Food Animal Production and Antibiotic Resistance

The Solution

The Challenge

Antibiotics are one of the most important tools in modern medicine. These drugs can mean the difference between life and death when humans contract a bacterial infection—from staph to salmonella to bacterial pneumonia. But overuse and misuse of these drugs are making bacteria more quickly resistant to essential antibiotics.

Antibiotic resistance complicates medical treatment, and frequently results in longer, more serious illnesses, and even death in some instances. Resistant bacterial infections are harder to treat, and require multiple applications of antibiotics, longer hospital stays and possibly other interventions. Children, the elderly and the chronically ill are particularly vulnerable to antibiotic-resistant infections.[1] In 1998, the Institute of Medicine estimated that antibiotic resistance generated at least $4 billion to $5 billion per year in extra costs to the U.S. health care system.[2] More recently, researchers with the Alliance for the Prudent Use of Antibiotics and Cook County Hospital in Chicago estimated that this number has grown to $16.6 billion to $26 billion per year.[3] For these reasons, the Centers for Disease Control and Prevention (CDC) has declared that antibiotic resistance is among its top concerns.[4]

The Link to Food Animal Production

In humans, antibiotic use is generally confined to treatment of illness. In contrast, antibiotics are used in food animal production not only to treat sick animals but also to prevent illness and spur growth. In fact, up to 70 percent of all antibiotics sold in the U.S. are given to healthy food animals.[5]

In July 2010 the FDA, U.S. Department of Agriculture (USDA) and the CDC testified before Congress that there was a definitive link between the routine, non-therapeutic uses of antibiotics in food animal production and the crisis of antibiotic resistance in humans.[6] Moreover, the American Medical Association, the American Academy of Pediatrics, the World Health Organization (WHO) and other leading public health and medical groups

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warn that the routine use of antibiotics in food animal production presents a serious and growing threat to human health because it creates new strains of dangerous antibiotic-resistant bacteria.

More than 25 million pounds of antibiotics are administered every year to healthy food animals. Many of the antibiotics used in food animal production—including penicillins, tetracyclines, macrolides, sulfonamides and other antibiotic classes—are identical to, or from the same family as, drugs used to cure serious diseases in humans. Most of the antibiotics used in food animal production in the U.S. are obtained and used without the consultation of a veterinarian.[7] The lack of oversight, coupled with the magnitude of administration of antibiotics for non-therapeutic purposes, has potentially serious and irreversible consequences for human health.

The Solution

Data show that improving management of food animals (for example, cleaning facilities more thoroughly and frequently) achieves the same benefits as routine use of antibiotics in healthy animals, without undermining the integrity of the antibiotic medicines we rely on to protect public health.[8]

Source: The Pew Charitable Trusts

That's why the FDA recommended to the U.S. Congress in 2009 that "to avoid unnecessary development of resistance under conditions of constant exposure (growth promotion/feed efficiency) to antibiotics, the use of antimicrobials should be limited to those situations where human health and animal health are protected. Purposes other than for the advancement of animal or human health should not be considered judicious use. Eliminating these uses will not compromise the safety of food."[9]

Working together, citizens, government, industry and public interest organizations have the tools to reduce the overuse and misuse of antibiotics:

- Individuals can practice safe and effective use of antibiotics by only taking them when and as prescribed by a doctor.

- The food animal industry can adopt cost-effective alternative hygienic strategies for preventing illness in animals and discontinue use of antibiotics in feed for growth promotion and feed efficiency.[10]

There are alternative methods to raising food animals on industrial farms that do not risk eroding the effectiveness of antibiotics. For example:

- The USDA acknowledged in a January 2009 report that the presumed economic and production benefits of antibiotics in animal feed can be largely achieved by improved cleanliness of animal houses and improved testing for diseases.[11]

- The WHO reported in 2000 that antibiotics should "not be used as an alternative to high-quality animal hygiene. Evidence shows that farmers who stopped relying on antimicrobials as growth promoters in livestock have experienced no economic repercussions—provided animals were given enough space, clean water, and high-grade feed."[12]

- The National Academy of Sciences reviewed meat consumption based on 1997 figures to determine the cost of removing the routine use of antibiotics in food animals. The results showed that on the high end of the assumptions, every person would pay $9.72 more per year for the meat they purchase.[13]

