

Diagnosis, Vaccination and Field Experiences with PCV-AD

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What is PCV2?

- A very small DNA virus
- It is considered to be a very stable virus
- It is fairly resistant to many disinfectants
- It has relatively good survivability in the environment
- It is found in pigs throughout the world

Why are we having problems now?

- In order to survive a virus needs to adapt to the host and continually infect new hosts
- Although PCV2 is a very conserved short virus, changes still happen during replication and some are significant to the survival of the virus and allow it to become better at “infection”

ISU – VDL Diagnostic breakdown of PCV-AD infections

- Systemic infection
- PCV2-associated pneumonia
- PCV2-associated enteritis
- PCV2-associated abortion – heart tissues of aborted fetuses
- PCV2 – associated PDNS – dermatitis and nephropathy syndrome

American Association of Swine Veterinarians Case Definition

- PCVAD can be subclinical or include one or more of the following clinical manifestations concurrently:
 - Multisystemic disease with weight loss (formerly known as PMWS)
 - High mortality: Doubling of historical mortality rate without introduction of a new known pathogen.
 - Respiratory signs including pneumonia
 - Porcine Dermatitis and Nephropathy Syndrome (PDNS)
 - Enteric signs including diarrhea and weight loss
 - Reproductive disorders including abortions, stillbirths and fetal mummification (diagnosis requires the presence of fetal myocarditis associated with PCV2 antigen in lesions)

American Association of Swine Veterinarians Case Definition

- PCVAD is a broad categorization of multisystemic diseases that are confirmed by documentation of the following histopathological findings in affected pigs:
 - Depletion of lymphoid cells in lymphoid tissues of the growing pigs.
 - Disseminated granulomatous inflammation in one or more tissues (e.g. spleen, thymus, intestines, lymph nodes (sternal, bronchial, inguinal and mesenteric), lung, kidney, liver, tonsil, etc.).
 - Detection of PCV2 within the lesions of growing pigs.
 - PCV2 associated reproductive disease diagnosis requires the presence of PCV2 antigen in fetal myocarditis lesions.

Clinical Signs of PCV-AD

- Loss of condition, rapid weight loss, fall-back pigs
- Unthrifty pigs - bony, sagging frame, hairy
- Diarrhea - Yellowish to reddish to brownish scour
- Respiratory signs – thumping, +/- cough
- Skin discoloration – red rash or yellow discoloration









PCV-AD Diagnosis

- Virus identified in lesions typical of the disease via diagnostic testing (IHC).
 - Respiratory
 - Enteric
 - Systemic
- The clinical signs in the herd and level of severity play a role in the clinical diagnosis

PCV-AD Diagnosis

- PCV2 virus has been identified in pigs for years and yet was not considered a clinical and economically significant disease until recently.
- PCV2 identification of virus with positive immunohistochemistry tests in tissues with the typical lesions confirms a diagnosis of PCV2 infection.

PCV-AD Diagnosis

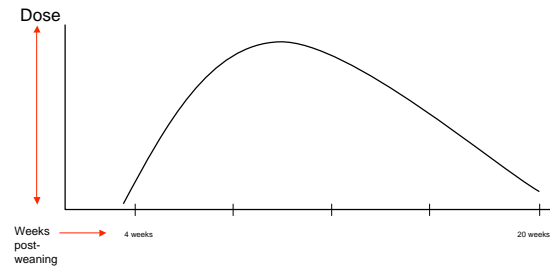
- To determine if you have a problem the typical clinical signs of the PCV-AD in the herd support this diagnosis along with significant production losses.
- Serology is consistently positive in most pigs as they grow. It is not diagnostic of PCV-AD.
- PCR will detect small amounts of virus which all pigs will have at some point in their lives and it is not diagnostic of PCV-AD.



What is actually happening to make these differences in PCV-Associated diseases?

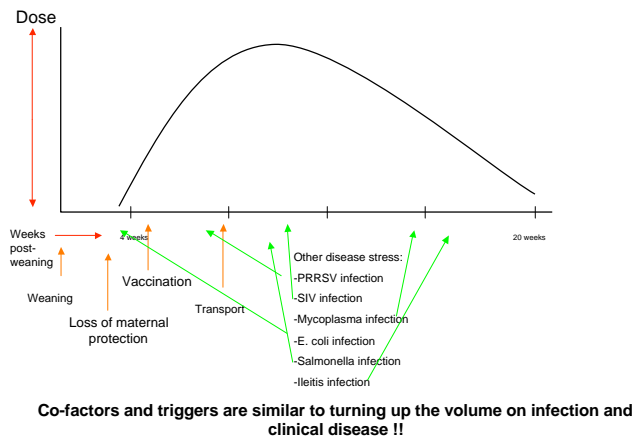
- All pigs undergo infection and circulation of virus during the grow-out phase
- Dose of infection early in life seems to matter how soon they will undergo infection
- Associated co-factors and triggers are important:
 - Environmental stress
 - Disease stress
 - Vaccination
 - Anything that turns the immune system “on” while PCV2 is circulating
- Watch for the delayed fall-out.

