

PEDV Update and Basic Biosecurity



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Overview

- Disease Update
- History
- Coronaviruses
- Clinical Observations
- Biosecurity
- Controlled Exposure
- After the Outbreak
- Diagnosis

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US BACON PRICES RISE AFTER VIRUS KILLS BABY PIGS

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INTERSTATE FAIR

Pig virus precaution cuts into hog numbers at fair

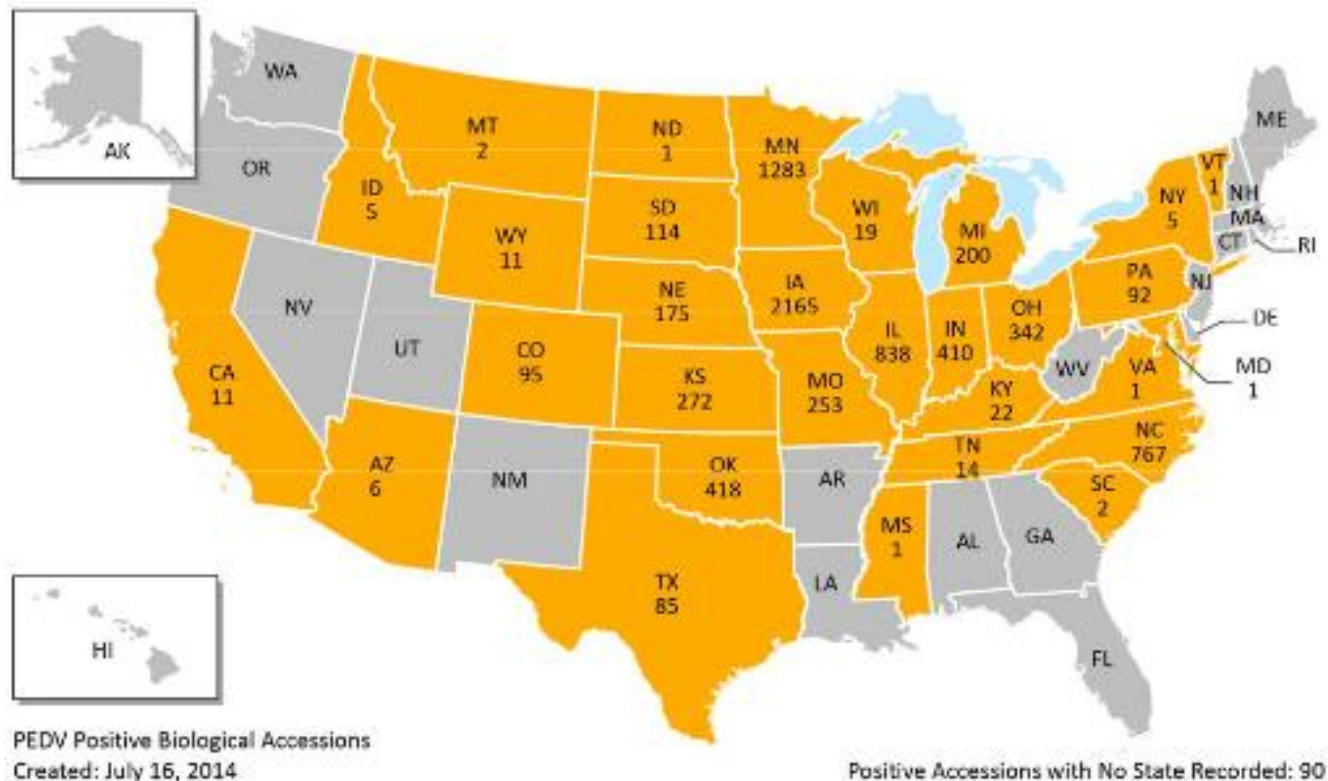


Update on PED

- 7,719 cases in 30 US states
 - Confusion in media with the word “cases” and accessions
 - Not necessarily individuals but farms or buildings
 - Iowa (2165) Minnesota (1283) and NC (767)
 - Nebraska 175
- Widespread in Mexico
- Parts of Canada



