

Variation in Viremic Concentration among Cattle Persistently Infected with Bovine Viral Diarrhea Virus

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Introduction

Cattle persistently infected (PI) with bovine viral diarrhea virus (BVDV) are the main viral reservoir of the disease. Despite associations between BVDV and negative health and performance effects, previous research suggests that PI cattle have minimal impact on non-PI cattle. This discrepancy is likely multi-faceted but may suggest that all PI cattle are not equally effective in transmitting BVDV. The objectives of this study were two-fold: (1) to assess differences in BVDV viremia concentrations among multiple PI cattle at one time point, and (2) to determine if BVDV viremia changed over time among PI cattle.

Materials and Methods

One cross-sectional study and two longitudinal studies were completed to answer the research questions. Virus isolation was performed on individual serum samples and BVDV antigen was quantified for each sample and reported as the median cell culture infectious dose (CCID-50).

Results

Results of the cross-sectional study revealed a significant difference ($P < 0.05$) in BVDV concentration among PI cattle at one time point. Additionally, BVDV serum concentration was observed to change significantly over time ($P < 0.05$ and $P = 0.06$) in the two longitudinal studies, respectively.

Significance

Our study identified differences in serum BVDV concentration both among PI cattle and over time in the calves. As previous research illustrates correlations between serum and nasal shedding viral levels, these differences may impact the level of BVDV that PI cattle shed into the environment, ultimately contributing to the variability of health outcomes observed following PI exposure. Further research is necessary to determine if these findings impact the infectious capability of PI cattle.