

**Swine Health Information Center
2021 Plan of Work**

Improve Swine Health Information

- Make industry swine health information available to help identify, communicate, and mitigate regional and national risks to herd health.
 - 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.
 - Continue to add to the scope of analysis and reporting by including more diagnostic signal information for diseases. Influenza and PCV2 are possible example additions of specific pathogens. Also, the 2013 PED outbreak experience showed that negative diagnostic tests associated with syndromic information could be an early indication of an emerging disease. Further compilation and analysis of negative diagnostic tests results and associated syndromic information may be a useful technique to identify emerging diseases more quickly.
 - Mine SDRS data for emerging disease signals. Some examples could include reporting of emerging syndromic conditions, investigating co-infection diagnostic results as an indicator of future PRRS outbreak, connecting Grow-Finish diagnostics with sow farm disease status to use G-F results as a predictor of sow farm disease outbreaks and using diagnostic and production data analysis to measure the economic impact of controlling emerging or endemic disease.
 - 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 2021. 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 2020 management webinars, will be offered. The objective is to “keep pace with industry chatter” about health challenges. Strep equi ss zoepidemicus, rotavirus, Strep suis, and Brachyspira are examples of possible topics.
- 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

48 the participants and encourage more producers to cooperate with the project. That value to
49 participants will also translate to value for all pork producers.

- 50 • Update the SHIC Swine Disease Fact Sheets.
 - 51 ○ The 34 Swine Disease Fact Sheets that are currently available are the second most accessed
 - 52 information on the SHIC website. They were authored in 2015 and may need to be updated
 - 53 to ensure that they include the latest research and information available.

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55 **Monitor and Mitigate Risks to Swine Health**

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- 57 • In coordination with other industry organizations, help to fill in the gaps of research and information
58 needed to prevent, prepare, and respond to foreign animal or emerging diseases.

- 59 ○ African Swine Fever will continue to be a monitoring priority in 2021 with the objective of
60 using the information to protect the US industry from its introduction. In conjunction with
61 the other pork industry associations, SHIC will continue to facilitate and inform effective
62 national biosecurity policy and programs.

- 63 ○ During 2020, SHIC partnered with the other industry organizations for a comprehensive
64 review of the diverse but interdependent components of national biosecurity. Border
65 protection, pig and sow movements, first points of concentration for pigs and sows, feed
66 safety, vaccine and other common inputs, state and federal movement and health
67 regulations and others are all pieces of US national pork industry biosecurity. Results will
68 focus on ensuring effectiveness of the highest priorities first and funds may be needed to
69 support addressing identified vulnerabilities.

- 70 ○ SHIC will coordinate with other industry associations to effectively communicate consumer
71 messaging and producer actionables in the event of a transboundary, foreign animal
72 disease.

- 73 ○ In 2019 SHIC received USDA Foreign Ag Service support for “Building capacity to support the
74 control of African Swine Fever (ASF) in Vietnam”, a project to inform Vietnamese producers
75 and veterinarians about ASF control and to learn the on-farm lessons about ASF
76 epidemiology and control that would be needed if ASF enters the US. Results will be
77 analyzed for any need to supplement and enhance the information gained.

- 78 • Identify swine disease risks by international monitoring.

- 79 ○ Enhance the Global Disease Monitoring Report to improve understanding of disease status
80 in countries around the world.

- 81 ■ Currently, the Global Disease Monitoring Report relies primarily on official sources
82 of information about country-specific disease status. A pilot project will explore an
83 expanded international veterinary diagnostic lab network that will provide
84 standardized disease reporting from other countries.

- 85 ■ There are multiple organizations and companies monitoring diseases around the
86 world and their information will be compiled into one, informative format.

- 87 ■ A panel of individuals with international disease experience will be formed and
88 asked for their input and analysis of unofficial perspectives about disease reports
89 from other countries. There will be a focus on Asia/SE Asia for disease status and
90 movement information as that region seeks to rebuild their herd.

- 91 ○ Foster information sharing with government and allied industry international contacts
92 through international animal health organizations and meetings.

- 93 ■ Understanding the origin and progression of emerging, re-emerging, and novel
94 infectious diseases is critically important to preventing epidemic and pandemic
95 outbreaks. The International Organization for Animal Health (OIE) and Food and

96 Agricultural Organization of the United Nations (FAO) facilitate international health
97 information sharing and build and maintain databases of emerging diseases of
98 member countries. Interacting with these entities and other swine disease centered
99 programs could provide lessons for the U.S. pork industry about monitoring,
100 analysis, preparedness, and response for emerging diseases.