International Leadership

Denmark is a leader in scaling back the use of antibiotics in food animal production. The Danes prohibited the administration of antibiotics in healthy food animals (cattle, chicken and pigs) for production purposes, such as growth promotion, in the late 1990s. Today, the use of antibiotics in Danish food animal production must be accompanied by a prescription obtained through a valid veterinarian-client-patient relationship, and veterinarians cannot profit from the sale of antibiotics. In addition, farmers, veterinarians and pharmacies must report the quantity of antibiotics used, and farm inspections are conducted regularly. The WHO has found that the ban on using antibiotics in healthy food animals in Denmark reduced human health risks without significantly harming animal health or farmers' incomes.[14] In fact, Danish government and

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Private Sector Leadership

Increasingly, leaders in the private sector are stepping up to demonstrate that food can be produced on a large scale without use of chemicals, antibiotics and other techniques that have the potential to harm human health. Additionally, consumers are increasingly demanding clean, safe food production. That is why food producers, grocery stores and restaurant chains are increasingly marketing their products under the banners of "organic," "natural" and "raised without antibiotics."

On the Farm

Small but growing numbers of farms in the U.S. are becoming certified organic, raising livestock on organic feed and without the use of hormones or antibiotics in healthy animals, while managing animal care in ways that more closely resemble natural behavior. Other farms also choose to raise their food animals in similar sustainable manners and label their meat "natural." Some examples include:

- Niman Ranch, which supplies grocery chains, independent markets and a portion of Chipotle Mexican Grill's beef and pork, is a network of traditional family farms in California, Iowa, Minnesota and Michigan committed to raising meat naturally and without antibiotics.[16] Its efforts have been bolstered by companies such as Chipotle that help increase the demand for these products. Niman Ranch had $44 million in sales in 2007.

- Bell and Evans, a Pennsylvania poultry company with more than 1,000 employees, has realized success by raising its chickens without antibiotics or hormones and using an all-vegetable diet that forgoes preservatives or artificial ingredients. Bell and Evans partners with several major restaurant and grocery chains, including Chipotle Mexican Grill, Panera Bread Company and Whole Foods Market. Earning $185 million in sales in 2008, Bell and Evans is part of a network of successful family-owned farming operations—growers, feed producers and hatcheries.[17]

- Applegate Farms produces natural and organic meat: turkey, chicken, beef and pork. Its products, which are available in many grocery stores across the country, are made from food animals that were raised without the use of antibiotics.[18]

At the Grocery

Source: Pavel Losevsky

Whether shopping at a farmers' market, natural food store or local grocery store, today's consumers have more places to find and purchase meats and poultry raised without the routine use of antibiotics:

- Whole Foods Market is the world's largest retailer of natural and organic products, including meat from food animals raised without antibiotics. Employing over 52,000 people, Whole Foods is a growing market force. The company earned more than $6.5 billion in sales in 2007, a 17.6 percent increase over the previous year and a 40 percent increase over two years.[19] Its profit margins are greater than those of major competitors Kroger and Safeway, as well as the industry average.[20]

- In 2003, the mass-market grocery company Kroger began offering its own line of organic food products, and today sells more than 450 items under its "natural" and "organic" labels. Kroger recognizes, "Consumer interest in healthier lifestyles and better nutrition has fueled significant growth in the natural and organic foods industry over the past several years."[21] Customers can shop in Kroger natural food departments in more than 1,650 stores across the country. Safeway, which unveiled an organic line in 2005, offers more than 300 certified organic products in its stores today.

In Restaurants

Demand for meat from food animals raised without the routine use of antibiotics goes beyond the grocery store. Chipotle Mexican Grill,[22] Chop't Creative Salad Company[23] and Panera Bread Company[24] are just a few leaders in the restaurant industry that have started serving meat from food animals raised without the routine use of antibiotics.

Chipotle, for example, began serving naturally raised pork in 2001 as part of its "Food with Integrity" program. Shortly after, Chipotle extended its policy of serving meat raised without growth hormones or antibiotics to chicken, and is currently working on ensuring that 100 percent of its beef meets these standards.[25] Today, Chipotle serves "more naturally raised meat than any other restaurant company in the world," some 52 million pounds annually.[26] In 2009, Chipotle had over $1 billion in sales and a one-year net income growth of 14 percent.

