

## SWINE HEALTH

**Title:** Evaluation of an accelerated hydrogen peroxide disinfectant and a chlorine dioxide disinfectant to inactivate porcine epidemic diarrhea virus in swine packing plant dock and unloading areas – NPB - #15-121

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### SCIENTIFIC ABSTRACT

Contaminated swine transport vehicles played a role in the rapid spread of porcine epidemic diarrhea virus (PEDV) across the United States in 2013. One potential source of contamination for livestock trailers is the unloading dock at swine packing plants or harvest facilities. These facilities typically do not require employees to perform sanitation and decontamination procedures on the unloading area between livestock trailers. The objective of this study was to test the efficacy of an accelerated hydrogen peroxide (AHP) disinfectant and a Chlorine Dioxide (CD) disinfectant at inactivating PEDV in swine feces on concrete surfaces, representative of those found in swine packing plants, with a very short contact time under both warm (20°C) and cold (-10°C) conditions. Ten treatment groups, including a positive control and a negative control group were evaluated. Two concentrations of AHP disinfectant (1:32 and 1:64), two concentrations of CD disinfectant (100 ppm and 50 ppm), and two temperatures (20°C and -10°C) were evaluated using a fixed level of fecal contamination (10ml) and contact time (5 minutes). For the treatment groups evaluated at -10°C, the AHP and CD disinfectants were mixed into a solution that was 10% propylene glycol (PG) by volume, to prevent freezing. The positive control group was conducted at -10°C and sham disinfected with a sterile water / PG solution. Forty concrete coupons, designed to mimic the non-slip “waffle” flooring present in swine packing plant unloading docks were matched with 40 clinically healthy 3-week old barrows. Each treatment group was conducted in 4 replicates (4 concrete coupons and 4 barrows per treatment). Ten (10) ml of PEDV positive feces (PEDV negative feces for the Negative Control group) were applied evenly to the concrete coupon. Feces were allotted a 10 minute rest

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period after application and then the subjected to one of the ten treatment groups described above. Following treatment, the contents from the coupons were suspended in sterile saline, collected, and administered to pigs via oral gavage. These pigs served as a bioassay to determine the infectivity of PEDV after treatment with either the AHP or CD disinfectant. Pigs were housed individually in raised tubs and observed for 7 days post inoculation. PEDV infectivity was determined by the detection of PEDV ribonucleic acid (RNA) by reverse transcriptase polymerase chain reaction (RT-PCR) quantitation on rectal swabs collected from pigs 3 and 7 days after inoculation. The positive control pigs failed to become positive through swine bioassay; therefore, the results from this study are inconclusive and cannot be used to determine the effectiveness of either the AHP or CD disinfectants on inactivating PEDV in swine feces on concrete surfaces.