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Introduction

Since the fall of 2005, swine practitioners in the United States have been reporting increased numbers of cases of postweaning multisystemic wasting syndrome (or PMWS) in finisher pigs. In contrast to previous reports of PMWS in the United States, this form of the disease has been more severe, with pigs experiencing rapid weight loss and higher rates of mortality.

Research trials and field cases have shown that porcine circovirus type 2 (or PCV2) plays a role in the presentation of PMWS. The role of other infectious and non-infectious agents has yet to be determined.

The National Pork Board, through the Pork Checkoff and the American Association of Swine Veterinarians have recognized the importance of this syndrome to our industry and have taken several actions.

The Pork Checkoff has committed over \$500,000 in funding toward research on PMWS and PCV2 associated diseases, \$200,000 in cooperative funding with USDA, and prepared producer-directed awareness and informational material on the same topics.

In March, the American Association of Swine Veterinarians (AASV) formed the PCV2 Ad Hoc Committee. One of the recommendations made by this committee has been to develop a name that encompasses several syndromes including postweaning multisystemic wasting syndrome (or PMWS). The name suggested by AASV is porcine circovirus associated diseases (or PCVAD). PCVAD will be used to describe the different diseases attributed to porcine circovirus. This brochure uses the new denomination (PCVAD) throughout.

In 1996, Dr. Francois Madec recommended 20 management practices to reduce the effects of PMWS. These principles have been utilized by practitioners around the world to reduce the losses associated with this disease. The “Madec principles”, as they are termed, are used as the basis for some of the recommendations included in this brochure. Other research findings are also included in this text.

This brochure is a joint effort between the AASV and the Pork Checkoff. Its goal is to offer recommendations that may help to reduce the economic effects of PCVAD.

Remember to consult with your herd veterinarian to confirm a diagnosis of PCVAD and for information on how the information in this brochure can be applied in your operation.



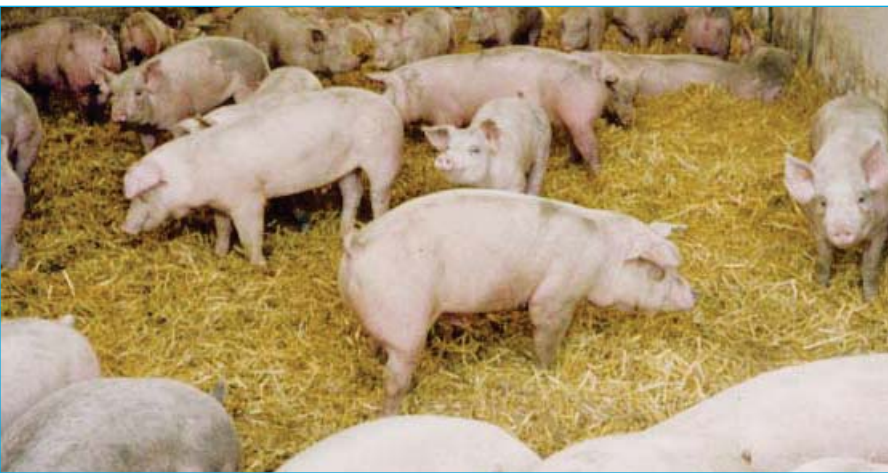
Disease description

Most PCVAD affect pigs in the early finisher phase.

Finisher farms affected by PCVAD have reported one, some, or all of the following signs:

Anorexia
Rapid weight loss
Unthrifty pigs
Skin discoloration
Respiratory signs
Diarrhea

