



Swine Health Information Center 2020 Plan of Work

Swine Disease Matrices

- Review and, when necessary, revise the Swine Viral Disease Matrix and the Swine Bacterial Disease Matrix.
 - The Monitoring and Analysis Working Group will review and revise the viral and bacterial matrices as needed.
- Use Swine Viral Disease Matrix research to enhance swine disease diagnostic capabilities.
 - Continue PCR and ELISA development for selected viruses in the Swine Viral Disease Matrix.
 - Thirty-three Swine Viral Disease Matrix pathogens have new or updated PCRs from SHIC-funded 2016 or USDA support. Six pathogens have ELISAs finished and added to the SHIC diagnostic tools catalog. As new information or emerging pathogens are discovered, through SHIC's surveillance and discovery plans or other means, there may be a need to continue to support improving diagnostic capabilities.
 - Consider diagnostic sensitivity and specificity validation for prioritized viruses in the Swine Viral Disease Matrix.
 - Matrix research thus far has been with a goal of validation to “fit for purpose”, which ensured performance under laboratory conditions. For these tests to be operational in the face of an outbreak, they may also need to be validated for sensitivity and specificity using clinical samples and tissues. Diagnostic sensitivity and specificity validation could be considered and may need to be funded for specific tests in 2020.

Monitor and Mitigate Risks to Swine Health

- Identify swine disease risks by international monitoring.
 - Enhance the Global Disease Monitoring Report to improve understanding of disease status in countries around the world.
 - Currently, the Global Disease Monitoring Report relies primarily on official sources of information about country-specific disease status. During the first half of 2020, a pilot project will explore an expanded international veterinary diagnostic lab network that will provide standardized disease reporting from other countries.
 - There are multiple organizations and companies monitoring diseases around the world and their information will be compiled into one, informative format.
 - A panel of individuals with international disease experience will be formed and asked for their input and analysis of unofficial perspectives about disease reports

- from other countries. There will be a focus on Asia/SE Asia for disease status and movement information as that region seeks to rebuild their herd.
- Foster information sharing with government and allied industry international contacts through international animal health organizations and meetings.
 - Understanding the origin and progression of emerging, re-emerging, and novel infectious diseases is critically important to preventing epidemic and pandemic outbreaks. The International Organization for Animal Health (OIE) and Food and Agricultural Organization of the United Nations (FAO) facilitate international health information sharing and build and maintain databases of emerging diseases of member countries. Interacting with these entities and other swine disease centered programs could provide lessons for the U.S. pork industry about monitoring, analysis, preparedness and response for emerging diseases.
 - Improve farm biosecurity.
 - Better understand transmission pathways to improve transport biosecurity related to markets and first points of concentration.
 - Pathogen transfer back to the farm from first points of concentration continues to challenge producer opportunity for profit and will risk emerging or foreign animal disease control. Innovative, cost-effective solutions to minimize this transfer will be studied.
 - The Morrison Swine Health Monitoring Project could be an opportunity to leverage the willingness to share swine health information to be able to evaluate transportation biosecurity opportunities.
 - Packers, market sow points of concentration and renderers will be engaged to explore practical solutions to aid in preventing pathogen transfer back to the farm.
 - Investigate biosecurity procedures to mitigate disease risk.
 - Experience during disease outbreaks questions if seasonality may be as large of a risk factor as previously thought. Risk of other routine farm practices, such as manure pit emptying, may be a higher risk for disease outbreaks but are masked by seasonality because the practices are associated with seasons.
 - Investigate the ability of common inputs to production to act as biologic or mechanical vectors for disease introduction onto farms.
 - Decrease the potential for pathogen transmission via feed.
 - USDA and FDA consider pathogen transport via imported feed products to be an unlikely risk because of limited objective information. Data and information will be gathered to support an objective risk assessment. Examples could include pathogen survivability during transport through a demonstration project and better understanding the survivability of pathogens while being subjected to different soy extraction or extrusion processes.
 - If contaminated feed component products are imported, those pathogens are likely to be spread within the country during feed processing. Understanding how pathogens are distributed in the mill and cost-effective procedures to prevent distribution or disinfect the facilities will be investigated.
 - Investigate common inputs other than feed for potential roles of pathogen introduction
 - Common inputs such as vaccines, breeding supplies and others could be a source of pathogen introduction to farms. Selected inputs will be investigated to identify if they could be biosecurity risks.
 - In coordination with other industry organizations, help to fill in the gaps of research and information needed to prevent, prepare and respond to foreign animal or emerging diseases.

