
Sponsors

University of Minnesota

College of Veterinary Medicine

College of Food, Agricultural and Natural Resource Sciences

Extension Service

Swine Center

Thank you to **IDEXX Laboratories** for their financial support to
reproduce conference proceedings

Production Assistants

Steven Claas

Michael Klatt

Layout and CD-ROM

David Brown

Logo Design

Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

The University of Minnesota is committed to the policy
that all persons shall have equal access to its programs,
facilities, and employment without regard to race, color,
creed, religion, national origin, sex, age, marital status,
disability, public assistance status, or sexual orientation.

The political situation surrounding antimicrobial use in agriculture

Liz Wagstrom, DVM, MS, DACVPM
National Pork Board, Clive, IA

Introduction

The use of antimicrobials in agriculture has been controversial for several decades. The issue has been studied by numerous committees, expert panels, agencies, organizations and researchers. The number of reports issued by the various bodies is impressive, and the data cited within those reports is used to support differing opinions about the issue. Because the epidemiology of antimicrobial resistance is complex, and varies according to different microbe/compound interactions, it is difficult to talk about resistance as a whole. However, this complexity makes it difficult for the lay person to understand, and generalities about resistance often become accepted as truths.

While concerns about antimicrobial resistance have existed almost since the discovery of penicillin, in the fairly recent past (10-15 years) these concerns have become more of a main stream debate, rather than a discussion among scientists. While public health drives some of the concern, the more strident voices belong to activist groups. These groups have selected antimicrobial resistance as one avenue in their campaign to limit or abolish modern agriculture. The information developed by these organizations typically ties the issue of antibiotic use to the "factory farm" and often paints the picture of the "factory farm" as dirty, stressful, lacking in animal husbandry, and environmentally damaging.

Chronology

The first of the study committees put together to study the issue of antimicrobial resistance was the Netherthorpe Committee formed in the UK in 1960. That was followed in 1969 by the Swann Committee, also in the UK. The Swann Committee reported no hazard to humans or animals from the use of antibiotics in poultry or swine, however they recommended dividing antibiotics into feed or therapeutic classes, and that feed antibiotics should not include drugs used therapeutically in humans or animals.

In 1970 the U.S. Food and Drug Administration (FDA) assembled a task force that issued the report "The Use of Antibiotics in Animal Feeds". That report concluded that the use of subtherapeutic antimicrobials favored selection and/or development of resistant bacteria, and that animals

receiving antimicrobials may serve as a reservoir of antibiotic resistant pathogens in humans. Based on the recommendations from the report, FDA-Center for Veterinary Medicine (CVM) began requiring microbiological safety studies for subtherapeutic uses.

The first action by FDA to withdraw a label claim for subtherapeutic uses of an antibiotic was in 1977 when they proposed limiting the use of tetracyclines and penicillin in animal feeds when used alone or in combination. This action was criticized because of lack of epidemiologic evidence to show that resistant organisms of animal origin were impacting human health. These criticisms led to a study by the National Academy of Sciences (NAS) commissioned by FDA. The study concluded that existing data had neither proved nor disproved the potential risks to human health due to subtherapeutic use of antimicrobials in animal feeds. In 1987 FDA issued another report "Antibiotics in Animal Feeds: An Assessment of Scientific Data Concerning Their Safety". That report concluded that due to the shorter duration of treatment and the more limited number of animals treated that therapeutic use of antibiotics in animal feeds would not significantly contribute to the frequency of resistant organisms.

In 1988 the Institute of Medicine (IOM) did another review of antibiotic use in animal feeds focusing on the subtherapeutic use of penicillin and tetracycline. They concluded that although there was indirect evidence implicating both subtherapeutic and therapeutic uses as a potential human health hazard, there was no direct evidence that would implicate these uses in human mortality, and urged further study of the issue.

Numerous other reports domestically and internationally have been issued. Most of them raise concerns over the subtherapeutic use of antibiotics and suggest limitations in those uses in animal agriculture.

