Southeast Dairy Producer's Check-Off Program

Research Summary

Surveillance of Bovine Leukemia Virus Prevalence in Southeast Florida Dairies

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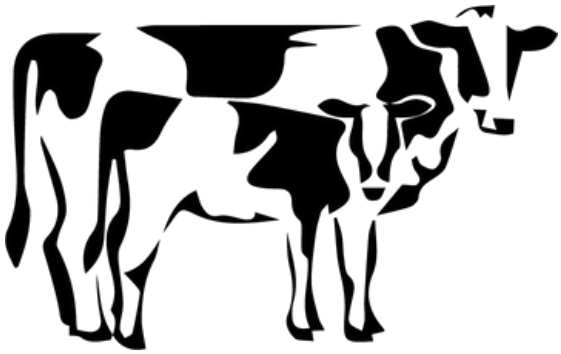
Objective

The objective of this study is to determine the prevalence of bovine leukemia virus (BLV) infection, a contagious disease of cattle, in dairy herds in southeast Florida.

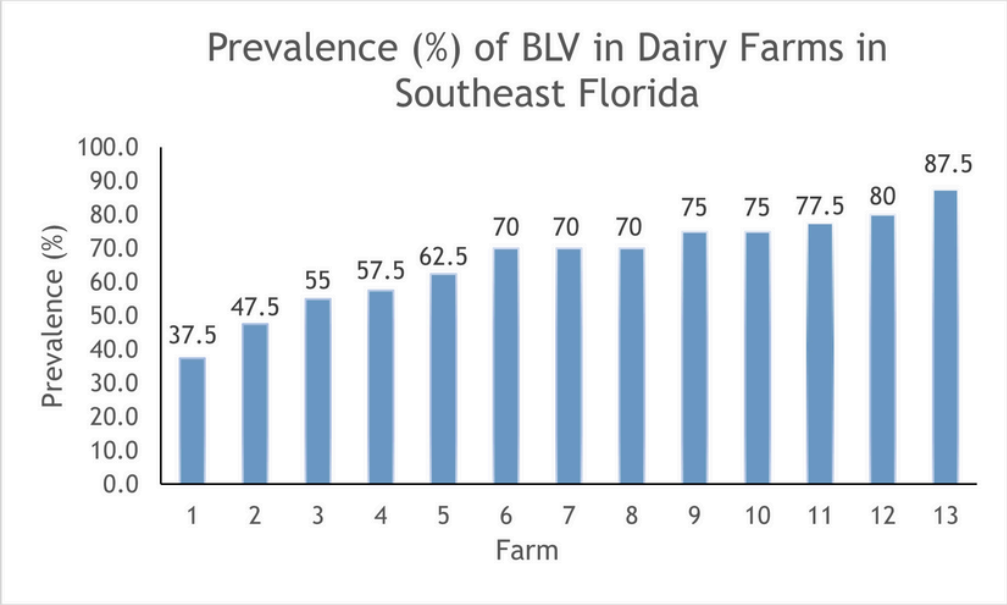


Methods

For this study, samples were collected continuously over a six-month period from a total of 13 herds, with each herd contributing 40 cows, resulting in a total sample size of 520 (n = 520). Each participating farm received a kit containing all the materials needed to collect blood samples. Ten cows from each lactation, from the first to those in the fourth or more lactations, were randomly selected for testing. Blood samples were obtained from tail vessels using evacuated tubes without anticoagulants. These samples were allowed to clot for one hour and then centrifuged at 3,000 g for 10 minutes to separate the serum. Two 1 mL aliquots were frozen at –20°C for future testing. One of these aliquots was sent to the Iowa Veterinary Diagnostic Laboratory at Iowa State University for BLV testing using a commercial ELISA kit (Bovine Leukemia Virus Antibody Test Kit, ELISA, VMRD Inc, Pullman, Wash). The ELISA test demonstrates high sensitivity and specificity, exceeding 95%, especially for animals infected for at least 55 days (Nagy et al., 2003). Dry cows or cows with 21 days of lactation were excluded from the study as false negatives are more likely in this specific group. This approach has been shown to result in a 99% correlation with true prevalence based on whole herd sampling (Erskine et al., 2012). The prevalence of BLV was compared between lactations using the Chi-square method from the stats package of R studio (Version 2023.09.1). P-values were adjusted for multiple tests using Bonferroni corrections.

Results

On the results of the descriptive analysis the average BLV prevalence was calculated at 66.5% (range = 37.5%- 87.5%). Based on the results from the Chi-square, the prevalence of BLV was lower in lactation number 1 (36.2%; confidence interval [CI] = 27.9 – 45.0%) than in lactation 2 (62.3%; CI = 53.4 – 70.7%; P < 0.01), lactation 3 (84.6%; CI = 77.2 – 90.3%; P < 0.01), and lactation 4 (83.1%; CI = 75.5 – 89.1%; P < 0.01). The prevalence of BLV was lesser in lactation number 2 than in lactation 3 (P < 0.01) and lactation 4 (P < 0.01). No difference in BLV prevalence was found between lactation 3 and lactation 4 (P = 0.86).



Conclusions

These results present the different prevalence rates of BLV at different stages of lactation in the studied population, highlighting the increased prevalence of the disease directly correlated with the number of lactations. In addition, BLV prevention and control strategies must target not only the northern states but also the southeast of the country. Therefore, a clear understanding of the relationship between BLV prevalence and lactation stages enables more effective decision-making in herd management, animal selection, and disease control leading to increased efficiency in livestock farming operations.