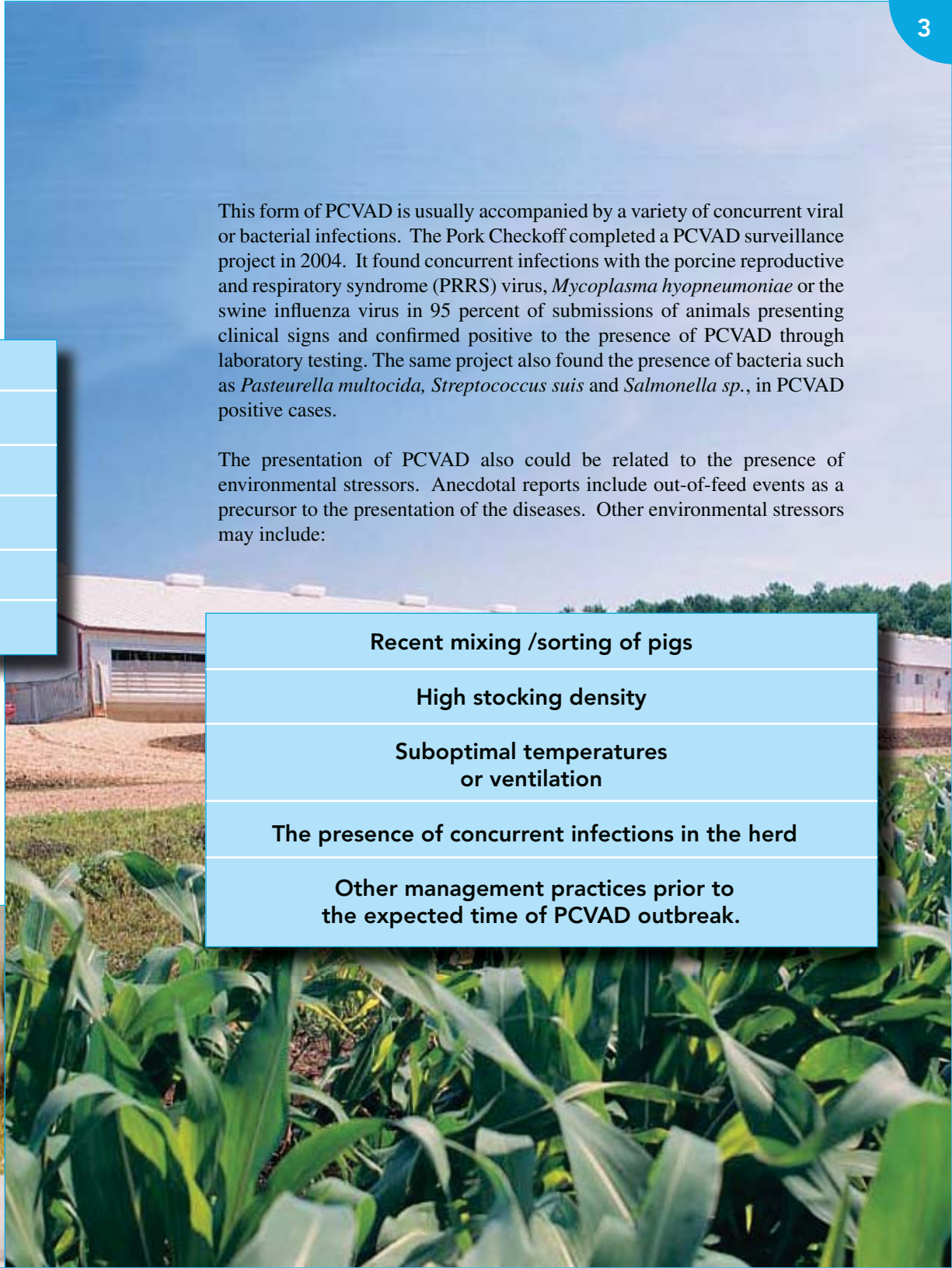
Symptoms, duration and mortality can vary by herd, group, barn or site. It is important to note, however, that within herds or groups, some PCV2-positive pigs may be asymptomatic and not express any kind of PCVAD. PCV2 is endemic worldwide and experts believe that there are no PCV2-negative swine herds. However, a herd that is positive to PCV2 will not necessarily experience PCVAD.



This form of PCVAD is usually accompanied by a variety of concurrent viral or bacterial infections. The Pork Checkoff completed a PCVAD surveillance project in 2004. It found concurrent infections with the porcine reproductive and respiratory syndrome (PRRS) virus, *Mycoplasma hyopneumoniae* or the swine influenza virus in 95 percent of submissions of animals presenting clinical signs and confirmed positive to the presence of PCVAD through laboratory testing. The same project also found the presence of bacteria such as *Pasteurella multocida*, *Streptococcus suis* and *Salmonella sp.*, in PCVAD positive cases.