PED positive accessions July 16 2014



Data from NAHLN



History

- Where did we get PEDV?
 - First recognized in the UK 1971
 - Endemic – Europe and Asia (1982)
 - Exact source in US is unknown
 - Initial isolates 99.4% homologous gene sequence to that reported from China in 2012
 - Enteric coronavirus similar to TGEV
 - TGEV has been in US
 - Does not infect humans or other animals



PEDV- All pigs All ages

- Farrowing
 - 100% mortality in pigs < 2 – 3 days
 - Almost 100% mortality in farrowing for nearly three - four weeks
 - 20% mortality in 7 – 10 day old pigs
- Nursery
 - Diarrhea <2 days after exposure
 - ≤5% mortality
 - Virus detected in pigs 21-35 days post infection



New Coronaviruses Emerge

- Deltacoronavirus
- DNA sequencing from samples taken from pigs negative for PED and other viruses
- Unknown source
- Grouped with PED under Swine Enteric Corona Disease (SECD) by USDA

HOME > HEALTH > NEW CORONAVIRUS DISCOVERED IN OHIO PIGS

New Coronavirus Discovered in Ohio Pigs

Not PEDV, but symptoms are similar.

Source: Ohio Department of Agriculture

Feb 12, 2014

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More About: Porcine Epidemic Diarrhea Virus (PEDV)

RELATED MEDIA



[PEDV Helps Reinforce the Importance of Premises IDs](#)

[Diagnostics to Assess the Role of PEDV on Swine Farms](#)

[Canada Focuses on Biosecurity Measures to Reduce the Spread of PEDV](#)

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A new coronavirus has been identified in pig fecal samples from four Ohio swine farms, according to the Ohio Department of Agriculture (ODA). The farms from which the samples were taken experienced outbreaks of a diarrheal disease in sows and piglets in January and early February of 2014. The clinical signs of the disease were similar to that of porcine epidemic diarrhea virus (PEDV) and transmissible gastroenteritis (TGE), which are both caused by coronaviruses. Electronmicroscopy of fecal samples from the four farms showed the presence of coronavirus-like viral particles. In one of the four farms, polymerase chain reaction (PCR) tests for TGE viruses and PEDV viruses currently circulating in the U.S. were negative, but all 10 samples were positive for a new virus. PEDV and the new virus were both detected in fecal samples from the other three farms.



Diagnosis

Diagnostic Tests at the UNL-VDC

- **PCR Testing**- detects virus RNA in feces, oral fluid, or environmental samples
- **Blood Testing (Serology)**- detects antibodies to PEDV in pigs that have been exposed to virus
- USDA may support some testing costs for **PCR** from approved samples



PEDV and SECD Regulation

- June 5, 2014 USDA Federal Order
 - Requires reporting of new detections to APHIS and/or Nebraska Department of Agriculture
 - No herd quarantines or movement restrictions
 - IF Enroll and Implement biosecurity plan designed by veterinarian
 - Some reimbursement available for vehicle cleaning and purchase of disinfectants
 - Work with your veterinarian to develop plan



Biosecurity Basics

- Limit traffic (people and equipment)
- Thoroughly **clean and disinfect anything coming onto the farm**
 - **Livestock Transport Biosecurity is critical**
- Enforce downtime requirements and maintaining a log of visitors
- Establish lines of separation
- Take precautions when disposing of dead stock
 - Isolate and Compost
- Shower-in where practical and change into clean boots and coveralls



