PORCINE EPIDEMIC DIARRHEA VIRUS (PEDV)
PORCINE EPIDEMIC DIARRHEA VIRUS (PEDV) was recently detected in the U.S. for the first time. This production-related disease, although not reportable through the World Organisation for Animal Health (OIE) or through the U.S. Department of Agriculture (USDA), still is of great concern to producers because of its high morbidity and mortality rate in certain groups of pigs and the economic losses that it can cause (USDA 2013). Since this is the first time the virus has been detected in the U.S., it is expected that there is no immunity in the U.S. swine herd (The Pig Site 2013).

Although new to the U.S., the virus is well known in other parts of the world. Since its discovery in the United Kingdom in 1971, it has spread throughout Europe and Asia. Its symptoms are extremely similar to transmissible gastroenteritis (TGE) and often can only be distinguished by lab tests (USDA 2013). Unlike TGE, PEDV spreads at a slower rate (the incubation period is roughly three to four days) and older pigs infected with PEDV tend to be more depressed and lethargic than those with TGE (Aiello et al 1998). The virus is transmitted via a fecal-oral route or via fomites in the pigs' environment. Pigs can shed the virus for a week to nine days (Geiger et al 2013).

Morbidity and mortality in pigs with PEDV can be high, especially in neonatal pigs where both can reach 80 to 100 percent. As age increases, mortality decreases (about 1 to 3 percent in grower pigs) (USDA 2013). Although vaccines for PEDV exist in China, Japan and South Korea, there is no approved vaccine in the U.S. or Europe (USDA 2013). The virus does not affect the safety of pork products nor is it transmissible to humans.
PORCINE EPIDEMIC DIARRHEA VIRUS

CLINICAL SYMPTOMS AND TREATMENT
PEDV has many of the same symptoms as TGE. The severity and presences of symptoms depend on previous exposure to the virus. Symptoms of PEDV include:

• Watery diarrhea
• Vomiting
• Dehydration
• Lack of appetite
• Pigs may appear to have colic, or abdominal pain (Aiello et al 1998).

There is no effective treatment for PEDV; however, symptoms may be treated. To avoid dehydration, pigs should have free access to water. Antibiotics may be used to treat secondary infections. Recovery typically takes a week to 10 days. Consult a veterinarian for specific treatment details.

Piglets can obtain immunity from their mothers if the female has an adequate amount of antibodies to pass immunity along through colostrum (Geiger et al 2013). Please contact a veterinarian for specific information on protecting the herd via a feedback program.

Biosecurity

The best way to prevent PEDV is to maintain a robust biosecurity program, which entails not only monitoring who goes in and out of the facility (and limiting the number of people who do so), but also keeping high risk pigs separate from lower risk pigs. Additionally, proper cleaning and disinfection of barns, feed and water troughs, fomites, trailers and vehicles is vital. Below are sample biosecurity protocols for animal housing facilities and transport vehicles.

Sample Protocol – Transport Vehicles

Transport vehicles should be disinfected after every haul. Trucks should be thoroughly cleaned, disinfected and allowed to dry before reloading. The person disinfecting the truck should be wearing clean boots and coveralls, as dirty boots and clothing can contaminate the clean truck once it’s been disinfected. Neogen recommends using BioSentry Acid-A-Foam™ as a cleaner for washing trucks and trailers.

1. First remove all organic material, trash and bedding from the trailer and the cab. Pre-clean all surfaces using a neutral pH cleaning agent such as BioSentry Acid-A-Foam.
2. Start on the top deck and work down, first spraying the ceiling with cleaner, followed by the walls and finally the floors. Move to the lower deck and repeat. Be sure to make sure the tail lift and ramp gates are thoroughly cleaned as well.
3. Next move to the outside of the trailer. Be sure that all organic material is removed from the underside of the vehicle, including the wheels, wheel arches, tires, mudguards and the chassis.
4. All equipment stored in any storage areas must be cleaned as well, in addition to the storage areas themselves.
5. Start the disinfection process inside the transporter. Apply disinfectant solution onto surfaces using an appropriate applicator and dilution rate.
6. Be sure to thoroughly disinfect the underside of the trailer with disinfectant after cleaning and rinsing all exterior surfaces.
7. The cab of the truck should be cleaned thoroughly as well. Apply the disinfectant solution with a soft brush. Be sure to clean the floor, mats and foot pedals.
8. Rinse all surfaces with water after allowing the disinfecting solution appropriate contact time.
9. The vehicle should then be allowed to drain and dry. Parking on a slope will help facilitate the draining process. The driver should again clean and disinfect coveralls and boots, as any remaining organic material poses a recontamination threat.
Neogen recommends proper cleaning procedures be followed prior to disinfection for maximum effectiveness of the disinfectant to be used. Neogen recommends using DuPont™ Virkon® S, BioSentry® BioPhene™, or Spectrasol™ for disinfecting livestock facilities and equipment.

