

Statement by The Johns Hopkins Center for a Livable Future
To the Maryland Senate Education, Health & Environmental Affairs Committee
on Senate Bill 463

Antibiotic Drug Use in Food Animal Production in Maryland

The views expressed in this statement do not represent the views of Johns Hopkins University, Johns Hopkins Bloomberg School of Public Health, or Johns Hopkins Medicine.

We are researchers and educators at The Johns Hopkins Center for a Livable Future, an interdisciplinary academic center based at the Bloomberg School of Public Health. The Center engages in research, policy analysis, education, advocacy, and other activities guided by an ecologic perspective that diet, food production, the environment, and public health are interwoven elements of a complex system. We recognize the prominent role that food animal production plays regarding a wide range of public health issues surrounding that system.

Our stance on the use of antimicrobial drugs in food animal production is informed by the public health concerns surrounding the current and future generation of antimicrobial resistant bacteria and their spread to human populations. We advocate for ending the nontherapeutic use of antimicrobial drugs in food animal production in order to preserve these precious, lifesaving medicines for the treatment of infections in people.

The inclusion of antimicrobials in animal feed and water has become commonplace—an estimated 80 percent of antibiotics sold in the United States (U.S.) are sold for use in food-producing animals (1). This directly affects Maryland where industrial food animal production is prevalent, especially in broiler production. In 2012, the state produced more than 300 million broiler chickens with fewer than 1,000 operations (2).

The U.S. Food and Drug Administration (FDA) has issued voluntary industry guidelines (Guidance for Industry #209 and #213) that continue to allow for the use of antibiotics in livestock production for “disease prevention,” which allows for use that is largely indistinguishable from growth promotion in dosage and routes of administration (3). The vast majority of food animals in the U.S. are produced at animal feeding operations characterized by high stocking densities and waste management systems that increase the exposure of food animals to bacterial pathogens (4, 5). The stresses induced by the inability of animals to express normal behaviors in food animal production facilities weaken the immune systems of food animals and leave them more susceptible to bacterial infection and disease (6-8). Improving the hygiene of animal environments—including poultry facilities—and reducing animal stresses are more effective at preventing disease and lack the hazard that comes with low-dose antibiotics applying selective pressure on the microbial gene pool. Furthermore, an economic analysis of

U.S. poultry producers demonstrated that the use of antibiotics for growth promotion incurs economic losses to producers (9). After a ban on routine antibiotic use in Denmark, pork and poultry producers maintained high levels of productivity, and long-term animal health was largely unaffected (10).

The continual exposure of food animals and their production environment to low levels of antimicrobials facilitates the selection of resistant pathogens, as some bacteria—those most resistant to the drug used—will survive and reproduce in this environment and increase their numbers relative to the susceptible bacteria. This practice promotes the propagation of antimicrobial-resistant bacteria and threatens public health.

A growing body of evidence provides support that resistant pathogens can be found in and around food animal operations. For example, in broiler production facilities that administer antibiotics for non-therapeutic purposes, chickens have been shown to be carriers of antibiotic-resistant pathogens (11-14) and these resistant pathogens have been found in the litter (15), flies (16), and manure (17) in and around broiler operations.

Studies suggest that resistant pathogens spread from food animal production and processing facilities to nearby communities and beyond via those who work in the facilities (18, 19), air (20-22), water (23), flies (16), and the food itself, as resistant bacteria have been shown to remain on the animal as it is raised and slaughtered and to persist on the animals' meat following slaughter (24, 25). Exposure to these bacteria can lead to infections in people that do not respond to treatment with commonly relied-upon antibiotics, as evidenced by recent outbreaks of foodborne illness (26, 27). Employees of food animal production operations are at greater risk of becoming infected with drug-resistant pathogens (28).

Resistant infections in humans are more difficult and expensive to treat (29) and more often fatal (30) than are infections with non-resistant strains. In some cases, no effective treatments are available. One resistant pathogen, methicillin-resistant *Staphylococcus aureus* (MRSA), causes more than 94,000 invasive infections and kills more than 18,000 people each year in the U.S. (31). Long associated with hospitals, MRSA is now increasingly acquired in the community, and emerging evidence has associated proximity to industrial food animal production sites with increased risk of MRSA infection (19, 32). Health economists estimate that antibiotic resistance adds between \$16.6 and \$26 billion to the nation's health care bill each year (32).

We have recommended that the FDA phase out and eventually ban the nontherapeutic use of antimicrobials in food animal production, including the use of antimicrobials for routine disease prevention (33). The FDA's approach thus far has been to issue guidances that essentially replace "production purposes" approvals with "disease prevention" approvals. Given that the amount, duration, and route of administration of antimicrobials use for disease prevention are similar, and in most cases identical, to those for growth promotion purposes, antimicrobial

approvals could change under Guidance #209 and #213 while non-medical use of antimicrobials may not. As evidence, the head of the pharmaceutical company Zoetis told *The Wall Street Journal* that adopting the FDA's guidances will not substantially affect revenues (34), implying that minimal changes to antibiotic sales are expected; many of the company's antimicrobials are also approved for disease prevention purposes.

The continued non-medical use of antimicrobials in food animal production threatens the effectiveness of these lifesaving resources for combating disease. To slow the evolution of antimicrobial resistant bacteria and preserve the efficacy of antibiotics for current and future generations, we recommend a ban on the nontherapeutic use (including use for disease prevention) of antimicrobials in food animal production. With little additional regulatory action expected at the Federal level and no action expected in the U.S. Congress, it falls upon states—particularly states with significant industrial food animal production—to take action. Please do not hesitate to contact us if you have any questions.

Sincerely,

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