



Swine Health Information Center

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Newsletter
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OUR LATEST INFORMATION ON PROTECTION OF US SWINE HERD HEALTH

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New Research Defines ASFV Stability in Feed Held at Three Storage Temperatures

A new report in the journal *Transboundary and Emerging Diseases* entitled, "[Stability of African swine fever virus in feed during environmental storage](#)," details the length of time ASFV remains stable in feed at different storage temperatures. The robust study was conducted by a research team led by Dr. Megan Niederwerder, now Associate Director of the Swine Health Information Center.

"Previous estimates of ASFV stability in feed were based on fluctuating temperature and humidity conditions consistent with global trade," Niederwerder explained. "Novel data generated in the current study defines ASFV stability in feed at constant temperatures. This was an essential next step to guide holding-time recommendations for high-risk feed ingredients within feed mills and swine farms."

In the published study, the stability of ASFV Georgia 2007 was determined in three feed matrices, including complete feed, soybean meal, and ground corn cob particles. After ASFV contamination, feed matrices were held at three environmental temperatures (cool storage at 40°F, ambient storage at 68°F, and hot storage at 95°F) for up to 365 days. Feed samples were tested throughout the one-year period for ASFV

genome detection on PCR and ASFV infectivity on cell culture and in swine bioassay.

Results demonstrate high stability of ASFV DNA in feed, with detection by PCR in almost all feed matrices throughout the conclusion of each study, including 365 days after ASFV inoculation when stored at 40°F and 68°F. Infectious ASFV was most stable in soybean meal, with the virus maintaining infectivity as determined by swine bioassay for at least 112 days at 40°F, at least 21 days at 68°F, and at least seven days at 95°F.

Additionally, feed additives were tested for their ability to reduce ASFV infectivity in complete feed stored at three environmental temperatures (40°F, 68°F, 95°F). Both medium chain fatty acid and formaldehyde-based feed additives were confirmed to be effective mitigants in tested conditions.

Results help define the risk and mitigation of ASFV introduction through feed, confirms thermal sensitivity of ASFV in feed, and underscores the stabilizing environment of soybean meal. Providing the most comprehensive data on ASFV longevity in plant-based feed to date, this study confirms ASFV DNA can be detected in feed at least one year after contamination. Further, swine bioassays demonstrate that infectious ASFV can be present in soybean meal for several weeks after testing negative on cell culture.

“Minimum holding time recommendations were generated in this research for three environments, providing producers and feed mills key guidance to reduce ASFV risk in feed,” Niederwerder concludes. “Feed biosecurity should be considered a fundamental part of all swine biosecurity plans. This foundational study furthers our goals toward ASFV prevention and protection of US swine herd health.”

Research was supported by funding from the National Pork Board and the Foundation for Food and Agriculture Research, the State of Kansas National Bio and Agro-defense Facility Fund, Purina Animal Nutrition, Cargill Animal Nutrition, and Kemin Industries.

Pen-side ASFV Testing Evaluated in SHIC-Funded Study in Vietnam

Rapid and reliable detection of African swine fever virus infected pigs is critical for successful control. One desirable property of a diagnostic test is the capacity to detect viral infection, especially during the incubation time, even before the infected animals may be displaying clinical signs. In this SHIC study conducted in Vietnam using funds from a USDA-Foreign Ag Service grant, three pen-side tests for ASFV detection were evaluated - one PCR test for detection of viral genomic DNA and two lateral flow tests for detection of viral antigens. Results show the PCR pen-side test performed better than the other two options.

The first objective of the study, directed by Dr. Hiep Vu, University of Nebraska-Lincoln, was to determine the time from infection to the earliest detection. Ten pigs were experimentally infected with an ASFV strain circulating in Vietnam. Whole blood and oral swab samples were alternatively collected from five pigs every other day post-infection (dpi) and tested with the three pen-side assays. The pen-side PCR test detected infected pigs starting at 2 dpi when using whole blood and at 3 dpi when using oral swabs. It consistently continued to detect infection until the end of the study (10 dpi).

Using whole blood, the antigen test identified infected pigs starting from 3 dpi but no longer detected infection at 10 dpi. The antigen test did not work well when using oral swabs. Compared with the reference laboratory real-time PCR test, the pen-side PCR test

exhibited 97.8% sensitivity and 100% specificity. The lateral flow antigen tests had 100% specificity but only 47.8% sensitivity, mainly because of failure to detect virus from samples collected early or late after infection.

The second study objective was to evaluate the diagnostic performance of the tests using samples collected from the field. Whole blood and oral swabs were collected from 205 pigs with 34 positive pigs and 171 negative pigs identified by the reference laboratory real-time PCR. All of the pen-side tests had 100% specificity, regardless of the sample types tested. The sensitivity of the pen-side PCR test was 88.2% and 70.4%, respectively when testing whole blood and oral swab samples. However the sensitivity of the antigen tests when using whole blood or oral swab samples was only 50% and 11.11%, respectively.