The debate on uses of antibiotics in animals broadened with the action to withdraw the label for the use of fluoroquinolones as a treatment in poultry. This action was initiated due to an increase in the number of fluoroquinolone resistant *Campylobacter* infections reported in humans.¹ Since the products were used for treatment, not for improvement of nutritional efficiency, this represented an increasing scope of discussion. While this action was taken to limit therapeutic use of an antimicrobial that

was available by prescription only, consumer groups and others have often represented this as proof of the hazard of subtherapeutic uses of antimicrobials.

Primary players

The most visible of the consumer groups is the Keep Antibiotics Working Group (KAW). It is a coalition of 13 other groups including:²

- Center for a Livable Future
- Center for Science in the Public Interest
- Environmental Defense
- Food Animals Concerns Trust
- Global Resource Action Center for the Environment
- Humane Society of the United States
- Institute for Agriculture and Trade Policy
- National Catholic Rural Life Conference
- Natural Resources Defense Council
- Physicians for Social Responsibility
- Sierra Club
- Union of Concerned Scientists
- Waterkeeper Alliance

While each of these organizations may have their own individual objectives the stated campaign principles of KAW are:

- Reduce overuse and misuse of antibiotics in both agriculture and human medicine
- Ban on the use in healthy farm animals of antibiotics used in human medicine, or closely related to human drugs
- Promote sustainable agricultural production methods that provide alternatives to the use of antibiotics in healthy farm animals
- Urge companies involved in the production or marketing of meat, poultry or fish to voluntarily agree to stop using, buying, or selling products produced with using antibiotics other than for the purpose of treating sick animals
- Efforts to educate patients and doctors about the prudent use of antibiotics, including the importance of prescribing them for only bacterial infections, taking entire course of drug
- Creation of a nationwide system to collect objective, verifiable data on the production and use of antibiotics in both human medicine and animal agriculture, make date public
- Affirm the importance of the ongoing collection of data at the state and federal levels on antibiotic residues and antibiotic resistance, including antibiotics and antibiotic-resistant bacteria both on foods and in surface and ground waters

One member of KAW is the Johns Hopkins Center for a Livable Future. Their stated mission is “To promote research and to develop and communicate information about the complex interrelationships among diet, food production, environment and human health; to advance an ecological perspective in reducing threats to the health of the public; and to promote policies that protect health, the global environment and the ability to sustain life for future generations.”³ The Center for a Livable Future gains credibility among various audiences by the association with the Johns’ Hopkins Bloomberg School of Public Health. One of the Center’s activities has been the production of the video “The Meatrix”, a cartoon depicting horrendous conditions of animal care, antibiotic abuse and environmental contamination at a “factory farm”. The Center also advocates for “Meatless Mondays” as well as purchasing of only locally grown seasonal foods.

Recent events

Pew Commission: The Pew Charitable Trust has granted the Johns’ Hopkins Bloomberg School of Public Health (JHSPH) with \$2.6 million dollars to conduct an assessment of the cost and benefits of Concentrated Animal Feeding Operations (CAFOs). They have formed the National Commission on Industrial Farm Animal Production which is tasked with identifying, defining and developing plans to mitigate social, economic, environmental, public health and animal welfare issues associated with CAFOs and modern farm animal production methods. They have assembled a panel to examine the available information and issue a report in 2008. Panel members include:

- Gov. John Carlin, Commission Chair
- Dan Glickman, Chairman and CEO Motion Picture Association of America
- Dr. Alan Goldberg, Director, Center for Alternatives to Animal Testing, Johns Hopkins Bloomberg School of Public Health
- Professor Bernard Rollin, Distinguished Professor of Philosophy, Physiology and Animal Sciences and University Bioethicist, Colorado State University
- State Sen. Tom Dempster (R-Sioux Falls) South Dakota°
- Dr. Lonnie King, Interim Director for the CDC Center on Zoonosis
- James A. Merchant, M.D., Dr. P.H., Dean, University of Iowa College of Public Health
- Frederick L. Kirschenmann, Distinguished Fellow, Leopold Center for Sustainable Agriculture
- Ms. Deirdre Imus, President and Founder, The Deirdre Imus Environmental Center for Pediatric Oncology

- Dr. Michael Blackwell, Dean, College of Veterinary Medicine, University of Tennessee, Knoxville
- Brother David G. Andrews, Executive Director, National Catholic Rural Life Conference
- Dr. John Hatch, North Carolina Baptist Convention
- Dr. Marion Nestle, Paulette Goddard Professor, Department of Food, Nutrition Studies, and Public Health, New York University
- Ms. Daryl Hannah, Activist/Actress
- Most Reverend Richard J. Garcia, Auxiliary Bishop of Sacramento
- Mr. Bill Niman, Niman Ranch, Oakland, California^o
- Mr. Dan Jackson, Ronen, Montana^o
- Mr. Fedele Bauccio, Chief Executive Officer, Bon Appétit Management Company
- Tom Hayes, President, Cargill Meat Solutions Corp.

