

## FDA: Food-animal antibiotic consumption dwarfs human medical use Part 2 of 4:

Part 1 of 4: Scrutiny of livestock antibiotic use pressures veterinary profession

Part 2 of 4: FDA: Food-animal antibiotic consumption dwarfs human medical use

Part 3 of 4: Antibiotics: precaution vs. proof

Part 4 of 4: Antibiotics: spinning the data from Denmark

*Editor's Note: This is the second installment of a four-part series that explores the use of antibiotics in the livestock industry, the threat of antibiotic-resistant pathogens and the veterinary profession's role in safeguarding animal and public health. Today's article reports the amount of antibiotics given to food-producing animals, as calculated by federal regulators, and how stakeholders come to their own estimates.*

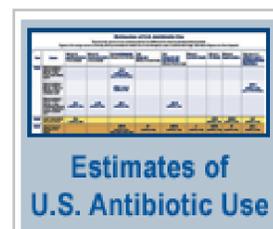
In December, the U.S. Food and Drug Administration (FDA) settled one of the central disputes in the debate about the use of antibiotics in food animals and its role in generating drug-resistant pathogens.

According to the new federal figures, U.S. livestock consumed about 28.9-million pounds of antibiotics in 2009, about four times the human medical antibiotic use of 7.3-million pounds.

During the past decade, competing estimates of antibiotic use have played a leading role in public relations battles over the issue.

Figures presented by public health advocates emphasize the quantities of antibiotics given to animals that are not clinically sick. They often exaggerate the amount of drugs used to promote growth in livestock.

Estimates from the pharmaceutical and food-animal industries and the American Veterinary Medical Association (AVMA), on the other hand, tend to minimize animal antibiotic use. These groups often assert, for instance, that “per unit biomass, human and companion animal antibiotic use is 10 times greater than food-animal use” — a figure discredited by the new FDA numbers.



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While the new federal numbers show that both sides have been overstating their case, the animal industry's “10 times greater” figure appears to be the most serious inaccuracy.

The FDA figures, unfortunately, don't illuminate a key area of uncertainty: The quantities of antibiotics used to promote growth and prevent disease in food animals versus to control and treat diseases.

The FDA labels food-animal drugs for four uses: 1) growth promotion and feed efficiency; 2) disease prevention; 3) disease control; and 4) disease treatment.

The first two of these uses are under scrutiny by the FDA because of their potential contribution to antibiotic drug resistance and their questionable benefit to animal health. The FDA figures released in December do not make clear whether growth promotion and disease prevention account for the large majority of all antibiotic use, as public health advocates claim.

For a variety of reasons, the total quantity of an animal antibiotic used is not necessarily a good proxy for its contribution to the antibiotic-resistance problem. The potency of a gram of one antibiotic can differ from the potency of a gram of another, for instance. Additionally, some animal antibiotics are not used in human medicine. Still, antibiotic-use figures are important indicators of broad trends. And the frequency with which the numbers are cited shows that both sides in the debate consider them to be critical in making their case to the public.

### **Important uncertainties remain**

The federal government has never published detailed data by type of use (growth promotion, disease prevention and so on) on the quantities of antibiotics administered to animals.

From 1950 to 1994, the U.S. International Trade Commission reported numbers on the total domestic production of antibiotic chemicals. According to the [U.S. Government Accountability Office](#), though, these figures were at best a rough estimate of combined human and animal uses. Still, in the absence of a more reliable source of information, the trade commission figures were the basis of widely circulated estimates. In 2000, for instance, the Centers for Disease Control and Prevention stated on its website that U.S. antibiotic production “exceeds 50 million pounds.” This extrapolation of the trade commission figures continues to be cited years later.

In order to make available better data to track antibiotic use and resistance trends, Congress mandated in 2008 that all producers of food-animal antibiotics must disclose annual sales figures and directed the FDA to publish summaries of the information. The first of these reports was released on Dec. 9, 2010. Congress did not, however, specify how the FDA was to present the data. Citing the need to protect confidential business data, the agency chose not to report the figures by their labeled use. As a result, it is not possible to distinguish the quantities of drugs used to treat and control disease from those used to promote growth or prevent disease.

The 2008 rule change does not apply to antibiotics for human medical use. The estimate of 7.3-million pounds presented by the FDA in December is a figure

generated by the market research firm IMS Health and endorsed by the agency. Prior to December, the only official government measure of human antibiotic use was the National Center for Health Statistics' estimate of total outpatient antibiotic prescriptions filled annually.

### **Advocacy groups offer competing figures**

In the many years when federal figures were not available, a number of independent researchers and advocacy groups compiled estimates of human and animal antibiotic use. Several such estimates are presented in Table 1 (See chart, upper right).

