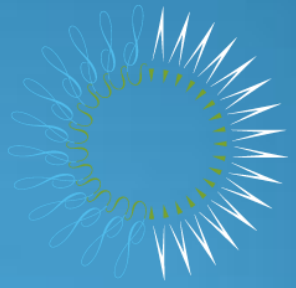
Industrial Animal Farms and Antibiotic Resistance

February 2010



THE PEW CHARITABLE TRUSTS

Definitions

- *Antibiotic*
  - A drug that kills bacteria or suppresses their ability to grow. Used mainly interchangeably with "*antimicrobial*."
- *Antibiotic resistance*
  - The ability of bacteria to withstand the effects of an antibiotic or group of antibiotics.
- *Industrial animal farm*
  - Large numbers of farm animals of the same species confined in relatively small areas in order to streamline and standardize their growth and production for food.

Government Oversight

- U.S. Food and Drug Administration

USDA Official inspecting beef, from USDA Agricultural Research Service photo gallery available at: www.ars.usda.gov/is/graphics/photos/

- Prior to approving an application for new antibiotic use in animals, FDA must determine that:
  - the drug is safe and effective for its intended use in the animal, and
  - is safe with regard to human health. "*Safe*" means there is reasonable certainty of no harm to people from the proposed use in food-producing animals.
- Meat must be free of unsafe drug residue. Drug applicant is responsible for clinical testing. There are no standards for acceptable levels of resistant bacteria in meat.
- FDA gives industry non-binding guidance in determining whether a new drug could affect bacterial resistance (Guidance #152).

THE PEW CHARITABLE TRUSTS

Antibiotics and Industrial Farming

- Perhaps as much as 70% of all antibiotics and related drugs sold in the U.S. is given to cattle, swine, and poultry on industrial animal farms, for purposes other than treating disease.[1]
- The exact quantity is unknown. FDA collects drug data from manufacturers, not users, and it is inconsistently reported and unusable for monitoring and research.

[1] Union of Concerned Scientists, *Hogging It: Estimates of Antimicrobial Abuse in Livestock,* January 2001, p. 63, http://www.ucsusa.org/food_and_environment/antibiotics_and_food/hogging-it-estimates-of-antimicrobial-abuse-in-livestock.html.



THE PEW CHARITABLE TRUSTS

Antibiotics and Industrial Farming

- Antibiotics are used in industrial animal production mostly for nontherapeutic reasons.
  - "*Nontherapeutic*" means drug use in the absence of documented disease. This includes routine use for:
    - Growth promotion,
    - Feed efficiency,
    - Weight gain, and
  - These uses typically involve long-term, low-dose treatment through feed and water to whole flocks or herds.
  - Antibiotics also are used on many industrial farms to prevent illnesses exacerbated by overcrowding and bad sanitation.
  - Many drugs are in the same class as human drugs.
  - Typically, veterinarians are not involved on the farm in nontherapeutic use of antibiotics.

THE PEW CHARITABLE TRUSTS

Antibiotics and Industrial Farming

- Historically, economic gains from nontherapeutic use of antibiotics on industrial animal farms have been thought to outweigh the costs of the drugs.

- However, recent studies show little to no net economic benefits. In fact, improving management of the animals (e.g., more thorough and frequent cleaning of facilities) was found to achieve the same benefits.[2]

- This does not take account of costs due to increased resistance – loss of disease treatment options in humans and animals, increased health care costs – estimated at between $17-26 billion annually nationwide[3] - and more severe and enduring infections.

2 Graham, Jay P. , PhD, MBA. June 24, 2008. Testimony before the Senate Committee on Health, Labor, Education, and Pensions. And, Graham JP, Boland JJ, Silbergeld E. "Growth promoting antibiotics in food animal production: an economic analysis." *Public Health Rep* 2007; 122:79-87; **and** Miller GY, Algozin KA, McNamara PE, Bush EJ. "Productivity and economic effects of antibiotics use for growth promotion in U.S. pork production." *Journal of Agricultural and Applied Economics* 2003; 35:469-482. See also, USDA Economic Research Service, 2009, *The Transformation of U.S. Livestock Agriculture: Scale, Efficiency, and Risks*.

3 Roberts, R.R., et al. 2009. "Hospital and Societal Costs of Antimicrobial-Resistant Infections in a Chicago Teaching Hospital: Implications for Antibiotic Stewardship." *Clinical Infectious Diseases* 49:1175–84.

THE PEW CHARITABLE TRUSTS

Human Health Risk

- Prolonged bacterial exposure to inappropriate and low doses of antibiotics increases their resistance to those drugs and makes them harder to kill.[4]

- Because of a steep rise in antibiotic use, bacteria in livestock are increasingly resistant to drugs.[5]
- Bacteria can transfer resistance to each other. Bacteria resistant to animal drugs can become resistant to similar human drugs.

