Use of epidemiologic approaches and operational data to elucidate feedlot cattle health issues
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Veterinarians and feedlot managers often have access to large amounts of health and production data routinely collected within the production systems. However, epidemiologic concepts and tools must be appropriately applied for these data to be utilized for accurate evidence-based decisions. We will demonstrate how our research team utilized a robust dataset compiled from U.S. commercial feedlots and applied core epidemiologic principles and methods to enhance the practical understanding of real-world cattle health problems. Our research allowed us to demonstrate how comprehensive, multivariable assessments with analytical control of potential extraneous variables enabled us to identify significant associations between weather conditions, cattle demographic factors, and daily respiratory disease incidence risk. In addition, we have generated unique results illustrating important interactions among cohort-level demographic factors associated with feedlot mortality and culling risks in heterogeneous populations of cattle from multiple feedlots monitored across several years. We also have utilized hierarchical and temporal data and multivariable mixed models to more thoroughly quantify the performance and economic impacts associated with the timing and number of respiratory disease treatments. We believe that researchers and veterinary practitioners can benefit from the use of existing data if appropriate epidemiologic concepts and analytical tools are applied. Alternatively, we can demonstrate with operational data how issues like confounding and effect modification need to be considered in order to make robust inferences that support appropriate health and economic risk management programs.