

## PEDv in the Literature

### Methods for Inactivating PEDV in Hog Trailers

Paul Thomas, L.A. Karkker, A. Ramirez, J. Zhang, J.S. Ellingson, D.J. Holtkamp

A part of this collection of studies was previously released by a National Pork Board update over 1 year ago and featured in an SHMP on 11/1/2013 which helped producers understand what time and temperature were required to inactivate PEDv in the presence of feces on a metal surface such as a trailer. On top of time and temperature, use of Stalosan F dry disinfectant, Accel peroxide disinfectant, and Synergize quaternary ammonium and aldehyde mixed disinfectant were also tested in the full collection for the ability to completely inactivate PEDv and prevent piglet infection. The Discussion section of the publication summarizes results nicely and is quoted below:

**“Discussion**

*These results suggest that it may be possible to inactivate PEDV in the presence of feces by heating trailers to 71°C for 10 minutes or by maintaining them at room temperature (20°C) for at least 7 days. No other combinations of time and temperature alone were shown to be effective at inactivating PEDV.*

*Additionally, it appears that Accel® disinfectant was effective at inactivating PEDV in the presence of both heavy (groups 10mL-1:16 and 10mL-1:32) and light (groups 5mL-1:16 and 5mL-1:32) fecal contamination. Accel® was also found to be effective at half the recommended rate (groups 5mL-1:32 and 10mL-1:32).*

*In contrast, the other disinfectant-only study (Study 2) demonstrated that Stalosan® F disinfectant powder alone did not inactivate PEDV in feces. This demonstrates the importance of evaluating proper disinfection choices for different applications. Disinfectants vary widely not only in their spectrum against pathogens, but in their physical properties as well. These properties include characteristics like liquid vs. powder and different foaming qualities. While the spectrum of activity is very important, these other properties are also important because they affect the application of the disinfectant and its ability to remain in contact with surfaces.*

*Study 4 demonstrates the value of a complete trailer sanitation protocol that includes a wash step, disinfection step, and a final heating step. In that study, all treatment groups were effective at inactivating PEDV to the point of preventing infection in 3-week old pigs. Furthermore, it is important to note that temperatures that were found to be ineffective under the conditions of Study 1 (63°C for 10 minutes, 54°C for 10 minutes, 38°C for 12 hours, 20°C for 24 hours) were effective following a wash and disinfection step.*

*The investigators do not propose that either a TADD-only or disinfectant-only approach to trailer sanitation is a preferred alternative to thoroughly washing, disinfecting, and drying trailers. Indeed, Study 4 demonstrated the value of including washing, disinfecting, and heating in a trailer sanitation protocol. Rather, this work demonstrates the value of possible alternatives when proper washing and disinfection cannot be accomplished as a means to reduce the risk of transmitting PEDV between groups of animals. This work also demonstrates that assumptions about temperature and time targets for TADD systems that are valid following washing and disinfection steps are not valid in the absence of those steps.”*



**Figure 1.** Elevated tubs used to house pigs for duration of the study. One tub was located in each room and each tub was split into quarters with one pig per quarter. Design of the tub prevented contact between pigs and movement of feces or other waste between tub quarters.

Another aspect of the study tested a method of separating bioassay groups within the same air space. It was shown that after 7 days, negative piglets housed separately without contact with an infected piglet in the same airspace (Figure 1) did not show signs of infection. This is a useful finding since a previous study using a higher number of infected piglets per group detected viable and infective PEDv aerosolized throughout the room. It’s possible that a small number of piglets within the same airspace can’t generate a short-distance aerosol like a larger group can or that increased stocking density increases probability of infective virus being deposited on surfaces and transmitted. Regardless, this publication presents a useful method of bioassay piglet housing separation for efficient replication of sample testing in a limited isolation space.

Paper found at [http://www.pork.org/wp-content/uploads/2014/05/pages-from-2014swinebooklet\\_final10-30-14-2-3.pdf](http://www.pork.org/wp-content/uploads/2014/05/pages-from-2014swinebooklet_final10-30-14-2-3.pdf)