



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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### USDA Grant Expands SHIC-Initiated Swine Disease Reporting System

After pioneering a SHIC-funded system to improve swine health by reporting pathogen test results from public veterinary diagnostic laboratories across the Midwest, a team led by faculty from Iowa State University's College of Veterinary Medicine has plans to glean even more insight from the vast data set. A new three-year, \$1 million grant from the USDA's National Institute of Food and Agriculture has been awarded to enable the Swine Disease Reporting System team and collaborators expand how this data is utilized to inform disease trends and improve swine health.

With a grant from SHIC, the SDRS was founded six years ago by Dr. Daniel Linhares, Iowa State University College of Veterinary Medicine. The goal was to compile and analyze testing data from veterinary diagnostic labs to detect disease trends as they emerged, providing producers with an early warning system to prompt preventative responses such as increasing monitoring and heightening biosecurity measures.

"It gives producers, practitioners and other stakeholders timely information about regional disease movement and risk that helps them manage the health of their own herds," SHIC Executive Director Dr. Paul Sundberg said.

With nearly 73 million hogs in the US, the testing data collected by SDRS is substantial – more than 530,000 individual results in 2022, per Dr. Giovanni Trevisan, Iowa State University College of Veterinary Medicine. "With the grant, we're going to dive deeper into the data to provide even more value to producers," said Trevisan, project director for the NIFA award.

The NIFA funding will support advanced genetic analysis to identify new variations of pathogens as they develop, leveraging what Trevisan said is one of the largest known private collections of genetic disease data. That will provide even earlier warnings about new swine health risks.

"We're going to continue to see new strains, we just don't know where or when. We want to be ahead of it whenever the next one comes," Dr. Linhares said.

Trevisan said expanded data analysis also will help determine if there are geographic areas where SDRS should seek more information. And there may be other novel uses for the data set. Part of the grant involves educating veterinary medicine students and graduate students in other fields on SDRS's trove of testing results, encouraging them to use it for conducting data-driven research or improving on-farm decision-making.

"We want to take the knowledge we've been building since 2017 and transfer it to students to help society," Trevisan said.

The grant also will fine-tune how the disease trend data is shared with producers. SDRS experts will meet with hog farmers and other industry partners to study possible improvements in how the information is communicated. “It’s a two-way road. It’s not just us downloading information to producers and industry stakeholders. We want their feedback,” Dr. Linhares said.

The initiative started with the labs at Iowa State and the University of Minnesota, collecting testing data for one pathogen. Now the consortium has five members – including the state-run lab in Ohio and labs at South Dakota State University and Kansas State University – and tracks seven pathogens, with breakdowns by location, age, farm type and specimen type. The anonymized data is designed for spotting macrotrends and can’t be tracked back to particular producers or labs.

“The SDRS provides that foundational data to educate the industry about pathogen activity in swine populations,” Dr. Linhares said. “For the first time, it’s systematic and reported widely. It’s really a matter of knowing what’s out there and understanding that you’re not in the dark.”

Data and analysis are shared monthly in an online dashboard and a podcast hosted by Drs. Linhares and Trevisan. SHIC, a pork checkoff-funded industry organization charged with monitoring swine diseases, provides SDRS with ongoing operational funding and publishes a monthly report and newsletter including the data. Dr. Sundberg said the five SDRS labs handle at least 96% of U.S. swine diagnostic testing, making their aggregated data of great interest to the industry.

Media contact: Barbara Campbell Determan, [barb@teamhmg.com](mailto:barb@teamhmg.com), 515-249-8460

## **SHIC-Funded Study Discovers First Association Between Astrovirus and Respiratory Pathology in Pigs**

A study funded by the Swine Health Information Center and conducted by Drs. Michael Rahe and Rachel Derscheid of the Iowa State University Veterinary Diagnostic Lab is the first to report astrovirus being associated with respiratory pathology in pigs. In their work, “Direct detection

of porcine epitheliotropic viruses: porcine astrovirus 4, porcine hemagglutinating encephalomyelitis, and porcine parainfluenza virus in clinical cases of undiagnosed respiratory disease,” the researchers report PoAstV4 was detected in lesions consistent with viral respiratory infection in 73% of pigs tested.

Astroviruses affect mammals and birds with infection typically resulting in gastroenteritis, neurologic disease, or asymptomatic infection. PoAstV4 has been detected in the upper respiratory tract of pigs with clinical respiratory disease but until Drs. Rahe and Derscheid’s study, recently published in *Transboundary and Emerging Diseases*, an association of the virus with respiratory pathology had not been demonstrated.

