

Swine Enteric Coronavirus Diseases

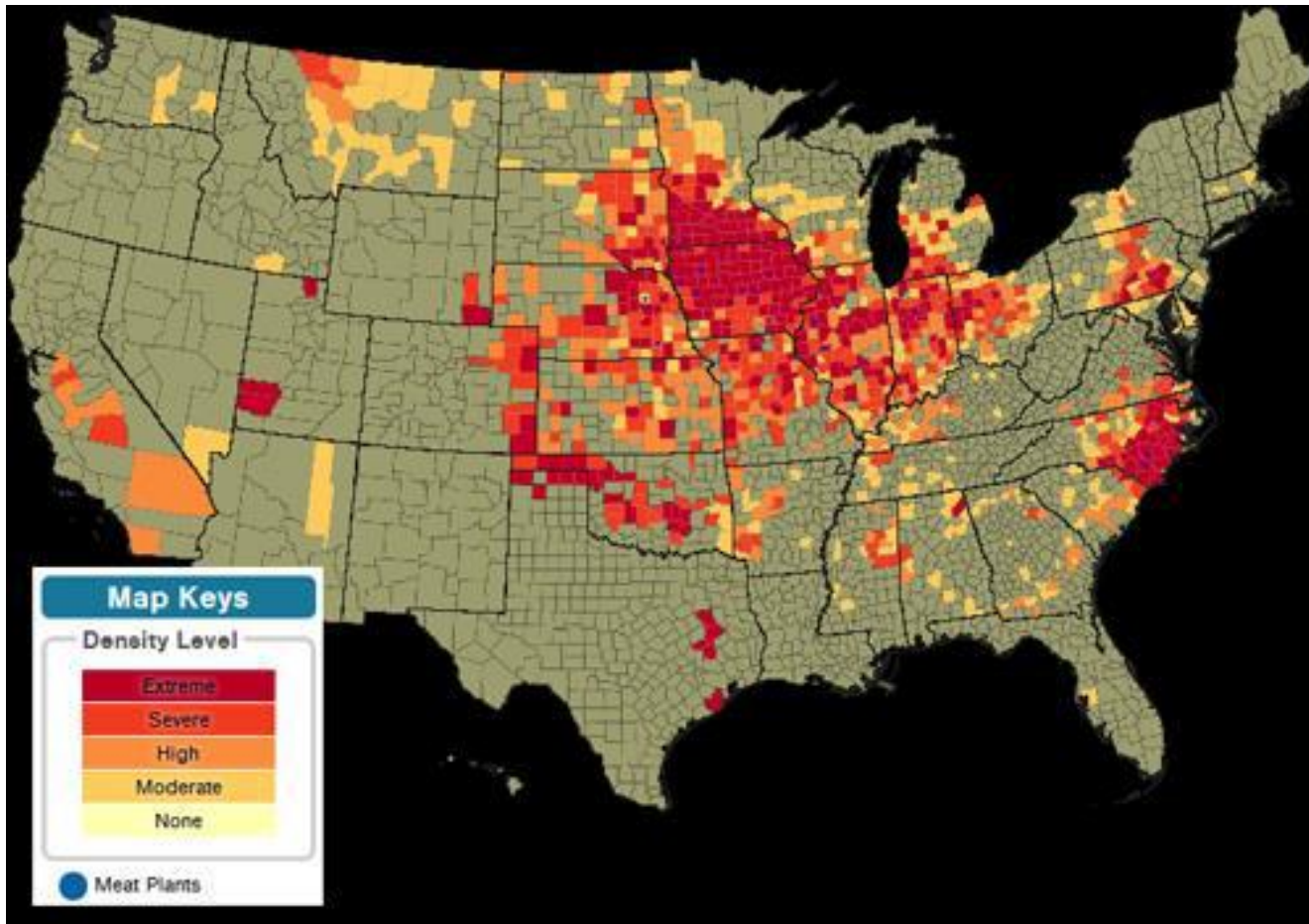


Craig Shultz, DVM

Pennsylvania Department of Agriculture

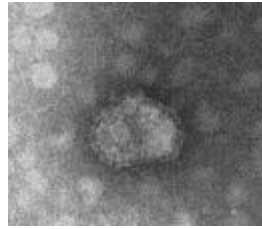
Bureau of Animal Health and Diagnostic Services

