HHM-048

DETERMINING THE OPTIMAL NUMBER AND CONFIGURATION OF SOUND MONITORING DEVICES FOR DETECTING AND ASSESSING DIRECTIONALITY OF COUGH IN GROWING PIGS

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Introduction

Continuous sound monitoring systems have been shown to better detect clinical episodes of respiratory disease. However, microphones used in such systems have distance limits of sound detection. The purpose of this project was to evaluate the optimal placement and configuration of a continuous sound monitoring system in large airspace buildings containing growing pigs to enable both a high sensitivity for detection and establishing directionality of clinical respiratory episodes.

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. Five devices were installed in each of the two 1200 head buildings, spaced equidistant from each other along the center alleyway. In the 2400 head building, 11 devices were installed, with four devices over the middle of the pens on each side of the building spaced equidistant from each other and three in the central alleyway spaced equidistant from each other.

Results

Where the device microphone was the center of a circle, the estimated optimal diameter for best detection of cough was determined to be approximately 18 meters. For optimal sound coverage in the 1200 head buildings the optimal number of devices was determined to be three to four, and for the 2400 head building the optimal number of devices was determined to be six to eight (depending on the length of the building).

Discussion and Conclusions

Each device represents an 18 meter sound detection "zone". The detection and directionality of cough is then a function of the square meters covered by the "zones" out of the total possible square meters in a barn.