Researchers noted a 2016 paper that described the use of next generation sequencing for the detection of PoAstV4 in nasal swabs from young pigs with clinical respiratory disease. But it was not until recent diagnostic efforts at the ISU VDL that PoAstV4 was also found in the lungs of young pigs with diagnosed bronchitis and/or tracheitis. Due to the possibility of PoAstV4 contaminating lung tissue during necropsy or sample collection, simply finding the virus via PCR or NGS did not confirm it was the cause of the clinical disease.

Drs. Rahe and Derscheid’s study sought to answer the question of disease association by investigating if PoAstV4 could be detected within the microscopic lesions of diseased respiratory tissues. The diagnostic technique used detected PoAstV4, porcine hemagglutinating encephalomyelitis virus, and porcine parainfluenza virus in 117 influenza-negative bronchitis and/or tracheitis cases in young pigs.

Results of the study showed PoAstV4 was detected in microscopic lesions from approximately 73% (85 of 117) of the cases. Porcine hemagglutinating encephalomyelitis virus was found in six of the 117 (5%) cases and porcine parainfluenza virus was found in five (4%).

While these results do not prove that PoAstV4 is a cause of respiratory disease in pigs, the researchers say it provides strong evidence it may be a significant contributor to porcine respiratory disease complex. The next step will be to determine if a purified

sample of the virus causes bronchitis and coughing in challenged pigs.

## **Regional Disease Warning Tool Results from SHIC Funding**

A SHIC-funded effort aimed at increasing swine disease awareness, prevention, and preparedness, The Early Regional Occurrence Warning project, was launched by Drs. Xiaomei Yue and Mariana Kikuti with the Morrison Swine Health Monitoring Project in September 2022. On May 9, 2023, the first TEROW report was sent to participants and will be released weekly. Through the TEROW report, participants are notified if a swine disease is occurring in the region surrounding their sites and are alerted if regional disease occurrence is increasing. MSHMP's primary mission, capturing and analyzing swine health data on a weekly basis from participating farms, makes TEROW possible. TEROW remains open for participation. Producers and practitioners who would like to better understand regional disease occurrence are encouraged to contact MSHMP by emailing Dr. Cesar Corzo at [corzo@umn.edu](mailto:corzo@umn.edu) to learn more about enrollment.

The MSHMP team began program development by 1) calculating the distance between the TEROW participating site(s) and neighboring site(s) recently reporting a PRRS outbreak on a weekly basis; 2) automating the generation of a reporting radius that balances the epidemiological relevance and confidentiality, enabling timely disease prevention measures while preserving confidentiality; and 3) automating the generation and delivery of individualized reports to specific participant email addresses, reducing manual errors.

In March and April 2023, the MSHMP team engaged with TEROW participants individually to assess program development progress, asking whether they agreed with the report outline and content. This process resulted in discussions regarding the reporting radius, site information listed, obtaining feedback, and any concerns participants raised ahead of the first TEROW report distribution in May.

Whether an endemic or emerging disease, the goal is to quickly report regional status to participating producers, allowing them to enhance diagnostic and clinical monitoring, together with ensuring biosecurity

protocols, to protect their herds. Enrollment in TEROW for MSHMP participants is dependent solely on signing a specific project agreement and no additional data is required as the project uses data already collected through MSHMP.

# 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 brings new PCV2 charts demonstrating changes in submissions' average Ct values by specimen and region, enhancing the SDRS monitoring capability for PCV2. Also, the report brings information about the PRRSV L1C variant scenario, with Iowa having the higher number of detections (76) and the continuous detection in eastern states (Ohio, Illinois, and Indiana) in May. For enteric coronaviruses, PEDV continued to have positivity above the expected in South Dakota, Nebraska, Missouri, and North Carolina. On the other hand, PDCoV positivity is back within expected level after two months of increased activity. Mycoplasma hyopneumoniae had a substantial increase in the percentage of positive submissions from the wean-to-market category. Lastly, Influenza A virus had an increased percentage of positive submissions in all age categories. In the podcast, SDRS hosts talk with Dr. Pablo Pineyro about PCV2 monitoring strategies, porcine circovirus associated disease (PCVAD) in vaccinated herds, and PCV2 genotyping.

[VIEW REPORT](#)

## GLOBAL

In this month's report, read about an extensive African swine fever outbreak reported occurring on a Russian commercial farm with over 100,000 animals. Veterinary authorities there reported feed contaminated with ASF as the plausible source of infection. Learn about a new long-distance jump of ASF in Italy to a previously free area almost 500 miles from the nearest affected area. In South Korea, after over four years, 11 new outbreaks of foot-and-mouth disease have been reported south of Seoul. According to EFSA's latest report, the number of ASF outbreaks in domestic pigs decreased by 79% across Europe in 2022 compared to the previous year. Information on ASF vaccines are included as well.

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