

Management Practices Associated with the Rate of Pre-Weaning Calf Respiratory Disease: Results from a National Survey of US Cow-Calf Operations

G.A. Hanzlicek¹, DVM, PhD; D.G. Renter², DVM, PhD; B.J. White³, DVM, MS; B.A. Wagner⁴, PhD; D.A. Dargatz⁴, DVM, PhD; M.W. Sanderson², DVM, MS

¹Kansas State Veterinary Diagnostic Laboratory, Kansas State University, Manhattan, KS 66506

²Department of Diagnostic Medicine and Pathology, Kansas State University, Manhattan, KS 66506

³Department of Clinical Sciences, Kansas State University, Manhattan, KS 66506

⁴United States Department of Agriculture, Animal Health Inspection Service, Centers for Epidemiology and Animal Health, Fort Collins, CO 80526

Introduction

Pre-weaning bovine respiratory disease complex (BRDC) in beef cow-calf herds can negatively affect calf sale weight and can lead to pre-weaning mortalities. Reductions in weight and number of calves that cow-calf operators sell will impact herd profitability. There are no large-scale studies documenting management factors associated with pre-weaning BRDC in cow-calf herds. The US Department of Agriculture National Animal Health Monitoring System's Beef 2007-08 study generated data on management factors and disease occurrences for US cow-calf herds. Our objective was to utilize these data to assess potential associations between cow-calf herd management practices and the rate of BRDC in pre-weaned beef calves.

Materials and Methods

Survey data were collected from beef herds located in states that represent 79.6% of US cow-calf operations and 87.8% of US beef cows. Data from separate surveys on management practices and health outcomes were combined for our study. Multivariable negative binomial regression models and a platform specifically designed for assessing weighted survey data were used to evaluate factors associated with herd BRDC rates, as defined by counts of reported cases of BRDC-treated calves and total calf-days at risk from birth to weaning.

Results

Our final multivariable model demonstrated that six variables were associated with pre-weaning BRDC

rates. Higher rates were found in operations that fed antibiotics to calves to prevent pre-weaning BRDC (incidence rate ratio (IRR) 3.46; 95% confidence interval (CI) 1.39, 8.60) compared to herds that did not feed antibiotics. Importing bred heifers was associated with lower BRDC rates (IRR 0.40; CI 0.19, 0.82), but operations that imported weaned steers (IRR 2.62; CI 1.15, 5.97) had higher rates than operations that did not import weaned steers. The number of reported visits by outsiders was non-linearly associated with herd-level BRDC rates; compared to 0 visits, IRRs were 2.06 (CI 0.59, 7.13), 0.57 (CI 0.19, 1.70), 0.46 (CI 0.16, 1.31), 1.26 (CI 0.45, 3.51) for 1-2, 3-5, 6-30, and >30 visits per month, respectively. Operations whose calves were from two (IRR 2.36; CI 1.30, 4.29) or three breed crosses (IRR 4.00; CI 1.93, 8.31), or from composite herds (IRR 2.27; CI 1.00, 5.16) had higher BRDC rates than single breed herds. Compared to respondents that considered the cow-calf operation to be the primary source of income, those that considered the operation as a supplemental source of income (IRR 0.48; CI 0.26, 0.87) had lower BRDC rates.

Significance

Our study demonstrated several associations between pre-weaning BRDC rates and broadly defined cow-calf management practices, thereby identifying several factors that may be useful as either indicators or predictors of pre-weaning BRDC rates in US cow-calf production systems. Documenting the cow-calf management factors that are associated with BRDC morbidity may allow further focus on management changes that are most likely to offer the largest positive impact on this important disease syndrome.