NAHMS Swine 2021 Large Enterprise Antimicrobial Stewardship and NAHMS Cooperative Agreement Antimicrobial Use and Resistance Monitoring Updates

Charles Haley, Alice Green, Matt Branan, Matthew Vuolo, Chelsey Shivley, Katherine Marshall (all, USDA-APHIS:VS: S&P:CEAH:NAHMS)
Laura Ruesch (South Dakota State University)
Taylor Spronk, Scott Dee (Pipestone Veterinary Services)

Background

NAHMS Swine 2021: The Large Enterprise segment of the NAHMS Swine 2021 study took an in-depth look at swine operations with 1,000 or more pigs. Summary estimates from the study's Large Enterprise segment will provide insights on how the majority of U.S. pigs are produced, their health status, and veterinary or biosecurity measures taken to maintain their health. For this conference, an overview of findings related to biosecurity and antimicrobial stewardship will be provided.

Cooperative agreement: APHIS is collaborating with South Dakota State University and Pipestone Veterinary Services to study quantitative antimicrobial use and resistance on commercial swine farms in the Midwest. Year 1 findings and ongoing work from this collaboration will be discussed.

Materials and Methods

NAHMS Swine 2021: From July 2021 through January 2022, the U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS), in collaboration with the USDA's National Agricultural Statistics Service (NASS), conducted its sixth national study of U.S. large enterprise swine operations. Approximately 2,700 operations were selected from 13 of the Nation's top swine-producing states for study participation.

Cooperative agreement: Twice-annual collection of samples from pigs along with AMR monitoring occurred on 138 swine farms in the Midwestern U.S. Detection and resistance of *Escherichia coli* from pig tissues was assessed, and associations between antimicrobial use and antimicrobial resistance were evaluated via comparison of AMU and minimum inhibitory concentrations (MICs) of antimicrobials within the same drug class, as determined via the Sensititre Bovine/Porcine plate.

Results

NAHMS Swine 2021: Results are being finalized. Those related to biosecurity, stewardship, and, where statistically valid, antimicrobial use, will be reported.
Cooperative agreement: An overview of recently published findings on AMU on participating farms will be reported. Higher MICs for enrofloxacin and danofloxacin in *E. coli* from swine tissues were associated with purchase of fluoroquinolones. There were no other significant associations between MIC and AMU combinations in *E. coli* isolated from pig tissues.

Conclusions

NAHMS Swine 2021: Conclusions will be discussed in relation to historic NAHMS Swine study findings. Limitations will be described.

Cooperative agreement: Limitations of published work will be discussed. Ongoing program work will be described.

SafePork 2023: The 14th International Symposium on the Epidemiology and Control Biological, Chemical and Physical Hazards in Pigs and Pork, New Orleans, LA, United States, May 15–17, 2023
https://doi.org/10.31274/safepork.16315