THE POLITICAL SITUATION SURROUNDING ANTIMICROBIAL USE IN AGRICULTURE

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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 layperson 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 mainstream 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 Netherthope Committee, formed in the United Kingdom in 1960. That was followed in 1969 by the Swann Committee, also in the U.K. 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 further recommended that feed antibiotics 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, the 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, therapeutic use of antibiotics in animal feeds would not significantly contribute to the frequency of resistant organisms.

In 1988 the Institute of Medicine 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; they 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 of 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. 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:

- 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 objectives, the stated campaign principles of KAW are to:

- Reduce overuse and misuse of antibiotics in both agriculture and human medicine.
- Ban 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 by using antibiotics other than for the purpose of treating sick animals.
- Promote efforts to educate patients and doctors about the prudent use of antibiotics, including the importance of prescribing them for only bacterial infections and taking entire course of the drug.
- Create a nationwide system to collect objective, verifiable data on the production and use of antibiotics in both human medicine and animal agriculture and make the data 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. Its 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." 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 "Meatless Mondays" as well as the purchase of only locally grown seasonal foods.

**Recent events**

The Pew Charitable Trust has granted the Johns Hopkins Bloomberg School of Public Health $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, CDC Center on Zoonosis
- Dr. James A. Merchant, Dean, University of Iowa College of Public Health
- Frederick L. Kirschenmann, Distinguished Fellow, Leopold Center for Sustainable Agriculture
- 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
- Daryl Hannah, Activist/Actress
• The Most Reverend Richard J. Garcia, Auxiliary Bishop of Sacramento
• Bill Niman, Niman Ranch, Oakland, California
• Dan Jackson, Ronen, Montana
• Fedele Baucio, CEO, Bon Appétit Management Company
• Tom Hayes, President, Cargill Meat Solutions Corporation

In June 2006 the Institute for Food Technologists Foundation (IFT) issued an expert report, “Antimicrobial Resistance, Implications for the Food System,” 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.” The report also acknowledges that preliminary evidence points toward, but does not prove, antimicrobial use in animals results in human health impacts. The panel encourages the responsible use of antimicrobials in food production. It also concludes, “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 level 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.” 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 made 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™ 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 Association’s annual meeting, at 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 suboptimal conditions. Antibiotic use is often viewed as size-linked, with large farms using antibiotics more often than small.

References

—Submitted by Morgan Morrow

CALENDAR OF EVENTS

December
7-8 National Swine Improvement Federation Annual Meeting
Nashville, Tenn.

February, 2007
13 Northeastern Regional Pork Conference
Edenton, N.C.
21-22 North Carolina Pork Conference
Greenville, N.C.
ON-FARM PERFORMANCE TESTING: The following breeders with validated herds have tested animals in the past 30 days.

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<tr>
<th>Breeder</th>
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<tr>
<td>Bob Ivey*</td>
<td>314 N.C. 111 S, Goldsboro 27530</td>
<td>L,D,Y,CW</td>
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<tr>
<td>Wesley Looper*</td>
<td>4695 Petra Mill Road, Granite Falls 28630</td>
<td>Y,L,H,D,X</td>
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<tr>
<td>Thad Sharp, Jr. &amp; Sons</td>
<td>5171 N.C. 581 Hwy., Sims 27880</td>
<td>Y,D,X</td>
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<td>Thomas Farms</td>
<td>8251 Oxford Road, Timberlake 27583</td>
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<tr>
<td>Tidewater Research Farm*</td>
<td>207 Research Station Road, Plymouth 27962</td>
<td>X</td>
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*Realtime Ultrasound

—Frank Hollowell, David Lee

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North Carolina Cooperative Extension Service

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