- 101 • Investigate the ability of common inputs to production to act as biologic or mechanical vectors for
102 disease introduction onto farms.
 - 103 ○ Decrease the potential for pathogen transmission via feed.
 - 104 ▪ USDA and FDA consider pathogen transport via imported feed products to be an
105 unlikely risk because of limited objective information. Data and information will be
106 gathered to support an objective risk assessment and evaluate cost-effective
107 mitigation techniques and strategies.
 - 108 ▪ If contaminated feed component products are imported, those pathogens are likely
109 to be spread within the country during feed processing. Understanding how
110 pathogens are distributed in the mill and cost-effective procedures to prevent
111 distribution or disinfect the facilities will be investigated.
 - 112 ○ Investigate common inputs other than feed for potential roles of pathogen introduction.
 - 113 ▪ Common inputs such as vaccines, breeding supplies and others could be a source of
114 pathogen introduction to farms. Selected inputs will be investigated to identify if
115 they could be biosecurity risks.
- 116 • Improve farm biosecurity.
 - 117 ○ Better understand transmission pathways to improve transport biosecurity related to
118 markets and first points of concentration.
 - 119 ▪ Transport biosecurity is directly dependent on the facility capacity and technologies
120 to effectively decontaminate conveyances. Investigating the availability of facilities,
121 their capacity for disinfection, alternative technologies that may offer cost-effective
122 solutions and the economic commitment needed to meet capacity needs will help
123 to inform long-term improvement in transport biosecurity.
 - 124 ▪ Pathogen transfer back to the farm from first points of concentration continues to
125 challenge producer opportunity for profit and will risk emerging or foreign animal
126 disease control. Innovative, cost-effective solutions to minimize this transfer will be
127 studied.
 - 128 ▪ The Morrison Swine Health Monitoring Project could be an opportunity to leverage
129 the willingness to share swine health information to be able to evaluate
130 transportation biosecurity opportunities.
 - 131 ▪ Packers, market sow points of concentration and renderers will be engaged to
132 explore practical solutions to aid in preventing pathogen transfer back to the farm.
 - 133 ○ Investigate procedures to mitigate disease risk.
 - 134 ▪ Bioexclusion
 - 135 • The pork industry now uses a variety of bioexclusion protocols to protect
136 swine health in breeding, farrowing and grow-finish facilities. More
137 information is needed to motivate compliance. Demonstration projects
138 validating the implementation of current bioexclusion protocols that
139 include, for example, the use of record keeping, employees on-farm and
140 between farm traffic patterns and service vendors and their equipment
141 could be used to facilitate implementation and may enhance the
142 implementation of Secure Pork Supply biosecurity guidelines.

- 143 • A variety of commodity and public and private organizations employ
- 144 bioexclusion or biocontainment to protect their interests and facilities. A
- 145 survey of these bioexclusion or biocontainment practices will be done to
- 146 help look for innovative, cost-effective practices that may be implementable
- 147 in the pork industry to help prevent disease introduction onto farms and be
- 148 offered for evaluation of addition to the Secure Pork Supply biosecurity
- 149 guidelines.
- 150 • Experience during disease outbreaks questions if seasonality may be as
- 151 large of a risk factor as previously thought. Risk of other routine farm
- 152 practices, such as manure pit emptying, may be a higher risk for disease
- 153 outbreaks but are masked by seasonality because the practices are
- 154 associated with seasons.
- 155 • Focus on Grow-Finishing sites' bioexclusion practices to validate and rank
- 156 bioexclusion options will help to protect the site's swine health and that will
- 157 help to protect neighboring farms and regions from emerging disease
- 158 outbreaks.
- 159 ▪ Biocontainment
- 160 • Decreasing the amount of pathogens from leaving an outbreak site will help
- 161 to protect neighboring farms and regions from emerging disease outbreaks.
- 162 Assessing existing technologies or new ideas for cost-effectiveness will help
- 163 inform producers' decisions about implementation.
- 164

165 Responding to Emerging Disease

- 166
- 167 • Identify high risk events likely to be responsible for introducing emerging diseases onto farms.
- 168 ○ Refine and enhance the Rapid Response Corps program
- 169 ▪ Continued program management and survey of Rapid Response Team candidates to
- 170 confirm continued willingness to participate. Rapid Response Team investigations
- 171 will be supported, if requested by producers. Transitioning from an adjunct
- 172 facilitator to a project coordinator will help meet the needs of the program in the
- 173 event of widespread outbreak investigations.
- 174 ▪ An industry standard for an outbreak investigation instrument will give the industry
- 175 an opportunity to analyze data for proactive risk identification instead of having
- 176 wide disparity in individual retroactive responses to disease introduction. An
- 177 advisory group will be formed to define the need and content of a standardized
- 178 outbreak investigation instrument.
- 179 • Help producers and veterinarians respond to and manage newly emerging diseases.
- 180 ○ Quickly research pathogens causing emerging disease outbreaks.
- 181 ▪ An industry-accepted definition of "emerging disease" to help justify spending finite
- 182 funds on a disease outbreak or investigation continues to be needed.
- 183 ▪ Senecavirus A (Seneca Valley Virus) was the first opportunity for SHIC to rapidly
- 184 respond to an emerging disease with research according to high priority industry
- 185 needs. There is no predicting when or where the next emerging disease will appear.
- 186 SHIC needs to be prepared with funds in place that can be quickly mobilized to
- 187 support filling the immediate research gaps following introduction. This research
- 188 will provide producers and their veterinarians with critical information that they will
- 189 need to effectively respond to the disease outbreak.