The highlighted rows show the figures that appear to be most commonly cited in news and opinion articles on the subject and in documents from advocacy groups:

a) The [2001 report](#) from the Union of Concerned Scientists (UCS), an environmental advocacy group, gives the following figures:

- Annual food-animal antibiotic use is 29.6-million pounds, while human medical antibiotic use is 3-million pounds.
- “Non-therapeutic” antibiotic use in swine, poultry and cattle, which UCS takes to include growth promotion as well as disease prevention, totals 24.6-million pounds. This comes to 70 percent of all food-animal antibiotic use or 83 percent of all use.

b) The 2000 news release from the Animal Health Institute (AHI), a coalition of drug makers, provides quite different numbers:

- Annual U.S. animal antibiotic use, based on a survey of the group’s members, is 17.8-million pounds. This figure is reported to be 36 percent of total U.S. antibiotic production, which is 50-million pounds (a commonly cited estimate at the time). Others later interpreted these figures to mean that annual human antibiotic use was therefore 32.2-million pounds — nearly twice animal use — though AHI did not state this in the release.
- Growth promotion uses are 3.1-million pounds annually, which amounts to 17 percent of animal antibiotic use or 6 percent of all use.

### **Numbers frequently misrepresented**

How did such wildly divergent figures develop? First, the two groups present growth promotion and disease prevention uses differently.

UCS, which wants the government to restrict these uses, lumped the two together as “non-therapeutic” uses, yielding a large total. AHI, on the other hand, rejects the term “non-therapeutic” and only reported a figure for growth-

promotion uses.

While UCS and AHI counted different things, their numbers have been erroneously compared head-to-head many times, such as in the following passage from a [June 2010 New York Times article](#):

“The Union of Concerned Scientists estimated in 2001 that ... 70 percent (of all antibiotics) were used simply to promote animal growth, not to treat or prevent illness. The Animal Health Institute, a trade association, estimated that 13 percent of agricultural antibiotics were used to promote growth.”

In fact, the UCS report didn't specify the percentage of antibiotics used to promote growth — only that growth promotion and disease prevention uses together total 70 percent. The [2008 report](#) of the Pew Commission on Industrial Farm Animal Production makes the same mistake, as do other public health advocacy groups such as the [American Public Health Association](#).

### **AVMA continues to cite outdated, inaccurate figures**

Similarly, though the 2000 AHI release does not make any direct statement about the quantity of antibiotics used annually in medicine, the notion that human antibiotic use is much greater than animal use has persisted in [pharmaceutical industry publications and AVMA documents](#).

These groups commonly state that “human and companion animal antibiotic use is 10 times greater, per unit biomass, than animal use.” The source cited for this figure is a [2001 commentary](#) in the Journal of the American Veterinary Medical Association (JAVMA) by Dr. David Barber, a veterinarian who at the time was affiliated with the University of Illinois.

In the commentary, the “10 times greater” figure is calculated as follows:

- Food-animal biomass is estimated at five times that of humans and companion animals.
- Human and companion animal antibiotic use is estimated at two times that of animals.
- Multiplying five by two yields 10.

The problem arises with the second assumption. The citation for it is a news article in the spring 2000 issue of the now-defunct publication Swine Health and Epidemiology. This journal was not available in several veterinary-college library collections searched by the VIN News Service. But Barber, who is now with the U.S. Department of Agriculture's Veterinary Services office in Springfield, Ill., provided a [scanned copy](#) from his personal records.

The Swine Health and Epidemiology article reprints the AHI news release nearly

verbatim, again making no mention of the magnitude of human use. But in the JAVMA article, Barber does the math: If total antibiotic production is 50-million pounds and animal use is 17.8-million pounds, then human use must be roughly 32.2-million pounds. He writes:

“Of the antimicrobials used in the United States, the percentage used by people and their pets is approximately twice the percentage used on food-producing animals.”

(Barber’s commentary reports that the 17.8-million pound figure refers only to food-animal use, while 32.2-million pounds is the quantity of antibiotics used by companion animals and humans together. However, the AHI news release and the Swine Health and Epidemiology article do not make this distinction: 17.8 million-pounds is reported simply as the amount “used in animals.” In a telephone interview, Barber explained that he had assumed 17.8-million pounds referred only to the amount of antibiotics used in food animals because the figure was drawn from a journal based in swine medicine.)

The FDA’s 2010 numbers confirm that Barber’s figure for human use (32.2-million pounds) was an overestimate. Human antibiotic use is not twice food-animal use; rather, it is one-fourth of food-animal use.

Notified in January by a VIN News Service reporter of the inaccuracy, Dr. Christine Hoang, AVMA’s assistant director of scientific activities, said the “10 times greater” figure was drawn from a peer-reviewed journal and represented the best available estimate. She added, however, that the organization would consider reviewing the figure. As of May 24, it still appeared on the AVMA website.

Reached by telephone, Barber said that he no longer follows the antibiotic-use issue closely and the numbers he reported could well have changed.

*Next up: Assessing the risk that antibiotics used in food-producing animals pose to human health is a challenge. Findings from pharmaceutical groups and the AVMA are at odds with those presented by advocates in public health and human medicine.*