Epidemiology of Salmonella Fecal Shedding in Subclinically Infected Dairy Herds

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Introduction

Salmonellosis can produce serious economic losses to dairies in terms of reduced animal health and production. The organism responsible for the disease more commonly exists in the subclinical form, which allows the organism to persist in the herd for extended periods of time. Animals infected with *Salmonella* organisms pose significant health risks to other animals and people on the farm, as well as risks to the safety of the human food supply due to infected milk or contaminated meat from culled animals. Unfortunately, little is known about the epidemiology of subclinical salmonellosis in dairy environments. By characterizing shedding patterns in infected animals, critical control points can be identified on the dairy at which disease prevention and control measures can be directed.

Materials and Methods

We are conducting an ongoing longitudinal observational study of three Ohio dairies who have recently experienced clinical salmonellosis. Herds were identified through private practitioners who had confirmed *Salmonella* infection within 6 months prior to the start of the study. Herd visits are conducted every two months. Individual fecal samples are collected from all cows over two years of age and from calves less than 3 months of age. *Salmonella* organisms are isolated using to standard culture procedures.

Results

At this time (January, 1999) each herd has been tested three times. Prevalence of *Salmonella* shedding varies among farms, ranging from 32-77% on a herd basis (Figure 1). The overall prevalence of shedding among all cows sampled is currently 63%. Lactating cows range from 38-93% shedding and dry cows range from 0-86%. *Salmonella* was isolated from only 5% of all calf samples, with 60% of these isolates from calves less than 2 weeks of age. The range of shedding in calves among farms is 0-15%.

Management and production factors are being evaluated and compared between farms. Herd 2 has upgraded facilities and instituted the use of calf hutches. Over 30% decrease in fecal shedding in cows was observed in the third visit. Only one herd, Herd 3, has experienced any clinical symptoms of salmonellosis during the period of observation. This may explain the slight rise in fecal shedding at the time of the third visit.

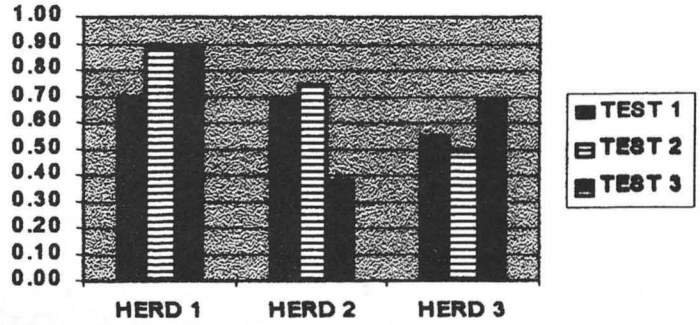

Figure 1. Prevalence of fecal shedding by adult cows.

Implications

In this ongoing study, clinical problems associated with Salmonella infection have virtually ceased yet cows in all stages of production continue to shed the organism A combination of heavy fecal shedding and environmental contamination has allowed infection to spread to the calf population and persist in these herds. More importantly, the high prevalence of fecal shedding by adult cows suggests that food products such as milk and meat derived from these animals may be important sources of food borne disease in humans. Preliminary results however have identified potential areas in management and in the cow's production cycle where effective intervention might control or prevent infection. Therefore, the implementation of preharvest food safety measures on-farm has the potential to protect both the animal and human populations.

References

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