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Respiratory disease prevention and control

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Introduction

Respiratory challenges in pork production systems have been a very dynamic phenomenon over the past couple decades. As new technologies and management methods are implemented, different pathogens seem to fill the voids left by the former etiologic agent(s). In order to stay profitable and remain in business, pork producers are constantly searching for new and better methods of raising pigs. Preventing or reducing health challenges in pork production chains can easily be placed in the top three factors that drive profitability.

There are a host of etiologic agents that can cause respiratory disease. In addition, some of these diseases can also be “multi-systemic” in nature as well. Relatively common respiratory diseases diagnosed in pigs within the United States include the following:

- Porcine reproductive and respiratory virus (PRRSV)
- Swine influenza virus (SIV)
- Porcine circovirus type 2 (PCV2)
- *Mycoplasma hyopneumoniae*
- *Actinobacillus pleuropneumoniae* (APP)
- *Pasteurella multocida*
- *Salmonella choleraesuis*
- *Haemophilus parasuis*

Prevention

Disease free gilt multiplication and boar studs

Respiratory disease prevention starts at the top of the production pyramid. Diseases present at the top will undoubtedly find their way downstream and create clinical and profitability challenges. Depending on the etiologic agent and what the industry currently knows about it will determine if and how the agent can be eradicated. Production systems at this level should also have a routine monitoring program in place to confirm their “negative” status.

Disease free commercial sow units

The same premise as gilt multiplication and boar studs stands for commercial sow units.

Biosecurity, biosecurity, biosecurity...

Biosecurity cannot be stressed enough. This is still a huge opportunity area within the swine industry. The top levels of management understand the what, why, and how's of biosecurity, but do the lower levels or grass roots personnel fully understand? Generally they do not. This may be due to a lack of training, a lack of personnel accountability, staff turnover, etc. In any event, production system personnel and veterinarians are too quick to throw up their hands and blame it on “area spread.” If a system is stocked with animals that are negative for certain target respiratory pathogens, precautionary methods should be put in place to ensure they stay negative. Such methods include the following:

- Multipliers, boar studs, and commercial sow units should isolate new introductions away from the parent herd and serologically screen them prior to entry
- Production systems that purchase animals from a commercial genetics supplier should have a strong familiarity with the genetic supplier's biosecurity protocols and serologic monitoring
- Commercial or system boar studs must be PRRSV negative and be monitored on a regular basis. Regular does not mean monthly anymore. The minimum a boar stud should be serologically sampling (PRRSV) is twice a week. Many studs are even sampling via PCR (PRRSV) every animal collected during a given collection day
- Transportation of animals at all levels of production should be meticulously looked at to ensure that exposure to pathogens is minimized or non-existent
- Geographic location at all levels of production should be strongly considered to minimize exposure risks. Every level down the pyramid can generally accept more risk of exposure, but if a producer has a choice of finishing pigs 5 miles away from any other pigs versus a 1/2 mile away, the obvious answer is 5 miles
- Establishing a strong culture of awareness among all personnel within the production system. This is no

easy task. Continued repetition of system protocols along with accountability for protocol oversights helps a system become more pro-active and not in a “finger pointing” mode that can occur post infection

- Supplies, tools, or any other “outside” or non-farm items must be properly disinfected prior to entry to any type of unit. This can be as simple as spraying the materials with disinfectant like Lysol(r) spray or placing the materials in a designated fumigation room and disinfecting them. It shouldn't be too complicated, though. Lack of compliance can occur if protocols become too complicated
- Personnel
 - Limit access of non-farm personnel. Some personnel are necessary visitors to the farm, but their travels should be limited to the task at hand
 - Feed truck drivers should not be dropping off feed tickets within the facilities entryway or office
 - Couriers should have certain drop points established to minimize their exposure. Some farm managers have supplies shipped to their home address. Semen can be delivered at an off-site location to be picked up by a member of the farm staff at a later time
 - Farm personnel should have limited or no exposure to other pig sources
- Downtime requirements
 - There is a large degree of varying opinions regarding downtime requirements needed between farm visits. Which one is right? It depends on your perspective or what specific agents you establish your protocol from. In any event, downtime requirements have to be manageable and realistic. Remember that complication leads to non-compliance

Control

- Breeding stock should be negative or stable for certain etiologic agents that cause respiratory disease (i.e. PRRSV). This author's definition of stable is serum PCR negative, but ELISA positive with a temporal serologic ELISA profile that is declining. If a herd is positive for specific respiratory pathogens, steps must be taken to minimize or eliminate their presence. Such steps may be temporary herd closure, serum inoculation (PRRSV), early medicated weaning, depopulation-repopulation, vaccination, and medication.
- Vaccinate breeding stock and/or pigs for specific respiratory pathogens.
- Create an optimum pig flow. Weaned pigs should be raised off-site from the breeding herd. This can be

either be accomplished through off-site nurseries and finishers or through wean to finish facilities. These sites need to be flowed all in – all out by the site. They should be populated within a week or two in order to minimize age spread. If this cannot be accomplished, the production system must be changed to accommodate the pig flow. This can be done through the following:

- Commingling same/similar health status of other pig sources
- Finding alternative facilities to match the flow
- Changing the weaning numbers each week from the sow unit—i.e. moving from a weekly breeding scheme to batch farrowing
- Serologically profile pigs to ascertain when pigs are being exposed to specific pathogens and strategically implement the appropriate feed, water, or injectable antibiotics during this time frame. Good husbandry skills can also be helpful in lieu of serology. Such skills or tools include the following
 - Daily/weekly mortality
 - Daily water consumption
 - Daily or weekly number of individual antibiotic treatments given
 - Observation of changes in pig activity or behavior
 - General respiratory clinical signs
 - Coughing
 - Sneezing
 - Nasal and lacrimal discharges
- Minimize pig stress
 - Do not overstock facilities in health challenged flows
 - Be sure facilities and barn manager create the right environment for the pig. This includes minimizing temperature swings, drafts, stale air pockets, etc
 - Get weaned pigs off to a good start via early and aggressive intervention
 - Feed quality and feed matched for the pig. Bagged feed may be necessary to target fallout pigs
 - Human resources. Find or train the right person for the job. None of the above can be accomplished if the production personnel are not doing their job. This is another opportunity area within the swine industry

Todd Distad

Conclusion

Swine respiratory disease continues to be a challenge to pork production operations of all sizes and to the swine veterinary community. All of the items listed for control and prevention you would think would be common knowledge, but that is not the case within all of the levels of the pork production chain. Production systems and their respective personnel need to be in a continuous training mode with a follow-up process implemented so that they can evaluate, modify, or check compliance of the established protocols. Coming up with sound protocols is usually the easy task. Implementation and execution of those protocols on a consistent basis is the challenge. Remember, you can not medicate your way out of a management problem.

