute to improving the health of humans, animals and the environment; and facilitate economic policy development for the region and beyond.
- **A complex issue requiring new research, extension and partnerships.** All uses of antibiotics contribute to antimicrobial resistance and impact people, animals and the environment. Trying to fix the blame for the global antibiotic resistance pandemic on a single source or use is contrary to the broad, systems approach required to make progress. To effectively address the issue, stakeholders must work together to ensure that guidelines are followed and emergence of resistance is monitored. Critical research is needed on transmission of antimicrobial-resistant organisms through the environment, contact and food. The Iowa State University-led Midwest Consortium on Antimicrobial Resistance will be committed to promoting the research and extension and outreach necessary to assure the public that food and health are protected.

**For more information:**

- [Iowa State University Antimicrobial Resistance Initiative](#)
- [American Veterinary Medical Association Resources on Antibiotic Use and Antimicrobial Resistance](#)
- [American Association of Avian Pathologist White Paper on Poultry Welfare and Careful Use of Antibiotics](#)
- [AAAP-AVMA Guidelines for Judicious Therapeutic Use of Antimicrobials in Poultry](#)
- [American Meat Institute: The Facts About Antibiotics in Livestock and Poultry Production](#)
- [Food and Drug Administration 2015 Summary Report on Antimicrobials Sold or Distributed for Use in Food-Producing Animals, December 2016](#)
- [Food and Drug Administration Guidance Document GFI No. 209](#)
- [Food and Drug Administration Guidance Document GFI No. 213](#)
- [Food and Drug Administration Guidance Document GFI No. 152](#)
- [Centers for Disease Control Antibiotic Resistance Threats in the U.S. 2013](#)
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