

SWINE HEALTH

Title: African swine fever surveillance using oral fluids for rapid detection and disease control” - **NPB #19-194**

Investigator: Dr. Aruna Ambagala

Institution: National Center for Foreign Animal Diseases (NCFAD),
Canadian Food Inspection Agency (CFIA)

Date Submitted: 2021-02-08

Scientific Abstract:

African swine fever is considered a global animal health priority. Introduction of African swine fever virus (ASFV) into North America would cause severe economic loss both directly and indirectly, as the USA is the world's third largest pig producer. To rapidly identify an ASFV incursion, a robust and effective surveillance program is critical.

Surveillance using individual pig sampling is labor-intensive and costly and therefore, impractical. Pen-based oral fluid (rope sampling) is a non-invasive alternative that requires significantly lower financial and human resources. In order to explore the practicality and efficacy of detecting ASFV in oral fluids in commercial settings, we have conducted four independent animal experiments. Experiments #1 and #2 had 24 and 25 pigs respectively and used the highly virulent ASFV Georgia 2007/1 strain. Experiments #3 and #4 had 20 pigs per pen and used the moderately virulent ASFV Malta' 78 strain. A randomly selected seeder pig from each group was infected intramuscularly with the respective ASFV strain and allowed back into the group. Aggregate oral fluid samples and oropharyngeal swabs were collected daily, and blood samples were collected every other day. ASFV genomic material was detected 3-5 days post introduction of the seeder pig into each pen. During this initial ASFV detection, the seeder was febrile, but this would be difficult to visually recognize in a pen by farm staff in an industry setting. ASFV genomic detection in oral fluids was possible at least 2 days prior to the seeder pigs being found dead. Following the death of the seeder pigs, it took about 3 days until mortality of contact pigs was observed. Although clinically un-apparent, ASFV genome was continuously detected in the oral fluids collected from these pens. Oropharyngeal swabs of contact pigs indicated the presence of ASFV around 3-5 dpi, prior to the contact pigs becoming viremic. By the time viremia was detected at 6-10 dpi, the contact pigs started showing fever, clinical signs and mortality. Oral fluid detection could be utilized for early detection so that affected pens could be identified, and infection would be controlled prior to spreading throughout the farm. According to the results of these experiments, it was evident that oral fluids could serve as an effective sample type to identify the introduction of ASF into commercial pig farms.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org
