

## Antibiotic resistance genes in our food?

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The food we eat could be promoting the disturbing spread of antibiotic-resistant infections, scientists warn. Harmless bacteria in our food carry genes that provide resistance to antibiotics, the researchers explained. Once in our bodies, they might transmit these genes to disease-causing bacteria, making them more dangerous.

“The magnitude of antibiotic-resistant bacterial contamination in the food chain is tremendous,” said Hua Wang of Ohio State University in Columbus, Ohio, who presents the findings May 23 at the American Society for Microbiology annual meeting in Toronto. Still Life With Food by Jan Davidsz de Heem (1626-1683)  
“Food could be an important avenue for antibiotic-resistant bacterial evolution and dissemination.” Antibiotic-resistant infections arise when bacteria evolve defenses against the antibiotics with which humans have been attacking them for years. Often, the microbes need not evolve resistance on their own: they can get the resistance genes free from their neighbors. The culprit, Wang said, is a process known as horizontal gene transfer, in which bacteria near each other can share genetic information. Gene transfer among disease-causing bacteria in hospitals is already a recognized problem. Research also shows that disease-causing bacteria can get genes from harmless microbes, including those in food, Wang said. Particularly worrisome, she added, is that these organisms are plentiful and have a rich gene pool, and some are particularly efficient at sharing genes. Hua and colleagues tested various ready-to-eat foods including seafood, meats, dairy, deli items and fresh produce from grocery chain stores. Resistance gene-carrying bacteria turned up throughout the samples, except in processed cheese and yogurt, she said. Antibiotic-resistant infections are a growing public health problem, said Marilyn Roberts of the University of Washington in Seattle: depending on the case, an antibiotic-resistant infection could triple a hospital stay. A methicillin-resistant Staphylococcus aureus infection can cost thousands of dollars more to treat. In some cases, such as the new extensively resistant tuberculosis, antibiotics no longer work, forcing doctors to take extreme measures like removing an infected lung. The problem is not confined to the food supply, Hua said: recent studies have found resistance genes in bacteria in babies’ digestive tracts. Since these children had not eaten solid food yet, they must have acquired these genes somewhere other than the food supply, suggesting resistance genes from the environment were involved, said Hua. “Antibiotics and the contamination of the environment is a medical problem, an agricultural problem and a human problem. Every body plays a role,” Roberts said. But there are things that can be done to minimize contamination in our food, Hua added. “Given the proper investment of money, effort and time we can identify the steps that need to be taken at the processing level.”

Courtesy American Society for Microbiology and World Science staff

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