- African Swine Fever will continue to be a monitoring priority in 2020 with the objective of using the information to protect the US industry from its introduction. In conjunction with the other pork industry associations, SHIC will continue to facilitate and advocate for effective national biosecurity policy and programs.
- Efforts to strengthen national biosecurity and protect the US industry from foreign, transboundary diseases like African Swine Fever have highlighted the diverse but interdependent components of national biosecurity. Border protection, pig and sow movements, first points of concentration for pigs and sows, feed safety, vaccine and other common inputs, state and federal movement and health regulations and others are all pieces of US national pork industry biosecurity. With finite resources, there needs to be focus on ensuring effectiveness of the highest priorities first. A comprehensive review of national biosecurity is needed to identify and prioritize those components. The results will inform industry, state and federal programs and funding decisions
- SHIC will coordinate with other industry associations to effectively communicate consumer messaging and producer actionables in the event of a transboundary, foreign animal disease.
- In 2019 SHIC received USDA Foreign Ag Service support for “Building capacity to support the control of African Swine Fever (ASF) in Vietnam”, a project to inform Vietnamese producers and veterinarians about ASF control and to learn the on-farm lessons about ASF epidemiology and control that would be needed if ASF enters the US.
 - Consideration will be given to leveraging the oral fluids ASF PCR Vietnam project to evaluate ASF ELISA development.

Improve Swine Health Information

- Update the SHIC Swine Disease Fact Sheets.
 - The 34 Swine Disease Fact Sheets that are currently available are the second most accessed information on the SHIC website. They were authored in 2015 and may need to be updated to ensure that they include the latest research and information available.
- Develop the industry capacity for detection of emerging disease, rapid response and continuity of business.
 - The Morrison Swine Health Monitoring Project (MSHMP) will help to identify industry needs through the input from the project’s participants and other sources. New efforts will be made to make the shared information more actionable, for example by the development of PRRS strain analysis or regional heat maps that will enable timely visualization of disease movement or evolution. Specific analysis projects using MSHMP data will be supported to return value to the participants and encourage more producers to cooperate with the project. That value to participants will also translate to value for all pork producers.
- Make industry swine health information available to help identify, communicate and mitigate regional and national risks to herd health.
 - Pork industry press provides information about swine health advancements and technologies. For example, novel approaches to ASF vaccine development will continue to be of high interest in 2020. A panel, or other method to review popular press articles, will evaluate the content and make comments will help to provide context and analysis to the industry.
 - Veterinarians are challenged with new technologies identifying agents either causing or associated with disease for which information about management or control might be limited. Sharing experiences and management options will foster communication and

- inform discussion about management. Four to six current topic webinars, using the model of the 2019 myelitis management webinar, will be offered. The objective is to “keep pace with industry chatter” about health challenges. Strep equi ss zooepidemicus, rotavirus, Strep suis, and Brachyspira are examples of possible topics.
- The Swine Disease Reporting System (SDRS) takes advantage of the willingness of the major veterinary diagnostic laboratories to share information and the SHIC-supported infrastructure to enable it. The SDRS will explore ways to become more helpful and informative.
 - Advisory member feedback regarding possible improvements or enhancements to SDRS will be gathered through periodic meetings and/or conference calls. The objective will be to make the SDRS a source of more timely and actionable information for the industry. Examples for discussion could be enhancing PRRS sequence monitoring, comparison and analysis; developing regional heat mapping for quick visualization of disease status and movement; supporting data analysis projects to investigate pathways of disease transmission; using diagnostic and production data analysis to measure the economic impact of controlling emerging or endemic disease; and transitioning the SDRS onto a sustainable platform to enable continued automation of the program.
 - SHIC supported reported and messaging diagnostic test results has been completed. The next need is to use the results of the project to transition the SDRS to an automatic, sustainable platform. A pilot project will automate cleaning and handling of data and give the veterinary diagnostic laboratories the ability to quickly and easily query and search SDRS data.
 - Facilitate swine health programs and information sharing
 - State associations and regional producer collaborators will be convened to encourage program coordination and information sharing to enhance regional cooperation and swine health.

