ASSESSMENT OF A MODIFIED LIVESTOCK PROTOTYPE TRAILER TO IMPROVE BIOSECURITY AND WELFARE DURING SWINE TRANSPORT

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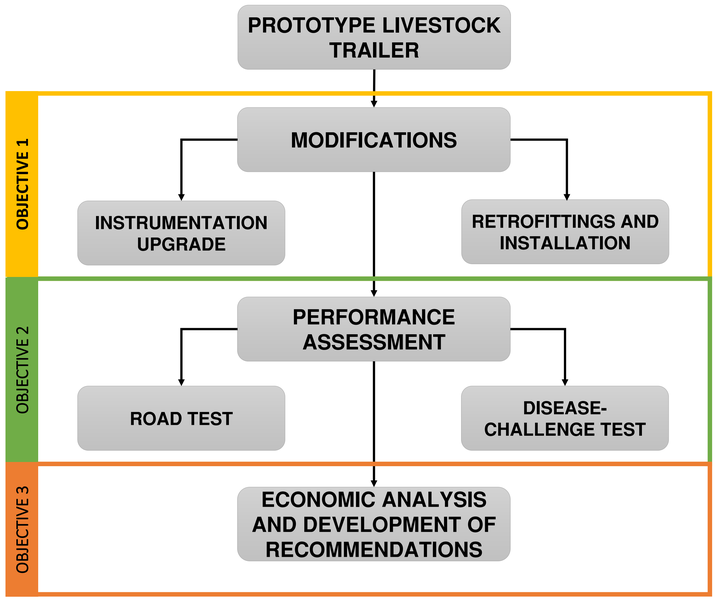
INTRODUCTION

- Swine farms can suffer devastating losses due to airborne diseases, thus barn air filtration systems are installed to protect the animals.
- Biosecurity risks exist when animals are taken out of the barn for transport.
- Current trailer designs need to be improved to provide enhanced animal welfare during transport.

OBJECTIVES

1. Enhance and optimize the current prototype trailer by installing new features in the trailer;
2. Assess the performance of the improved trailer through road, and disease-challenge tests, and
3. Conduct economic analysis and develop recommendations for commercialization

METHODOLOGY



ON-GOING ACTIVITIES

TRAILER MODIFICATIONS:

Based on findings and observations from previous project and inputs from various swine stakeholders, desired features such as misters, pig drinkers, emergency and inspection access, and permanent sensors and devices for real-time monitoring of thermal conditions were installed in the prototype.

Figure 1. Prototype livestock trailer

Figure 2. Animal compartment.

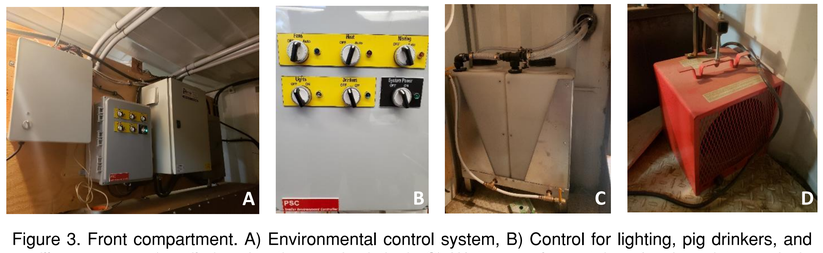
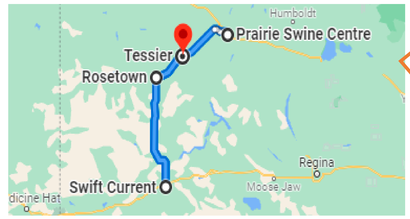


Figure 3. Front compartment. A) Environmental control system, B) Control for lighting, pig drinkers, and ancillary systems (ventilation, heating, and misting), C) Water supply container for the mister and pig drinkers, and D) Supplemental heater for the animal compartment.

PLANNED ACTIVITIES

ROAD TEST:

- Evaluation of the following parameters under summer and winter conditions:
  - ✓ Performance of installed ventilation, heating, and misting systems and functionality of sensors and devices to record real-time conditions inside the prototype trailer.
  - ✓ General welfare of the pigs during transport.



- A group of 40 weaned pigs (approx. 25-kg BW) will be transported in the trailer over a 5-hr trip.
- A total of 4 trips (n = 2 per season) will be conducted.

Figure 4. Planned route for the road test

DISEASE-CHALLENGE TEST:

- The trailer with 10 pigs inside will be exposed to exhaust air from an IAV-infected barn - with or without air filtration (Treatment vs. Control).

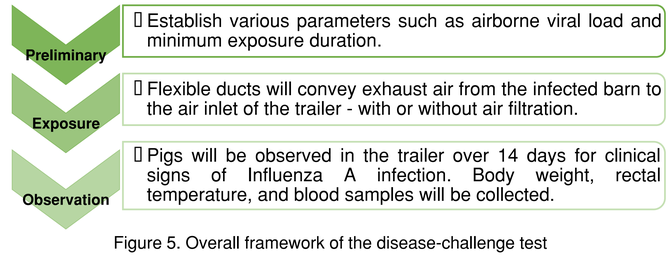


Figure 5. Overall framework of the disease-challenge test

INDUSTRY IMPLICATIONS

The improved air-filtered trailer can fill the biosecurity gap to mitigate the transmission of airborne pathogens during transport. New trailer design features incorporated in the trailer can help address critical issues with existing livestock trailers currently used in industry.

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