The presentation of PCVAD also could be related to the presence of environmental stressors. Anecdotal reports include out-of-feed events as a precursor to the presentation of the diseases. Other environmental stressors may include:

Recent mixing /sorting of pigs
High stocking density
Suboptimal temperatures or ventilation
The presence of concurrent infections in the herd
Other management practices prior to the expected time of PCVAD outbreak.



What will the veterinarian do?

If PCVAD is suspected on the farm, contact the herd veterinarian immediately. Because of the variability in signs and severity, the veterinarian may want to examine the herd, perform several necropsies and submit good quality samples to a laboratory to confirm the diagnosis.

Farm
Inspection

Necropsy

Samples for
Laboratory
Diagnosis



The need for laboratory diagnosis

Pigs experiencing PCVAD can have clinical signs which can be mistaken for many other diseases, especially because coinfections are common. It is critical for the herd veterinarian to examine the animals in their environment and perform necropsy on sick pigs.

The herd veterinarian will collect samples from numerous organs and from several animals to send to a diagnostic laboratory.

To confirm PCVAD, porcine circovirus type 2 has to be identified in the tissues and associated with damage found in these tissues. The laboratory will also identify existing coinfections.

What can you do if PCVAD is diagnosed on your farm?

If PCVAD is diagnosed on your farm, follow the herd veterinarian's advice. Veterinarians may include some or all of the practices detailed on the following pages. These are presented by production phase and further categorized as biosecurity practices, production and management practices, environmental management practices and health practices.



Farrowing Barn

Biosecurity

Limit personnel that come in contact with animals.

Control visitors.

Control rodents.

Use a detergent in the soak/ prewash period.

Clean and disinfect the facilities with an effective disinfectant.

Ensure that ceilings, walls, flooring and equipment are cleaned and disinfected between groups of pigs.

Allow the facilities to dry before pigs are moved in.



Production/Management

Empty, clean and disinfect between groups. When possible, empty the pit as well.

Wash sows and treat for parasites before farrowing.

Ensure adequate colostrum intake by piglets.

Limit cross-fostering of piglets as much as possible. If cross-fostering is necessary, perform it within the first 24 hours after birth.

Use good hygiene when docking tails and clipping teeth.

Consider increasing weaning age.

Do not move pigs from room to room.



Environment

Keep rooms at the correct temperature (65-75°F).

Keep rooms at comfortable humidity levels.



Health

In many cases of PCVAD, controlling the coinfections has helped reduce the impact of PCVAD.

Control parvovirus with vaccination.

Control porcine reproductive and respiratory syndrome through breeding herd stabilization, adjusting pig flow or possible vaccination.

Consider other vaccinations in the breeding herd that are effective in reducing coinfections in piglets.

When processing litters, use one needle per litter, one scalpel blade per litter, and disinfect tail docking equipment between litters to minimize transmission of infections between litters.

Nursery Facilities

Biosecurity

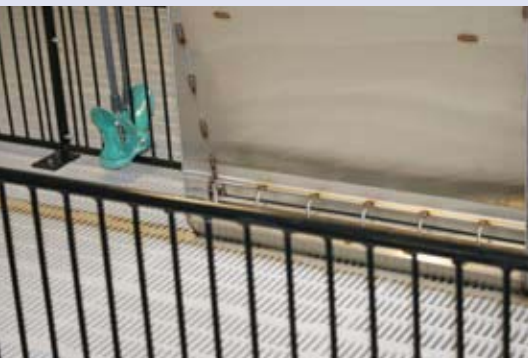
Limit personnel that comes in contact with animals.

Use a detergent in the soak/prewash period.

Clean and disinfect the facilities with an effective disinfectant.

Ensure that ceilings, walls, flooring and equipment are cleaned and disinfected between groups of pigs.

Allow the facilities to dry before pigs are moved in.



Production/Management

Practice strict all in/all out animal flow.

Clean and disinfect the facilities between groups. When possible, empty the pit as well.

Reduce mixing of litters at weaning as much as possible.

Do not overstock pens.

