

## **Antibiotic-Resistant Bacteria in Food – an Emerging Food Safety and Public Health Concern**

Uncontrolled use of antibiotics and antimicrobials for managing human and animal diseases gave rise to the problem of antibiotic resistance. Today, one can find traces of antimicrobial chemicals (AMCs) almost everywhere in our environment. The presence of these AMCs accelerates the development of antibiotic resistance in different bacteria. When the bacteria develop resistance, they may become extremely difficult to control in an infected individual with currently available drugs (antibiotics). This research focuses on to evaluate trace-level of AMCs and antibiotic resistance genes (ARGs) in bacterial communities of food products sold in different socioeconomic status (SES) areas within a US metropolitan by using next-generation sequencing of microbial DNA and other analytical methods. The prevalence and abundance of ARGs in bacterial communities of foods sold by retailers from different SES areas varied significantly. The highest abundance of ARGs was found in low SES deli meat, including ARGs to carbapenem and multidrug efflux systems. ARGs to amphenicols and erythromycin were present in all high SES lettuce and deli meats, respectively. The class 1 integron-integrase genes were detected in all chicken samples.

### **Dr. Pratik Banerjee's brief bio:**

Dr. Pratik Banerjee is an Associate Professor of Environmental Health in the School Food Public Health and the Co-Director of Agriculture and Food Technologies Research Cluster at the FedEx Institute of Technology at the University of Memphis. Dr. Banerjee received his Ph.D. in Food Science from Purdue University working in the area of food safety focusing on rapid detection of pathogens and toxins in food and drinking water. He received his M.Tech. in Biotechnology from Jadavpur University. The primary areas of his research interests involve developing novel biosensor-based diagnostics using tools of nanotechnology, immunochemistry and molecular biology, investigating the epidemiological aspects of foodborne pathogenic organisms using molecular and cell biological methods, automation of the cell-based screening and providing science-based assistance to ensure on-farm or in-plant food safety practices of small and medium-scale operations. As the principal investigator or as a collaborator, Dr. Banerjee has secured funding from the US Department of Agriculture (USDA), the US Food and Drug Administration (FDA), the National Science Foundation (NSF), and from State and local agencies. The findings of Dr. Banerjee's work have been published in several internationally reputed peer-reviewed journals with wide readerships.