Research Summaries II

Use of Rapid Thoracic Ultrasonography for Detection of Subclinical and Clinical Pneumonia in Dairy Calves

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Introduction

Detection of subclinical disease has become the focus of much research in the recent past, e.g. mastitis and ketosis in dairy cattle, and pneumonia secondary to *Rhodococcus equi* infection in foals. The purpose of this study was to assess, using thoracic ultrasonography, the prevalence of abnormal lungs in pre-weaned dairy calves. Subsequent objectives were to describe ultrasonographic changes within the lung, respiratory score, and treatment of respiratory disease.

Materials and Methods

A longitudinal study was performed using female dairy calves from six commercial dairy farms in New York State. Calves were enrolled in the study based on age. Thoracic ultrasound and respiratory scoring were performed on each calf at two time points. A standard 5 mHz linear reproductive ultrasound probe was utilized to evaluate intercostal spaces 1 through 10 of each hemithorax with the calf in lateral recumbency (US 1) or standing (US 2). Lesion appearance (pleural roughening versus consolidation), size, and location were recorded. Respiratory scores were based on a previously published protocol incorporating fever, nasal discharge, cough, ocular discharge, and ear droop into a numerical score. Abnormal lung was defined as the presence of 1 cm or greater area of non-aerated lung. Farm records were evaluated to identify treated animals. Non-parametric methods were used to evaluate the data.

Results

Ninety-one calves were enrolled in the study, with six lost to follow-up. An average of four minutes was spent performing the respiratory score and ultrasound on each calf. The median age at first (US1) and second (US2) examination were 13 (interquartile range 12-15) and 46 (interquartile range 44-47) days, respectively. The prevalence of abnormal lungs with a low respiratory score (RS<5) was 5.5% (US1) and 16.5% (US2). The prevalence of abnormal lungs with a high respiratory score (RS>4) was 0% (US1) and 3.5% (US2). Only 3.2% of calves had a respiratory score high enough to warrant treatment based on previous recommendations (RS>4). Thirteen percent of calves with a low respiratory score (RS<5) and abnormal lungs were treated with antimicrobials within seven days of the examination. None of the calves with high respiratory scores and abnormal lungs were treated with antibiotics within seven days of examination.

Significance

This study demonstrates a high prevalence of abnormal lungs, as detected via thoracic ultrasonography, without significant clinical signs in pre-weaned dairy calves. The relatively low treatment rate in these calves may suggest an area of opportunity for improvement in calf health, welfare, and herd longevity. Further studies are needed to elucidate the significance of these findings and whether or not treatment is indicated.