Johns Hopkins Center for a Livable Future
Bloomberg School of Public Health
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National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave SW, Room 2648-S
Mail Stop 0268
Washington, DC 20250-0268

This comment is the Johns Hopkins Center for a Livable Future's own and does not necessarily reflect the views of the larger Johns Hopkins University.

RE: Comment on Extension of Expiration Date for Oxytetracycline (AMS-NOP-12-0070)

To Whom It May Concern:

Thank you for the opportunity to comment on the proposed extension of the expiration date for the authorized use of oxytetracycline pesticides in organic apple and pear production. The Johns Hopkins Center for a Livable Future (CLF) is an academic research and education center based at the Bloomberg School of Public Health that investigates the interconnections among food systems, public health, and the environment. CLF has supported and conducted numerous studies of antimicrobial compounds in the food system and the development of antimicrobial resistance.

To help protect the efficacy of antimicrobial drugs used in human medicine, the National Organic Standards Board (NOSB) should not extend the expiration date. The NOSB should instead allow the authorized use of oxytetracycline pesticides to expire on October 21, 2014 as scheduled.

The evolution of antimicrobial resistance results from the exposure of bacterial populations to compounds with antimicrobial properties. These antimicrobials selectively kill or inhibit susceptible bacteria while other bacteria, which have developed resistance to the compounds via random genetic mutations or the horizontal transfer of resistance determinants from other bacteria, survive and reproduce. To help prevent antimicrobial resistance, the use of antimicrobial compounds should be limited to uses that are necessary to assure public and animal health; this will help reduce the exposure of bacterial populations to these compounds. Such necessary uses do not include spraying crops with antimicrobial pesticides, which is guaranteed to expose bacterial populations (potentially including populations of human pathogens) to compounds that may select for antimicrobial resistance in those populations.

When bacteria develop resistance to antimicrobial drugs, infections by those bacteria are more difficult — and sometimes impossible — to treat. If other effective drugs are available, they may be more expensive and more toxic than the ineffective first-line drug. Lengthy hospital stays and, in some cases, surgical

intervention may be required to resolve the infection. More expensive and less efficacious patient care is the result. For example, the Centers for Disease Control and Prevention (CDC) have estimated that just one resistant human pathogen, methicillin-resistant *Staphylococcus aureus* (MRSA), is responsible for more than 94,000 invasive infections and more than 18,000 deaths in the U.S. each year. The annual cost to the U.S. health care system associated with treatment of antimicrobial-resistant infections has been estimated at $16.6-26 billion. These and other data compel the NOSB to move expeditiously.

Importantly, the scientific questions relevant to assessing the public health impact of oxytetracycline use in apple and pear production are not limited to whether the use of this compound selects for tetracycline resistance in *Erwinia amylovora*, the etiologic agent of fire blight disease, and whether *E. amylovora* can horizontally transfer tetracycline resistance determinants to human pathogens. Many species of bacteria are ubiquitous in the environment, including in apple and pear orchards and in the environmental media (i.e., soil, water, and air) to which oxytetracycline and other pesticides are released. The release of antimicrobial compounds to the environment can contribute to the development of reservoirs of resistance determinants in environmental bacteria. These determinants may be transferred to human pathogens, increasing the public's risk of antimicrobial-resistant infections.

The World Health Organization considers tetracyclines (including oxytetracycline) to be highly important to human medicine. These antimicrobials are used to treat multiple diseases of public health importance, including chlamydia, Lyme disease, and Rocky Mountain spotted fever. Notably, use of an antimicrobial can also select for resistance to antimicrobials other than the one used. This is because the same bacterial gene can encode resistance to multiple compounds or because two bacterial genes, each encoding resistance to a different compound, may be linked. As a result, oxytetracycline use may select for resistance to other antimicrobials and compound the public health impact of its misuse in agriculture.

It is imperative that policymakers take action to prevent antimicrobial resistance wherever possible. The use of oxytetracycline and other antimicrobial pesticides in crop production increases the exposure of bacterial populations to antimicrobial compounds, potentially selecting for bacteria that are resistant to those and other compounds, without providing a public health benefit. These resistant bacteria may be human pathogens and/or they may contribute to environmental reservoirs of resistance determinants that may be transferred to human pathogens. To protect public health, the NOSB should allow the authorized use of oxytetracycline to expire next year as scheduled. Please contact us with questions about this comment or antimicrobial resistance more generally.

Sincerely,

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