

The Association Between Persistently Bovine Viral Diarrhea Virus-Infected Calves and Pen Levels of Morbidity and Mortality in an Iowa Feedlot

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Introduction

As persistently infected (PI) cattle are the primary reservoirs of bovine viral diarrhea virus (BVDV) in cattle populations, there is general agreement that effective control of BVDV-induced losses requires the detection and elimination of these carriers from dairy and cow-calf herds. However, the significance of the presence of PI calves in pens of feedlot cattle is unknown. Our long-range goal is to determine whether identification and removal of PI calves prior to shipment to feedlots would be economically advantageous to feeders, and if such testing should be incorporated into preconditioning programs. As the first step toward answering this question, the objective of this study is to determine whether differences exist in morbidity and mortality in groups of calves that include PI calves and groups that do not include PI calves. If PI calves negatively impact morbidity and mortality, then future studies can be designed to examine the feasibility and economic impact of including BVDV PI testing in preconditioning programs.

Materials and Methods

A 4000 head capacity feedlot was identified for this cross-sectional observational study. The feedlot owner obtained ear notches at processing from recently weaned calves (not yearlings) received after October 1, 2001. Each pen contained animals from only one consigner, but the consigner could consign single or multiple source groups. Once allocated to a pen, calves remained together for the entire feeding period. BVDV immunohistochemistry (IHC) was performed on ear notches from 4705 calves in 40 pens. The feedlot operator recorded treatment information for the calves. The diagnosis was classified as respiratory disease, foot problems, etc., using the classifications available on a computerized record keeping system.

A logistic model was used for analysis. The outcome of interest was the treatment result for the individual animal, yes or no. The explanatory variables were: a pen

effect, the BVDV status of the pen and a categorical variable describing the number of head in the pen (<100 head or > 100 head). Because the level of aggregation of the explanatory variable was at the pen level, the unit of concern was the pen while the unit of measurement of the explanatory variable was the individual animal.

Results and Discussion

Notches from 12/4705 calves were BVDV IHC positive, consistent with persistent infection. Therefore, the overall prevalence of BVDV PI (to date) is 0.26%. Seven of 40 lots were positive, so the prevalence of positive lots (i.e., lots containing at least one PI calf) to date is 18%. Three pens contained one PI calf, three pens had two PI calves, and one pen had three PI calves.

The overall treatment rate was 16% (759/4705). Seventy percent of all treatments administered were for undifferentiated bovine respiratory disease (UBRD). There were no significant differences in morbidity between pens that contain PI calves (20%) and pens that did not contain PI calves (21%); the odds of a calf being treated in a BVDV positive pen versus a BVDV negative pen = 1.056 (95% CI = 0.87 – 1.282). Seventeen animals died during the study period from arrival to close out; to date, none of the BVDV PI animals have died. We initially suspected that the presence of one or more PI calves would negatively impact morbidity and mortality in a group of feedlot calves. However, analysis of the data available to date suggests that PI calves do not negatively impact pen morbidity (treatment rates) and mortality, and that individual PI calves are no more likely to require treatment or die than their non-PI penmates. The reason for this is unclear. However the degree of mixing, i.e., the number of owners that contribute to each pen, may be a factor that should be included in future studies looking at the association between BVDV PI animals and pen morbidity rates.