Other Ventures

Bon Appétit Management Company provides cafe, restaurant and catering services on-site to corporations, colleges and universities and specialty venues. The company operates cafes for many well-known groups, including Target, Best Buy, Nordstrom, Yahoo!, eBay, the Monterey Bay Aquarium, American University, the Massachusetts Institute of Technology and Washington University. A growing company, Bon Appétit now operates more than 400 cafes in 29 states and serves over 110 million meals a year.[27] As part of its commitment to addressing the threat of antibiotic resistance, Bon Appétit only buys and serves chicken, turkey and ground beef that are raised without the routine use of antibiotics. The company expects to apply the same standard to all meat it serves as supplies become more available. Yet company CEO Fedele Bauccio has testified, "Many producers are afraid to change, even with economic incentive. They need a push. H.R. 1549 [Preservation of Antibiotics for Medical Treatment Act] could be that lever of change we need."[28]

Large and profitable grocery stores, catering companies, farms and restaurants have demonstrated that it is both profitable and socially responsible to serve meat raised without the routine use of antibiotics. The demand of this growing group of companies for this meat is exceeding current supply levels,[29] indicating that there is a market waiting to be filled by farmers and ranchers.

Congressional Leadership

Because of both poor regulation and oversight of drug use in industrial food animal production, consumers in the U.S. do not know what their food is treated with, or how often. Nor is there an adequate system in place to test meat for dangerous antibiotic-resistant bacteria. In order to limit the development of antibiotic-resistant bacteria in food animals and the threat it poses to people, the overuse and misuse of antibiotic drugs in poultry and livestock must be discontinued, and antibiotic use must be more carefully regulated and monitored. Congress can tackle the problem by reforming reporting and monitoring requirements for drug manufacturers and food producers and by passing legislation that would curtail the routine use of antibiotics on industrial farms.

In the 112th Congress, legislation was introduced that would address this issue. The Preservation of Antibiotics for Medical Treatment Act would withdraw the routine, non-therapeutic use of seven classes of antibiotics vitally important to human health from food animal production unless animals or herds are sick with diagnosed. Federal legislation such as this and/or regulation is needed in order to preserve the effectiveness of these life-saving drugs and to protect human health.

Food Animal Production and Antibiotic Resistance: The Solution

Our Campaign

The Pew Campaign on Human Health and Industrial Farming is working to save antibiotics by phasing out the routine use of the drugs in food animal production. We work with public health leaders, veterinarians, agricultural interests, academics and citizens' groups who share our objective of preserving the integrity of antibiotics as a means of protecting human and animal health.

Source: USDA

[1] Katherine Shea, K. Florini, and T. Barlam, "When Wonder Drugs Don't Work: How Antibiotic Resistance Threatens Children, Seniors, and the Medically Vulnerable" (Washington, DC: Environmental Defense Fund, 2001).
[2] Polly Harrison and J. Lederberg, "Antimicrobial Resistance: Issues and Options," Workshop Report, Forum on Emerging Infections, Division of Health and Sciences Policy, Institute of Medicine (Washington, DC: National Academy Press, 1998).
[3] James Gallagher, "Study: Antibiotics Problems Cost U.S. between $17B and $26B a Year." *Triangle Business Journal*, October 19, 2009, http://triangle.bizjournals.com/triangle/stories/2009/10/19/daily4.html (accessed July 15, 2010). Based on: Rebecca R. Roberts et al., "Hospital and Societal Costs of Antimicrobial-Resistant Infections in a Chicago Teaching Hospital: Implications for Antibiotic Stewardship," *Clinical Infectious Diseases* 49 (2009): 1175–1184.
[4] Centers for Disease Control and Prevention, *Antibiotic Resistance Questions and Answers*, www.cdc.gov/getsmart/antibiotic-use/anitbiotic-resistance-faqs.html (accessed July 22, 2010).
[5] Margaret Mellon, C. Benbrook, and K. L. Benbrook, *Hogging It! Estimates of Antimicrobial Abuse in Livestock.* (Cambridge, MA: Union of Concerned Scientists, 2001).
[6] Hearing: Antibiotic Resistance and the Use of Antibiotics in Animal Agriculture, Subcommittee on Health, Energy and Commerce Committee, US. House of Representatives, July 12, 2010, http://energycommerce.house.gov/hearings/hearingdetail.aspx?NewsID=8001 (accessed January 24, 2011).
[7] Alliance for the Prudent Use of Antibiotics. "The Need to Improve Antimicrobial Use in Agriculture: Ecological and Human Health Consequences," *Clinical Infectious Diseases* 2002; 34, supp. 3 (2002).
[8] Jay P. Graham, J. J. Boland, and E. Silbergeld, "Growth-Promoting Antibiotics in Food Animal Production: An Economic Analysis," *Public Health Reports* 122 (2007): 79–87. See also: Gay Y. Miller et al., "Productivity and Economic Effects of Antibiotics Use for Growth Promotion in U.S. Pork Production," *Journal of Agricultural and Applied Economics* 35 (2003): 469–482.
[9] Joshua M. Sharfstein, U.S. Food and Drug Administration, testimony before the Committee on Rules, U.S. House of Representatives, July 13, 2009.
[10] James M. MacDonald and W. D. McBride, "The Transformation of U.S. Livestock Agriculture: Scale, Efficiency, and Risks," *Economic Information Bulletin*, no. 43 (2009). Economic Research Service, U.S. Department of Agriculture.
[11] Ibid.
[12] World Health Organization, "Overcoming Antimicrobial Resistance," www.who.int/infectious-disease-report/2000/index.html (accessed July 22, 2010).
[13] Harrison and Lederberg, "Antimicrobial Resistance: Issues and Options."
[14] World Health Organization, "Impacts of Antimicrobial Growth Promoter Termination in Denmark: The WHO International Review Panel's Evaluation of the Termination of the Use of Antimicrobial Growth Promoters in Denmark," 2003, http://whqlibdoc.who.int/hq/2003/WHO_CDS_CPE_ZFK_2003.1.pdf (accessed July 22, 2010).
[15] Jan Mousing, Danish Veterinary and Food Administration, letter and fact sheet to Sen. Edward Kennedy, August 12, 2009, www.uk.foedevarestyrelsen.dk/NR/rdonlyres/63497AA7-8E8A-4C6A-9C74-E56C3383F26A/0/Info_om_vaekstfremmerforbud_samt_oevrige_riskmanagement_str_UK.pdf (accessed July 22, 2010). See also: Frank Aarestrup to Nancy Pelosi, letter and presentation to Congressional Delegation, Sept. 2009,

