



Testimony of Gail R. Hansen, MPH, DVM
The Pew Charitable Trusts
Before the President's Council of Advisors on Science and Technology
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Good morning members of the President's Council of Advisors on Science and Technology. My name is Gail Hansen and I am a public health veterinarian and a senior officer with The Pew Charitable Trusts. Previously I was in private clinical veterinary practice for 12 years and then worked as an infectious disease epidemiologist and public health veterinarian in local and state public health departments for 15 years. I appreciate the opportunity to speak before you today about the problem of antimicrobial resistance and the use of antibiotics in food animal production.

My message to you today is this:

- 1) Antibiotics are widely used – and overused – in industrial farming to the detriment of human health. Antibiotic-resistant bacteria generated by the overuse of antibiotics in conventional animal husbandry causes life threatening illnesses in people that were once easier to treat.
- 2) The scientific literature shows that nontherapeutic and subtherapeutic antibiotic uses in food animals are, in particular, the most concerning agricultural contributors to antibiotic resistance.
- 3) The President's Council of Advisors on Science and Technology has the opportunity to advise the President that antibiotic resistance is an urgent public health problem requiring a comprehensive and coordinated federal strategy that includes preserving the agricultural use of antibiotics for disease treatment and control only. The Council also can advise the President that failure to act threatens to undermine policy priorities of this Administration such as reducing the cost of and access to effective health care.

Industrial farming routinely and extensively incorporates low-dose concentrations of antibiotics in the feed and water of healthy food animals for growth promotion, feed efficiency and other uses where the animal has not been exposed to disease. A wide range of antibiotics, such as penicillins, macrolides and tetracyclines, are available over the counter for use in food animal production in this countryⁱ. The Food and Drug Administration (FDA) allows this practice under its current rules and regulations and yet almost none of the over the counter uses have been

reviewed by the FDA to ensure they are safe with respect to antibiotic resistance and public health. FDA approved over-the-counter antibiotic sales more than 50 years ago when understanding of the mechanics and implications of antibiotic resistance was still in its infancy and the largest safety concern was drug residues in meat.

The World Health Organization, Centers for Disease Control and Prevention and FDA have all stated that the problem of overuse of antibiotics in industrial farming is an urgent public health issue. Four decades of rigorous science and research confirm that the routine use of antibiotics in food animal production promotes the development of dangerous drug-resistant bacteria that can spread to humans. FDA recognized these findings when it first attempted to curtail antibiotic use in 1977, though its efforts were thwarted. In the 1980s, the National Research Council and Institute of Medicine warned of the dangers of overuse of antibiotics in food animals. In 1993 the National Academy of Sciences stated: “Clearly, a decrease in antimicrobial use in human medicine alone will have little effect on the current situation. Substantial efforts must be made to decrease inappropriate overuse in animals and agriculture as well.”ⁱⁱ In addition, this Council, PCAST, touched upon the public health threat in its December 2012 report to the President on agriculture.

These findings are of little surprise to those of us who have studied medicine or microbiology. Even introductory microbiology classes teach that using antibiotics at levels that are below a therapeutic dose sets up a perfect environment for bacteria to develop and share resistance. Up to 95% of antibiotic resistance has been attributed to sharing genetic material.ⁱⁱⁱ This means that most bacteria never need encounter an antibiotic to become resistant to it.

We produce about nine billion food animals in this country every year. The most recognizable route of infection for people is the contamination of meat in the food supply with antibiotic resistant organisms from the animals. Several recent studies have shown that conventionally raised livestock and poultry have larger numbers of antibiotic resistant bacteria than animals raised without antibiotics.^{iv,v} Antibiotic-resistant bacteria also enter the environment when animal waste is spread on fields for fertilizer, or runs off livestock and poultry farms when rains are intense.

