



## Truck Wash Project Aims to End Bioinsecurity

By Geoff Geddes, for Swine Innovation Porc

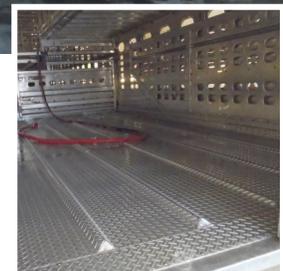
They say that "cleanliness is next to godliness", but for trailers hauling hundreds of hogs, it can be next to impossible. Since "dirty" and "diseased" often go hand in hand, science is targeting these trailers as part of the project "Improved Biosecurity in the Canadian Swine Transport Industry – Phase 3".

"Phase 1 of this research was sparked by the arrival of PEDv in Canada," said Dr. Terry Fonstad, P.Eng, P.Ag., Associate Dean - Research and Partnerships for the College of Engineering at the University of Saskatchewan, and lead investigator for the team. "It became clear early on that the trucking sector was a likely vector for disease transfer, so it was an obvious target in our efforts to enhance biosecurity."

Work completed in the first two phases of this project, combined with industry consultation, helped researchers identify several goals. Chief among them was determining the physical conditions under which pathogens like PEDv, and others that impact the pork sector, could be inactivated.

Though team members at the Vaccine and Infectious Disease Organization-International Vaccine Centre (VIDO-InterVac) found that dry heating of pathogens for 15 minutes at 70°C had the potential to inactivate most of them, the more resilient PEDv required even more intensive treatment: 65°C for 45 minutes, 75°C for 15 minutes or 80°C for one minute. The result was a recommendation that trailers need to reach a consistent temperature of 75°C for 20 minutes in all regions of the trailer.

Of course, heating a 16 metre livestock trailer for 20 minutes at 75°C can be a challenge for some facilities. As a result, researchers plan to test the air flow and heat transfer at several trailer cleaning facilities in Canada and assist them with design and operation to try and limit the energy required. Additionally, graduate students are working with Transport Genie



*Truck wash facility (above) and trailer floor after flood wash (right). Photos: PAMI*

in Guelph, ON to develop sensors and data acquisition to verify heating "in all regions of the trailer", as well as track trailer traceability.

The project's second objective was developing an automated cleaning system that would limit or eliminate the need for workers to enter trailers as part of the cleaning process. This may take the form of hydrovac technology borrowed from the construction industry, where a high-volume vacuum and pressure wash is used to maximize trailer cleanliness and minimize disease risks.

As part of this objective, research partners at the Prairie Agricultural Machinery Institute (PAMI) developed a manually operated system that would





allow one person to clean each level of a trailer using 250 litres of water and a high-volume vacuum.

"The longer-term goal is to develop a remotely controlled system that would allow complete cleaning of trailers without the need for human workers entering the trailer," said Dr. Fonstad.

For their third goal, team members at the Prairie Swine Centre in Saskatoon conducted a survey of trailers currently used in the swine transport industry. In the process, they documented the various trailer types, issues related to animal welfare and challenges around cleaning and disinfection.

Not surprisingly, they did find animal welfare issues arising - such as the challenge of navigating ramps - when trailers designed for cattle transport are used to ship pigs. The cleaning problems arose from hard to clean surfaces and corners, as evidenced by debris that remained in trailer crevasses after cleaning was completed.

As a result of the survey, the Prairie Swine Centre team members made a number of recommendations to enhance trailer biosecurity and comfort, ranging from minor modifications to existing trailers to new trailer designs that are tailored specifically to pigs.

"At this point, we have completed the initial proof of concept and investigation stage for these objectives," said Dr. Fonstad. "We are now working with companies at a pre-commercialization stage to design better trailers that may include sensors to verify traceability and pathogen control, and some interior enhancements."

Phase 4 will focus on full commercialization, where research gives way to construction of trailers and facilities that incorporate the project's findings. While the timing of phase 4 has yet to be determined, the overall project could not have come at a better time for industry.

"We're going to get a good handle on trailer design for the pork sector, and that's no small thing," said Dr.

Fonstad. "From a social license standpoint, we want to see pigs transported as humanely as possible. We already see transports with built-in water supplies and fans that will represent great strides in animal welfare."

While no one is calling PEDv a "blessing in disguise", it has served as an excellent learning tool for biosecurity on farm, and it's now informing research on trailers that will serve producers well going forward.

"We are so much better prepared now in the event of a foreign disease outbreak. There is greater confidence that we could contain it and stop it with a fraction of the damage caused by PEDv in the United States."

The next step is to share what they've learned with their colleagues around the world, extolling the virtues of heating trailers at higher temperatures and looking at alternative designs.

"It's great to see everyone on board and working together. From trailer manufacturers to regulators, we're all committed to enhancing animal welfare while bettering the food supply and the industry as a whole." 

#### For more information...

You may contact Dr. Terry Fonstad from the University of Saskatchewan at [terry.fonstad@usask.ca](mailto:terry.fonstad@usask.ca) if you would like to learn more about the work described in this article.

More information about the project *Improved biosecurity in the Canadian swine transport industry - Phase 3* may be found on our website:

[swineinnovationporc.ca/research-animal-health](http://swineinnovationporc.ca/research-animal-health)