PIG HEALTH TODAY®

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NEWS ABOUT PIG HEALTH PRODUCTS

An interview with
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Don't lose sight of *M. hyo* while battling other swine pathogens

Q: With all the concern about porcine reproductive and respiratory syndrome (PRRS), swine influenza, porcine circovirus and other diseases, it's sometimes easy to overlook long-standing problems like enzootic pneumonia. Is the causative organism, *Mycoplasma hyopneumoniae* (*M. hyo*), still prevalent in swine herds?

LG: It certainly is. We've made progress managing this disease, but *M. hyo* is still a widespread disease and top cause of pneumonia in swine, with serious economic consequences.[1] We need to keep *M. hyo* on our radar.

> "…for every 10% increase in swine-lung tissue affected by pneumonia, there is a nearly 17-day increase in days to market weight."

Q: What is it about *M. hyo* that makes it so prevalent and persistent?

LG: *M. hyo* has a unique ability to colonize the respiratory cilia. It therefore has a persistent presence in the airway and produces a population of infected pigs with no symptoms that continually expose other pigs to the bacterium.[2]

The "herd effect" leads to recurring clinical episodes of enzootic pneumonia, often with co-pathogens. These herds are likely to be diagnosed with porcine respiratory disease complex (PRDC), which we usually see in mid-finishing to market-weight pigs.[3] At that stage, any health setback can be particularly costly.

Q: Have the symptoms of *M. hyo* changed at all? Does it look any different?

LG: No, pigs with *M. hyo* still show the same symptoms — dry, non-productive cough, labored breathing, loss of appetite. The challenge with *M. hyo* pneumonia is its persistence. Polymerase chain reaction studies have demonstrated *M. hyo* infection lasting in some cases from 15 to 30 weeks after initial exposure.[4] Between the chronic reduction in feed efficiency

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and increased opportunity for co-infection with other respiratory pathogens, it's the perfect storm for more severe PRDC syndrome.

Q: Do you have a handle on the economic impact of the disease?

LG: Yes — and it's considerable. It has been estimated that for every 10% increase in swine-lung tissue affected by pneumonia, there is a nearly 17-day increase in days to market weight.[5] Even the cost of uncomplicated *M. hyo* infection can be staggering — $1 per pig versus approximately $10 per pig in *M. hyo*-positive sites co-infected with swine influenza virus or PRRS virus.[6]

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Q: Are some farms at greater risk for *M. hyo*?

LG: Yes, they are. In one study, farms near other farms infected with *M. hyo* or near livestock-transportation parking sites were found to be more at risk for *M. hyo* re-infection. Farms purchasing pigs from multiple sources were also at higher risk and so were finishing-only farms compared to breeding-only herds.[7] This study was conducted in Europe, but its findings about *M. hyo* transmission are applicable to the US.

Q: The economic losses you mentioned are substantial. What is it about *M. hyo* that makes it so difficult to control?

LG: *M. hyo* is also a tricky pathogen, for several reasons.

First, *M. hyo* has the ability to alter the host's immune response. Studies have shown that macrophages activated by *M. hyo*-infected pigs undergo marked reduction in phagocytic response when exposed to a secondary pathogen.[8]

In addition, *M. hyo* can vary the genetic expression of its surface antigens. That in turn allows it to evade immune recognition following host infection. Finally, the cellular and humoral immune response to *M. hyo* appears to provide incomplete protection.[9]

Q: What interventions have proved to be successful against *M. hyo*?

LG: The pork industry has had good results with vaccination including early vaccination of suckling pigs. All-in/all-out and multi-site production systems also help. At

peak-transmission times, antimicrobial treatments can be valuable. In endemic environments, however, these practices — whether used individually or in combination — have failed to fully control clinical and subclinical *M. hyo*-associated disease. It's therefore important to focus on prevention. This includes introducing gilts to sow farms with similar *M. hyo* status and uniform immunity.

In recent years, producers and veterinarians have worked closely together to eliminate *M. hyo* from some farms. Producers should check with their veterinarian to discuss whether elimination is feasible in their herds.

Q: What steps should producers take to ensure the best results from their vaccination?

LG: First, it's important to recognize that not all *M. hyo* vaccines are the same. As noted earlier, *M. hyo* is a persistent infection, one that can remain a threat to pigs up to market weight. It's important to check the vaccine's duration of immunity — this is the period it has been demonstrated to be effective. This helps ensure the infection doesn't outlast the vaccine.

A study[10] reviewed and approved by the USDA Center for Veterinary Biologics demonstrated that the *M. hyo* antigen in Fostera® Gold PCV MH was effective at mitigating lung lesions caused by *M. hyo* and, more importantly, demonstrated at least 23 weeks' duration of immunity against the pathogen. Fostera Gold PCV MH now is the only combination vaccine to have demonstrated 23 weeks' duration of immunity for both *M. hyo* and porcine circovirus-type 2.

Q: What results can producers expect from *M. hyo* vaccination?

LG: The vaccine helps in reducing enzootic pneumonia, which in turn helps pigs reach their full genetic potential and market value. Control of *M. hyo*, however, requires a comprehensive approach focused on weaning litters that are preferably negative or have a low prevalence of *M. hyo* at weaning. Additionally, wean-age pigs must be vaccinated to help minimize the chances of having clinical enzootic pneumonia or PRDC. Appropriate biosecurity and control of concurrent disease like PRRS and swine influenza are also important for successful management of *M. hyo*.

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[1] Mycoplasmal Pneumonia (Enzootic Pneumonia). Iowa State College of Veterinary Medicine. Veterinary Diagnostic and Production Animal Medicine.

[2] Pieters M, et al. An assessment of the duration of *Mycoplasma hyopneumoniae* infection in an experimentally infected population of pigs. Vet Microbiol 2009;134:261-266.

[3] Ibid.

[4] Ibid.

[5] Hill MA, et al. Association between growth indicators and volume of lesions in lungs from pigs at slaughter. Am J Vet Res 1992;53:2221-2223.

[6] Haden DC, et al. Assessing production parameters and economic impact of swine influenza, PRRS and *Mycoplasma hyopneumoniae* on finishing pigs in a large production system. In: Proceedings 43rd Annual Meeting Am Assoc Swine Vet, Denver, Colorado. 2012:75-76.

[7] Hege R, et al. Incidence of reinfections with *Mycoplasma hyopneumoniae* and *Actinobacillus pleuropneumoniae* in pig farms located in respiratory-disease-free regions of Switzerland – identification and quantification of risk factors. Acta Vet Scand 2002;43:145-156.

[8] Caruso JP, et al. Effects of *Mycoplasma hyopneumoniae* and *Actinobacillus (Haemophilus) pleuropneumoniae* infections on alveolar macrophage functions in swine. Am J Vet Res 1990;51:227-231.

[9] Thacker E. Mycoplasmal diseases. In: Straw BE, Zimmerman JJ, D'Allaire S, et al, eds. Diseases of Swine, 9th ed. Oxford, UK: Blackwell Publishing Ltd; 2004:701-717.

[10] Data on file, Study Report No. B824R-US-15-505, Zoetis LLC.

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toolbox

Toolbox is a series of interviews with veterinarians about their experiences managing antimicrobials, vaccines and other tools for swine health. It is produced by the editors of *Pig Health Today*® on behalf of the US Pork Business of Zoetis.

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