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Superbugs in our food supply: A study of MRSA and antimicrobial-resistant *Listeria* from retail meat

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A ntimicrobial-resistant microorganisms compromise the effectiveness of antibiotics and are a serious public health concern. Methicillin-resistant *Staphylococcus aureus* (MRSA) and antimicrobial-resistant Listeria were recovered from retail meat in metro Detroit. The overall prevalence of *S. aureus* was 22.83% and 6 meat samples (2 beef, 3 chicken and 1 turkey products) shed MRSA. Resistance to non-beta lactam antibiotics was observed in MRSA. All MRSA isolates were USA300, the most common clone in community-associated MRSA infections in the US. A total of 138 Listeria isolates, including 58 *Listeria welshimeri*, 44 *Listeria* monocytogenes, and 36 *Listeria innocua*, were recovered and characterized by antimicrobial susceptibility tests. Resistance to one or two antimicrobials was observed in 32 Listeria (23.2%). Tetracycline resistance was the most common resistance phenotype and identified in 22 Listeria isolates. L innocua demonstrated the highest overall prevalence of antimicrobial resistant (12 of serotype 1/2b, 2 of 1/2a, and 1 of serotype untypeable). A diverse population of *L. monocytogenes* was identified as evidenced by multiple PFGE (pulsed-field gel electrophoresis) patterns in the 44 isolates. In conclusion, distinct MRSA USA300 clones exist in US meat products and may pose potential threat to meat handlers and consumers. Although antimicrobial resistance in Listeria still occurs at low prevalence, multiple Listeria species can serve as reservoir of antimicrobial resistance. Variation of antimicrobial susceptibilities in *L. monocytogenes* serotypes may exist.

Biography

Yifan Zhang is an Assistant Professor in food microbiology and safety at Wayne State University (WSU). She obtained her Ph.D. and postdoctoral training from University of Maryland and The Ohio State University, respectively. She is also members of American Society for Microbiology (ASM), Institute of Food Technologists (IFT), and International Association of Food Protection (IAFP), and reviewers for prestigious journals in the field of food science and food safety. Her research focuses on microbial food safety and beneficial bacteria on human health, molecular epidemiology of antimicrobial-resistant bacteria, and development of novel microbial detection methods.