PREVALENCE OF *ESCHERICHIA COLI* O157:H7 IN COW-CALF HERDS IN KANSAS [1]

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Summary

Fecal samples from cows and calves and samples of water sources were collected monthly for 8 months from 10 Kansas cow-calf farms to determine the prevalence of *E. coli* O157:H7. The bacterium was found in 8% of fecal samples from cows that were within 24 hours of calving, 1.4% of fecal samples from cows which were not within 24 hours of calving, 1.4% of calf fecal samples, and 1.5% of water samples. *E. coli* O157:H7 was identified from at least one sample on all farms.

(Key Words: Cow-Calf Herds, *E. coli* 0157:H7, Bacterial Infection.)

Introduction

Over the past decade, *Escherichia coli* O157:H7 has emerged as a significant public health concern. Humans infected with this bacterium experience a range of illnesses, including severe bloody diarrhea, hemolytic uremic syndrome, and occasionally death. Many cases of the disease in humans are linked to consumption of contaminated beef products. The food processing industry has introduced HACCP (Hazard Analysis Critical Control Points) programs aimed at reducing the risk of contamination of beef products with pathogens, including *E. coli* O157:H7. Considerable interest exists in extending HACCP programs to the farm to further minimize the risk that *E. coli* O157:H7 will enter the human food chain.

To extend HACCP programs to the farm, it is necessary to identify the prevalence of *E. coli* O157:H7 infection in livestock and to understand how the bacterium is spread between animals. Although this bacterium is shed in animals' feces, it does not cause illness in cattle. Because infection is relatively uncommon, it is necessary to sample large numbers of apparently healthy animals to identify which cattle are shedding *E. coli* O157:H7. The cow-calf industry is generally pasture-based, making it difficult to collect samples from large numbers of animals. Therefore, little is known about the frequency of *E. coli* O157:H7 in these animals. The objective of this study was to determine the prevalence of *E. coli* O157:H7 in cow-calf herds in Kansas.

Experimental Procedures

Ten commercial cow-calf herds in Kansas participated in the study; five were large (>300 cows) and five were small (<100 cows). All herds had a spring calving program. Each farm was visited approximately once per month from Dec., 1996 to July, 1997. At each visit, we collected fecal samples from 10% of the cows and a water sample from all water sources available to the

[1]This research was funded in part by USDA Special Research Grant #96-34359-2593 and the KSU-Food Animal Health and Management Center.

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cattle. After the start of the calving season, we also collected fecal samples from 10% of the calves. We collected fecal samples from 50 cows that were within 24 hours of calving, 1277 cows that were not within 24 hours of calving, and 418 calves. We also collected 135 water samples.

The fecal and water samples were tested for *E. coli* O157:H7 using standard culture techniques, which included immunomagnetic separation and latex agglutination.

Results and Discussion

E. coli O157:H7 was isolated from 8.0% of the cows that were near calving, 1.4% of the cows that were not near calving, 1.4% of the calves, and 1.5% of the water samples. The presence of *E. coli* O157:H7 in water samples is of concern, because this might spread the bacterium to uninfected cattle.

Prevalence did not differ (P>.05) between the types of samples, and tended to be higher in cows near calving.

Figure 1 shows the prevalence of *E. coli* O157:H7 by farm. Although smaller farms tended to have a higher prevalence, the difference was not significant (P>.05). The prevalence was quite low on all farms (<4%), but every farm in this study had at least one sample that contained *E. coli* O157:H7. This suggests that, although the rate is low, infection is present to some degree on many farms. This has implications for control programs but also suggests that producers should use hygienic practices such as hand-washing after handling cattle and prior to eating.

Figure 2 shows the prevalence of infection by month. The prevalence of *E. coli* O157:H7 was higher (P<.05) in March compared to May and June. The graph indicates that infection was also more common in December. However, relatively few cattle were sampled in December, so this rate was not different (P>.05). The increased prevalence in March may be related to calving patterns and not a true seasonal effect. The majority of samples from cows near calving were collected in March, and cows near calving tended to have a higher prevalence of *E. coli* O157:H7.