In June, 2006 the Institute for Food Technologists Foundation (IFT) issued an expert report “Antimicrobial Resistance, Implications for the Food System”. The report was compiled by an expert panel chaired by Dr. Michael Doyle, Regents Professor and Director, Center for Food Safety, University of Georgia. IFT is a 22,000-member nonprofit scientific and educational society. One of the report conclusions was “Eliminating antibiotic drugs from food animal production may have little positive effect on resistant bacteria that threaten human health”.⁴ They also acknowledge that preliminary evidence points toward, but does not prove, that antimicrobial use in animals results in human health impacts. They encourage the responsible use of antimicrobials in food production. They also conclude that “There is evidence that there are significant human health benefits from subtherapeutic antibiotic use to prevent subclinical disease in food animals and reduce levels of *Salmonella* and *Campylobacter* contamination of poultry carcasses”.

Efforts to pass legislation on a national effort to limit uses of antimicrobials in food animals have not been successful. However, there have also been activities at the state level. Recently, the state of Maine adopted a policy that, according to the Bangor Daily News will “tell meat producers that the state prefers to buy products from animals that have not been given antibiotics for nontherapeutic purposes. It also encourages Maine school districts to engage in contracts with suppliers whose products meet that preference”.⁵ However, the policy also states that those products should be of similar price, quality, and availability.

Industry activities

Animal agriculture and the pharmaceutical industry have had numerous efforts to support the continued availability of antimicrobials for use in food animals. As an example, the Pork Checkoff, has an ongoing history of providing producers with educational materials about pork safety, including antimicrobial use. These include such programs as the Pork Quality Assurance program, the Judicious Use of Antimicrobials for Pork Producers Guidelines, and a Pork Board Policy Statement on Antimicrobial Use. With increasing scrutiny on antimicrobial use in agriculture from consumer, government, and public health groups the Pork Checkoff developed a comprehensive educational program covering therapeutic and nutritional efficiency uses of antimicrobials for pork producers, the Take Care – Use Antibiotics Responsibly(tm) program. Currently, approximately 45 million pigs per year are produced by producers who have endorsed the program. Information about this program has been presented at the American Public Health Associations annual meeting, to the Centers for Disease Control and Prevention’s Get Smart – Know When Antibiotics Work conference, and to other public health, consumer, and food service audiences.

Summary

The issue of antimicrobial use in food animals has in many ways moved out of the arena of scientific debate, and into the arena of consumer activism. The issue often gets generalized and tied to the structure of industrial agriculture. The “factory farm” is characterized by groups opposed to intensive agriculture as dirty, stressful, lacking in adequate animal husbandry and environmentally damaging. It is often suggested by these groups that excessive antibiotic use is required for pigs to survive in these sub-optimal conditions. Antibiotic use is often viewed as size linked, with large farms using antibiotics more often than small.

References

- 1 Smith, KE, Besser JM, Hedberg, CE, Leano FT, Bender JB, Wichlund JH, Johnson BP, Moore KA, and Osterholm MT. 1999. Quinolone-resistant *Campylobacter jejuni* in Minnesota, 1992-1998. *N Engl J Med* 340: 1525-32.
- 2 Keep Antibiotics Working website accessed at www.Keepantibioticsworking.com, July 14, 2006
- 3 Center for a Livable Future website accessed at <http://www.jhsph.edu/clf/>, July 14, 2006
- 4 Institute for Food Technologists website accessed at http://members.ift.org/IFT/Research/IFTExpertReports/antimicrobial_report.htm, July 14, 2006.
- 5 Bangor Daily News website accessed at <http://www.bangordailynews.com/news/templates/?a=135419>, July 14, 2006.

