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Test characteristics when verifying *Mycoplasma hyopneumoniae* status in expected negative herds

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Introduction and Objectives

Mycoplasma hyopneumoniae (Mhyo) causes a chronic, non-productive cough and increases the susceptibility of animals to secondary bacterial infections. Production losses in finishing include reduced average daily gain and feed efficiency.¹ Mhyo negative pigs are highly sought after for both replacement females and for commercial production. This demand has led to the establishment of many Mhyo negative herds that have implemented continuous monitoring programs to verify their negative status.

In today's US industry, routine surveillance in non-clinical, expected Mhyo negative herds is commonly accomplished by serum testing 30 animals monthly with the HerdChek[®] Mhyo Antibody Test Kit (IDEXX Laboratories, Westbrook, ME) [IDEXX], an indirect ELISA. The competitive inhibition or blocking ELISA, IDEIA[™] Mhyo EIA KIT (Oxoid, ELY, Cambridgeshire, UK; formerly DAKO Mhyo ELISA) [OXOID] is then used in a serial testing scheme², testing only samples previously testing positive by IDEXX. Samples positive to both tests warrant additional diagnostics, either re-testing the individual animal and the herd or humane euthanasia of the animal complete with tissue PCR and histopathology. Animals testing negative on the IDEXX alone or positive on the IDEXX and negative on the OXOID are not considered for further testing in the absence of clinical signs in the herd.³

This paper describes the compiled test results, of expected negative populations with a history of Mhyo negative status, using this testing scheme.

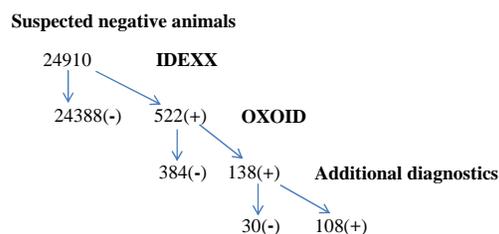
Materials and Methods

A database of 24,910 individual serum samples from expected Mhyo negative populations, both sow herd and growing pig populations, tested using this scheme over a two year time period was examined. Several labs were used to complete this testing and samples were determined to be either positive or negative; no suspect range was used in this evaluation.

Results

24,388 (97.9%) were IDEXX negative, while 522 (2.1%) were IDEXX positive and re-tested with OXOID. Of those tested by OXOID, 138 samples (26.4%) were positive and required further testing. Further testing, either a follow-up herd test with increased sample size and/or tissue samples submitted for PCR and histopathology, revealed 108 true positive and 30 false positive samples.

Mycoplasma test results of individuals in expected negative populations, tested w/ IDEXX followed by OXOID



Discussion and Conclusions

Evaluation of this database has several challenges including lack of a concise definition of an expected negative herd, lack of a consistent plan for additional diagnostics among herds, differences in labs used and lack of a gold standard for test validation. This database provides an estimated benchmark of 1.2 false positives per 1000 samples using this testing scheme. Although the false positive rate of this series testing scheme is low, veterinarians should be reminded that series testing schemes are designed to reduce the false positive rate at the expense of a higher false negative rate. The false negative rate of this testing scheme, although not examined here, should also be considered when verifying Mhyo negative status in expected negative herds.

References

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3. Geiger, J. Pers. comm. 11/2008.