

On-Farm Research Studies

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Introduction

- Studies began in 2011- completed in 2015
- Funded by FDA as part of NARMS
- Large and complex study
 - Multiple scientists- from both government and academic institutions



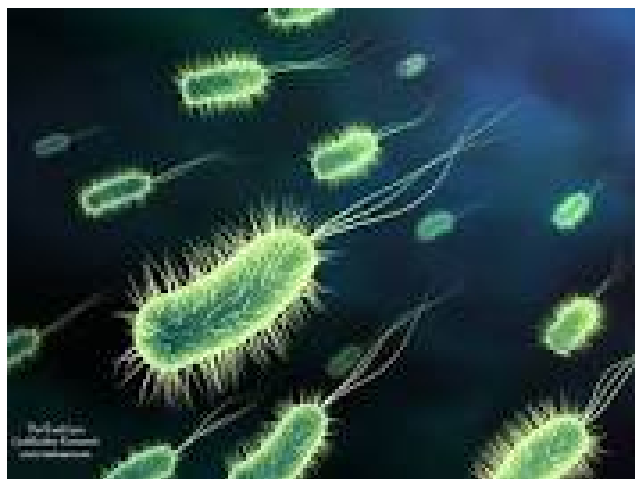
Goal

- Evaluate the relationship of food safety bacteria between on-farm isolates and in-plant isolates
- Determine the feasibility of a study on food borne pathogens and AMR to be performed long term on farms



Goals (cont.)

- Use as point for obtaining on-farm antimicrobial use information
- Evaluate the logistical challenges and the potential value in adding a pre-harvest component to NARMS



Overview

- Species evaluated:
 - Dairy cattle
 - Beef cattle
 - Poultry – broilers and turkeys
 - Swine



Dairy Cattle



- On farm and cull cow sampling
- Research conducted by Drs. Van Kessel, Karns and Harhay (ARS) and Drs. Wolfgang and Hovingh (Penn State)
- Studies conducted in Pennsylvania
- Cultured Salmonella and *E. coli*

Dairy Cattle (cont.)

- 3 studies conducted:
 - Study 1: determine optimal sample collection and culture methods
 - Study 2: Collected samples from 2 commercial dairy farms and a slaughter facility
 - Study 3: Sampling a cross section of the dairy herds
 - Pre-weaned calves
 - Post-weaned calves
 - Dry cows
 - Lactating cows



Beef Cattle



- Objectives:
 - Three sample types
 - Variability of AMR between cattle operations
 - Determine the prevalence, statistical variation, and AMR across feedlots in Texas and NE
- Research conducted by: Drs. Loneragan (TTU), Schmidt (ARS) and H. Morgan Scott (KSU/Tex A&M)

Beef (cont.)

- Sampled for: *E. coli* and Salmonella
- Assessed for carbapenemase and ESBL resistance genes
- One study investigated the potential presence of extra intestinal *E. coli* associated with HUT infections

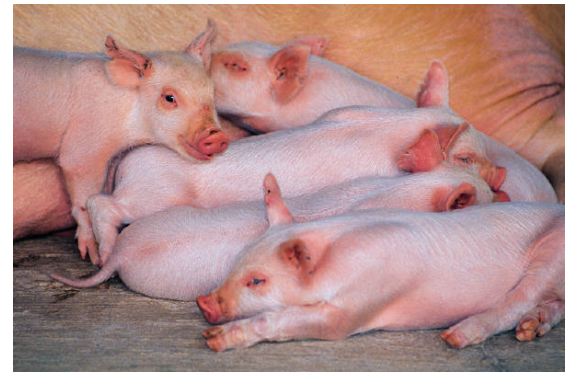


Poultry

- Broilers and turkeys
- Drs. Hofacre (UGA) and Singer (U of MN)
- Testing for Salmonella and Campylobacter
- 3 studies – 2011-present
- Dr. Singer is continuing this project



Swine



- Objectives:
 - Impact of normal lairage practices on Salmonella and Campylobacter
 - Uptake of AMR bacteria at lairage and cecal samples
- Research conducted by Drs. McKean, Frana, Logue, O'Connor (ISU) and Cray and Plumblee (ARS/NC State)

Swine (cont.)

- Study design: truckloads of pigs directly from farm at slaughter
 - Samples collected at:
 - Directly from truck
 - 6 additional samples from holding area at lairage
 - Cecal sample at slaughter



Results

- Data for each study will be published by scientists
- High prevalence of foodborne pathogens – *E. coli* and Salmonella present in all species of animals
- Most isolates were pan-susceptible to all antibiotics
- AMR bacteria found in all species
- No significant levels of carbapenamase or ESBL resistant bacteria found
- No extra intestinal *E. coli* associated with HUT found

Conclusions



- Limited sampling – a small snapshot
- On-farm sampling protocols need to be developed for each species and production type
- Obtaining data requires the trust of the producers that the data and information will be held confidential
- Educating industry and producers the rationale for collecting the data is required

Questions and Thank you!
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