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The Isolation of Antibiotic-Resistant Salmonella from Retail Ground Meats

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ABSTRACT

Background Salmonella is a leading cause of food-borne illness. The emergence of antimicrobial-resistant salmonella is associated with the use of antibiotics in animals raised for food; resistant bacteria can be transmitted to humans through foods, particularly those of animal origin. We identified and characterized strains of salmonella isolated from ground meats purchased in the Washington, D.C., area.

Methods Salmonella was isolated from samples of ground chicken, beef, turkey, and pork purchased at three supermarkets. The isolates were characterized by serotyping, antimicrobial-susceptibility testing, phage typing, and pulsed-field gel electrophoresis. The polymerase chain reaction and DNA sequencing were used to identify resistance integrons and extended spectrum -lactamase genes.

Results Of 200 meat samples, 41 (20 percent) contained salmonella, with a total of 13 serotypes. Eighty-four percent of the isolates were resistant to at least one antibiotic, and 53 percent were resistant to at least three antibiotics.

Sixteen percent of the isolates were resistant to ceftriaxone, the drug of choice for treating salmonellosis in children. Bacteriophage typing identified four isolates of *Salmonella enterica* serotype typhimurium definitive type 104 (DT104), one of DT104b, and two of DT208. Five isolates of *S. enterica* serotype agona had resistance to 9 antibiotics, and the two isolates of serotype typhimurium DT208 were resistant to 12 antibiotics. Electrophoretic patterns of DNA that were indistinguishable from one another were repeatedly found in isolates from different meat samples and different stores. Eighteen isolates,

representing four serotypes, had integrons with genes conferring resistance to aminoglycosides, sulfonamides, trimethoprim, and -lactams.

Conclusions Resistant strains of salmonella are common in retail ground meats. These findings provide support for the adoption of guidelines for the prudent use of antibiotics in food animals and for a reduction in the number of pathogens present on farms and in slaughterhouses. National surveillance for antimicrobial-resistant salmonella should be extended to include retail meats.

Source Information

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