

# Evidence of banned antibiotics in poultry products found

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In a joint study, researchers at the Johns Hopkins Bloomberg School of Public Health and Arizona State University found evidence suggesting that a class of antibiotics previously banned by the U.S. government for poultry production is still in use. Results of the study were published March 21 in *Environmental Science & Technology*.

The study, conducted by the Bloomberg School's Center for a Livable Future and Arizona State's Biodesign Institute, looked for drugs and other residues in feather meal, a common additive to chicken, swine, cattle and fish feed. The most important drugs found in the study were fluoroquinolones—broad spectrum antibiotics used to treat serious bacterial infections in people, particularly those infections that have become resistant to old-er antibiotic classes. The banned drugs were found in 8 of 12 samples of feather meal in a multstate study. The findings were a surprise to scientists because fluoroquinolone use in U.S. [poultry](#) production was banned by the U.S. Food and Drug Administration in 2005.

This is the first time investigators have examined feather meal, a byproduct of poultry production made from poultry feathers, to determine what drugs poultry may have received prior to their slaughter and sale.

The annual per capita human consumption of poultry products is approximately 100 lbs, greater than that of any other animal- or vegetable-derived protein source in the U.S. To satisfy this demand, each

year, the U.S. poultry industry raises nearly 9 billion broiler chickens and 80 million turkeys, according to the U.S. Department of Agriculture. A large percentage of the fresh weight of these animals is inedible—an estimated 33 percent for chickens, for example—and is recycled for other uses, including feather meal.

The rendering industry, which converts animal byproducts into a wide range of materials, processes poultry feathers into feather meal, which is often added as a supplement to poultry, pig, ruminant, and fish feeds or sold as an "organic" fertilizer. In a companion study, researchers found inorganic arsenic in feather meal used in retail fertilizers.

"The discovery of certain antibiotics in feather meal strongly suggests the continued use of these drugs, despite the ban put in place in 2005 by the FDA," said David Love, PhD, lead author of the report. "The public health community has long been frustrated with the unwillingness of FDA to effectively address what antibiotics are fed to food animals."

A primary reason for the 2005 FDA ban on the use of fluoroquinolones in poultry production was an alarming increase in the rate of the fluoroquinolone resistance among *Campylobacter* bacteria. "In recent years, we've seen the rate of fluoroquinolone re-sistance slow, but not drop," noted study co-author Keeve Nachman, PhD, Farming for the Future Program Director at the Johns Hopkins Center for a Livable Future. "With such a ban, you would expect a decline in resistance to these drugs. The continued use of fluoroquinolones and unintended antibiotic contamination of poultry feed may help explain why high rates of fluoroquinolone-resistant *Campylobacter* continue to be found on commercial poultry meat products over half a decade after the ban."

In the U.S., antibiotics are introduced into the feed and water of industrially raised poultry, primarily to make them grow faster, rather than to treat disease. An estimated 13.2 million kg of antibiotics were

sold in 2009 to the U.S. poultry and livestock industries, which represented nearly 80 percent of all antibiotic sales for use in humans and animals in the U.S. that year.

In conducting the study, researchers from the Johns Hopkins Bloomberg School of Public Health and Arizona State University analyzed commercially available feather meal samples, acquired from six U.S. states and China, for a suite of 59 pharmaceuticals and personal care products. All 12 samples tested had between 2 and 10 antibiotic residues. In addition to antimicrobials, 7 other personal care products, including the pain reliever ac-etaminophen (the active ingredient in Tylenol), the antihistamine diphenhydramine (the active ingredient in Benadryl) and the antidepressant fluoxetine (the active ingredient in Prozac), were detected.

Researchers also found caffeine in 10 of 12 feather meal samples. "This study reveals yet another pathway of unwanted human exposure to a surprisingly broad spectrum of prescription and over the counter drugs," noted study co-author Rolf Halden, PhD, PE, Co-Director of the Center for Health Information & Research, and Associate Director of the Swette Center for Environmental Biotechnology at Arizona State University.

When researchers exposed several strains of *E. coli* bacteria to the concentrations of [antibiotics](#) found in the feather meal samples, they also discovered the drug residues could select for resistant bacteria. "A high enough concentration was found in one of the samples to select for bacteria that are resistant to drugs important to treat infections in humans," noted Nachman.

"We strongly believe that the FDA should monitor what drugs are going into animal feed," urged Nachman. "Based on what we've learned, I'm concerned that the new FDA guidance documents, which call for

voluntary action from industry, will be ineffectual. By looking into feather meal, and uncovering a drug banned nearly 6 years ago, we have very little confidence that the food animal production industry can be left to regulate it-self."

Provided by Johns Hopkins University Bloomberg School of Public Health

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