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# Why Does Antibiotic Resistant Campylobacter Persist in Poultry?

by Stacy Kish, CSREES

One of the most common food-borne pathogens, *Campylobacter* sickens more than two million people in the United States every year. With funding from USDA's Cooperative State Research, Education, and Extension Service (CSREES), scientists in Iowa are examining how this pathogen develops resistance to antibiotics and is transferred to humans via the food chain causing food-borne illness. >>

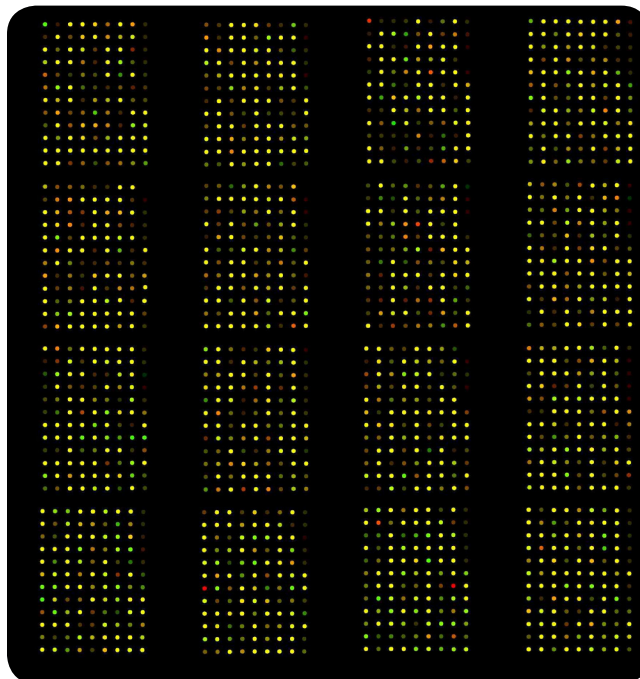
The results of this study will help improve the safety, quality, and value of the nation's food supply, particularly through pre-harvest intervention strategies.

*Campylobacter jejuni* is a bacterial species associated mainly with poultry. The pathogen developed resistance to fluoroquinolone antibiotics, such as Cipro, after antibiotic treatment of animals. Although the poultry industry banned these antibiotics

in 2005, the presence of antibiotic-resistant strains of *C. jejuni* in poultry remained high.

Qijing Zhang and colleagues at Iowa State University found that the antibiotic-resistant strains grow more successfully in the intestinal track of poultry than the non-resistant strain, even in the absence of antibiotics. The persistence of antibiotic-resistant *C. jejuni* in poultry highlights the need for new strategies to control it.

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Right: Zhang's group is using a DNA microarray to study how *Campylobacter* develops antibiotic resistance and persistence.

Credit: Ying Wang and Qijing Zhang



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Above: Principal Investigator Qijing Zhang.  
Credit: ISU CVM

Researchers are targeting the genes involved in the development and persistence of the antibiotic resistant organisms to prevent emergence and transmission .

“We will continue our efforts to understand the antibiotic resistance mechanisms and ecology of antibiotic-resistant *Campylobacter*,” Zhang said. “We are also interested in developing intervention strategies to prevent the transmission and colonization.”

Researchers tested fecal samples from both poultry and swine farms. *Campylobacter* strains were isolated from the samples. The researchers examined the isolates for vulnerability to various antibiotics using molecular techniques to analyze the resistance-associated genetic mutations.

Antibiotic-resistant isolates of *Campylobacter* can infect humans through contaminated poultry meat, water, or raw milk. The resulting infection produces an illness called campylobacteriosis. *C. jejuni* is responsible for 95 percent of *Campylobacter* infections in humans.

Although the consumption of pork is not a major mode of *Campylobacter* transfer, the presence of antibiotic-resistant *Campylobacter* on pig farms makes pork a potential source of horizontal transfer across production systems.

CSREES funded this research project through the National Research Initiative’s Food Safety program. CSREES advances knowledge for agriculture, the environment, human health and well-being, and communities by supporting research, education, and extension programs in the Land-Grant University System and other partner organizations. For more information, visit [www.csrees.usda.gov](http://www.csrees.usda.gov). ■

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