Swine Health Information Center

2019 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. Thirteen pathogens have oral fluid ELISAs being developed using 2017 and 2018 SHIC support. 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 2019.
    - Ensure effective SHIC-funded Matrices diagnostic tools are available to the veterinary diagnostic laboratories.
        - Prioritized SHIC-funded diagnostic tools and resources enabling their implementation need to be available to veterinary diagnostic laboratories. A catalog of SHIC-funded PCR tests was distributed to the veterinary diagnostic labs in 2018. In 2019, the catalog will be updated to include SHIC-funded ELISA tests.

Monitor and Mitigate Risks to Swine Health

- Identify swine disease risks by international monitoring.
    - Continue and enhance foreign disease monitoring and reporting.

        - A formal program for monitoring disease status and circulation around the world began in 2017. Reporting about swine diseases circulating in other countries help support prevention and preparedness. Reporting on the 2018 African Swine Fever outbreak in China is one example but FMD, CSF and PRV continue to circulate, as well. Expanding the monthly reporting to biweekly, if needed and appropriate, will be implemented. Additional information about non-regulatory, transboundary production diseases will be included in reports. USDA collaboration will be solicited.
    - Use international contacts to survey for on-the-ground foreign disease information.
        - Expertise and experience with foreign, transboundary diseases already lies with veterinarian and other professionals that work or consult internationally. Also, members of the Monitoring and Analysis Working Group have international contacts. Surveying these groups for emerging diseases or health challenges can help to inform the prioritization of the Swine Viral and Bacterial Disease Matrices and enhance the foreign disease monitoring reporting.
    - 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 points of concentration.
        - Identify and validate cost-effective biosecurity procedures at the truck and finishing site interface to help prevent pathogen introduction during sequential marketings at closeout.
        - There is no industry benchmark of transport biosecurity practices after trucks leave market sites. Establishing this industry benchmark may help identify the most effective biosecurity practices to emphasize, inform benchmarking and enable measuring progress.
    - Investigate biosecurity procedures to mitigate disease risk. Projects are yet to be determined but some proposed examples might be:
        - 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.
        - Validate streamlined PRRS biosecurity recommendations. A 2018 data analysis project identified a prioritized list of PRRS biosecurity practices. The list needs to be validated by comparison between farms implementing and farms not implementing it.
        - Validate UV exposure standards for use during product introduction onto farms.
- 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.

        - Completed proof-of-concept research has identified higher potential risk virus by feed component combinations. Research to test feed additives for their ability to reduce virus load in feeds is underway. The results of this research will be brought to the farm to test under farm feeding conditions.
        - USDA and FDA consider pathogen transport via imported feed products to be an unlikely risk because there is little objective information about it. Data and information will be gathered to support an objective risk assessment.
        - 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.

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 commonly 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 will help to identify industry needs through the input from the project's participants. Specific data analysis projects within the Project or using its 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.
    - Continue to evolve and refine domestic swine disease monitoring and reporting.
        - Veterinary diagnostic laboratories are contributing their selected test results data to the domestic Swine Disease Reporting System. The reports are delivered monthly for the SHIC e-newsletter, the AASV e-letter and posting on the SHIC website. This will continue in 2019.
        - Communicating the results of the data analysis will inform the industry about emerging diseases or syndromes that might look like an isolated, local incident without this coordination. Regional analyses of the data will help producers to be informed of risks.

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 continue to 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.
- 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.
        - Evaluate novel surveillance programs to see if they can be best used to manage emerging disease. Sampling blood collection vessels at processing plants, oral fluid collection in lairage or spatially balanced surveillance programs are examples of surveillance tools to consider.

Responding to Emerging Disease

- Identify high risk events likely to be responsible for introducing emerging diseases onto farms.
    - Refine and enhance the Rapid Response Program
        - A Rapid Response Program for investigating incidents of emerging disease was completed in 2017. To make it as responsive and efficient as possible, it will be tested and refined by investigating epidemiologically distinct incidents of endemic disease outbreaks. Then enhancements to the program by automating and streamlining the rapid response investigation process will be implemented.
- Help producers and veterinarians respond to and manage newly emerging diseases.
    - Improve communications so people know actionables in the event of an emerging disease.
        - People need to be clear about the communications pathway that will facilitate rapid response to an emerging disease and need to be reminded of resources available to them to help detect, prepare and respond to emerging diseases on the farm. Within the communications programs budget, there will be a focused effort in 2019 to communicate an effective response communications pathway.
    - Quickly research pathogens causing emerging disease outbreaks.
        - Continue to work on an industry-accepted definition of "emerging disease" to help justify spending finite funds on a disease outbreak or investigation.
        - 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.