

Antibiotics in animal feeds: Threat to human health?

Scientists are not sure. But an
FDA policy change is imminent

by Joan Arehart-Treichel

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Most persons are not fully aware that a large part of the American agricultural revolution of the past several decades has consisted of adding antibiotic drugs to livestock feeds to enhance the growth of the animals. Since the 1950's, when antibiotics were discovered to promote growth, antibiotics in animal feeds have become a \$478 million American market. Antibiotics are added to animal feeds in most countries of the world. The antibiotic growth-promotant market promises to swell even more; American meat production will have to rise 40 percent to meet expected 1980 needs, and American farm-

ers will be called upon more and more to provide food for a world population that is expanding twice as fast as the American one. Currently the yield from one out of five arable acres in the United States is being sent abroad.

In all, growth-promotant antibiotics appear to be a boon to farmers' efforts to meet the food needs. But there is rising concern among some medical scientists, environmentalists and others that antibiotics in animal feeds may have a serious drawback. The projected drawback is that human pathogens, by being heavily and continually exposed to antibiotics in animal feeds, are building up resistance against antibiotics that used to kill them. If this is indeed the case, then these antibiotic-resistant bacteria might touch off diseases in humans that could no longer be controlled by antibiotic therapy.

This concern first arose in the late 1960's, when an increase in antibiotic-resistant strains of bacteria—particu-

larly of *Salmonella*, an organism that causes food poisoning—was noted in American and British hospitals. It is possible, of course, that these strains had developed antibiotic resistance because of heavy use of antibiotics on patients in the hospitals. However, resistant strains were also detected in meat and meat products in the United States and in Britain and in some hospital settings. So the natural conclusion of some people was that lavish use of antibiotics in animal feeds, rather than in hospitals, was why the bacteria were becoming antibiotic-resistant.

The unresolved question, then, is whether heavy use of antibiotics in animal feeds allows pathogens dangerous to humans to develop antibiotic resistance. At the recent annual meeting of the American Society for Microbiology in Philadelphia, some scientists closest to the problem debated the question. If anything came out of their debate, it was that the answer simply is not yet available.

Microbiologist-chemotherapist Gordon Kemp, for example, is with the American Cyanamid Co. Cyanamid has large stakes in the livestock antibiotics market. Kemp reported that even as long ago as 1960, scientists knew that antibiotic resistance could be transmitted from certain animal bacteria to others by "R factors." An R factor is a little piece of DNA in the cytoplasm of the bacterial cell that mediates resistance to antibiotics. But although antibiotic-resistant bacteria might be transmitted through meats to humans and cause untreatable disease, Kemp claimed there is absolutely no evidence it actually happens.

Microbiologist Stanley Falkow of the Georgetown University Medical School asserted, however, that most scientists generally accept that animals can transmit antibiotic-resistant bacteria to humans. He is convinced that the overuse of antibiotics in animals might eventually compromise the effectiveness of antibiotic therapy in humans.

Thomas H. Jukes of the University of California at Berkeley, the scientist first to discover the value of antibiotics to growth, contended that if antibiotic-resistant bacteria were a health threat, they would cause uncontrollable outbreaks of disease among livestock long before they would do so among humans. There is no evidence of such outbreaks among livestock, Jukes stated. Falkow disagreed, noting that in certain countries outbreaks of diarrhea among swine have been attributed to *E. coli* bacteria that were made antibiotic-resistant by overexposure to animal-feed antibiotics. James Leece of the department of animal sciences at North Carolina State University presented evidence contradicting Falkow's assertion and underscoring Jukes'. Leece has evi-



American Cyanamid Co.

Antibiotics fed to cattle in 1970 were worth \$149 million to meat producers.

dence that swine diarrhea is caused by a virus, not by bacteria.

At one point in the Philadelphia meeting, microbiologist Arthur K. Saz of the Georgetown Medical School and a member of a recently appointed Food and Drug Administration Task Force on the Use of Antibiotics in Animal Feeds declared: "It is a microbiological monstrosity to have an ever-replenishable pool of antibiotic-resistant organisms being fed to the population." Yet as another researcher pointed out, even if such a supply were being given to everyone, cooking would probably kill antibiotic-resistant bacteria in meats so that they could not spread to the guts of people eating the meat.

