

**TITLE:** FURTHER CHARACTERIZATION OF SALMONELLA AND CAMPYLOBACTER ISOLATES FROM NARMS STUDY: **NPB#13-258**

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### SCIENTIFIC ABSTRACT

There is a public health concern related to the use of antimicrobials in agriculture and in response the FDA has taken certain actions including the voluntary phase out of the use of antimicrobials for production purposes. Surveillance systems such as National Antimicrobial Resistance Monitoring System (NARMS) have been in place for many years. While NARMS does monitors trends in antimicrobial resistance among foodborne bacteria from humans, retail meats, and animals, it was not designed to correlate on-farm antimicrobial use practices with observed antimicrobial resistance trends. Therefore, a surveillance system which can correlate antimicrobial resistance patterns to antimicrobial use would be very helpful in assessing the impact of FDA judicious antimicrobial use policies. Since USDA's Food Safety and Inspection Service does collect samples at abattoirs for microbiological and antimicrobial susceptibility testing, it seems logical to explore the possibility of using these results as a means to evaluate antimicrobial resistance patterns from known sources with antimicrobial use practices. However, studies have shown changes in Salmonella population patterns during transport to and lairage within abattoirs which would affect the relationship between antimicrobial resistance patterns and antimicrobial use practices seen from samples collected following slaughter. Therefore, an in-depth comparison of antimicrobial resistance patterns of Salmonella, Campylobacter and E. coli isolates collected from pigs at different points of slaughter would be useful to determine if abattoir samples are appropriate for monitoring the impact of changes in on-farm antimicrobial use practices. In this study fecal samples were collected upon arrival at the abattoir and later from the cecum following evisceration within cohort groups. Also non-cohort pig and environmental samples were collected from the abattoir for comparison purposes. Isolates of Salmonella, Campylobacter, and E. coli tested for resistance to a panel of antimicrobials as well as characterized by serotype, phenotype and genetic patterns as appropriate. A total of 358 pigs were sampled (arrival, n=139; post-slaughter, n=140, lairage environment, n=79). For Salmonella, 1163 isolates were collected, serotyped, and tested for antimicrobial susceptibility to a panel of drugs. Similarly 303 Campylobacter and 703 E. coli isolates were collected and tested. The results suggest that samples collected post-slaughter are not reflective of antimicrobial resistance patterns observed at arrival for any of these organisms. Therefore, if patterns at arrival are not reflected by post-slaughter partners, this suggests sample collected post-slaughter are not useful as measures for monitoring on-farm resistance, as on-farm resistance is even more distal geographically and temporally then arrival samples. These results are important to the swine industry as well as researchers and regulators and they explore options and make decisions regarding implementation of appropriate antimicrobial resistance surveillance systems to meet the needs of changing antimicrobial use practices.

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