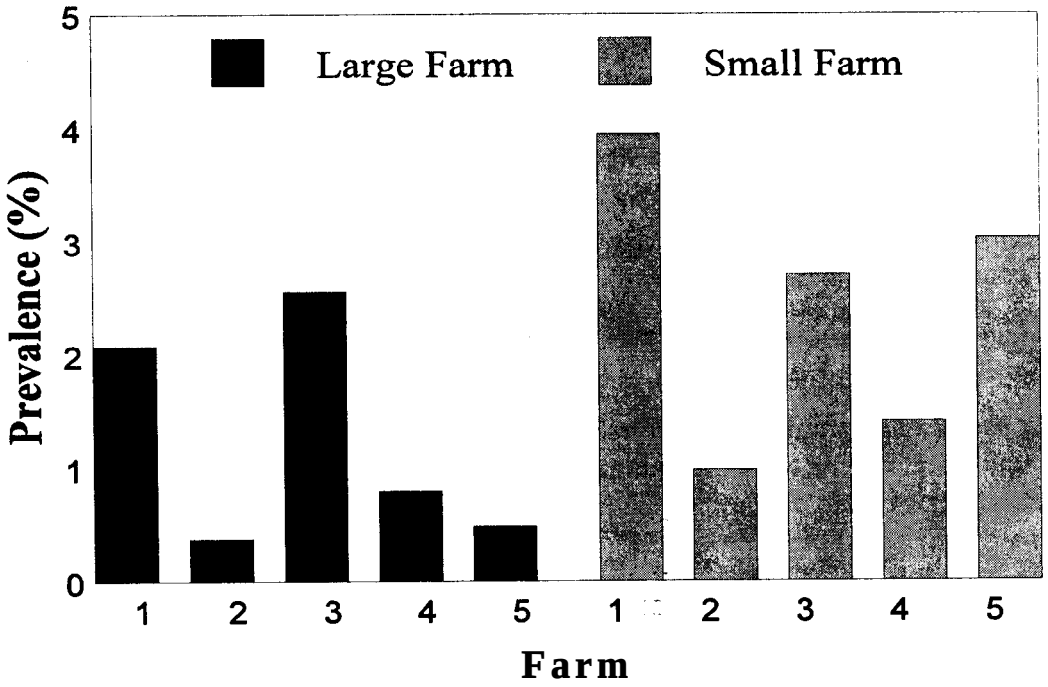

Figure 1. Prevalence of *E. coli* O157:H7 in Fecal and Water Samples by Farm.

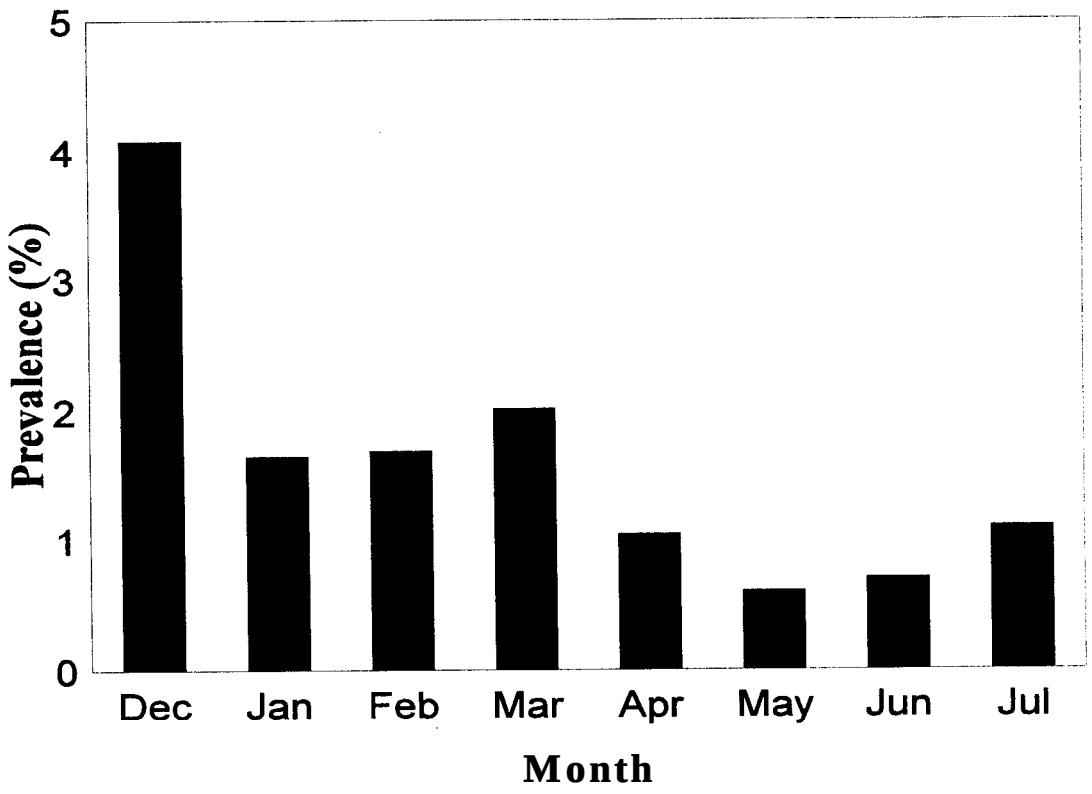

Figure 2. Prevalence of *E. coli* O157:H7 in Fecal and Water Samples by Month.