

# Antimicrobial Resistance of *Campylobacter* Isolated from Organic and Conventional Dairy Farms in the Midwestern and Northeastern United States

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## Introduction

*Campylobacter* infections are the most commonly identified cause of human gastroenteritis in the United States. Increased resistance to several antimicrobials is being observed in *Campylobacter* from humans, swine, and poultry. Meanwhile, dairy cattle have been identified as sources of *Campylobacter* infection in humans through consumption of raw milk, educational visits to farms, or water contamination. Thus, dairy's role in dissemination of this foodborne pathogen warrants further study.

## Materials and Methods

An ongoing three-year longitudinal study of 128 dairy herds is being conducted to evaluate occurrence of infection, risk factors, and patterns of antimicrobial resistance of *Campylobacter* from cattle and farm environmental samples. The objective of this portion of the study was to compare antimicrobial susceptibility profiles of *Campylobacter* isolates between organic and conventional dairy farms.

Herds were enrolled in Michigan, Minnesota, New York, and Wisconsin according to herd size and management styles (conventional or organic methods). Farm environment and fecal specimens from target animal populations were sampled on a bi-monthly basis at each

herd for 10 months. Specimens from all states were processed at a central laboratory for isolation and identification of *Campylobacter* using standard laboratory procedures. Antimicrobial susceptibility for azithromycin, chloramphenicol, ciprofloxacin, clindamycin, erythromycin, gentamicin, nalidixic acid and tetracycline was determined by automated microbroth dilution technique on commercially prepared plates. Minimum inhibitory concentrations were read manually as well, with the lowest concentration showing no visible growth.

## Results and Conclusions

Using NCCLS guidelines for enteric pathogens, preliminary results show resistance in *Campylobacter* for all eight antimicrobials. From 742 conventional dairy isolates, resistance was demonstrated to all eight antimicrobials. However, 279 organic isolates did not demonstrate resistance to chloramphenicol, gentamicin or clindamycin. Tetracycline resistance was found in 54% of conventional isolates and 43% of organic isolates, which did significantly differ according to farm type. There are also associations between tetracycline resistance and increasing herd size and use of medicated milk replacer. These results and other risk factors will be discussed.