Sow farm classification according to *Mycoplasma hyopneumoniae* status

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Key points:

- Sow farm classification according to *M. hyopneumoniae* status helps to manage this bacterium's transmission chain.
- The proposed farm classification system for *M. hyopneumoniae* can be used for one (farrow-to-finish) or multiple-site (farrow-to-wean and farrow-to-nursery) production systems.
- Monitoring of *M. hyopneumoniae* to classify farms requires the combination of observational and laboratory analyses.

Mycoplasma hyopneumoniae (M. hyopneumoniae) is the primary agent of enzootic pneumonia (EP) and one of the main agents involved in the porcine respiratory disease complex (PRDC). These respiratory diseases are of concern for the swine industry worldwide due to the economic losses they cause. *M. hyopneumoniae* can be transmitted between pigs by direct contact (nose-to-nose). Sows and gilts play a critical role on *M. hyopneumoniae* infection of piglets. *M. hyopneumoniae* piglet prevalence at weaning has been correlated with respiratory problems in terms of lung lesions during the finishing phase and at slaughter. Therefore, monitoring and classifying breeding and replacement herds according to *M. hyopneumoniae* status can be a key point for controlling the *M. hyopneumoniae* transmission chain. Monitoring will enhance the understanding of the disease dynamics over time, in different production systems and geographical areas, allowing the identification of potential risks and minimizing its impact.

Since *M. hyopneumoniae* associated disease can take clinical or subclinical courses, monitoring of this pathogen should be based on observational and laboratory analyses. On one hand, observational data will provide information on clinical signs (dry and non-productive cough) together with lung lesions (presence of cranio-ventral pulmonary consolidation). On the other hand, samples tested by laboratory methods will help establish a conclusive diagnosis by detecting the presence of the pathogen (PCR) and/or the antibody response against it (ELISA). Finally, according to the results obtained in monitoring, farms can be classified as follows (Table 1):

- **Negative**: absence of clinical signs and lung lesions associated with *M. hyopneumoniae.* Furthermore, antibodies and pathogen detection are negative.
- **Provisionally negative**: clinical signs and lung lesions are not present, and the pathogen is not detected. However, antibodies against *M. hyopneumoniae,* due to prior infection or vaccination, can be present.
- **Positive**: These farms will be positive (ELISA and PCR). Farms included in this category will be sub-classified depending on the presence/absence of clinical signs and lung lesions into:
  - **Subclinically infected:** clinical signs are not observed. These farms can be further divided into two categories: **category I** (absence of lung lesions) and **category II** (presence of lung lesions).
  - **Clinical affected**: both clinical signs and lung lesions will be observed.

In summary, this farm classification according to *M. hyopneumoniae* status can facilitate the establishment of management practices for disease control. This is especially important when external replacement breeding-stock is required, since an adequate acclimation program is needed according to *M. hyopneumoniae* status of replacement and breeding herds. Therefore, the classification of farms for *M. hyopneumoniae* can be a useful strategy to control this respiratory pathogen in swine.

Classification		Monitoring *M. hyopneumoniae* status			
		Observational diagnosis		Laboratory diagnosis	
		Clinical signs	Lung lesions	ELISA*	PCR result
Negative		Not observed	Not observed	Negative	Negative
Provisionally negative		Not observed	Not observed	Positive	Negative
Positive	Subclinically infected I	Not observed	Not observed	Positive / Negative	Positive
	Subclinically infected II	Not observed	Observed	Positive / Negative	Positive
	Clinical affected	Observed	Observed	Positive / Negative	Positive

*ELISA results will be dependent on infection dynamics, sampling time point and if the vaccination against *M. hyopneumoniae* is applied.

Table 1. Farm classification for *M. hyopneumoniae*.

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