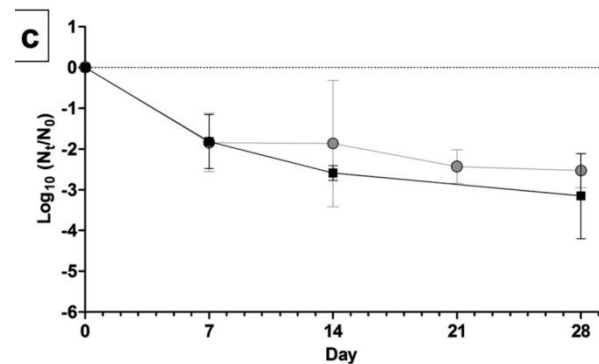
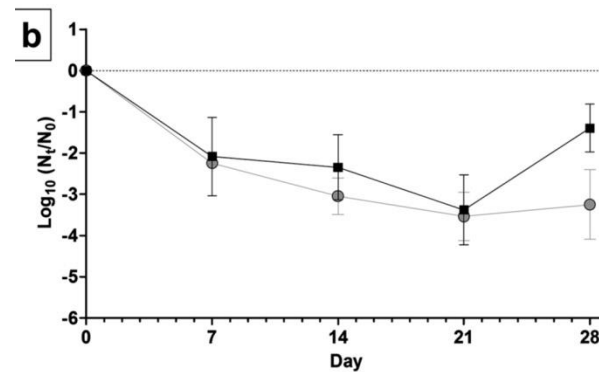
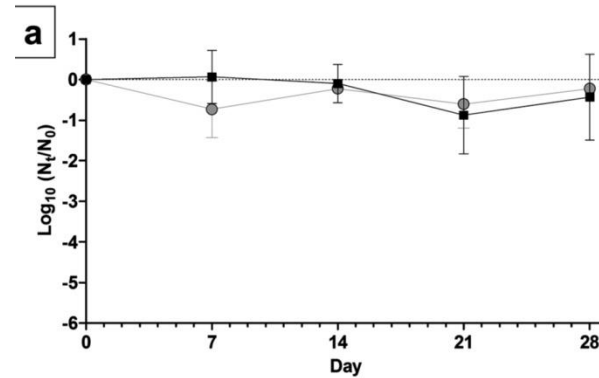
Biosecurity and Manure Handling

- PEDV and swine coronaviruses are spread by manure
- Infected pigs shed billions of virus particles in each gram of feces
- Viruses are stable for several weeks
 - Less in hot weather
 - Less if exposed to UV



Virus Survival

Virus is stable for **at least** a month at low temperatures



Survival of TGEV (Related to PEDV)

(a) 4° C and 20% RH,

(b) 50% RH

(c) 80% RH.

Squares, TGEV

Circles, MHV

Error bars indicate 95% confidence intervals.

2010 Cassanova App & Environ Micro



Biosecurity for Manure Haulers

- Manure Haulers
 - Communication is key: with handlers and employees
 - Establish and enforce “Line of Separation”
 - May include maps or actual markings on site
 - Minimize contact with hauling crew and equipment with farm traffic areas
 - Use clean coveralls boots and gloves
 - High risk or biosecure sites like nucleus herds consider farm specific equipment



Disinfection

- Completely disinfect **and dry** equipment
- Organic debris inactivates disinfectants, must remove all manure from surfaces
- Some addition of heat
 - “trailer bakers”
 - “room bakers”
- Heat + Dry + Disinfectant + Time
- Challenge in the winter, disinfectants need time before freezing



Effective disinfectants for PEDV

<u>Class</u>	<u>Trade name</u>
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<i>Phenols</i>	Tek-Trol 1Stroke Environ
<i>Peroxygen</i>	Virkon S
<i>Chlorine</i>	Chlorox
<i>Combination Products</i>	Synergize

Table 1: Disinfectants effective against porcine epidemic diarrhea virus

Product	Manufacturer	Disinfectant class	Dilution rate	Precautions
Virkon S	Antec International, Arlington, Texas	Oxidizing agent (potassium peroxymonosulfate)	1:100	Contact with skin is corrosive: use of goggles and rubber gloves is recommended.
Clorox bleach	The Clorox Company Oakland, California	Oxidizing agent (sodium hypochlorite)	1:32	Disinfectant properties inactivated by organic material and diminished by alkaline materials (eg, lime) and moisture. Contact with skin is irritating.
1 Stroke Environ	Calgon Vestal Saint Louis, Missouri	Phenolic compound	1-2%	Disinfectant properties not inactivated by organic debris, enhanced by warm temperatures, diminished by cold temperatures. Contact with skin is corrosive: use of goggles and rubber gloves recommended.
Tek-Trol	Bio-Tek Industries, Inc Atlanta, Georgia	Phenolic compound	1-2%	Disinfectant properties not inactivated by organic debris, enhanced by warm temperatures, diminished by cold temperatures. Contact with skin is corrosive: use of goggles and rubber gloves recommended.



Prevention and Mitigation

- Manage risk of introduction via biosecure practices
- Make biosecurity a priority
- Controlled exposure in positive herds
- Vehicles are a critical control point
- Environmental elimination following exposure
 - Reduce risk of “rebreaks”



Questions?

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