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Experiences with Mycoplasma vaccinations: What to do if vaccination doesn't live up to expectations

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Mycoplasma pneumonia has caught the attention of producers and swine veterinarians in the last 10 years as the number of acute outbreaks and severity of the disease has increased. Changes and alterations in pig flow methods, such as multi-site production, increased population density, and confounding pathogens—including PRRS, SIV (H1N1 & H3N2), PRV, Respiratory Corona, Circo virus etc.—or all the above have been suggested as contributing factors to the increased incidence and severity of this disease. Mycoplasma is the significant player in the PRDC syndrome.

Although vaccines had historically been available for mycoplasma, their use was limited because, in all-in—all-out by room systems, within a building the cost of the vaccination could not be justified. However with the changes in pig flow and greater prevalence of multiple site production on today's farm, compounded by the severity of the disease and/or its combination with other diseases, we have seen use of the vaccine dramatically increase. Today the majority of finishing pigs are vaccinated. Vaccination has proven to be an effective tool in the battle to control Mycoplasma's biologic and economic impacts.

Vaccination with Mycoplasma in some cases has not lived up to expectations. One common problem is vaccinating piglets too young, permitting maternal antibodies to interfere with the vaccine and, therefore, not achieving the expected response. If the sow herd is vaccinated, this can extend the maternal antibody even further. The next most common problem is the combination with other organisms in the PRDC complex that can overwhelm the pigs and not permit the protection that was expected, even if timing and administration of product were done properly.

Vaccination programs have become even more complicated with both single dose and the traditional two dose products available. Both vaccination protocols can be successfully used to control the disease. Circumstances in the herd help determine which protocol to use. Many of our herds use a combination of the two protocols in the same herd and system based on what's going on in the herd at the time. When deciding on which vaccine to use, consider the following factors:

Single dose vaccination

- relatively stable herds, with low pressure from other (PRRS and SIV are not active in the herd) diseases and all-in—all-out by site systems, will respond well to this protocol this is the preferred protocol if the control is acceptable
- vaccinate at the end of the nursery phase when the pigs are 9–10 weeks of age, to allow for minimal impact of maternal antibody and maximum response to the vaccine
- serologic monitoring for vaccine response and compliance is difficult because only a low percentage (25% or less) of animals will read positive

Two dose vaccination

- disease pressure from other active pathogens
  - prrs unstable herd with seroconversion at the end of the nursery and high colonization rate that results in more severe clinical signs
    - some farms have chosen not to vaccinate if pigs are seroconverting because this will spread the PRRS through the group quicker and the pigs may not respond to the vaccine as well
  - siv problems in the nursery or finisher
  - seasonal vaccination in the fall months (vaccinating pigs in the nursery in July, August, September) because of the added environmental control stresses when these pigs are at the critical stage 8–10 weeks in finishing
  - commingled pigs:
    - different nurseries in the same system on the same site but in separate barns, or if mixed in the barn
    - different sources of pigs (outside the normal flow)
  - all-in—all-out rooms within buildings or in close proximity to each other
  - continuous flow facilities
  - timing of the vaccinations:
    - first dose
      - 6–8 weeks of age
    - second dose
      - 8–10 weeks of age

- minimum of 2 weeks between vaccinations
- minimum of 6 weeks in before the usual occurrence of clinical signs

Some problem farms even with good vaccination procedures and timing of vaccination will continue to have problems. In cases in which herds continue to experience problems, a combination of medication may need to be added to the vaccinations as an improved control program. This has been done with both feedgrade or water medication. In herds with more severe problems use a combination of both.

The use of medication programs along with vaccination administered at the time when colonization is occurring can help reduce the load of organisms. This will hopefully mean that there will not be as much pressure on the vaccine to hold when the animals routinely break later in the finishing period. These are some examples of pulse dose feedgrade medication programs used:

- Lincomycin at 100 grams per ton for a 2-week period has been helpful
- CTC at 10 milligrams/lb for 2 weeks
- Denagard and CTC at 35 grams/ton and 10 milligrams/lb for 2 weeks. This is a more expensive to approach but is effective if there are problems with *Streptococcus suis*, *Haemophilus parasuis*, *Actinobacillus suis*-type of problems at this same time.
- Pulmotil at the 181 grams/ton for 21 days. There may be some help with the Mycoplasma, it is not documented, but does help with other secondaries. This is also a more expensive treatment for the 21 days of treatment.

If the herd continues to be a problem after medicating in the colonization phase, treatment in the acute phase will be necessary. The next step is to try to time the pulse of medication just prior to (1 week before) the normal onset of clinical signs, to help control clinical signs in the face of the disease.

