

Curtailing antibiotic use in agriculture

It is time for action: this use contributes to bacterial resistance in humans

Antibiotics are arguably the single most important and widely used medical intervention of our era. Almost every medical specialty uses antibiotic therapy at some point. These drugs have prevented incalculable suffering and death and are perhaps still the closest medications we have to a “magic bullet.”

Of course, bad bugs can bite back, and bacterial adaptation and resistance were reported soon after antibiotics were first used. The struggle to stay one step ahead of pathogens has been widely described and debated. Correcting the overuse of antibiotics in human medicine has gradually become a priority, with slow but heartening progress being gained in this darwinian race. Still, the rise of multidrug resistance and the ready transfer of resistant traits among pathogens require heightened action if we are to prevent increasing outbreaks of infections that become more difficult, or even impossible, to treat.

One essential course of action is to minimize any and all causes and reservoirs of antibiotic resistance. Besides medical use in humans, there is the troubling issue of use in agriculture, specifically in livestock production. Antibiotics have long been routinely used not only for the treatment of infections, but also as a means of getting animals to market faster by growth promotion. Controversies about these practices have resulted in numerous reports, dating back decades, urging more caution or outright bans on the practice. The World Health Organization and other leading medical and public health bodies have advised that animals not be dosed with antibiotics used in humans—to little avail here in the United States to date,

even though our own Food and Drug Administration (FDA) took this position as far back as 1972.¹

Still, many longtime observers of the issue were surprised—or even shocked—to learn the true extent of antibiotic use on farms. A recent report estimates that upward of 70% of all antibiotics manufactured are used in agricultural settings.² Although the exact percentages are uncertain, agricultural antibiotic use is apparently more substantial than previously thought. And the type of use is worrisome because it involves continual, subtherapeutic doses that would seem to provide ideal environments for the selection of resistant pathogens.

The introduction of new molecular epidemiologic tools has heightened the worry because these tools have been used to show that resistant bacteria originating on farms are finding their way into humans.³⁻¹⁰ The extent of this epidemiologic “spillover” to date is uncertain—assertions of the extent of bacterial resistance arising from farms vary widely—and this needs to be a higher research priority. But there is no question that the phenomenon does exist.

Recognizing this risk, the American Medical Association’s house of delegates recently adopted a policy stating that the association “urges that nontherapeutic use of antimicrobials in animals that are also used in humans should be terminated or phased out based on scientifically sound risk assessments.”¹¹ Reaction from the pharmaceutical industry, in the guise of a trade association of manufacturers of animal drugs, was swift. The Animal Health Institute erroneously claimed that “The assertion that

Steve Heilig
San Francisco Medical
Society
1409 Sutter St
San Francisco, CA
94109

Philip Lee
*Professor social medicine
emeritus*
School of Medicine
Senior advisor
Institute of Health
Policy Studies
University of California,
San Francisco

Lester Breslow
*Professor and dean
emeritus*
School of Public Health
University of California,
Los Angeles

Correspondence to:
S Heilig
heilig@sfnms.org

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Brian Prechel/ARS/USDA

Nontherapeutic agricultural use of antibiotics should stop while its risks are fully assessed

there is increasing evidence that resistance developed in animals is spreading to humans is not true,” and it went on to oppose any further restriction on agricultural use.¹²

As a case study of such profit-motivated opposition, Bayer Corporation is vigorously contesting the FDA’s proposal to withdraw a widely used class of antimicrobial, fluoroquinolones, from agricultural use. These medications are used only therapeutically in agriculture, but they are used to combat some of the same bacterial pathogens that are treated with the same drugs in human medicine. Hence, there is a high risk of resistant strains finding their way from animals to humans.¹³ Abbot Laboratories, the other major manufacturer of fluoroquinolones, showed admirable scientific judgment and corporate responsibility in agreeing to the FDA’s request. Unfortunately, judging from the Animal Health Institute’s response to the AMA, we fear the drug industry’s reactions may more closely mirror Bayer’s shortsighted approach. Notably, even some forward-thinking agricultural leaders are now questioning the wisdom of such stonewalling.¹⁴

Admittedly, we tend to give more credibility to those who do not have any financial interest in the status quo. Leading experts unequivocally state that our current practices of feeding antibiotics to animals goes against “a strong scientific consensus that it is a bad idea” and that the long stalemate on this issue constitutes a “struggle between strong science and bad politics.”¹⁵ The intentional obfuscation of the issue by those with profit in mind is an uncomfortable reminder of the long and ongoing battle to regulate the tobacco industry, with similar dismaying exercises in political and public relations lobbying and even scandal.¹⁶ As with tobacco control, science and health concerns should take precedence over profit in

regulating the overuse of antibiotics in the production of meat and other agricultural products.

Antibiotics do have a place on farms, but the benefits of their use can likely be preserved while minimizing harm. We need to learn more about the extent of risk, but the delay tactic of allowing current practices to continue while “more research” is conducted is unacceptable. Enough is already known to justify a more cautious, preventive approach.¹⁷ Other nations are ahead of the United States in this regard and have banned routine agricultural use, with demonstrable benefit in reduced bacterial resistance.¹⁸

We call on the FDA or legislators to, in the coming year, ban the nontherapeutic agricultural use of antibiotics. This ban should be lifted only if it is scientifically proved, in unbiased studies, that this use does not contribute to bacterial resistance in humans. Producers of agricultural antibiotics should be required to submit data on the specific antibiotics used, in sufficient detail to track usage and resistance trends. Bayer should reverse its opposition to the ban on fluoroquinolones. Finally, individual and business consumers of meat should begin to demand that the meat they purchase be grown without the routine use of antibiotics.

With newly heightened concerns about the threat of biologic terrorism, including the possible use of infectious agents, the need to preserve the efficacy and supply of our antibiotic tools becomes even more crucial. It is time for our government to act in the public interest on this important issue.

For information on the growing campaign surrounding this issue, see www.keeptantibioticsworking.com.

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The history of medicine

2001 BC	Here, eat this root.
1000 AD	That root is heathen. Here, say this prayer.
1850 AD	That prayer is superstition. Here, drink this potion.
1920 AD	That potion is snake oil. Here, swallow this pill.
1945 AD	That pill is ineffective. Here, take this penicillin.
1955 AD	Oops . . . bugs mutated. Here, take this tetracycline.
1960–1999 AD	39 more “oops” . . . Here, take this more powerful antibiotic.
2000 AD	The bugs have won! Here, eat this root.

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