

BEEF INDUSTRY SAFETY SUMMIT
March 1-3, 2016
Austin, TX

Project Title: Preliminary Investigation of Antibiotic Resistant and Susceptible *Campylobacter* in Retail Ground Beef in the United States.

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Category: Post-Harvest

Published: Unpublished to date

Objective: Identify antibiotic resistant patterns of *Campylobacter* spp. isolated from retail ground beef collected in the United States in 2015.

Experimental Design & Analysis:

A total of 96 ground beef samples were collected from a variety of retail stores across five cities in various regions of the United States during the summer months (May, June, July, and August) of 2015. Samples were weighed, enriched, and plated to Modified Charcoal Cefoperazone Deoxycholate Agar and R&F® *Campylobacter* chromogenic plating media. Potential positives were confirmed using Schimdex latex agglutination kits. Three presumptive, positive isolates were taken from each sample, frozen and subjected to recovery for further analysis. Of the 210 isolates collected, 70 were subject to National Antimicrobial Resistance Monitoring System (NARMS) protocols to identify resistance patterns. A Chi-Squared for linear trend was conducted in the statistical program R to compare resistance of the samples across multiple antibiotics.

Key Results:

Across the 96 samples, 88.5% were positive for *Campylobacter* spp. (n=85). A total of 79 samples were successfully isolated, frozen, and subjected to preliminary recovery methods. A total of 64 isolates were successfully revitalized and subjected to NARMS testing. MIC breakpoints for four antibiotics determined resistance results as follows: 21.9% of isolates were resistant to ciprofloxacin (n=14), 39.1% of isolated were resistant to erythromycin (n=25), 51.6% of isolates were resistant to gentamicin (n=33), and 14.1% of isolates were resistant to tetracycline (n=9).

How can this information can be applied in the industry?

Retail is the final level of the farm to fork chain; it is the last step before product reaches the consumer. It is crucial to consider the pathogens that are present at retail. Little is known about *Campylobacter* prevalence in ground beef; however, *Campylobacter* is the leading cause of diarrheal illness in the U.S. Also, antibiotic resistant organisms are a controversial issue across multiple industries, including meat production. Determining a baseline for resistant *Campylobacter* at retail may contribute to future interventions and controls throughout processing specifically targeting *Campylobacter*.

Figure 1. Percentage of antibiotic resistant and susceptible *Campylobacter* isolates to the following antibiotics: ciprofloxacin, erythromycin, gentamicin, and tetracycline.