Surveillance and Discovery of Emerging Disease

- Investigate newly identified agents associated with disease.
 - Understand the clinical relevance and epidemiology of novel viruses in the Swine Viral Disease Matrix.
 - The veterinary diagnostic labs find novel viruses in the Swine Viral Disease Matrix being associated with clinical disease syndromes. Better understanding these agents’ epidemiology and pathogenicity are important to identifying if they have a role in clinical disease.
 - Porcine circovirus (PCV) strains continue to present a challenge. A standardized case definition for PCV3 needs to be agreed upon, pathogenicity needs to be further analyzed and processing fluids or other ways to monitor associations with clinical disease need to be studied. In addition, identification of a novel PCV4 will call for adequate diagnostics to ensure the ability to detect and evaluate the potential introduction into the US.
- Ensure detection of emerging disease to facilitate rapid response.
 - Offer diagnostic fee support to help detect emerging diseases.
 - There continues to be incidents of high morbidity/high mortality where an etiology is either not identified or there is a strong supposition that the identified pathogen is not the likely cause of the outbreak. In these cases, there is a need for further

- diagnostic workup. Support for these follow up diagnostic workups will come after producers have funded the initial diagnostics. This work will help ensure that an emerging disease is quickly and accurately identified for action by the industry's emerging disease response plan.
- Find improvements that can be made toward a nationally coordinated swine health surveillance system to prepare, detect and rapidly respond to emerging and regulatory foreign animal diseases.
 - Veterinary diagnostic laboratories submissions need to be characterized to understand the messaging and incentive needed for accurate information to accompany tissues. For example, identifying the reason for inaccurate premises identification numbers will facilitate quick and effective response to an emerging or transboundary, foreign animal disease outbreak.
 - Building on previous SHIC support for investigating spatially balanced surveillance models, the next step is to evaluate the application of spatially balanced surveillance using contemporary or the next generation of surveillance sampling.

Responding to Emerging Disease

- Identify high risk events likely to be responsible for introducing emerging diseases onto farms.
 - Refine and enhance the Rapid Response Corps program
 - A Rapid Response Corps program for investigating incidents of emerging disease was completed in 2017. To make it as responsive and efficient as possible continued management is needed.
 - Continued program management and survey of Rapid Response Team candidates to confirm continued willingness to participate.
 - An exercise will be conducted to ensure rapid response teams have the core competencies needed to implement the program in the event of a disease outbreak.
 - Rapid Response Team investigations will be supported, if requested by producers.
- Help producers and veterinarians respond to and manage newly emerging diseases.
 - Quickly research pathogens causing emerging disease outbreaks.
 - An industry-accepted definition of “emerging disease” to help justify spending finite funds on a disease outbreak or investigation continues to be needed.
 - Senecavirus A (Seneca Valley Virus) was the first opportunity for SHIC to rapidly respond to an emerging disease with research according to high priority industry needs. There is no predicting when or where the next emerging disease will appear. SHIC needs to be prepared with funds in place that can be quickly mobilized to support filling the immediate research gaps following introduction. This research will provide producers and their veterinarians with critical information that they will need to effectively respond to the disease outbreak.
 - Support a rapid, unified industry response to emerging disease outbreaks.
 - Working with the National Pork Board, National Pork Producers Council and American Association of Swine Veterinarians, continue to facilitate a coordinated, industry-wide emerging disease response through the National Swine Disease Council.