

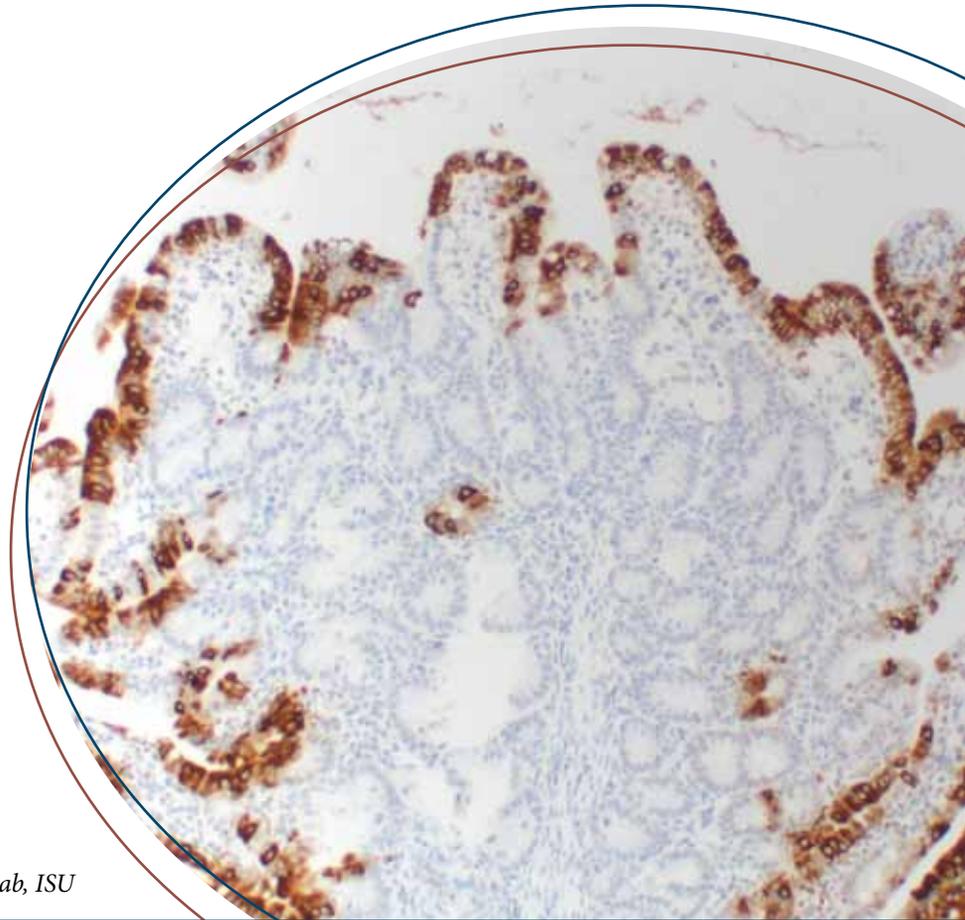


# IOWA Pork Producer *Headlines*

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## Porcine Epidemic Diarrhea Virus { PEDv }

On May 17, 2013, the National Veterinary Services Laboratories confirmed a case of Porcine Epidemic Diarrhea Virus (PEDv) in the United States. It may be new to the United States, but the virus has been found in swine herds around the world for more than 30 years.



*Photo Credit: Dr. Phil Gauger, Veterinary Diagnostic Lab, ISU*



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Therefore, this virus should not affect pork exports, nor does it play a role in public health. Dr. Howard Hill, DVM of Iowa Select Farms and president-elect of the National Pork Producers Council, confirmed that inquiries have been made about the virus, but nobody is threatening trade restrictions at this time.

## Experiences Abroad

PEDv was first diagnosed in feeder pigs and fattening swine in Great Britain in the early 1970s. As it became more prevalent around Europe, the virus was given the name “Epidemic Viral Diarrhea.” Research showed it was only found in swine, which caused the name to be changed to its current title, Porcine Epidemic Diarrhea Virus or PEDv. Not even 10 years later, it was diagnosed in Asia.