In summary, results of this study show the PCR pen-side test performed better than the lateral flow antigen tests as it can detect infected pigs earlier and for a longer duration after infection. Additionally, the pen-side PCR test was able to detect virus in both whole blood and oral swab samples while the antigen test found virus only in whole blood.

SHIC Talk Podcast Offers ASF Update with AASV, NPB, NPPC

In the latest edition of SHIC Talk, SHIC Associate Director Dr. Megan Niederwerder is joined by NPPC Consultant Dr. Liz Wagstrom, AASV Executive Director Dr. Harry Snelson, and NPB Assistant Chief Veterinarian Dr. Patrick Webb, along with host Barbara Campbell Determan, to share an update on African swine fever. SHIC Talk, the podcast produced by the Swine Health Information Center, is available on the Center’s website and most podcast sources. It brings industry experts together to share their knowledge and pertinent information regarding swine health.

Representatives of these industry organizations last shared an ASF update on [SHIC Talk](#) in May 2021. Over the last 15 months, the disease continued to spread to new regions in Europe and Asia then was detected on the island of Hispaniola in the western hemisphere. Exactly one year ago, the first case of ASF was identified in the Dominican Republic and

soon thereafter in Haiti. Dr. Niederwerder pointed to the SHIC [Disease Monitoring Reports](#) as a resource for global ASF awareness, highlighting the first official reports of ASF detection in Thailand and mainland Italy occurring in January 2022.

Significant progress in preparedness and prevention has been made in the US since May 2021, including the creation of an Industry ASF Strategy Work Group by [NPB](#) and [NPPC's](#) Boards of Directors to unify ASF preparation and response efforts. This group developed priorities for a national ASF strategy which includes [AASV](#), [SHIC](#), and other allied industry groups. Dr. Wagstrom reviewed the six main priorities during the podcast.

Additionally, significant efforts have been made to identify gaps in response capabilities and develop strategies and resources to address those gaps. Dr. Snelson pointed to the shortage in resources and personnel in the industry for an ASF response effort and shared information on the [Certified Swine Sample Collector](#) program now in the pilot phase of development. Goals include increasing the number of trained personnel proficient at sample collection in the event of an ASF outbreak.

Dr. Webb offered information on [AgView](#) database dashboard technology where producers and state animal health officials are creating accounts which will enable them to communicate rapidly in the event of a FAD investigation or outbreak. Contributing to US preparedness is the continued increase in the number of AgView accounts and adoption of this contact-tracing technology.

While awareness of ASF has risen in the US pork industry, there are areas where further work is needed. SHIC Talk participants said the US pork industry should be doing more FAD investigations and laboratory surveillance to increase our likelihood of early and rapid detection should ASF be introduced. Continued focus on farm biosecurity is necessary, including applying sow/breeding farm practices to grow-finish sites where vulnerabilities have been exposed. Interest remains high regarding feed biosecurity and how to mitigate those risks on the farm. Recognizing ASF may not always present with high death loss is important as a broad spectrum of clinical signs have been reported in the Dominican Republic. Broadening our testing protocols by using

additional sample types would benefit surveillance capacity.

As the participants in the podcast concluded their remarks, each shared a take home message for the US pork industry.

- Create an AgView account for movement tracking and rapid communication
- Establish a relationship with your state animal health official and USDA area veterinarian in charge
- If you see something, say something: report abnormal clinical signs in your herd
- Emphasize biosecurity as a priority day in and day out to personnel on your site

SWINE DISEASE MONITORING REPORTS

As the world deals with the COVID-19 pandemic, SHIC continues to focus efforts on prevention, preparedness, and response to novel and emerging swine disease for the benefit of US swine health.

DOMESTIC

This month's Domestic Swine Disease Monitoring Report reveals a within-expected RT-PCR detection for PRRSV for July. However, PRRSV detection in three states (Nebraska, Missouri, and Indiana) remains above state-specific baseline levels, with RFLP 1-4-4 L1C variant being predominantly detected in two of the three states (Nebraska and Missouri). Also, a non-expected increase of respiratory agents activity in the summer, such as a moderate increase in Influenza A virus in the RT-PCR positive detection in the wean-to-market category, and overall increased positive PCR detection for *Mycoplasma hyopneumoniae* is noted.

In the podcast, the SDRS hosts talk with Dr. Marcelo Almeida, clinical assistant professor at Iowa State University and diagnostician at ISU-VDL, about post-weaning colibacillosis, APP outbreak investigation, and the importance of population-based samples for disease monitoring.

[VIEW REPORT](#)

GLOBAL

In this month's Global Swine Disease Monitoring report, read about increased ASF concern in the UK. Due to new long-distance jumps of ASF across Europe, the UK has raised concern and increased ASF risk status of introducing the virus through a human-mediated route from medium to high. Since January, more than 4000 kilos of pork have been seized at Las Americas International Airport in the Dominican Republic. FMD in Indonesia is raising regional concern due to the fast spread of the disease in the archipelago. And Australia remains on high alert with increased vigilance as FMD viral fragments are detected in meat products.

[VIEW REPORT](#)