

Epidemiology of *Salmonella* Fecal Shedding in Naturally Infected Ohio Dairy Herds

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Introduction

Salmonella is a common bovine pathogen that is known to cause severe enteritis and septicemia in cattle of all ages, often resulting in serious economic losses through increased disease or reduced production. The gastrointestinal tract of food animals is also considered to be a major source of food-borne *Salmonella* infections in humans. However, little is known about the transmission patterns and cycles of infection that allow this bacteria to persist in populations of dairy cattle. The goal of this project was to characterize the population dynamics of *Salmonella* infection and fecal shedding in naturally infected dairy herds.

Methods

The study involved a cross-sectional sampling of dairy herds across the state to estimate the prevalence of *Salmonella* fecal shedding among Ohio dairies. We utilized whole-herd fecal samples submitted to the Ohio Department of Agriculture Animal Disease Diagnostic Laboratory (ADDL) under the Ohio Johnes Certification Program. Herds were identified as either positive or negative, with a positive herd defined as having at least one animal shedding *Salmonella* in the feces. All herd identifications and test results were held confidential. General herd information and health history was obtained from the herd veterinarian through a standardized questionnaire sent out upon receipt of fecal samples. Cultures for *Salmonella spp* from fecal samples were performed following the standard *Salmonella* microbiological protocols from the ADDL.

Results

Following seven months of testing, 21 of 56 herds from 27 Ohio counties have had at least one animal shed-

ding *Salmonella* in feces, for a prevalence of 38%. This is higher than the 27% prevalence estimate from the 1996 National Animal Health Monitoring System (NAHMS) dairy survey. Within-herd prevalence rates of *Salmonella* fecal shedding ranged from 1% to 97%, with an average of 15% of cows on a particular dairy found shedding. Prevalence appears to be higher in the winter, although additional observations are needed. We are testing additional herds to more accurately determine patterns of *Salmonella* fecal shedding and compare various management and production factors according to *Salmonella* shedding status. When data collection is complete, such management practices as vaccination protocols, feed management and heifer rearing will be investigated. In addition, information regarding antimicrobial use on farms, such as dry cow treatments and medicated calf replacers, will be examined. This information may be useful in studies to determine potential correlations between antimicrobial use and patterns of antimicrobial resistance in organisms found on these farms.

Conclusion

Determining the prevalence of *Salmonella* fecal shedding in Ohio dairy herds will enable us to determine patterns of infection and allow us to identify risk factors associated with *Salmonella* fecal shedding, and establish within-herd and between-herd variability in shedding status. Using this knowledge we can recommend prevention and control strategies of bovine salmonellosis, and identify critical control points in dairy production systems which potentially could be incorporated into on-farm pathogen reduction programs.