Research shows that Asia is having a much harder time controlling the disease than Europe. When the disease first appeared in Europe, PEDv caused widespread epidemics with severe losses in suckling piglets for about 10 years. Today, single outbreaks are more common in weaned pigs.

This isn’t different from the TGE experience in the United States prior to the introduction of modern production practices and bio-exclusion efforts. “With the introduction of this virus in new countries, the picture has been the same – high suckling pig losses,” says Dr. James McKean, DVM, MS, JD Vet extension and Iowa State University professor.

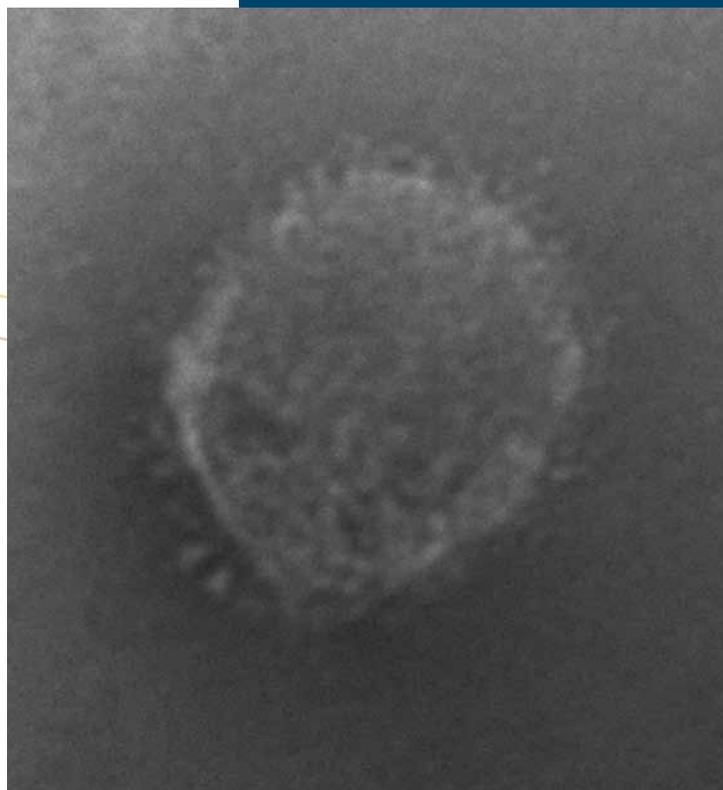
Pigs under 10-14 days old see mortality rates around 100 percent. As pigs age, the mortality rate decreases to almost 0 percent. From the time it appeared in Asia, through the 1990s, mortality ranged from 30 to 100 percent in suckling piglets. Dr. Rodney Baker, DVM, MS, and interim director of the Iowa Pork Industry Center, believes this is due to differences in biosecurity standards in Europe compared to much of Asia.

“Effective coronavirus vaccines are hard to develop. PEDv is no exception,” says Dr. McKean.

Dr. Baker agrees, saying “Coronaviruses have traditionally not made good vaccine candidates. TGE vaccines, even modified live attenuated products, failed to produce effective immunity.” Even with the use of vaccines in China, PEDv infections occur frequently on swine farms and the damage is serious in many areas of the country. China is working to develop attenuated virus vaccines at this time.

# What is PEDv?

Porcine Epidemic Diarrhea Virus is a coronavirus, similar to transmissible gastroenteritis (TGE), that causes diarrhea, dehydration and vomiting in all ages of swine, but it particularly affects young piglets. PEDv is a production disease. The only known host for this virus is swine. It is an enteric disease that is hard to distinguish from TGE. Only laboratory tests can confirm if the virus is PEDv or TGE. There isn’t cross protection in TGE-exposed pigs to PEDv. TGE vaccines will not provide protection.