Decreasing the amount of nontherapeutic antibiotics given to food animals has not been shown to undermine food safety. In fact, in the United States, foodborne illness associated with chicken consumption declined significantly during a period that the poultry industry reduced antibiotic use.^{vi} Former FDA Principal Deputy Commissioner Joshua Sharfstein confirmed in Congressional Committee testimony that, “Eliminating these [growth promotion and feed efficiency] uses will not compromise the safety of food.”

There is general agreement that antibiotics have a place in animal production. As a veterinarian, I know that appropriate antibiotic use – to treat sick animals or to control the spread of infection

in animals at heightened risk – can be beneficial to animal and human health. But just as surely, inappropriate uses where there is no disease present are contrary to human health practices, and to public health.

Antibiotics should be prescribed only to treat individuals and groups of animals exposed to disease. Over-the-counter use of antibiotics is not allowed in human medicine or for companion animals and should not be allowed in food animal production. The World Animal Health Organization (OIE), the Food and Agricultural Organization of the United Nations (FAO) and the World Health Organization (WHO) recognize that the animal and human health sectors have a shared responsibility to minimize antibiotic resistance. And as all three have jointly stated, antibiotic usage, if necessary, should always be a part of, not a replacement for, an integrated animal health program. The routine use of antibiotics should never be a substitute for good animal health management; when these routine practices are employed in disease control programs, they should be regularly assessed for effectiveness and necessity.

While FDA has formulated but not yet finalized guidelines (i.e., Draft Guidance #213) to eliminate the use of antibiotics as growth promoters, the agency has not indicated its plans to evaluate the effectiveness of the guidelines or proceed with enforceable requirements. Pew is hopeful that the guidelines will produce results benefitting public health. However, the implementation period is three years, and antibiotics grow less effective every day.

The Pew Charitable Trusts asks the President's Council of Advisors on Science and Technology to take up this important public health issue and advise President Obama on effective and swift means to curtail the widespread overuse of antibiotics on industrial farms, such as, at minimum, the finalization of FDA guidelines. Stewardship of antibiotics for both human and animal health must be a White House policy priority. Every day that we delay implementing effective and unambiguous policies to curtail the overuse of antibiotics in food animal production, the risks to the American people increase.

Thank you for the opportunity to testify on this very important issue.

Gail R. Hansen, MPH, DVM
Senior Officer
The Pew Charitable Trusts
ghansen@pewtrusts.org
202.540.6467
www.saveantibiotics.org

¹ Sarmah AK, Meyer MT, Boxall AB. A global perspective on the use, sales, exposure pathways, occurrence, fate and effects of veterinary antibiotics (VAs) in the environment. *Chemosphere* 2006; 65:725-59.

ⁱⁱ National Academy of Sciences NAS 2003. Microbial Threats to Health: Emergence, Detection and Response (Smolinski MS, Hamburg MA, Lederberg J, eds). Committee on Emerging Microbial Threats to Health in the 21st Century, Board on Global Health. Washington, DC:Institute of Medicine of the National Academies, National Academies Press.

ⁱⁱⁱ Nwosu VC. Antibiotic resistance with particular reference to soil microorganisms. *Res Microbiol* 2001; 152:421-30.

^{iv} I. Young, A. Rajic, B.J. Wilhelm, L. Waddell, S. Parker, and S.A. McEwen. Comparison of the prevalence of bacterial enteropathogens, potentially zoonotic bacteria and bacterial resistance to antimicrobials in organic and conventional poultry, swine and beef production: a systematic review and meta-analysis. *Epidemiol. Infect.*, 2009. 137: 1217-1232.

^v J.A. Funk, J.T. Lejeune, T.E. Wittum, and P.J. Rajala-Schultz. The effect of subtherapeutic chlortetracycline on antimicrobial resistance in the fecal flora of swine. *Microbial Drug Resistance*, 2006. 12(3): 210-218.

^{vi} Chapman. Use of antibiotics and roxarsone in broiler chickens in the USA: analysis for the years 1995 to 2000. *Poultry Sci.* 81(3): 356-64.