Health and Performance Effects of Inadequate Colostral Transfer in Beef Calves

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Abstract

A retrospective cohort study of 1568 beef calves was conducted at the Roman L. Hruska United States Meat Animal Research Center (MARC) in Nebraska. Study objectives were to evaluate associations between serum IgG1 level, measured 24 to 48 hours after birth, and preweaning or feedlot morbidity, mortality, and average daily gain. Logistic regression, analysis of covariance, and likelihood ratio tests were used to analyze data. Lower perinatal IgG1 levels were significantly associated with higher morbidity, higher mortality, and lower gain in the preweaning period (P<= 0.05). New thresholds were identified for optimal IgG1 transfer. Calves with serum IgG1 levels up to 2500 mg/dl were 1.5 times more likely to get sick before weaning ($P \leq 0.05$) and 2.4 times more likely to die before weaning ($P \leq 0.05$) than calves with higher IgG1 levels. Calves with serum IgG1 levels of at least 2700 mg/dl weighed 7.38 lb more at 205 days of age than calves with lower IgG1 ($P \leq 0.05$). No significant association of serum IgG1 with feedlot morbidity, mortality, or average daily gain was identified in this study. This study presents new evidence and substantiates other reports that initial acquisition of an adequate mass of colostral immunoglobulin is important in optimizing preweaning health and performance. Further, using likelihood ratio tests, it defined a much higher threshold of IgG1 for optimal health and performance of calves than many other studies have reported.