*Photo Credit: Dr. Eric Burrough, Veterinary Diagnostic Lab, ISU*

## Disease Transmission

It has been confirmed that the virus can be transmitted through a direct or indirect fecal oral route. The disease is transferred via feces from infected pigs, trucks, boots, clothing and other contaminated fomites that could potentially carry the virus. Research leads us to believe these are the only current routes of transfer, but that has not been confirmed. It is recommended to strengthen bio-security protocols, communicate with neighbors, transportation sources, veterinarians and others to avoid risk of contamination. Manure is a key point of contamination for this virus. Make sure to change boots/shoes between buildings, sites and everyday use. It is very important to have on-farm boots for you, your family and any visitors to keep the disease from spreading. If clinical signs are observed, diagnostics are essential.

## Diagnosis

PEDv presents itself much like TGE. It is almost impossible to distinguish between these two diseases without diagnostics. According to Dr. Paul Sundberg, vice president of science and technology for the National Pork Board, reports from veterinarians show, in some cases, PEDv is more severe than TGE and in other cases seems to be less severe.

It is critical for producers to work with their veterinarians to ensure a prompt and accurate diagnosis. The incubation period post exposure is quite short with a 12-24 hour window. The virus is shed for 7-10 days. Clinical signs include:

- Watery diarrhea that can be found in pigs of all ages.
- Sows may go off feed and water for 1-2 days.
  - Vomiting and diarrhea are typical.
  - Some sows may not have diarrhea but will show other signs.
- Piglets may die after 3-4 days of diarrhea due to dehydration.
  - Lesions can be found within the small intestine of pigs.
  - Thinning of the intestinal wall
- Young suckling piglets see a much higher mortality rate.



*Photo Credit: Dr. Matt Ackerman,  
Swine Veterinary Services, Greensburg, IN*

As the pigs age, the severity of the virus seems to decrease. Older pigs can recover from the virus after a week or so with diarrhea and a fever likely.

Dr. Hill is hopeful that some hot weather could slow the virus spread, so veterinarians can look at potential eradication. Like TGE, they believe the virus can be eliminated from herds with the proper procedures. Depopulation has not been necessary for TGE elimination, and PEDv should respond similarly.

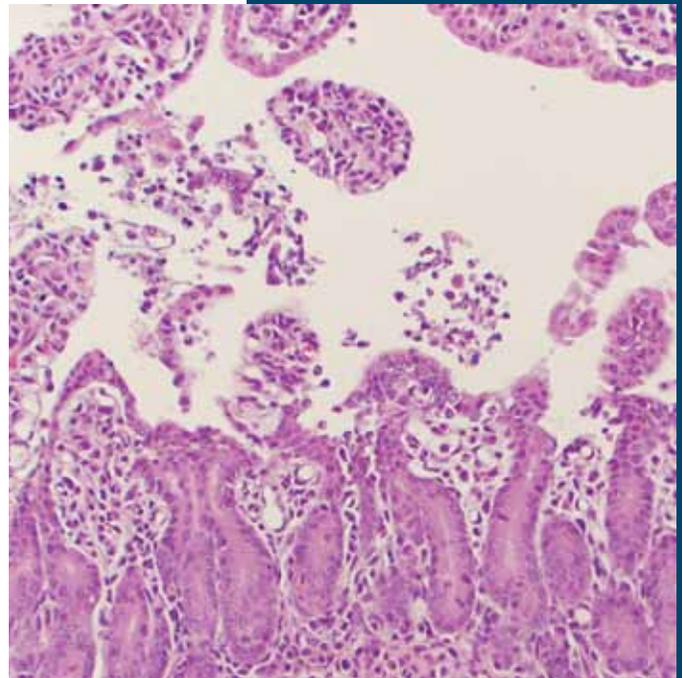
The ISU Diagnostic Laboratory is prepared and has the equipment to diagnose the disease in your herd. High capacity PEDv tests are under development.

