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A DIAGNOSTIC APPROACH FOR DETECTION OF *MYCOPLASMA HYOPNEUMONIAE* IN LOW PREVALENCE SCENARIOS

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Introduction

Eradication of *Mycoplasma hyopneumoniae* (Mhp) from breeding herds has become a popular method in U.S. production systems to improve downstream performance. However, there are no guidelines available to confirm success of an eradication program. Therefore, the objective of this study was to develop diagnostic sampling guidelines specific to Mhp low prevalence populations.

Methods

A sample size calculator was used to determine the number of pigs to sample in various population sizes in order to detect at least one positive individual or one positive pig in a pool of 3 or 5 to represent Mhp low prevalence scenarios. Input values included: individual diagnostic sensitivities determined during the chronic phase of Mhp infection (> 100 days post-exposure) for laryngeal swabs (53.01%) and deep tracheal catheter samples (47%) as previously described; pool sensitivities for Mhp high Ct (36) value in 3:1 pools (79.1% (99% lower confidence limit)) and 5:1 pools (58.5% (99% lower confidence limit)) as previously described; population size (200, 300, 500, 600, 1,000, 2,500, 5,000, and 10,000); confidence level (≥99% and ≥95%); and percent prevalence (1%, 3%, and 5%).

Results

The number of individuals to sample required for detection of 1%, 3%, or 5% Mhp prevalence increases when pooling is applied and as pool size increases, population size increases, confidence level increases and as prevalence decreases. However, cost of the testing scenario decreases as pooling is applied and as pool size increases from 3 to 5.

Conclusions

These sampling guidelines are specific to Mhp and take into account individual diagnostic sensitivity for two ante-mortem sample types with the highest known Mhp PCR diagnostic sensitivity, pool sensitivity, population size, and confidence level, to provide guidance for determining number of pigs to sample to economically detect Mhp in low prevalence scenarios. These guidelines are being implemented to monitor Mhp suspected negative populations.