

Flies may spread drug-resistant bacteria from poultry operations

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Researchers at the Johns Hopkins Bloomberg School of Public Health found evidence that houseflies collected near broiler poultry operations may contribute to the dispersion of drug-resistant bacteria and thus increase the potential for human exposure to drug-resistant bacteria. The findings demonstrate another potential link between industrial food animal production and exposures to antibiotic resistant pathogens. Previous studies have linked antibiotic use in poultry production to antibiotic resistant bacteria in farm workers, consumer poultry products and the environment surrounding confined poultry operations, as well as releases from poultry transport.

"[Flies](#) are well-known vectors of disease and have been implicated in the spread of various viral and bacterial infections affecting humans, including enteric fever, cholera, salmonellosis, [campylobacteriosis](#) and shigellosis," said lead author Jay Graham, PhD, who conducted the study as a research fellow with Bloomberg School's Center for a Livable Future. Our study found similarities in the antibiotic-resistant [bacteria](#) in both the flies and [poultry](#) litter we sampled. The evidence is another example of the risks associated with the inadequate treatment of animal wastes."

"Although we did not directly quantify the contribution of flies to human exposure, our results suggest that flies in intensive production areas could efficiently spread resistant organisms over large distances," said Ellen Silbergeld, PhD, senior author of the study and professor in the Bloomberg School of Public Health's Department of Environmental

Health Sciences.

Graham and his colleagues collected flies and samples of poultry litter from poultry houses along 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. The analysis by the research team isolated antibiotic-resistant enterococci and [staphylococci bacteria](#) from both flies and litter. The bacteria isolated from flies had very similar resistance characteristics and resistance genes to bacteria found in the poultry litter.

Flies have ready access to both stored poultry waste and to poultry houses. A study by researchers in Denmark estimated that as many as 30,000 flies could enter a poultry house over the course of six week period.

Additional authors of "Antibiotic-resistant enterococci and staphylococci isolated from flies collected near confined poultry feeding operations" are Lance Price, Sean Evans and Thaddeaus Graczyk. The study is published in the April 2009 issue of *Science of the Total Environment*.

The research was funded by a grant from the Johns Hopkins Center for a Livable Future.

According to Robert Lawrence, MD, director of the Center for a Livable Future, confined animal feeding operations—where thousands of animals are crowded together and are fed antibiotics for growth promotion—create the perfect environment for selection of bacteria that are resistant to antibiotics. "Antimicrobials are among the most important developments of the twentieth century in managing infectious diseases in people. We can't afford to squander them by using them as growth promoters in industrial food animal production. The increase in antibiotic-resistant bacteria is a major threat to the health of the public,

and policymakers should quickly phase out and ban the use of antimicrobials for non-therapeutic use in food animal production," said Lawrence.

Source: Johns Hopkins University Bloomberg School of Public Health

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