The Diagnostic Laboratory would like to have samples from live pigs in the acute stages of the disease. However, samples from dead or euthanized pigs can be submitted too. Some of the samples include:

- The intestines from several pigs euthanized in the acute stage of the disease.
- Fresh feces from an acutely affected pig.
- Tissue from a variety of other organs.

Diagnosis of PEDv is made by direct demonstration using PEDv antigens using direct immunofluorescence tests that are applied to sections of the small intestine one day after the onset of diarrhea. ELISA techniques have been developed for detection of the virus antigens in feces using polyclonal antibodies. Lab tests must be done to confirm PEDv and differentiate it from TGE. Currently two different PCR tests are used to confirm PEDv. Immunohistochemistry can confirm the virus from tissue samples.

Dr. Hill encourages producers to thank the ISU, University of Minnesota, Kansas State and South Dakota State University diagnostic labs for their rapid development of PCR tests and collaboration.

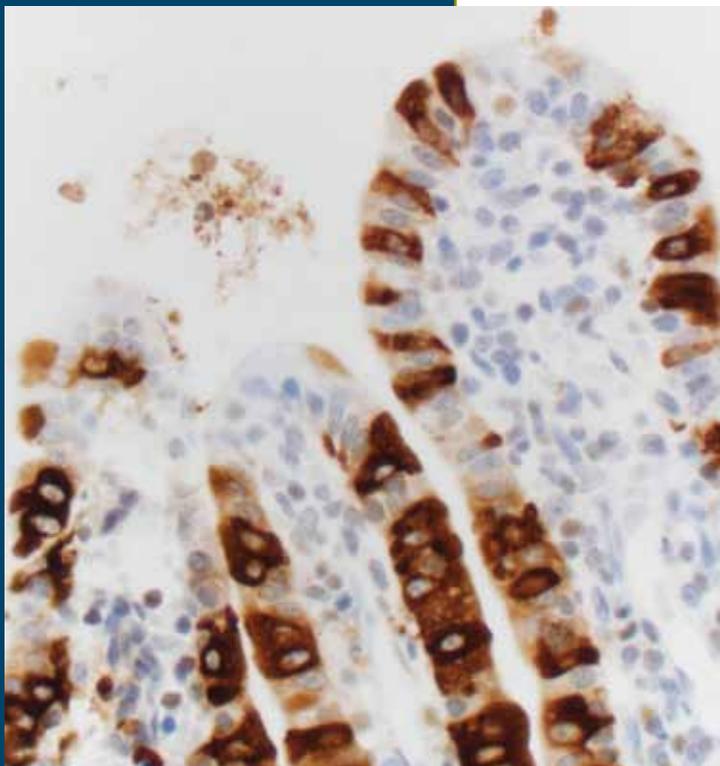


*Photo Credit: Dr. Eric Burroughs,  
Veterinary Diagnostic Lab, ISU*

## Prevention

Dr. Hill strongly suggests reviewing your on-farm bio-security protocols, as this is proving to be the most effective way to keep the virus off your farm. At this point, it is key to maximize your bio-security protocols. Your farm has a much better chance avoiding infection if bio-security protocols are strictly enforced and followed by all employees and visitors. Getting in the habit of following these simple bio-security protocols can keep this virus off your farm. It is important to concentrate on manure as the virus's main way of travel. Some suggestions include:

- This is crucial. Manure is a main contamination point and changing shoes/boots and clothes each time before you enter your barns can prevent your farm from getting the virus.
  - Change clothes and shoes/boots between facilities, concentration points, county fairs and neighbors' farms.
  - Get in the habit of doing this all the time!
  - Never let your on-farm boots touch the same area as your "other" boots.
  - Advisable to have a location away from your barns on your farm to change your boots and coveralls (garage or office).
  - Wash your hands before entering a facility.
  - Consider use of building-specific boots to minimize spread within site.
- Showering in and out of facilities can be very effective, but it is difficult. Concentrate on keeping manure out of the site.
- Limit visitors on your farm.
  - This includes truckers, veterinarians, maintenance people, feed delivery services, neighbors, etc.
  - Have building/farm specific boots/plastics on farm for ALL visitors.
  - Make them wash their hands before entering any facility.
  - Know where the people on your farm are coming from and if they have had contact with other livestock.
  - Practice down time after pig exposure.
- Commercial truckers
  - They should not use their boots and coveralls/chaps.
  - Farms should supply boots and appropriate clothing for them to put on before leaving their trucks.
  - Limit their access to facilities during loading process.



