

# Determining frequency of common pulmonary gross and histopathological findings in feedyard fatalities

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## Introduction

Pulmonary disease is often associated with morbidity and mortality in feedlot cattle. The most common syndromes include bronchopneumonia, acute interstitial pneumonia, and bronchopneumonia with an interstitial pneumonia. Systemic necropsy is a useful diagnostic tool to collect information to enhance decision making about the health and management of feedlot cohorts. The study objective was to utilize gross necropsy and histopathology to determine the frequency of pulmonary lesions associated with 3 major syndromes and the agreement between gross and histopathological diagnoses. Furthermore, we assessed the consistency of classifying histopathologic lesions from 4 different lung lobe samples taken from an individual case.

## Materials and methods

A cross-sectional, observational study was performed at 6 feedyards located in the High Plains region of the United States using a full systemic necropsy to assess all mortalities with minimal autolysis during June and July 2022. For a subset of mortalities from each feedyard, 4 lung samples taken from the right cranioventral, left cranioventral, right caudodorsal, and left caudodorsal lobes were submitted for histopathological diagnosis. Gross necropsy was performed on 417 mortalities, 402 received a gross diagnosis and 189 had a histopathological diagnosis. Descriptive statistics were used to evaluate frequency of pulmonary diagnosis based on each method (gross/histopathology), and generalized linear mixed models were used to evaluate agreement between histopathological and gross diagnoses, and agreement among the lung sample location in comparison to the overall histopathological diagnosis.

## Results

Using gross diagnosis, bronchopneumonia represented 36.6% of cases with acute interstitial pneumonia and bronchopneumonia with an interstitial pneumonia representing 10.0% and 35.8%, respectively. Histopathological diagnosis had similar findings, bronchopneumonia represented 32.3% of cases with acute interstitial pneumonia and bronchopneumonia with an interstitial pneumonia representing 12.2% and 36.0%, respectively. Histopathological diagnosis tended ( $P = 0.06$ ) to be associated with gross diagnosis. Lung sample location was not significantly ( $P = 0.11$ ) associated with the probability of agreement between the sample diagnosis and the overall histopathological diagnosis for each lung.

## Significance

Pulmonary disease was common in mortalities and both gross and histopathologic diagnostic modalities illustrated 3 primary syndromes: bronchopneumonia, acute interstitial pneumonia and bronchopneumonia with an interstitial pneumonia with similar frequencies. Furthermore, a single sample may not be representative of the entire pulmonary area when using histopathology for pulmonary disease diagnostics. Refined mortality diagnostics are necessary to improve understanding of pulmonary pathology which can be valuable for evaluating and adjusting therapeutic interventions.

