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CLASSIFICATION OF COUGH PATTERNS IN GROWING PIGS USING CONTINUOUS SOUND MONITORING AND AN ALGORITHM-BASED RESPIRATORY DISTRESS INDEX

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Introduction

Continuous sound monitoring systems hold the potential to remotely differentiate the primary etiology of clinical episodes of respiratory disease. The purpose of this project was to evaluate the ability of a continuous sound monitoring system to classify patterns of clinical respiratory disease in growing pigs according to their primary etiology under large-scale commercial production conditions.

Materials and Methods

Cough monitors (SOMO+ Respiratory Distress Monitor, SoundTalks NV, Leuven, Belgium) were obtained and installed in three large commercial wean-to-finish facilities designed to house 1200 to 2400 pigs per airspace. Three different farm sites / production systems were enrolled in the project. Pigs were placed into these site facilities per normal practice. An algorithm-based respiratory distress index (RDI) was continuously generated from recorded sound files and uploaded to a cloud database. The RDI data were charted and patterns of cough were categorized. For each RDI episode, diagnostic samples were collected and tested by PCR for PRRS, IAV-S, Mycoplasma hyopneumoniae, PCV2 and parainfluenza. RDI episodes were aligned with their corresponding diagnostic results and the resulting aggregate cough patterns were characterized.

Results

Two distinctive RDI patterns were detected across the three farm sites, one associated with IAV-S (H1N1 or H3N2), and another associated with Mycoplasma hyopneumoniae. IAV-S associated RDI patterns had a distinctive bi-modal shape, whereas the pattern associated with Mycoplasma hyopneumoniae showed a gradual relatively linear rising pattern.

Discussion and Conclusions

The ability to classify cough patterns according to primary etiology is useful at both a local site and global aggregate levels. With this information, local site managers can better adjust and respond with more timely, appropriate diagnostics and treatment. Further, those responsible for flows/systems and areas/networks can better assess larger scale behavior of specific disease agents and the clinical impact of intervention and control protocols.