Swine Health Information Center
2017 Plan of Work
January 27, 2017

Swine Disease Matrix

- Matrix review/revision
    - The objective is to facilitate a swine health reporting and communication network among the international contacts of the SHIC Monitoring and Analysis Working Group. That network will support the Working Group's charge to review the Matrix content and ensure it is up to date as the Swine Disease Matrix is a living document that will demand periodic updates. The Working Group also would like to include bacterial pathogens in the Matrix. It may take resources to contract for that Matrix expansion.
- Swine Disease Matrix research
    - Continue PCR development for selected viruses in the Swine Disease Matrix
        - Twenty-one projects were funded in 2016 to update or develop PCR capability for viruses in the Swine Disease Matrix. Work will continue to complete this capability for select viruses that weren't included in the 2016 research. Ebola-restin, Kobuvirus and perhaps others will be completed.
    - Clinical validation of PCRs for prioritized viruses in the Swine Disease Matrix
        - Matrix research in 2016 focused on updating or developing PCR capability for viruses in the Swine Disease Matrix. The standard of validation for these PCRs was "fit for purpose", which ensured PCR performance in laboratory conditions. For these tests to be operational in the face of an outbreak, they must also be validated using clinical samples and tissues. The Monitoring and Analysis Working Group will prioritize the viruses in the Swine Disease Matrix to advise the Preparedness and Analysis Working Group as they seek proposals and select projects for clinical validation that could include oral fluid samples.
    - Update or develop serologic test capabilities for selected viruses in the Swine Disease Matrix
        - Matrix research in 2016 focused on updating or developing PCR capability for viruses in the Swine Disease Matrix. The focus of this round of Matrix research will be on updating or developing serologic test capabilities. Working with the Preparedness and Response Working Group a call for proposals will be developed for high priority viruses in the Swine Disease Matrix.

Identify Risks to Swine Health

- International swine disease monitoring
    - Understanding the origin and progression of emerging, re-emerging, and novel infectious diseases is critically important to preventing epidemic and pandemic outbreaks. Whether naturally occurring or intentionally introduced, such diseases pose a massive risk to global health and require active vigilance for signs of outbreak, rapid recognition, and accurate diagnosis of the microbial cause. The Predict Program strives to monitor animal health, zoonotic disease and outbreak potential. The International Organization for Animal Health (OIE) and FAO build and maintain databases of emerging diseases of member countries. Interacting with these entities and programs could provide lessons for the U.S. pork industry about monitoring, analysis, preparedness and response for emerging diseases.

    - 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 U.S. industry of risks.
- Using first points of concentration as a surveillance opportunity to detect or respond to emerging diseases
    - Packing plants and market buying stations receive a wide variety of animals from a wide geographic distribution. This provides a cost-efficient opportunity for survey to help identify endemic swine pathogens. At the same time, regional pathogen differences are also known to occur. Identifying pathogens brought into first points of concentration will help to identify emerging diseases and inform producers and their veterinarians about regional differences that might affect the health of their herds unless effective biosecurity protocols are implemented.
    - Market sow and secondary pig market channels include a wide range of movements affected by market needs, prices, weather and regulations. A qualitative, and when possible quantitative, description of these market channels will help to provide a foundation for actions that might maintain market sow and secondary pig value in the face of a highly contagious disease.
- Investigating the ability of common inputs to production to be able to act as biologic or mechanical vectors for introduction onto farms
    - Continue virus rate of inactivation using a shipping model for feed ingredient imports and add investigations into possible mitigations.
        - 2016 results of these studies provided the first objective data indicating contaminated feed ingredients might serve as fomites for FAD and Matrix priority pathogens introduction into the U.S. Collaboration with a biosecure laboratory has provided the opportunity to continue this work using the actual viruses in additional to viral surrogates. ASF will be included in the research using a biosecure laboratory. In addition, viruses or surrogates that have demonstrated the ability to remain viable during transport conditions will be selected for testing feed mitigations that could help prevent their introduction on to farms.
    - Investigate if vaccine production could serve as a biological pathway of pathogen introduction.
        - Common inputs with the ability to affect large numbers of animals at relatively the same time in different geographic locations include vaccines and other animal health products. There are imported components used in vaccine production. Some investigation to understand if there is risk of importing foreign viruses through vaccine production will inform and could help to identify mitigation protocols and procedures.
- Feed ingredient monitoring research project
    - The U.S. pork industry is importing feed ingredients from countries with endemic swine diseases that are not present in this country. Ongoing monitoring of feed ingredients to look for the presence of these pathogens will help to inform the U.S. industry and add to the data needed for pathogen-specific risk assessments. The project will help inform a HACCP-like approach to feed bio-safety through identifying and controlling critical control points in feed production and delivery.

