Organic meat less likely to be contaminated with multidrug-resistant bacteria

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Meat that is certified organic by the U.S. Department of Agriculture is less likely to be contaminated with bacteria that can sicken people, including dangerous, multidrug-resistant organisms, compared to
conventionally produced meat, according to a study from researchers at the Johns Hopkins Bloomberg School of Public Health.

The findings highlight the risk for consumers to contract foodborne illness—contaminated animal products and produce sicken tens of millions of people in the U.S. each year—and the prevalence of multidrug-resistant organisms that, when they lead to illness, can complicate treatment.

The researchers found that, compared to conventionally processed meats, organic-certified meats were 56 percent less likely to be contaminated with multidrug-resistant bacteria. The study was based on nationwide testing of meats from 2012 to 2017 as part of the U.S. National Antimicrobial Resistance Monitoring System (NARMS).

In order for meat to be certified organic by the USDA, animals can never have been administered antibiotics or hormones, and animal feed and forage such as grass and hay must be 100 percent organic. A longstanding concern about antibiotic use in livestock and livestock feed is the increased prevalence of antibiotic-resistant pathogens. To monitor this trend, in 1996 the federal government developed NARMS to track antibiotic resistance in bacteria isolated from retail meats, farmed animals, and patients with foodborne illness in the U.S.

For their study, the Bloomberg School research team analyzed U.S. Food and Drug Administration-NARMS data from randomly sampled chicken breast, ground beef, ground turkey, and pork for any contamination and for contamination by multidrug-resistant organisms. The analysis covers four types of bacteria: Salmonella, Campylobacter, Enterococcus, and Escherichia coli.

The study covered a total of 39,348 meat samples, of which 1,422 were found to be contaminated with at least one multidrug-resistant organism.
The rate of contamination was 4 percent in the conventionally produced meat samples and just under 1 percent in those that were produced organically.

The study was published May 12 in *Environmental Health Perspectives*.

"The presence of pathogenic bacteria is worrisome in and of itself, considering the possible increased risk of contracting foodborne illness," says senior author Meghan Davis, DVM, Ph.D., associate professor in the Department of Environmental Health and Engineering at the Bloomberg School. "If infections turn out to be multidrug resistant, they can be more deadly and more costly to treat."

The analysis also suggested that the type of processing facility may influence the likelihood of meat contamination. Meat processors fall into three categories: exclusively organic, exclusively conventional, or those that handle both organic and conventional meats—so-called "split" processors. The study found that among conventional meats, those processed at facilities that exclusively handled conventional meats were contaminated with bacteria one-third of the time, while those handled at facilities that processed both conventional and organic meats were contaminated one-quarter of the time. The prevalence of multidrug-resistant bacteria was roughly the same in these two meat processor categories.

"The required disinfection of equipment between processing batches of organic and conventional meats may explain our findings of reduced bacterial contamination on products from facilities that process both types of meats," says Davis.

The authors believe their findings have relevance for regulatory agencies and consumers. "How we raise animals matters," says Davis. "As a veterinarian, I recognize that we sometimes need to use antibiotics to
treat sick animals, but taking advantage of opportunities to reduce antibiotics use could benefit everyone. Consumer choice and regulatory oversight are two strategies to do this."

First author Gabriel Innes, VMD, Ph.D., led the study while completing his Ph.D. at the Bloomberg School, where he was a Center for a Livable Future-Lerner Fellow.

"Contamination of Retail Meat Samples with Multidrug-Resistant Organisms in Relation to Organic and Conventional Production and Processing: A Cross-Sectional Analysis of Data from the United States National Antimicrobial Resistance Monitoring System, 2012–2017" was co-authored by Gabriel Innes, Keeve Nachman, Alison Abraham, Joan Casey, Andrew Patton, Lance Price, Sara Tartof and Meghan Davis.


Provided by Johns Hopkins University Bloomberg School of Public Health

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