4 The Department of Health and Human Services; Center for Disease Control and Prevention; "National Antimicrobial Resistance Monitoring System (NARMS) Frequently Asked Question about Antibiotic Resistance." <www.cdc.gov/narms/faq_antiresis.htm>.

5 See, for example: Smith, K.E, et al. 1999. Quinolone-resistant Campylobacter jejuni infections in Minnesota, 1992-1998. New England Journal of Medicine. 340(20): 1525-1532.

Human Health Risk

- Drug-resistant bacteria are picked up by people through:
  - Eating contaminated meat or produce fertilized by contaminated manure,
  - Contact with farm or food workers that handle contaminated animals or meat, and
  - Contact with soil and water that has been polluted by animal farm waste.[6]
- The result can be increased human illness that is difficult to treat, and even death.[7]

6 U.S. General Accounting Office (GAO). 2004. Report to Congress No. 04-490, "Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals." <www.gao.gov/new.items/d04490.pdf>.

7 UN FAO, OIE, and WHO, "Joint FAO/OIE/WHO Expert Workshop on Non-Human Antimicrobial Usage and Antimicrobial Resistance: Scientific Assessment," Presented in Geneva, Switzerland, Dec. 1-5, 2003. <www.who.int/foodsafety/micro/meetings/nov2003/en/>.

Legislation (111th Congress)

- **PAMTA – Preservation of Antibiotics for Medical Treatment Act** (H.R. 1549 / S. 619)

  - Phases out the use of medically important human antibiotics in food animals that are not sick, unless manufacturers can show reasonable certainty of no danger to public health from resistance. New drugs must meet the same standard.

  Introduced March 17, 2009.

THE PEW CHARITABLE TRUSTS

The Pew Commission on Industrial Farm Animal Production

- A national, independent commission to assess the farm animal industry's impact on the public's health, the environment, farm communities and animal health and well-being.
- In April 2008, the Pew Commission on Industrial Farm Animal Production released its recommendations, some of which call for stricter regulation of antibiotic use in large-scale animal operations.

PEW COMMISSION ON INDUSTRIAL FARM ANIMAL PRODUCTION

THE PEW CHARITABLE TRUSTS

Summary of Pew Recommendations to Reform Antibiotic Use in Food Animals

- **1. Restrict the use of antimicrobials** to reduce the risk of antimicrobial resistance:
  - *Phase out and ban the use of antibiotics for nontherapeutic uses; ban new approvals for such uses; strengthen FDA Guidance #152 to enforce investigations of previously approved animal drugs; and use USDA's extension service to educate producers on best practices.*
- **2. Clarify definitions** to improve estimates of drug use and facilitate clear policies as the following:
  - *Nontherapeutic: Any use of antimicrobials in the absence of disease or documented exposure to microbial disease.*
  - *Therapeutic: Use of antimicrobials in animals with diagnosed disease.*
  - *Prophylactic: Use of antimicrobials in healthy animals in advance of expected exposure or after an exposure to an infectious agent, before laboratory diagnosis.*

THE PEW CHARITABLE TRUSTS

Recommendations, cont'd.

- **3. Improve monitoring and reporting** of antimicrobial use in food animal production:
  - *Implement new pharmaceutical and animal producer reporting requirements on how many antimicrobials are sold and are used for food animal production; develop a comprehensive plan to monitor antimicrobial use in animals as called for by the National Research Council.**
- **4. Improve monitoring and surveillance** of antimicrobial resistance in the food supply, environment, and animal and human populations:
  - *Integrate, expand, and increase funding for current monitoring programs; establish an apolitical, interdisciplinary oversight group to gather useful data as recommended by the NRC;* revise existing programs to monitor farm soil, plants, and nearby water supplies along with farm animals; and improve testing and tracking of antimicrobial-resistant infections in healthcare settings.*

*See National Research Council, 1999. "Approaches to Minimizing Antibiotic Use in Food-animal Production," in: *The Use of Drugs in Food Animals: Benefits and Risks.* National Academy Press: Washington, D.C. pp. 189-193.

Recommendations, cont'd.

- **5. Increase veterinary oversight** of all antimicrobial use in food animal production:
  - *Restrict public access to agricultural sources of antimicrobials; enforce restrictions; enforce veterinary oversight and authorization of all decisions to use antimicrobials in food animals, and encourage veterinary consultation in these decisions.*

To read more about the Pew Commission's recommendations to reform antibiotic use in food animals, as well as other recommendations on industrial farm animal production, visit www.pcifap.org .

THE PEW CHARITABLE TRUSTS

Contact:

Laura Rogers, Project Director, Human Health and Industrial Farming

Pew Charitable Trusts

(202) 552-2018 lrogers@pewtrusts.org

www.saveantibiotics.org