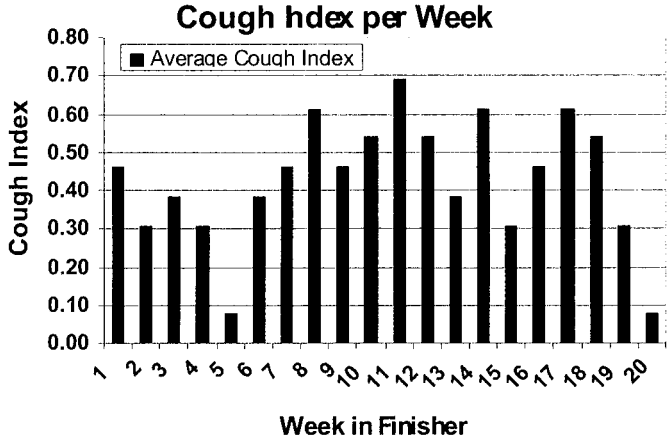
- Feedgrade medication. Pulse dosing is the treatment of choice if the clinical signs are constant in timing and feed deliveries can be coordinated. Some farms have placed a budgeted diet with the only change being the feedgrade medication to help simplify the process.
  - Lincomycin at 100 grams/ton in the feed for 7 days.
  - CTC in the feed at 10milligrams/ pound for 7 days.
  - Denagard and CTC can be used (at 35 grams/ ton and 10 milligrams/lb) for 7 days. This, again, is a more expensive treatment, depending on the other secondaries involved.
  - Pulmotil at 181 grams/ton can be used for 21 days. This is more expensive program and has a longer treatment time frame but may be necessary in some herds. This depends on the pathogens present and their interactions.
- Water medication. The flexibility of the water medication can be useful when sites vary with timing of the clinical signs.
  - CTC in the water for 3–5 days.
  - Lincomycin in the water for 3–5 days.
- Vaccination for other organisms:
  - SIV
    - bivalent product
    - 2 doses
  - PRRS
    - MLV strain

The preference of products varies with the farm's pathogens and their sensitivity patterns. Once the Mycoplasma is under control and the herd is more stable you can then return to just the 2-dose vaccination protocol as the control program. If the herd stays stable on the 2-dose program then try to return to the 1-dose. The goal for our herds is to reduce the amount of treatment and vaccination cost as quickly as possible without giving up herd performance.

When problems are occurring in the system and results are less than expected, its time to perform some background diagnostics to make sure the vaccine program is being implemented properly. Determining the clinical expression of the problem and maternal decay of antibody are important to identify for vaccination and medication timing. Tests that we have routinely done to help determine the proper timing and protocol include:

- clinical observations
- do the pigs cough at a consistent time?
  - barn walk throughs
  - cough indexes
    - score 0-3
      - 0=no coughing while walking through the finisher
      - 1=less than 10% of the pigs with a cough but does not persist while walking through the finisher
      - 2=cough of 10–50% of the pigs and does subside while walking through the finisher
      - 3=cough in greater than 50% of pigs and remains constant the whole time walking the barn
- serological profiles. Various tests have been used (Tween 20 test, Herd check*Mhyo Idexx, DAKO), just need to stay consistent so that you can compare your results going forward.

Figure 1. Example of a coughing index chart over time from a multiple site production system



- cross sectional study (multiple age groups on a given day). This gives a quick picture of the herd may not be as accurate because the pigs are multiple different groups.
    - STOMP (Pharmacia)(
    - testing
        - PRRS
        - SIV
        - Mycoplasma
- longitudinal study (following the same pigs through the entire production cycle). This can give an accurate picture but takes time to get the information and the system may have already changed by the time you get the information.
- combination of the cross sectional and longitudinal studies. Will usually give the best information so that you can get an idea about the herd from the cross sectional and then see if it's consistent in the longitudinal after that is complete.
- post-mortems. To identify what other agents are interacting in the PRDC complex and then you can decide on how to address each problem specifically once identified.

Mycoplasma has become a greater challenge with acute disease outbreaks in our multiple site production systems. This not only cost the herds in death loss and cost of treatment, but also in poorer daily gain, feed efficiency, and percent light pigs (culls). The PRDC syndrome combination of pathogens has complicated the picture but this is the reality of our production systems today. The other factor is that the systems are dynamic and always changing requiring us to monitor the system regularly and adjust vaccination and control programs.

The vaccines have been very effective tools for producers and veterinarians to help in Mycoplasma-control efforts. However, vaccinating pigs isn't a one-size-fits-all proposition. The vaccination schedule must be tailored to the farm and production system. Control programs may include other medications or vaccination for other pathogens to be effective. Because our farms are dynamic and changing, continual monitoring is needed to decide when the program needs to be more intense; regular testing is also required to see when things can be pulled back out once the herd is more stable. Simply vaccinating will not provide good Mycoplasma control.