Improving Swine Health Information

- Swine Health Monitoring Project
    - The Swine Health Monitoring Project will help to identify industry needs through the input from the project's participants. Specific data analysis projects will be supported within the Project. They will serve 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. Projects that are related but tangential to the Swine Health Monitoring Project may be identified. Support for these projects will return value to the Project's participants and other producers.
- Standardization of swine health information
    - To ensure consistent and accurate communication and swine health benchmarking, there needs to be a common language to report herd health status. PRRS and PEDv control programs have status reporting standards in place. Convening all industry stakeholders to help define a common swine health language for communicating health status and reporting will help the industry to accurately evaluate and analyze swine health data.
- Making industry swine health information available will help communicate regional and national risks to herd health.
    - Rotavirus, PRRS and Strep suis have or are demonstrating the ability to evolve different serotypes or pathogenicity. Communicating the results of the data analysis will inform the industry about emerging diseases or syndromes that might look like an isolated incident without this coordination. This information could be used by producers to evaluate regional risks from movement of swine and be better informed and therefore prepared.
    - Multiple data streams are collecting health data but there is no centralized, coordination or reporting of these data. Qualitative, syndromic information, quantitative veterinary diagnostic lab data and market condemnation data gathered by USDA are examples.
        - Access syndromic information by taking advantage of the capabilities and information from appropriate sources. The Enhanced Passive Surveillance project and the National Pork Board's Sentinel Veterinary Clinic project could be two examples.
        - Access VDL information by developing ways to take advantage of the standardization of VDL test result data. Mining and using newsletters or other means to report trends is a short-term goal. Longer term is providing an objective, web-based, swine diagnostic warehouse of information that will give access to standardized data across VDLs.
        - Work with USDA-FSIS to gain access to timely harvesting plant condemnation information.

Monitoring and Discovery of Emerging Disease

- Diagnostic fee support to detect emerging diseases
    - There continue 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 investigation and further work needs to be done to ensure that an emerging disease is accurately identified for action of the industry's emerging disease response plan.
- Improving active and passive swine disease surveillance to better detect and respond to emerging disease
    - Investigate improvements that can be made toward a nationally coordinated swine health surveillance system to prepare, detect and rapidly respond to regulatory foreign animal and emerging diseases.
        - With state, federal and industry stakeholders, hold a national workshop to identify gaps, tools and research needs for a workable, credible, affordable and robust national swine health surveillance system that supports coordinated early detection, rapid response and efficient control of FADs and emerging diseases.
        - Study the feasibility and cost of implementing Spatially Balanced Surveillance to improve cost-effective disease detection and response.
        - In 2016 a SHIC funded pilot project showed a surprising degree of variability between veterinary diagnostic labs when testing identical, split clinical tissues. SHIC will work with NAHLN to investigate coordination of sample processing and testing protocols to help producers and their veterinarians have added confidence in test results.

Responding to Emerging Disease

- Emerging disease research
    - 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.
- Enable oral fluids monitoring to demonstrate disease status and support pig movement via the Secure Pork Supply Plan
    - Historically, individual animal tissue collection like sera samples have been used to monitor herd disease status to enable movement or sale during a disease eradication program. The Secure Pork Supply includes surveillance to demonstrate freedom of disease to enable pig movement or sale during a disease outbreak or eradication program. Validation of oral fluids-based surveillance that will demonstrate herd health status will give animal health officials information needed for them to permit movements from a Control Zone and producers a cost-effective and scientifically sound way to collect herd samples for testing.

- Improve communications so people know actionables and contacts in the event of an emerging disease
    - Communications during 2016 focused on outreach and information about emerging disease issues to veterinarians and producers. In spite of that, people are still not clear about a communications pathway that will facilitate rapid response to an emerging disease. Within the communications programs budget, there will be a focused effort in 2017 to develop, test and communicate an effective response communications pathway to veterinarians. This will inform them of resources that are available to help detect, prepare and respond to emerging diseases.