

source, domestic and wild animals, housing, and nutrition were similar for case and control farms. There was no difference between case and matched control farms in the number of cattle moved to the farm or taken to a veterinary clinic and returned to the farm during 1993 and 1994 ($p > 0.5$). Many study farms reported spreading poultry manure or litter on crops or pasture (48%), spreading uncomposted litter (26%), feeding poultry litter (11%), or having a poultry operation on the farm (33%), but these factors were not different between case and control farms ($p > 0.25$). There was a marginally significant association of clinical salmonellosis with exposure of cattle or feed to wild geese (odds ratio=7, 95% confidence interval; 0.9, 151).

We found that case and control farms were similar with respect to several potential risk factors for clinical salmonellosis. However, the small sample size for investigating herd-level factors, diversity of the herds in the study, and the probable complexity of factors that lead to clinical salmonellosis need to be considered in the interpretation of negative findings from this analysis. *S. typhimurium* was the serotype most often found in samples from clinical cases, environmental samples,

and feces collected from asymptomatic animals during the study. This non host-adapted serotype of salmonella infects multiple species, is easily transmitted between species, can be shed by animals which are not showing clinical signs, and survives well in uncomposted manure¹. These characteristics make it less probable that a single risk factor would account for most herd outbreaks. However, we did find that case farms were more likely to report having exposure of cattle or feed to wild geese. This finding is consistent with results from another report where wild birds were implicated as the source of salmonella infection in a dairy herd outbreak² and should be considered as a possible risk factor in future field investigations of clinical salmonellosis in cattle.

References

1. Forshell, L. P., and I. Ekesbo. Survival of salmonellas in composted and not composted solid animal manures. *J Vet Med B* 1993;40:654-658.
2. Glickman, L. T., P. L. McDonough, S. J. Shin, J. M. Fairbrother, R. L. LaDue, and S. E. King. Bovine salmonellosis attributed to *Salmonella anatum*-contaminated haylage and dietary stress. *J Am Vet Med Assoc* 1981;178:1268-1272.

Effects of a select direct-fed microbial gel effects of a select direct-fed microbial gel supplemented with different levels of vitamin E in neonatal Holstein calves

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The objective of this study was to determine if an oral microbial gel supplemented with a natural source of vitamin E increased plasma concentrations of vitamin E in neonatal Holstein calves. The study was conducted in two commercial dairy locations. Holstein female calves ($n = 30$) were assigned randomly at birth to one of five treatment groups: A) control with no direct-fed microbial B) direct-fed microbial C) direct-fed microbial with 300 IU vitamin E, D) direct-fed microbial with 600 IU vitamin E and E) direct-fed microbial with 900 IU vitamin E. An Apgar scheme was performed within the first hour of birth, calves were treated according to the treatment group and received 2 L of pooled colostrum. Blood was sampled at 0, 24, 48 h and 7 days. Sera were analyzed for IgG by radial immunodiffusion.

Plasma samples were analyzed for α -tocopherol levels using a modification of the method of Kaplan et al. (1987). Diarrhea was assessed using a scoring system (1-4) for all calves for 21 days after birth. Compared to control group A and group B there was a significant difference (p -value < 0.01) for vitamin E levels in plasma for treatment group E at 24 and 48 h. No differences were detected for morbidity, weight and maturity indexes and hypoxia (Apgar score). Mean concentration of IgG at 48 h of age and plasma levels at 0 h were similar to all groups, hence all calves received similar and adequate amounts of colostrum. The results suggest that with a unique dose of a direct-fed microbial with high levels of vitamin E, α -tocopherol levels peak at 24 hr. plasma remaining at significant amounts at 48 h post-treatment.