USDA-FSIS and Antimicrobial Resistance: How FSIS Contributes to National Antimicrobial Resistance Monitoring System (NARMS)

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To protect the health of animals, people and the environment, United States Department of Agriculture (USDA) scientists play a key role in understanding antimicrobial resistance (AMR) in bacteria. For decades USDA has worked to effectively prevent, control, and contain bacterial AMR in the food and agricultural settings. For instance, over 70 years ago, USDA developed the methods to produce large amounts of penicillin to treat wounded Allied soldiers during World War II. This contribution is a testament to USDA's longstanding commitment to the field of antibiotics. Antibiotics are used to treat microbial infections in humans, animals, and plants. Microbes can develop resistance which makes antibiotics less effective. USDA conducts surveillance to identify changes in AMR that may signal emergence of new resistance patterns.

AMR along the farm-to-fork continuum is a complex process. Agencies in the Department of Health and Human Services (HHS) and USDA, including USDA's Food Safety and Inspection Service (FSIS), actively address different aspects of AMR surveillance. NARMS, which started over 23 years ago, is a multiagency AMR collaboration. FSIS NARMS monitors the emergence, persistence, and spread of antibiotic resistant microbial strains in food-producing animals at slaughter and in food. FSIS focuses on testing AMR in food animals at slaughter and processing. The U.S. Food and Drug Administration (FDA) monitors the retail meat and poultry food products. The Centers for Disease Control and Prevention (CDC) monitors enteric (intestinal) infections and AMR in people. The state and local health departments work in collaboration with the FDA and CDC to monitor bacterial AMR in foods and ill people.

The NARMS surveillance program provides information each year to help the USDA and HHS AMR teams assess the nature and magnitude of AMR in bacteria moving through the food supply and ill people. The information FSIS collects under the NARMS program comes from food products (Pathogen Reduction/Hazard Analysis and Critical Control Point -PR/HACCP) and cecal (from the intestine) samples. The agency uses this information in outbreak investigations and inspection activities.

The NARMS surveillance data and information are routinely published on each NARMS partner agency's website. In addition, NARMS periodically publishes an Integrated Report which summarizes the most important resistance findings for *Salmonella*, *Campylobacter*, *E. coli* and *Enterococcus* from the participating agencies. NARMS data and publications help in identifying new and changing AMR profiles, examine how AMR might be spreading, and show similarities or differences in bacterial AMR from food animals and human. Access to NARMS findings ensures information transparency and enables industry and other stakeholders to make AMR informed food safety decisions.

The USDA plays a key role in protecting the health of animals, people and the environment and the FSIS NARMS program is a part of this larger USDA effort. As the NARMS 2018 Integrated Report (publication pending) indicates, AMR pathogens currently pose a low level of threat to the average consumer. Still, to stay safe from all food pathogens, everyone should remember to follow FSIS's safe food preparation recommendations to Clean, Separate, Cook and Chill.

For more about the NARMS surveillance program, visit FSIS NARMS.