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FOR IMMEDIATE RELEASE

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Note: This is the fifth of an eight-part series from the National Institute for Animal Agriculture (NIAA), with thought leadership and technical support from Merck Animal Health. The One Health series explores antimicrobial resistance and the collaborative efforts between ranchers, and animal health and human health experts to explore the issue.

Video package available at: <https://vimeo.com/294809674>

Photo available upon request.

One Health Series:

Researcher offers one way to stem antibiotics problem

On a busy campus in Minnesota's Twin Cities, Professor Tim LaPara works to understand a complex problem – one with growing implications for humans, animals and the environment.

“Antimicrobial resistance is becoming more of a problem because more and more of our infections are resistant to antibiotics, thus limiting the effectiveness of these drugs,” LaPara says. “There are predictions that antimicrobial resistance will actually be responsible for more deaths in the next 50 years than cancer.”

LaPara is an environmental engineer at the University of Minnesota. He's devoted the past 15 years to exploring antibiotic resistance – looking for clues that could slow the growth of resistant bacteria in both urban and rural communities.

“The problem with antibiotic resistance is almost certainly related to how much antibiotics we use. The unfortunate part of that is we can't stop using antibiotics. They're incredibly important. This is called the antibiotic resistance paradox – the thing that we need destroys the thing that we need,” he says. “So, we need other solutions beyond reducing antibiotics use.”

LaPara and his students have turned to investigating the environment, searching for antimicrobial-resistant genes in materials like human and animal waste. There, the bacteria compound the problem.

“The environment plays a vital role in the spread of antimicrobial resistance. If you think about it, organisms that make us sick can't magically go from human to human. There has to be some sort of conduit by which they spread,” LaPara notes. “Bacteria have the ability to evolve exceptionally quickly. We can do it in the laboratory within a few days and actually observe them change and become resistant to antibiotics.”

LaPara's research focuses on how to improve municipal wastewater treatment practices, as well as the treatment of animal manure, to more effectively kill the bacteria. He suggests wastewater centers adopt a type of high-temperature or incineration system to more effectively kill bacteria. In places like feedyards or dairies, LaPara says composting or spreading less manure over more land can help stem the resistance problem, where everyone plays a role.

"There are a lot of potential driving forces for bacteria to become resistant to antibiotics. Certainly, there is human medical use of antibiotics. There are also a lot of anti-bacterial compounds that we use in everyday life such as in hand sanitizers, hand soap and even toothpaste," he says. "In all of those places, we're imposing selective pressure on bacteria.

In all, reducing antibiotic resistance will require what the National Institute for Animal Agriculture calls a "One Health" approach.

"The problem is extraordinarily complex. There are a lot of people and entities that are responsible for the spread of antimicrobial resistance. Similarly, I think the solution to antimicrobial resistance needs to be multi-faceted," he says. "It needs to take into account reductions in human health, reductions in animal agriculture and a lot of other changes in the environment to really slow the spread of resistance."

NIAA encourages all producers to learn more and to join in the One Health conversation next month during its 8th annual Antibiotic Symposium. Scheduled for Nov. 13 through 15th in Kansas City, early registration is due Oct. 29. Visit animalagriculture.org to learn more.

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About the One Health series:

This series of video- and print-ready resources is funded by Merck Animal Health and brought to you by the National Institute for Animal Agriculture (NIAA), which works with industry producers, leaders and others to address issues concerning animal agriculture. This is an eight-part series that explores NIAA's ongoing One Health initiative to collaboratively address antimicrobial resistance (AMR) in the animal and human health sectors.

About NIAA:

The National Institute for Animal Agriculture (NIAA) was established in 2000 to provide a forum to facilitate and engage industry leaders and organizations to derive solutions on the most current issues in animal agriculture. Its members include producers, veterinarians, scientists, and government and allied industry representatives.

NIAA is dedicated to programs that work toward the eradication of diseases that pose a risk to the health of animals, wildlife and humans. It also promotes a safe and wholesome food supply and best practices for animal health and well-being as well as environmental stewardship. NIAA issue initiatives encompass the entire animal agriculture field including cattle, sheep, swine, avian, equine and aquaculture industries. More information is available at animalagriculture.org.