Where Pigs are Located in the United States



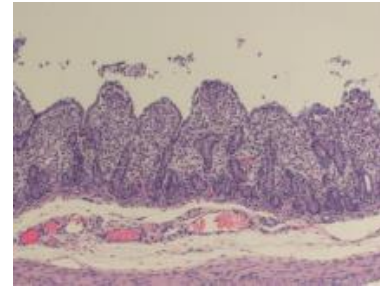
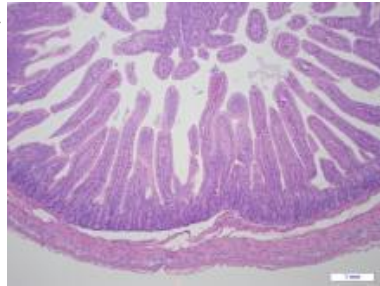
What is Porcine Epidemic Diarrhea Virus?

- A coronavirus



- Causes intestinal damage

- Villous atrophy



- Resulting malabsorption syndrome
- Clinical signs in swine are indistinguishable from transmissible gastroenteritis, also a corona viral disease.
- **Not a food safety or public health concern**

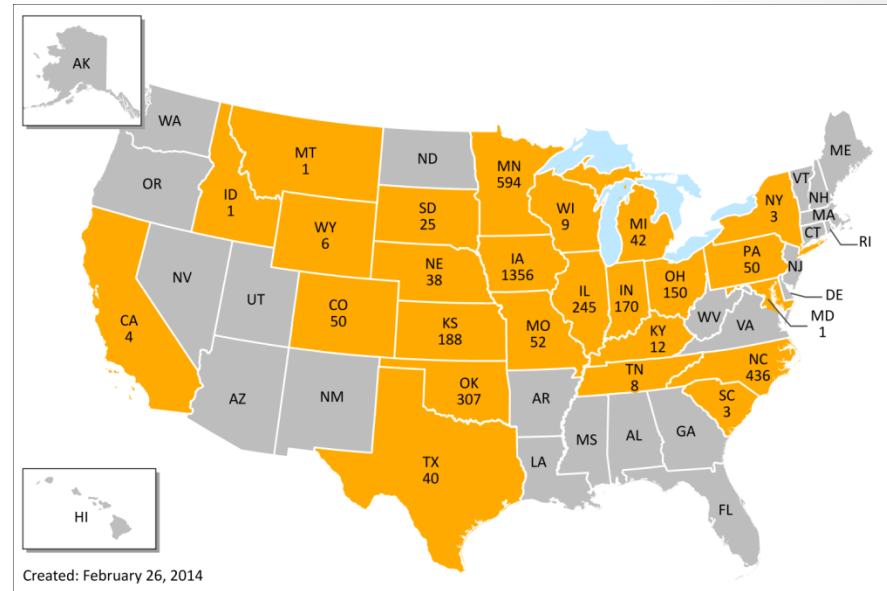
Disease History

- TGE-like outbreaks in the UK and elsewhere in Europe in the early 1970s.
 - Observed in young and growing pigs.
 - Considered insignificant today
- More recently, severe disease in Southeast Asia with severe outbreaks and persistent endemic situations in China and South Korea
- First Diagnosed in US swine in May 2013

