

Association between heart measurements and the prevalence of heart lesions at necropsy in feedlot cattle

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Introduction

Heart disease is an animal health and economic concern to feedlot cattle producers. The objective was to determine associations between heart measurements and heart lesions in feedlot cattle at necropsy. We hypothesize that heart measurements will differ between cattle with heart lesions present during gross necropsy vs. those without.

Materials and methods

Between June and July of 2022, full systemic necropsies were performed at 6 central Kansas feedyards. Two heart images were taken from each necropsied animal ($n = 369$), one lateral and one cross-sectional view. ImageJ software was used to calculate measurements from images including heart area, circumference, left and right ventricular lumen areas, and thickness of septum and ventricular walls. Animals enrolled in this study died from a variety of causes, but in each case, the presence or absence of heart lesions (endocarditis, heart failure, left ventricular concentric hypertrophy, myocarditis and pericarditis) was noted. Correlation coefficients among heart measurement variables were evaluated to eliminate collinearity. Generalized linear mixed models were used to identify associations between heart measurements and presence of heart lesions.

Results

From the multivariable model, only left and right ventricular lumen area were associated with heart lesion cases ($P < 0.05$). For cattle with no heart lesion, the average right ventricular lumen area was 3.56 (SD = 1.79) inches squared compared to cattle with heart lesions with an average of 5.45 (SD = 3.48) inches squared. Similarly, left ventricular lumen areas were 1.79 (SD = 1.23) and 2.90 (SD = 1.92) inches squared, respectively.

Significance

Ventricular lumen area measurements from heart images can provide an objective measure to determine heart lesions in feedlot mortalities.

