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Transporting broiler chickens could spread antibiotic-resistant organisms

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Researchers at the Johns Hopkins Bloomberg School of Public Health have found evidence of a novel pathway for potential human exposure to antibiotic-resistant bacteria from intensively raised poultry—driving behind the trucks transporting broiler chickens from farm to slaughterhouse. A study by the Hopkins researchers found increased levels of pathogenic bacteria, both susceptible and drug-resistant, on surfaces and in the air inside cars traveling behind trucks that carry broiler chickens. The study is the first to look at exposure to antibiotic-resistant bacteria from the transportation of poultry. The findings are published in the first issue of the *Journal of Infection and Public Health*.

Typically, broiler chickens are transported in open crates on the back of flatbed trucks with no effective barrier to prevent release of pathogens into the environment. Previous studies have reported that these crates become contaminated with feces and bacteria.

The new study was conducted on the Delmarva Peninsula—a coastal region shared by Maryland, Delaware and Virginia, which has one of the highest densities of broiler chickens per acre in the United States. Ana M. Rule, PhD, a research associate in the Bloomberg School's Department of Environmental Health Sciences, along with professor Ellen K. Silbergeld, PhD, and Sean L. Evans collected air and surface samples from cars driving two to three car lengths behind the poultry trucks for a distance of 17 miles. The cars were driven with both air conditioners and fans turned off and with the windows fully opened. Air samples collected inside the cars, showed increased concentrations of

bacteria (including antibiotic-resistant strains) that could be inhaled. The same bacteria were also found deposited on a soda can inside the car and on the outside door handle, where they could potentially be touched.

"We were expecting to find some antibiotic-resistant organisms since it's pretty clear that the transportation conditions for these chickens are not closed or contained," Rule said. "Our study shows that there is a real exposure potential, especially during the summer months, when people are driving with the windows down; the summer is also a time of very heavy traffic in Delmarva by vacationers driving to the shore resorts."

The strains of bacteria collected were found to be resistant to three antimicrobial drugs widely used to treat bacterial infections in people. These drugs are approved by the U.S. Food and Drug Administration for use as feed additives for broiler poultry. The study findings were also consistent with other studies on antibiotic resistance in poultry flocks and poultry products.

According to the authors, the findings support the need for further exposure characterization, and attention to improving methods of biosecurity in poultry production, especially for regions of high density farming such as the Delmarva Peninsula.

Source: Johns Hopkins University