Global African Swine Fever Research Alliance – Manila Philippines, Dec 5-7, 2023

About the Global African Swine Fever Research Alliance

The Global African Swine Fever Research Alliance (GARA) aims to build worldwide research partnerships to tackle African Swine Fever (ASF). Their goals include identifying research opportunities, conducting diverse studies on ASF, assessing its societal and economic effects, developing new tools for prevention and control, evaluating their impact, and acting as a hub for communication and technology sharing in the global ASF research community. GARA fosters a coordinated effort leading to the progressive control and eradication of ASF. One of their most recent scientific meetings, the 2023 GARA Gap Analysis Presentations took place in Manila, Philippines, on December 2023.

The meeting addressed ASF updates in Asia, country reports from Philippines, Vietnam, Thailand, and South Korea, state-of-the-art epidemiology, research supporting prevention and control, strategies for biosecurity regulation adoption, advancements in diagnostics, ASFV virology updates, vaccine developments, and live attenuated virus vaccine evaluation. The full proceedings can be found at: https://www.ars.usda.gov/gara/Phillipines2023.htm . Examples of the work presented are below.

Molecular Surveillance of ASFv in Raw Meat and Processed Pork Products in the Philippines

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African swine fever (ASF) is a hemorrhagic viral disease of domestic and wild pigs that causes almost 100% mortality. Although, the Philippines being an archipelago has a geographical advantage in terms of the risk of transmission of ASF, the disease has continuously spread throughout the country. The source of the ASF outbreak in the Philippines has been attributed to the feeding of leftover food scraps or “swill” to pigs and from frozen raw meat and other pork products. Detection of the virus in raw meat and processed pork products and the possibility of disease transmission have not been extensively studied in the Philippines. Therefore, we conducted a surveillance study and detected the presence of ASFv in raw pork meat and processed pork products from randomly selected wet markets in the Philippines. The study collected a total of 384 raw meat and 384 processed pork products from randomly selected municipalities of 21 provinces based on the current ASF zoning status of each province. DNA was extracted from the samples and qPCR assay was performed to amplify the presence of the ASFv VP72 gene, which encodes the major structural protein of ASFv. Out of 384 total raw meat samples collected, 39/384 (10.16%) samples were tested ASFv-positive using qPCR assay. On the other hand, out of 384 total processed pork products, 41/384 (10.68%) were ASF-positive. The results of this study revealed that ASFv is still present throughout the country and that there is a need to craft contingency plans on pre-slaughter inspection and testing before raw meats are used to make processed products and distributed into the markets.

Comparative evaluation of qPCR diagnostic tests for the detection of African swine fever virus DNA in oral swabs, swine oral fluids and whole blood

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Evaluation and validation of African swine fever (ASF) PCR tests is essential for reliable pathogen detection. Moreover, biological specimens should also be evaluated for “fit for purpose” when being considered for diagnostic testing. Our primary objective was to determine the relative sensitivity of ASF virus (ASFV) DNA detection in swine oral fluids (SOF), oral swabs (OS) and whole blood samples using the USA National Animal Health Laboratory Network (NAHLN) extraction protocol and ASFV qPCR assay. Four commercial ASF PCR assays were also evaluated: (i) IDEXX Real PCR ASFV DNA test; (ii) Ingenasa INgene qPPA; (iii) Applied Biosystems VetMAX ASF Detection Kit; and (iv) Indical Biosciences Virotype ASFV PCR kit. Experimental challenge trials using domestic swine were performed using genotype 2 ASFV to produce study samples. Pigs received either high (>300 HAD50/TCID50) or low (<200 HAD50/TCID50) dose ASFV. Samples were collected daily or every other day until clinical endpoints. OS samples were positive from 3-5 DPC, with positive rates ranging from 0-20% in the low-dose group to 100% in the high-dose group by 5 DPC. SOF samples from the low-dose pigs were positive at 5 DPC (50% of pigs), while 3 DPC SOF were negative. SOF samples from high-dose groups were weakly positive at 3 DPC (0-33%) and 5 DPC (66%). Nearly all OS and SOF samples (75-100%) from both groups were positive by 7 DPC, when pigs began to develop severe disease. A total of 364 blood, 158 SOF and 424 OS samples were tested using commercial PCR kits. High levels of sensitivity (>96%) and specificity (>98%) were found for all kits using whole blood. For OS samples, 2 of 4 kits had Se ~94% (Ingenasa and VetMax) and two had reduced Se of 88 and 83% (IDEXX and Indical, respectively); Sp was 98-100% for all kits. The Se for ASFV detection in SOF was lower for all commercial assays (92% Ingenasa, 87% VetMax, 85% IDEXX, 76% Indical); specificities ranged from 93-100%. The use of blood samples and any of the 5 PCR protocols evaluated in this study will most likely offer the most sensitive and rapid detection of ASFV in an outbreak situation. However, for surveillance purposes, blood, OS and SOF testingusing the commercial kits evaluated here may provide a suitable approach particularly when testing sick animals with high viremia and oral shedding of virus.