



AFRICAN SWINE FEVER

Develop tools required to minimize losses to the swine industry in the event of an African swine fever outbreak in North America

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Why is this project important?

African swine fever (ASF) is considered a global animal health priority. It is a contagious, fatal hemorrhagic fever characterized by high fever, dark red to purple discoloration of the skin, and severe mortality. The causative agent, ASF virus (ASFV), is a highly stable virus that can survive in the environment, pig carcasses and pork products for long periods. ASF can seriously affect local and international trade of live swine and pork products. Further complicating the issue, there are no globally accepted vaccines or effective treatments available for this disease.

Early detection of ASF is critical for effective disease control. The testing process usually requires samples to be shipped to a central laboratory, which delays the results needed for a rapid response. The ability to identify ASFV-infected animals on-site or in a regional laboratory that has limited technical capacity and/or infrastructure should help to eliminate these issues. To that end, the National Centre for Foreign Animal Disease (NCFAD) evaluated a portable hand-held real-time PCR machine that performs similarly to the complex, real-time PCR instruments used in the laboratory. This portable system has the ability to run up to nine samples at a time and takes only 30 minutes to complete the reaction. NCFAD successfully transferred the ASF real-time PCR assay validated and used at the NCFAD and in Canadian Animal Health Surveillance Network (CAHSN) laboratories to this new, portable instrument.

In the event that ASF enters the Canadian swine population, zoning and/or compartmentalization, combined with active surveillance, is critical to facilitate progressive elimination and eradication efforts, while maintaining pork exports from the unaffected areas. Unfortunately, active surveillance based on individual pig sampling is labour-intensive and costly, and therefore impractical during a large disease outbreak.

Pen-based oral fluid (rope) testing is a non-invasive alternative that requires significantly lower financial and human resources. Collection of the sample is simple and can be completed within 30 minutes. Oral fluid samples are already being used in North America as an effective sample type to assess the health status of swine herds for a number of endemic diseases. Therefore, oral fluid is an attractive surveillance sample for early detection of ASF.

What will be the benefit of this research?

The United States (U.S.) and Canada are two of the largest pork exporters in the world, with a high volume of movement of pigs across the border in both directions. Introduction of ASF into Canada or the U.S. would cost billions of dollars, impacting farmers and thousands of workers – directly and indirectly – due to trade restrictions applied after disease notification. Availability of highly sensitive portable diagnostic assays, and establishment of surveillance tools such as oral fluid testing, are critical to control and maintain trade between the U.S and Canada during a potential ASF outbreak.

What was done?

Scientists on the study identified multiple farms in Vietnam affected by ASF and collected whole blood samples from animals, including those that showed clinical signs of the virus and pigs that were perfectly healthy. The samples were tested with the portable PCR machine, and the results were similar to tests run on the same samples in a laboratory setting.

NCFAD received additional funds from the U.S. National Pork Board (NPB #19-194) and Swine Health Information Centre (SHIC). This money was used for evaluation of oral fluid for early detection of ASF in commercial size pig pens (NPB #19-194) and a field-validation of oral fluid for ASF detection in Vietnam (SHIC 20-015).

Collaborators

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Project status

Completed in 2021.

Additional resources & information about this project

R&D Featured Articles by Swine Innovation Porc

- [Science Works Feverishly to Diagnose ASF](#)
July 29, 2021

Farmscape interviews

- [Scientists Examine Alternative Sampling Methods for ASF Detection](#)
January 21, 2021
- [SIP African Swine Fever Conference Audio Special](#)
January 7, 2021

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This project is part of the Swine Cluster 3 (2018-2023) research program, made possible through financial support from Agriculture and Agri-Food Canada's Canadian Agricultural Partnership, eight provincial pork producer organizations and over 30 industry partners. [Click here to learn more about the financial partners for Swine Cluster 3.](#)