PCV population infection process



Each individual pig may be infected over an approximate time period. It may be a shorter time period if there is a high level of infection and shedding. It may be a longer time period if there is a low level of infection and shedding.

PCV population infection process



Management of PCV-AD

- Minimize co-factors and triggers
- Crowding and mixing
- Adjust timing of immunizations if potentially setting up disease.
- Pigs appear to be long-term shedders once clinically ill with the disease.
 - Segregate and/or remove clinical pigs
- All out barns and clean up contaminated clothing and facilities.

Treatment Considerations for PCV-AD

- Focus on minimizing other diseases via properly timed vaccination
- Use diagnostics to support these decisions and determine other bacterial sensitivities
- Medications need to address the bacterial infections and/or clinical signs of the pigs.
- Treatments may minimize the number of clinically affected pigs initially.

Treatment Considerations for PCV-AD

- Repeated treatments do not prevent pigs from continuing to fall-out that were unable to clear the PCV2 infection.

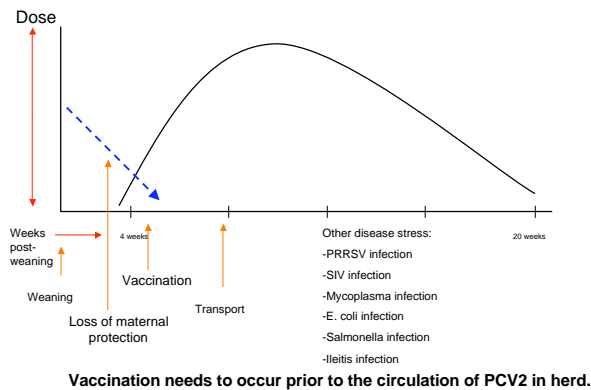
Management of PCV-AD with Vaccination

- Good news – Vaccines appear to work very well
- Timing is important
 - The vaccination should be prior to PCV2 circulation in the herd
 - Pigs must be healthy when vaccinated
- Maternal interference does not appear to be as important as other vaccinations

Management of PCV-AD with Vaccination

- Vaccination failure(s)
 - Immunization was too late in the disease process.
 - Pigs were unhealthy when vaccinated.
 - Other diseases are or were causing as much of the production and clinical issue(s) as the PCV2.

PCV population infection process



Vaccination Results with PCV2 Vaccine

- Vaccination has generally decreased mortality from wean to finish by 20% to 70%. (ex. 12% to 7% or 30% to 15%)
- Trial - 10 barns ~1400 head/barn
 - Vaccinates 7.04% mortality, Non-vaccinates 13.77% mortality
- Most systems have gone back close to what is considered “normal” for them in production
- Vaccine does not eliminate the fall-back pigs; however, greatly reduces the clinical pigs in a population

Vaccine Information for PCV2

- Intervet – 2 dose product, 2 cc / dose
- Fort Dodge Animal Health (FDAH)
 - Suvaxyn PCV2 One Dose, 2 cc / dose
- Boehringer Ingelheim
 - Circoflex, 1 dose product, 1 cc / dose
- Merial Animal Health –
 - Circovac - Sow and Gilt Vaccination
 - Approved in Europe and used in Canada
 - Undergoing work to release in the U.S.A.

Summary

- Diagnosis of PCV-AD requires lesions typical of the disease and virus identification in the clinically affected pigs.
- Clinical signs are systemic, pneumonia, enteric, reproductive and skin/kidney.
- Production losses are severe

Summary – Treatment / Management

- Control and understand the other disease co-factors and triggers that amplify PCV clinical pigs
- Manage other controllable triggers:
 - Transport, Environmental, Vaccination
- Segregate and remove clinically ill pigs
- Clean up and clean out the barns/rooms
- Treat bacterial infections and symptoms
- Vaccination works if timed properly in healthy pigs

PCV-AD Resources

- ISU PCV Web page – go to Iowa State University Homepage and type in PCV2 in the search box.
- National Pork Board – A Producers Guide to Managing PCV-AD (Porcine Cirovirus Associated Disease)
- Local veterinarian
- ISU Production Animal Medicine Department and Veterinary Diagnostic Laboratory

Thanks – Clients, Veterinary Colleagues, ISU-VDL

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