



Improved biosecurity in the Canadian swine transport industry - Phase 3

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Why is this project important?

This project is the third phase of a study aimed at increasing biosecurity within the swine transport industry. The Canadian Health of Animals Act requires that all vehicles used to transport animals be “cleaned and disinfected” before crossing the United States (U.S.) - Canadian border. Both domestically and outside of Canada, the “cleaning and disinfection”, although thorough, was thought to be linked to instances of disease transfer. Additionally, the layout and headspace conditions within livestock trailers, although sufficient for swine, are not suited to humans needing to scrape and clean the trailer.

What did researchers do?

- Field verification of dry heating of pathogens through the heat mapping of trailers. Research has revealed that under laboratory conditions, PEDv (the most resilient of the pathogens tested) was inactivated when heated to 75C for 15 minutes. Other pathogens inactivated under these conditions included *S. suis*, APP, salmonella, *E. coli*, brachyspira, *M. hyopneumoniae*, PRRSV, swine influenza, PCV, rotavirus and TGEV.
- Development of a data acquisition system for swine transport trailers to record and transmit the temperatures in various locations within the trailers during heating. The system will also record and transmit trailer GPS location, temperature, and relative humidity in the animal spaces during transport. Trailer interior cleaning system automation, including the development of a sweeper bedding removal system, providing an option that industry stakeholders can keep at their site for extensive evaluation.
- Development of automated interior wash capabilities for an existing automated exterior trailer wash system to allow for automatic washing of the interior and exterior of trailers simultaneously.
- Development of design criteria for cleanability and welfare characteristics of pig transport trailers by the Prairie Swine Centre (PSC).

- The Vaccine and Infectious Disease Organization (VIDO) at the University of Saskatchewan (U of S) completed simulations of trailer heating using aluminum trailer pieces within controlled lab conditions on various viruses.
- Transport Genie sensors are currently being used by industry swine transport companies. The University of Saskatchewan has established a testing protocol and facilities to test these sensors for quality control.
- The Prairie Agricultural Machinery Institute (PAMI) has developed tools to aid in removal of bedding from livestock trailers.
- Truck Wash Technologies' exterior wash system is in use at Titan Trailers to acid wash trailers after manufacture to remove welding residue. Design drawings of an add-on interior wash system for swine transport trailers have also been developed.

What will be the benefit of this research?

This project has the potential to significantly improve biosecurity, traceability and animal welfare within the swine transport system.

The study could also enhance efficiencies in the pork value chain. Heating disinfection of trailers may allow the use of trailers immediately upon leaving the cleaning/heating facility. As well, verification of disinfection through temperature monitoring and traceability through GPS location records could improve biosecurity. Apart from enhancing animal welfare, this move will aid both trucking companies and packers, as each is responsible for the pigs once in their possession. Bedding removal with the sweeper and automated wash system have the potential to reduce both cleaning time and water use while improving working conditions for trailer cleaning staff.

Collaborators

Jennifer Brown Bernardo Predicala	Prairie Swine Center
Volker Gerdts	VIDO
Angie Hurst	Luckhart Transport
Jyrki Koro	Truck Wash Technologies
Mark Marianchuk	Prairie Agricultural Machinery Institute
Tom Patenaude	Blue Water Wash
Joel Sotomayor	Transport Genie

Project status

Completed in 2023.

Additional resources and information about this project

R&D Featured Articles by Swine Innovation Porc

- [The “Dirt” on Cleaner Trailers](#)
August 7, 2023
- [Truck Wash Project Aims to End BioINsecurity](#)
August 27, 2020

Farmscape interviews

- [Heat Disinfection Revolutionizes Transport Biosecurity](#)
June 22, 2021
- [Durability of Sensors Key in Tracking Biosecurity and and Animal Welfare Parameters](#)
June 7, 2021
- [Durable Temperatures and Humidity Sensors Key for Biosecurity and Animal Welfare](#)
August 17, 2020
- [Durability Key Factor in Development of Temperature and Humidity Sensors](#)
August 4, 2020
- [More Durable Swine Transport Trailer Sensors Ready for Testing](#)
July 22, 2020
- [Automated Swine Transport Trailer Disinfection Moving Closer to Commercialization](#)
November 18, 2019
- [Updated Transport Trailer Design Criteria Expected to Enhance Animal Welfare](#)
August 16, 2019
- [Simple Effectiveness Disease Risk Mitigation Strategies Critical to Maintaining Swine Health](#)
August 8, 2019
- [Research Demonstrates Pork Sector Commitment to Animal Welfare](#)
July 30, 2019
- [Scientists Identify Transport Trailer Design Criteria to Enhance Biosecurity](#)
July 25, 2019
- [New Sensors to Monitor Swine Welfare and Trailer Disinfection Expected by 2020](#)
July 18, 2019
- [Sensors Designed to Improve Animal Welfare During Transport Being Adapted for Biosecurity](#)
July 5, 2019
- [Automated Swine Transport Trailer Cleaning Offers Added Animal Welfare Benefits](#)
May 17, 2019

Additional resources

- Heck, A. (2019, Summer). Transport Genie, University of Saskatchewan research collaboration funded by Swine Innovation Porc. *Canadian Hog Journal*. p. 32.
<https://www.albertapork.com/wp-content/uploads/2019/09/Canadian-Hog-Journal-Summer-2019.pdf>
- Friesen, C. (2019, August 16). Updated transport trailer design criteria expected to enhance animal welfare. *mySteinbach*.
<https://www.mysteinbach.ca/news/4941/updated-transport-trailer-design-criteria-expected-to-enhance-animal-welfare>
- Better Pork. (2019) Transport Genie, University of Saskatchewan research collaboration funded by Swine Innovation Porc (SIP). *Better Pork*.
<https://www.farms.com/news/transport-genie-university-of-saskatchewan-research-collaboration-funded-by-swine-innovation-porc-sip-145875.aspx>

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