Keep group size as small as possible.

Increase feeder space.

Avoid resorting of pigs after weaning.

Do not move pigs between rooms or groups.



Environment

Keep rooms at the correct temperatures. Adequate temperatures in the nursery depend on the age of the pig. (70-85°F).

Keep rooms at comfortable humidity levels.

Improve air quality ($\text{NH}_3 < 10\text{ppm}$ and $\text{CO}_2 < 0.15\%$).



Health

Discuss the timing and necessity of vaccinations with your herd veterinarian.

Consider vaccinating for *Mycoplasma* before the animals start to break with PCV2. Some producers vaccinate pigs in the farrowing rooms while others wait until two weeks after the animals have moved into the nursery.

Vaccinating animals can be stressful. By vaccinating pigs against coinfections before they break with PCVAD, the PCVAD break may have less of an impact.

Grow-Finish and Finisher Facilities

Biosecurity

- Limit personnel that comes in contact with animals.
- Clean and disinfect the facilities with an effective disinfectant.
- Ensure that ceilings, walls, flooring and equipment are all cleaned and disinfected between groups of pigs.
- Allow the facilities to dry before pigs are moved in.



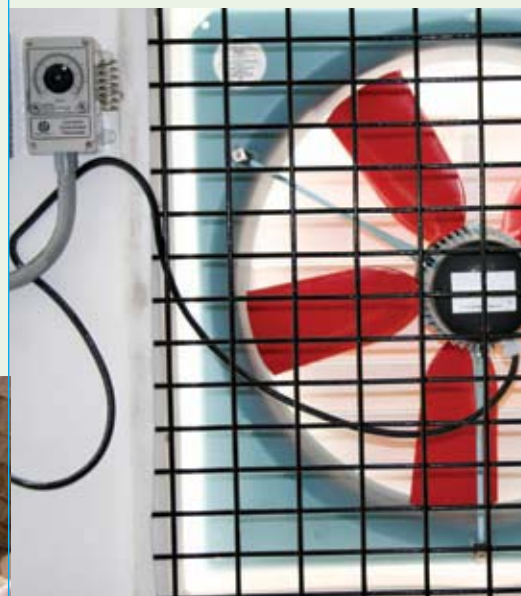
Production/Management

- Practice strict all in/all out animal flow.
- Clean and disinfect between groups. When possible, empty the pit as well.
- Minimize the mixing and moving of pigs.
- Do not overstock pens.
- Keep group size as small as possible.
- In Europe, solid partitions between pens have been used successfully to reduce spread. Your state's extension agent can help you design the partitions to ensure the facilities maintain proper ventilation.
- Remove affected pigs that do not respond to treatment.



Environment

- Keep rooms at the correct temperatures.
- Keep rooms at comfortable humidity levels.



Health

- Minimize the effects of a *Mycoplasma* infection by vaccinating in farrowing and/or the nursery or through strategic pulse medication.
- Control bacterial coinfections with the appropriate antimicrobial treatment plan.
- Consider vitamin E and selenium supplementation three to five weeks before an outbreak or while a barn is experiencing PCVAD.
- Consider feeding diets enhanced with plasma protein to affected pigs.



Replacement Stock

Biosecurity

Maintain incoming breeding stock in isolation for 60 days or more.

As possible, locate your isolation facility more than 300 yards from other swine.

Use strict all-in/all-out in the isolation facility.

Clean and disinfect the facilities with an effective disinfectant.

Ensure that ceilings, walls, flooring and equipment are cleaned and disinfected between groups of pigs.

Allow the facilities to dry before pigs are moved in.

Limit the number of people caring for replacement animals in isolation.

Instruct employees to limit contact with herd animals after caring for animals in isolation.

If contact with the herd is necessary, employees should shower into the facility or, at minimum, thoroughly wash their hands and arms.



Production/Management

Empty isolation rooms between groups. When possible, empty the pit as well.



Environment

Keep rooms at the correct temperature (65-75°F)

Keep rooms at comfortable humidity levels.



Health

Establish communication between your herd veterinarian and the source herd veterinarian to discuss the health status of the breeding stock's source units.