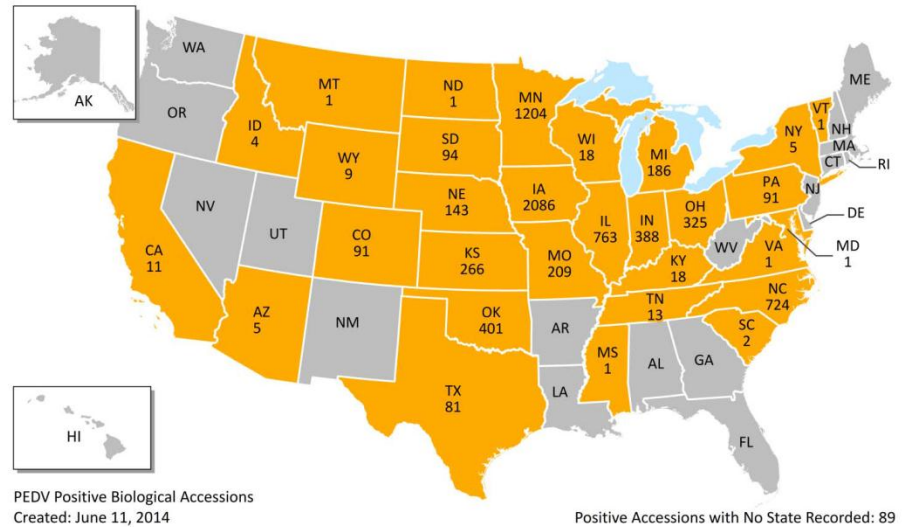
Disease Progression in the United States

- Index case diagnosed in Ohio in May 2013
- 5500 cases in 28 states nationwide by April 2014

February 2014



June 2014



Factors in Disease Spread

- Transport vehicles, lairage at collection points and animal movement.



- Dual usage of vehicles for transport of animals to positive slaughter plants and movement of production swine.
- Ability of virus to overcome intensive biosecurity measures
 - Massive amounts of viral particle shedding compared to TGE
- Area spread – especially where there are high concentrations of breeding herds

Disease Characteristics

- Virus Shedding
 - Extraordinary Level of shedding
 - >10 million viral particles in one quarter teaspoon of infected feces
- Viral persistence in the presence of maternal antibody
 - Infected sow units take over 90 days to produce negative pigs
 - Environmental samples remain positive up to 6-8 weeks post exposure
- Mixed response to conventional TGE disease management techniques (“feed back”).
 - Massive viral dose is the problem

Magnitude of Disease Impact

- Reports of on-farm losses of thousands of piglets
 - Irreversible malabsorption syndrome in very young animals
 - Devastating to farrowing and nursery operations