1. Animals should be removed from the area prior to cleaning.
2. Remove/cover items in the area to be cleaned that are sensitive to water.
3. Empty all feeders, and if necessary, manually remove heavy organic matter load from the area to be cleaned.
4. Presoak the area to be cleaned.
5. Use a cleaner with appropriate applicator and dilution rate to loosen organic material from the area to be cleaned.
6. High-pressure wash the area (preferably with hot water), ensuring complete removal of all organic material. Proceed from the cleanest areas to the dirtiest and from the highest level (ceiling) to the lowest (floor).
7. Allow the facility to dry completely.
8. Apply an appropriate disinfectant using a proper applicator at the correct dilution rate and ensure that surfaces stay wet for the duration of the required contact time (usually 10 minutes). Always read the entire product label and follow dilution instructions to ensure the safest, most effective concentration is applied.
9. Thoroughly rinse area at low pressure to remove all residues.
10. Allow facility to dry completely before re-stocking with animals.
Virkon® S is intended to disinfect inanimate environmental surfaces: such as floors, walls, gating, feeders, ventilation and other equipment, utensils, trays, and other containers, water systems, evaporative coolers, storage rooms, and vehicles in swine farm and other agriculture settings prior to introduction or reintroduction of animals. Not approved in California for use on ventilation and other equipment and water systems. It is not intended to directly affect agricultural production and must not be applied to animals. Remove animals prior to use of the product.

FOR SURFACES AND EQUIPMENT
1. Sweep and remove all organic debris. Use power sprayer to wash all surfaces to remove all organic material.
2. Use a dilution of 1:100 or 1.3 oz. Virkon® S per gallon of clean water. Use a dilution of 1:50 or 2.6 oz. per gallon of clean water if surfaces that are to be treated have not been pre-cleaned with water to remove organic deposits. Not approved in California for use at 1:50 dilution on surfaces that have not been pre-cleaned with water to remove organic deposits.
3. Apply solution with mop, sponge, power sprayer, or fogger to thoroughly wet all surfaces.
4. Rinse surfaces after appropriate contact time is achieved.
5. Reapply as often as needed for control.

FOR CLEAN NON-POROUS SURFACES
Floors, walls, gating, etc.: Use a dilution of 1:100 or 1.3 oz. per gallon of clean water. Soak tools to ensure complete coverage.

Work areas: Sweep and remove all organic debris. Use power sprayer to wash all surfaces to remove loose dirt. Use a dilution of 1:100 or 1.3 oz. of Virkon® S per gallon of clean water. Use a dilution of 1:50 or 2.6 oz. of Virkon® S per gallon of clean water if surfaces that are to be treated have not been pre-cleaned with water to remove organic deposits.

For evaporative coolers Not approved use in California: treat existing algae and slime-contaminated surfaces with a 1:100 dilution of Virkon® S. Treat cooler water every week with a dilution of 1:200 or 0.65 oz. of Virkon® S for every gallon of cooler water.

Virkon® S may also be used to disinfect irrigation tanks and lines. Not approved use in California: Run a 1% solution through the system or soak equipment in a 1% solution. Let stand for ten minutes and flush system with clean water after treatment.

Virkon® S at 0.5-1% solution is recommended for use in fogging (wet misting) operations or as a supplemental measure either before or after regular cleaning and disinfecting procedures. Fog (wet mist) until the area is moist using automatic foggers according to manufacturer's use directions. Rinse foggers and sprayers with water following use.
TO CALCULATE THE NUMBER OF DILUTED GALLONS NEEDED TO DISINFECT A BARN OR ROOM, USE THE FOLLOWING FORMULA:

Square footage of the area x 2.5 ÷ 135 = Total gallons of disinfectant solution needed

For example: To calculate the number of diluted gallons needed to disinfect a barn that is 40 feet wide and 100 feet long (or 4,000 square feet):

Multiply the square footage of the area by 2.5. Divide that number by 135 (because 1 gallon of disinfectant solution is sufficient to disinfect 135 ft²). The product of that calculation equals the total number of gallons of disinfectant solution needed.

4,000 x 2.5 ÷ 135 = 74 Total gallons of disinfectant solution needed

12 gallons of disinfectant solution can be generated from each fill of the 96 oz sprayer.

USAGE INSTRUCTIONS AND DILUTION CHART:

Fill sprayer reservoir with water (96 fl oz.), then add Virkon S powder to achieve recommended solution concentration (see chart below). Connect inner hose to cap and affix to reservoir. Screw on sprayer to cap and hose to sprayer.

The sprayer provides a 16:1 use-dilution of the reservoir, so filling 96 oz provides 12 gallons of disinfecting solution. 1 gallon of disinfecting solution is sufficient to treat 135 square feet.

<table>
<thead>
<tr>
<th>Quantity of Water</th>
<th>0.5% Solution*</th>
<th>1.0% Solution</th>
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<tr>
<td>96 ounces</td>
<td>7.8 ounces* (6 scoops)</td>
<td>15.6 ounces (12 scoops)</td>
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*The 0.5% solution currently is not approved for use in California
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Neogen’s Animal Safety Division is a leader in the development of animal genomics, along with the manufacturing and distribution of a variety of animal healthcare products, including diagnostics, pharmaceuticals, veterinary instruments, wound care and disinfectants.