Assess the immune status of replacement animals in isolation through blood testing post-arrival and prior to entry into the breeding herd. Your herd veterinarian can help you determine which diseases to test for and the most appropriate time for testing.

Consider the use of sentinel pigs to monitor the health of replacement stock during isolation.



Others

- Use needles for single injections only.
- Assess the need for vaccinations and evaluate the timing of these with the herd veterinarian.
- Establish an effective pest control program.
- Wash, disinfect and allow trucks and trailers to dry after every load.
- Enforce strict biosecurity from service providers including dead stock transporters, utility personnel, etc.
- Designate and enforce the use of clean, farm-specific clothing and boots. Instruct employees to shower into the facility. If not possible, instruct them to thoroughly wash their hands and arms.
- Designate and enforce the use of coveralls and boots specific for hauling mortality. Instruct employees not to return to the farm until they have followed the farm's biosecurity guidelines for re-entry (shower in and farm-specific clothing).



What other practices may your veterinarian recommend?

In addition to recommending strict biosecurity, effective control management practices, and utilizing strategic medication and vaccination to control coinfections, the herd veterinarian may consider recommending the use of a circovirus vaccine.

Circovirus vaccine is now available in the United States. Talk to the herd veterinarian to learn more about this technology, its appropriate use and timing.

Due to the widespread incidence of porcine circovirus, finding breeding stock replacements, or a semen source, that are negative to PCV2 will be unlikely. It is important to remember that a pig positive for PCV2 may not have presented, and may not present PCVAD. Discuss with your herd veterinarian the advantages of acquiring replacement stock from a herd of a known PCVAD status.



Technical Recommendations

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The following recommendations, or Madec principles, were compiled by Dr. François Madec based on a combination of field observations and experimental trials with PCVAD in France. They are referred here with his consent.

Experiences with PCVAD in Europe and in Canada suggest applying at least 16 of these practices may significantly reduce mortality rates during PCVAD outbreak.

Farrowing

1. Apply strict all-in / all-out
Empty pit, clean and disinfect between batches
2. Wash sows and treat for parasites before farrowing
3. Cross-foster
 - Limit to only that which is necessary
 - Within 24 hours of farrowing only

Post Weaning

4. Use small pens (<13 animals), solid partitions
5. Apply strict all-in / all-out
Empty pit, clean and disinfect between batches
6. Lower stocking density (3 pigs / m²)
7. Increase space at the feeder (> 7 cm / piglet)
8. Improve air quality (NH₃ < 10ppm, CO₂ < 0.15%)
9. Improve temperature control
10. Do not mix batches

Grower / Finishing

11. Use small pens, solid partitions
12. Apply strict all-in / all-out
Empty pit, clean and disinfect between batches
13. Do not mix pigs from different pens post-weaning
14. Do not mix pigs from different pens in finishing
15. Lower stocking density: + 0.75m² / pig
16. Improve air quality (NH₃ < 10ppm, CO₂ < 0.15%) and temperature

Others

17. Use the appropriate vaccination program
18. Ensure sensible flow within buildings (air, animals)
19. Ensure strict hygiene (tail and teeth clipping, injections...)
20. Remove sick pigs in a timely manner (hospital room or euthanasia)

References

- Cardinal, F. 2006. Practical management of PMWS: The Canadian experience. In proceedings of the American Association of Swine Veterinarians Annual Meeting preconference seminar: Understanding factors that impact disease expression and control. Pp 61-64.
- Engle, M. J. and Bush, E. 2006. Risk factors associated with the diagnosis of PMWS during a U.S. case investigation pilot project. In proceedings of the American Association of Swine Veterinarians Annual Meeting preconference seminar: Understanding factors that impact disease expression and control. Pp 39-54.
- Halbur, P. and Opriessnig, T. 2006. Practical management of PCV2-associated diseases: The American experience. In proceedings of the American Association of Swine Veterinarians Annual Meeting preconference seminar: Understanding factors that impact disease expression and control. Pp 65-71.
- Madec, F. 2006. Madec principles. Personal communication.



A PRODUCER'S
GUIDE TO MANAGING

PCVAD

Porcine Circovirus Associated Diseases



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