www.louise.house.gov/index.php?option=com_content&view=article&id=1314:rep-slaughter-releases-letter-from-denmark-on-non-therapeutic-use –of-antimicrobials-&catid=41:press-releases&letmid=109 (accessed July 15, 2010); Niels J. Kjeldsen, and Danish Integrated Antimicrobial Resistance Monitoring and Research Program, 2007: 81–83, www.danmap.org/pdfFiles/Danmap_2007.pdf (accessed July 22, 2010).
[16] Niman Ranch, *The Niman Ranch Story*, www.nimanranch.com/about_us.aspx (accessed July 22, 2010).
[17] Hoovers, *Hoover's Company Records: In-depth Records, Bell and Evans Holding LLC*, Aug. 31, 2010.
[18] Applegate Farms, http://www.applegatefarms.com/products/default.aspx?id=1510 (accessed Sept. 8, 2010).
[19] Hoovers, *Hoover's Company Records: In-depth Records, Whole Foods Market, Inc.*, July 20, 2010.
[20] Ibid.
[21] The Kroger Company, *Kroger Fact Book*, Section III: Sales Drivers, 2008, www.thekrogerco.com/finance/documents/2008_KrogerFactBook.pdf (accessed July 23, 2010).
[22] Chipotle Mexican Grill, *Food with Integrity*, www.chipotle.com/en-US/fwi/fwi.aspx (accessed July 23, 2010).
[23] Chop't Creative Salad Company, *Chop't Point of View*, www.choptsalad.com/#point_of_view (accessed July 23, 2010).
[24] Panera Bread Company, *Panera Bread Reports Fiscal 2009 EPS of $2.78, up 25% over Fiscal* 2008, www.panerabread.com/pdf/er-20100211.pdf (accessed July 23, 2010).
[25] Chipotle Mexican Grill, *We Treat Them Like Animals*, www.chipotle.com/#/flash/fwi_fare (accessed July 23, 2010).
[26] Chipotle Mexican Grill, "Chipotle is first restaurant to serve 100 percent naturally raised chicken," news release, May 5, 2008, http://phx.corporate-ir.net/phoenix.zhtml?c=194775&p=irol-newsArticle&ID=1139427&highlight= (accessed July 23, 2010).
[27] Bon Appétit Management Company, *About Us*, www.bamco.com/page/2/about-us.htm (accessed July 23, 2010).
[28] Fedele Bauccio, Bon Appétit Management Company, testimony to the Rules Committee, U.S. House of Representatives, July 13, 2009, www.rules.house.gov/111/oj/hr5419/statements/fedele_hr1549_111.pdf (accessed July 23, 2010).
[29] Associated Press, "U.S. Demand for Organic Food Exceeds Supply," July 6, 2006, www.foxnews.com/story/0,2933,202433,00.html (accessed July 23, 2010).