The adaptation of replacement gilts to control M. hyopneumoniae

Replacement gilts play an increasingly important role in modern production systems. The percentage of gilts in the sow inventory is increasing because of higher replacement rates and the greater number of litters per sow per year.

by Dr Jordi Mora,
Global Technical Director,
ECO Animal Health Ltd, UK.
www.ecoanimalhealth.com

Additionally, the fact that some production systems with a conventional health status receive replacement stock of high health status, is increasing the role that vertical transmission plays for diseases such as Mycoplasma pneumonia.

Obviously, the adaptation protocol needs to ensure that these replacement gilts develop immunity against the disease, and yet are not infective to other individuals or their own litters. Production systems as a whole have not paid enough attention to the importance of the proper adaptation of replacement breeding stock.

The importance of adaptation to ensure the stabilisation of the sow inventory, to ensure the breeding barn has no circulation of a given pathogen so that the likelihood of vertical transmission is minimised, was already highlighted when the first control measures against PRRS were established.

Key aspects for success

Once the importance of proper gilt adaptation is understood, there are two aspects of the epidemiology of Mycoplasma hyopneumoniae (M. hyo) that prove particularly challenging:

- Extremely low rate of horizontal transmission.
- Extended shedding time by infected sows (in excess of 200 days).

The evidence mostly indicates that vaccination does not reduce vertical transmission, so it is not a tool that can be used to the end.

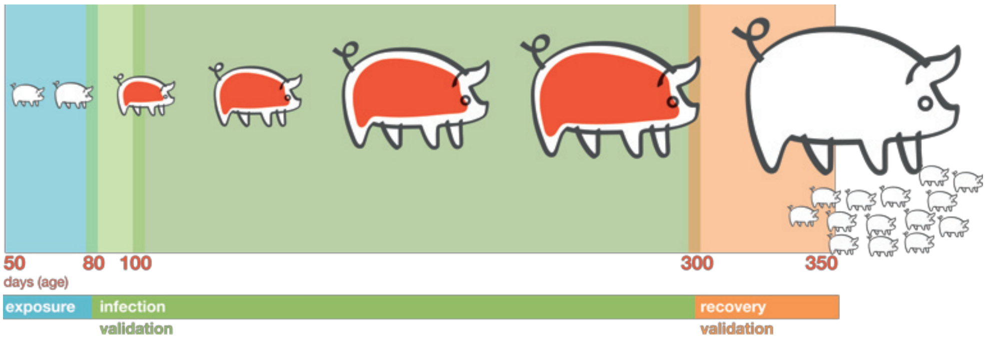

Fig. 1. Proposed protocol for the introduction of negative replacement stock in Mycoplasma hyopneumoniae positive units (Pieters and Fano, 2016).

Thus, the challenge is to make sure that young replacement gilts are infected with an agent that has a very slow pig-to-pig transmission. This has to be done as soon as possible to prevent shedders entering the breeding barn where they could infect naïve sows, therefore increasing the risk of vertical transmission to their offspring.

This is one of the major challenges that the swine industry is facing today, specifically in large units bringing in M. hyo naïve replacement stock.

The current situation

In spite of all the evidence, a recent survey conducted in Europe reported that only a minority of units assess health status of incoming replacement stock, and that the most common acclimation procedure was vaccination (58.2%) or a combination of vaccination and animal exposure using cull sows (21.3%).

This is despite the fact that vaccination does not prevent vertical transmission and cull sows are an extremely poor choice to infect naïve gilts, since most of them will not be shedding M. hyo at all.

Given the importance of proper stabilisation of the sow herd for the control of one of the most important diseases in swine production in terms of productivity and the amount of antibiotics used for its control, the industry should take the results of this survey with some degree of self-criticism.

Proposed protocol

Based on the long persistence and infectious period, and low transmission rate, Pieters et al, have proposed a scenario for gilt acclimation (Fig. 1).

According to this protocol, negative gilts should enter the adaptation process at a young age allowing for an effective exposure, development of disease, and recovery from the infectious period that takes place before the gilt's first farrowing.

This time point is based on the repeated demonstration of the dam's influence on piglet's colonisation with M. hyo.

The proposed timeline for gilt acclimation will be to start the exposure at no later than 50 days of age and to provide a safe and effective introduction of those gilts to infected sows of the recipient herd.

Due to the slow nature of M. hyo infections, gilts will start developing infection and shedding the microorganism in the 4-6 weeks following exposure.

Since shedding lasts for a maximum of 240 days, infection needs to be confirmed by 100 days of age via a PCR test on laryngeal swabs.

This would then allow for a total recovery and lack of shedding by the time the first farrowing occurs (230 days of age at first mating +115 days of pregnancy).

This protocol could provide good control of M. hyo by ensuring uniform and controlled exposure of the young reproductive herd.

A major challenge

Nevertheless, implementing this protocol is a major undertaking. According to research conducted recently, the only way to achieve a consistent infection of 100% of the naïve gilts brought into a system over a course of four weeks is to expose them to continuous contact with infected gilts with a minimum ratio of 1:1. Consequently, the only way to achieve a system that consistently provides infective material for incoming replacement gilts is to have a continuous adaptation system in which gilts recently arrived are exposed to gilts that have been successfully infected previously.

Therefore, gilts are used to infect younger gilts to perpetuate infection within the Gilt Development Unit.

Summary

It is an accepted fact that proper gilt adaptation is paramount for M. hyo control. However, the industry as a whole has not significantly changed its protocol in order to prevent vertical transmission of this very important pathogen.

Understanding the challenges of the requirements for a proper adaptation will ensure a much better approach towards the control of Mycoplasma pneumonia. ■

References are available from the author on request