# The accuracy of field diagnosis and key diagnostic findings in feedlot cattle diagnosed with acute interstitial pneumonia in southwest Kansas at the time of necropsy

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## Introduction

Acute interstitial pneumonia (AIP) is a non-infectious respiratory disease that affects the beef cattle industry and has been identified as one of the costliest diseases affecting feedlot cattle. Causative agents of AIP have been identified in grazing cattle; however, AIP cases in finishing feedlot cattle needs more research to identify and verify etiology, treatment options, and further define causative agents. The objectives of this study were to determine the accuracy of field diagnosis of AIP, determine the histological and infectious profiles of multiple organs of AIP affected cattle, and to define the production status and physical characteristics of AIP affected cattle.

## Materials and Methods

Five feedlots in southwest Kansas voluntarily participated in this study. All feedlot personnel involved with necropsies and sample collection were trained to collect samples from the following tissues: left cranioventral lung, left caudodorsal lung, right cranioventral lung, right caudodorsal lung, heart, kidney, liver, spleen, rumen wall, duodenum, jejunum, ileum, pancreas and a sample of rumen contents. All tissue samples were less than 1 cm thick and placed in a formalin jar for histological analysis. A second tissue sample of all four lung fields, liver, kidney, spleen, and rumen contents were placed in whirl-packs for fresh tissue submission. The fresh lung was PCR analyzed for all major viral and bacterial causes of bronchopneumonia, while the fresh liver, kidney, and spleen were submitted for aerobic and anaerobic culture. All samples were submitted to the Kansas State University Veterinary Diagnostic Laboratory for analysis. Feedlot participants also submitted production/demographic information including: sex, days on feed, rumen pH, breed, health risk classification, pull history, and pen health history for all cattle that were necropsied and tissue samples submitted.

## Results

Lungs from cattle diagnosed at necropsy as AIP cases (n = 49) were histologically analyzed and 89.6% were confirmed AIP cases. A majority of the cattle confirmed as AIP cases were heifers (65.0%) from low health risk classified lots (97.5%), and had been on feed for an average of 123 ± 30.5 days. Eighteen (45%) of the AIP confirmed cases had been removed for treatment from the home pen with 16 (89%) of those pulled for respiratory disease, while the remaining 2 (11%) had been pulled for suspected AIP. The average rumen pH of the AIP confirmed cases was 6.2 ± .78. Sixty-five percent of confirmed AIP cases also had concurrent bronchopneumonia based on histological exam. Lung samples from AIP confirmed cases tested with multi-plex PCR revealed only 1 case (2.3%) BRSV positive, 0 cases (0%) were BVDV, BHV-1, and IDV positive, and 3 cases (7.0%) were BCV positive. Twenty-one (48%) AIP confirmed cases were positive for *Mycoplasma bovis*, 8 (19%) cases were positive for *Mannheimia haemolytica*, 16 (37%) cases were positive for *Pasteurella multocida*, 14 (33%) cases were positive for *Histophilus somni*, and 7 (16%) cases were positive for *Bibersteinia trehalosi.*

## Significance

This study provides information that contributes to a better understanding of AIP diagnosis and has stimulated questions of AIP being a primary insult or a secondary lung insult associated with bronchopneumonia from bacterial infections. Further histological examination could also begin to suggest different pathways leading to AIP cases; inhalation verses a hematogenous route of the insult. Understanding these mechanisms and pathways could lead to better control and prevention of AIP in feedlot cattle.