Then, at a peak in the discussion, Jukes avowed: "This has been my life, improving growth in animals with antibiotics. To feed the world's population, we need every trick we know." Saz disagreed. He suggested that animal husbandry, genetics, environment, nutrition and vaccines might be explored to enhance livestock growth by some means other than antibiotics.

In all, the microbiology meeting confrontation produced more emotion than consensus about the available scientific evidence. Yet the importance of the problem may well justify throwing off some excess heat in the attempt to cast light on the issues. The long-range

problem is not what antibiotic-resistant bacteria are doing to people now, but what they might eventually do if more and more strains of bacteria become antibiotic-resistant, and antibiotic drugs no longer control them. This is the essential concern of the FDA.

In fact, the FDA is expected to change its policy on antibiotics in animal feeds early in June. Its task force on antibiotics in animal feeds concluded its inquiries and made some proposals several months ago. The proposals would require antibiotic manufacturers to prove that their products, when used in animal feeds, are not a human health hazard. Otherwise the products would no longer be allowed in animal feeds, or at least be severely restricted. The proposals also included a proviso that those antibiotics of life-and-death importance to humans not be used in animal feeds at all. Current sentiment at the FDA is that these proposals will be adopted. One FDA official says the agency is drawing up test criteria drug manufacturers may have to meet if they wish to exonerate their products and keep them on the market.

Any such change by FDA of its posture on animal feed antibiotics will probably have a profound impact, not just on the multimillion-dollar livestock-antibiotics market, but also upon meat supplies and meat prices. □

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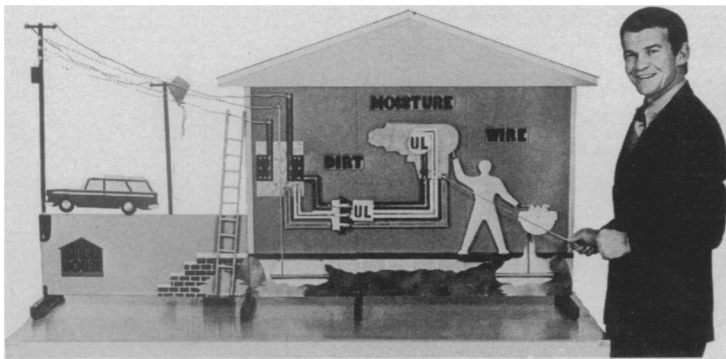
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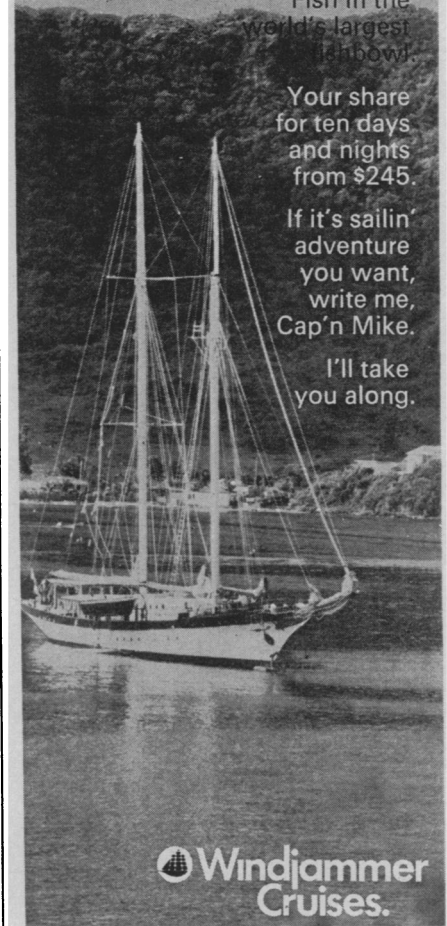
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