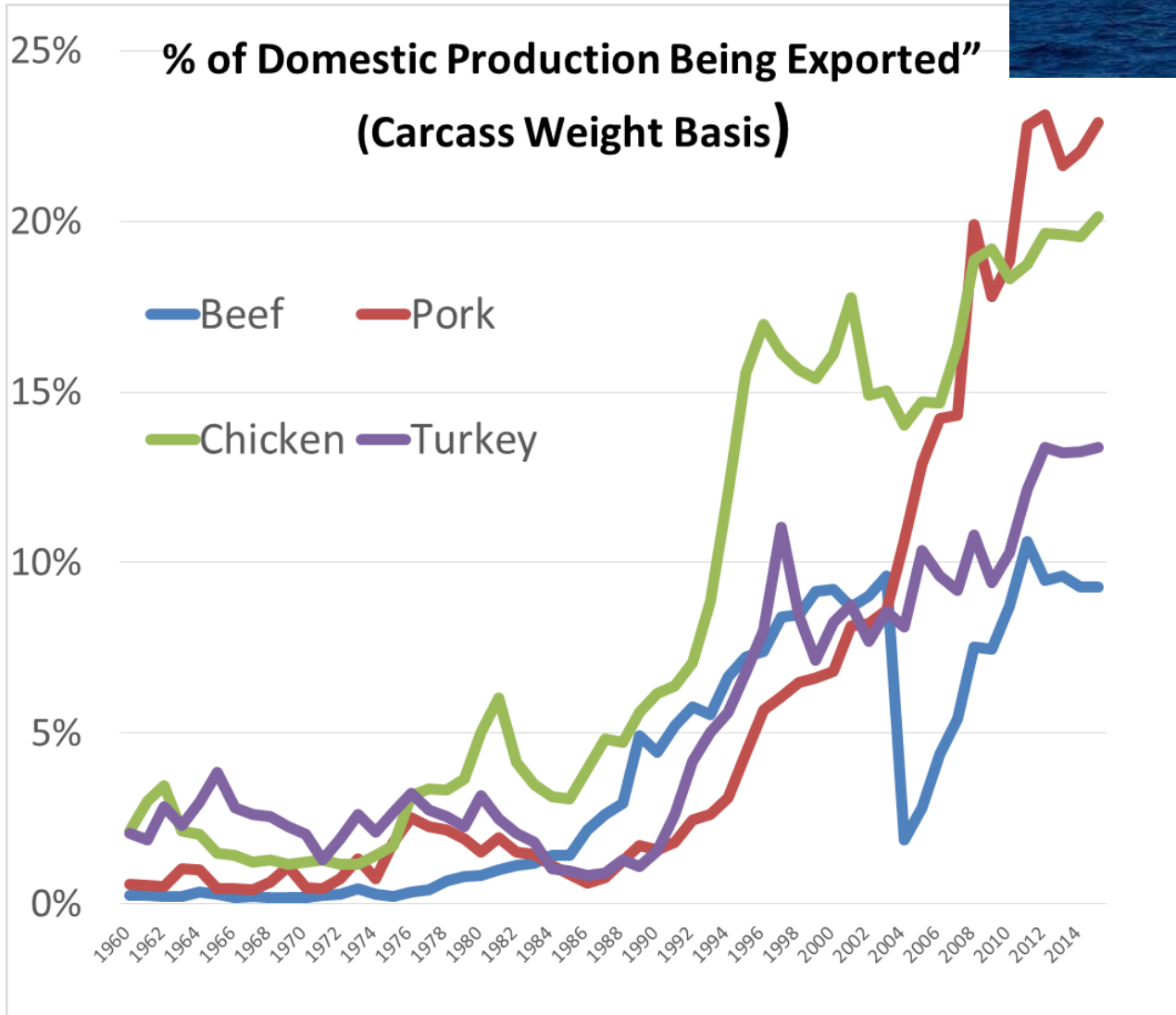


- Adult pigs show very mild clinical signs
 - Transient diarrhea

Additional Viral Strains/ Reinfections

- In recent months a second coronavirus with effects similar to PEDV has emerged
 - Porcine Delta Corona Virus (PDCoV).
 - This virus has been diagnosed in Pennsylvania swine.
- The disease complex is now referred to as swine enteric coronavirus diseases (SECD)
- There are documented incidents of herds considered to be immune having become re-infected.
 - This was not characteristic of transmissible gastroenteritis virus (TGE)

International Trade



Systems of Response Required for Effective Disease Containment and Continuity of Business

- Swift, Calculated, Coordinated and Firm
 - Built around continuity of business plans
 - Compartmentalization
 - For safe, secure, and continuous movement of food from unaffected farms in disease control zones



Milk, Egg, Pork, Turkey industries are developing plans

Regulatory Strategy

- Since July 2013 USDA has provided a weekly PEDV update to state animal health officials and industry stakeholders
- USDA Federal Order issued June 5, 2014
 - Producers, veterinarians and diagnostic laboratories are now required to report all cases of new SECD including PEDV and PDCoV.
 - Federal/State collaboration to manage disease in a manner to support business continuity for producers and maintain a plentiful supply of pork
 - Operators of premises found to be infected must work with their herd veterinarian or state or federal animal health officials to develop and implement a disease management plan.