

## SWINE HEALTH

**Title:** Environmental stability of PDCoV (porcine delta coronavirus) – NPB #14-191

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### Scientific Abstract

The primary route of transmission of swine enteric coronaviruses including Porcine Delta Coronavirus (PDCoV) is via the fecal-oral route. Because the virus is excreted in the feces of infected animals, it can easily contaminate the environment and be transmitted to naïve animals. Therefore, it is important to study the survival of PDCoV in various environmental samples such as feces, slurry, drinking water, recycled water, feed, and feed ingredients. The objective of this project was to determine if different storage and handling methods will decrease the time of virus survival. For each experiment, aliquots were prepared and placed into plastic vials after confirming by RT-PCR that samples were negative for PDCoV. Aliquots of feces and slurry in 3.5 g amounts were spiked with 0.5 mL of virus and subjected to various treatments. The virus was grown and titrated in swine testicular (ST) cells. The samples were tested for the amount of virus immediately after spiking and after 1, 3, 7, 14, and 28 days of storage for the first 4 experiments. In experiments 5 and 6, samples were collected weekly for 6 weeks for feces and 8 weeks for slurry. Both feces and slurry were exposed to 3 levels of relative humidity (RH) (30%, 50%, and 70%). Spiked feces were placed in water baths 40°C, 50°C, and 60°C. Slurry was stored at 4°C, 25°C, and -20°C. To determine virus survival in feed and feed ingredients, 5 g aliquots of were placed in scintillation vials followed by the addition of 1 mL/vial of PDCoV. For drinking water and recycled water, 5 mL of the sample was spiked with 100 µL of the virus and stored at room temperature. Samples were taken at weekly intervals for 7 weeks to determine the amount of virus survival. Data obtained were analyzed by calculating percent virus reduction. Regardless of temperature or RH, PDCoV in feces and slurry 3 log<sub>10</sub> of virus was inactivated after 28 days. In recycled water virus inactivation occurred at 42 days. In spray dried plasma, we achieved >3 log reduction in just 3 days. It was found that there could be a 4 log<sub>10</sub> reduction in virus titer spiked into meat meal, corn, low oil DDGS, and medium oil DDGS. These data will help us develop more robust biosecurity protocols to control PDCoV infections.

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