*Photo Credit: Dr. Phil Gauger,  
Veterinary Diagnostic Lab, ISU*

- Practice all-in, all-out production.
  - Clean and disinfect all floors, ceilings, light fixtures, feeders and other equipment in the barn between groups of pigs.
- Properly wash, sanitize and dry all transport vehicles.
  - Transport vehicles allow the virus to spread quickly from farm to farm.
  - The Iowa Pork Industry Center recommends heating pig trailers to temperatures above 150° F. for more than 10 minutes to inactivate the virus.
  - Have a 12-hour down period between groups of pigs.
- Have a plan with your veterinarian for how to introduce new animals to the farm.
  - 30-day isolation period
  - Isolation
  - Daily observation and what to look for in your herd
  - Vaccinations
  - Diagnostic tests
- Run tests on your new animals.
  - Make an introduction plan with your veterinarian to include observation, vaccination, diagnostics, etc., that is specific for your farm.
- Do not allow dogs, cats, rodents or other animals in the building because they can carry the virus on their feet or fur.
  - Use fly spray to keep flies at a minimum.

## Control

If the virus does end up on the farm, take appropriate steps to minimize impacts.

- Keep nursery/finisher pigs hydrated with unlimited access to water.
- Withhold feed for a few days in nursery/finisher pigs.
- Provide a clean, dry and draft-free environment for nursery/finisher pigs.
- Take precautionary measures to prevent the virus from entering your farrowing facility until the latest date possible.
  - Pigs that are older are able to recover from the virus better than younger pigs.
- If an outbreak in the farrowing facility occurs, research shows exposing sows to the virus will stimulate immunity and could potentially shorten the outbreak on the farm. If sows are exposed to the virus, studies show that pregnant sows can become immune and protect the piglets by lactogenic immunity.
  - A way of ensuring uniform infection in adult

animals is to feedback infected fecal material. Both Dr. McKean and Dr. Baker recommend contacting your veterinarian about proper feedback procedures in your operation.

Experts continue to analyze and gather information on the impact of the virus. The individual producer, at minimum, will experience devastating losses of 3-4 weeks of production.

## Industry Response

Research is being conducted at this time to learn everything possible about the virus. Pork producers are investing about \$593,000 from the Pork Checkoff and Iowa Pork Producers Association to get answers about the virus such as transmission, diagnostic test development and methods of spread.

According to Dr. Paul Sundberg, the first thing they want to do is find out how the virus entered the United States, then they will investigate how it is moving from farm to farm. Funds will be used to support surveys and diagnostic work as well.

## Conclusion

Overall, PEDv may be new to the U.S., but it is not a new virus to the world. Since it is not a World Organization for Animal Health reportable disease or a food safety concern, we should not see a decline in pork exports in the coming months. With technology advancements, the ISU and other university labs are prepared to diagnose this disease. If producers increase bio-security practices around their facilities, they stand a much better chance of keeping the virus off of their farm, which greatly reduces future opportunity for the virus to spread.

## For More Information

Contact the Iowa Pork Producers Association at (800)-372-7675 or visit [www.aasv.org](http://www.aasv.org), [www.ipic.iastate.edu](http://www.ipic.iastate.edu) or [www.pork.org](http://www.pork.org).



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### Mission Statement

The Iowa Pork Producers Association is an industry inclusive organization whose mission is to provide a unified voice to promote and educate for a sustainable, socially responsible, profitable and globally competitive pork industry.