- 190 ○ Support a rapid, unified industry response to emerging disease outbreaks.
- 191 ▪ Working with the National Pork Board, National Pork Producers Council and
- 192 American Association of Swine Veterinarians, continue to facilitate a coordinated,
- 193 industry-wide emerging disease response through the National Swine Disease
- 194 Council.
- 195 ● Assess the effectiveness sanitation and decontamination protocols.
- 196 ○ Sanitation and decontamination protocols are designed to prevent pathogen transmission
- 197 through contact with contaminated surfaces. Monitoring and assessing the protocols will
- 198 offer a way to validate effectiveness and compliance. This could be important for containing
- 199 an emerging production disease. It will be an important question to answer in preparation
- 200 for effective response to a foreign animal disease. Cost-effective, validated plans for
- 201 disinfection of sites after an ASF depopulation will be needed to repopulate the site with
- 202 confidence.
- 203 ● Learn lessons from COVID-19 that will benefit swine health through effective response to emerging
- 204 disease.
- 205 ○ Human health response analysis projects have investigated the drivers that make
- 206 governments act to effectively respond to disease outbreaks. For example, the Gates
- 207 Foundation has done analyses of different countries expected ability to effectively respond
- 208 to COVID-19. Investigating the models used and the lessons learned will help assess if those
- 209 models and lessons could be applied to motivate health improvements in the US swine
- 210 herd.
- 211 ○ The veterinary diagnostic laboratories were enlisted to help with COVID-19 laboratory
- 212 capacity to meet demand. There may be lessons that can be learned from that experience
- 213 that could inform emergency foreign animal disease response capacity. A comprehensive
- 214 review will help industry foreign disease response.

216 **Surveillance and Discovery of Emerging Disease**

- 217
- 218 ● Ensure detection of emerging disease to facilitate rapid response.
- 219 ○ Offer diagnostic fee support to help detect emerging diseases.
- 220 ▪ There continues to be incidents of high morbidity/high mortality where an etiology
- 221 is either not identified or there is a strong supposition that the identified pathogen
- 222 is not the likely cause of the outbreak. In these cases, there is a need for further
- 223 diagnostic workup. Support for these follow up diagnostic workups will come after
- 224 producers have funded the initial diagnostics. This work will help ensure that an
- 225 emerging disease is quickly and accurately identified for action by the industry's
- 226 emerging disease response plan.
- 227 ▪ Diagnosticians will be asked for their views of barriers to broader use of the
- 228 diagnostic fee support program and if there are ways that it can be enhanced.
- 229 ○ Find improvements that can be made toward a nationally coordinated swine health
- 230 surveillance system to prepare, detect, and rapidly respond to emerging and regulatory
- 231 foreign animal diseases.
- 232 ▪ Veterinary diagnostic laboratories submissions need to be characterized to
- 233 understand the messaging and incentive needed for accurate information to
- 234 accompany tissues. For example, identifying the reason for inaccurate premises
- 235 identification numbers will facilitate quick and effective response to an emerging or
- 236 transboundary, foreign animal disease outbreak.

- 237 ▪ Building on previous SHIC support for investigating spatially balanced surveillance
- 238 models, the next step is to evaluate the application of spatially balanced
- 239 surveillance using contemporary or the next generation of surveillance sampling.
- 240 • Investigate newly identified agents associated with disease.
- 241 ○ Understand the clinical relevance and epidemiology of novel viruses in the Swine Viral
- 242 Disease Matrix.
- 243 ▪ The veterinary diagnostic labs find novel viruses in the Swine Viral Disease Matrix
- 244 being associated with clinical disease syndromes. Better understanding these
- 245 agents' epidemiology and pathogenicity are important to identifying if they have a
- 246 role in clinical disease.
- 247 ▪ Porcine circovirus (PCV) strains continue to present a challenge. A standardized
- 248 case definition for PCV3 needs to be agreed upon, pathogenicity needs to be further
- 249 analyzed and processing fluids or other ways to monitor associations with clinical
- 250 disease need to be studied. In addition, identification of a novel PCV4 will call for
- 251 adequate diagnostics to ensure the ability to detect and evaluate the potential
- 252 introduction into the US.
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254 **Swine Disease Matrices**

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- 256 • Review and, when necessary, revise the Swine Viral Disease Matrix and the Swine Bacterial Disease
- 257 Matrix.
- 258 ○ The Monitoring and Analysis Working Group will review and revise the viral and bacterial
- 259 matrices as needed.
- 260 ○ The Swine Bacterial Disease Matrix will be assessed to try to identify risks to animal and
- 261 human health, pork industry vulnerabilities to these pathogens and possible actions that will
- 262 mitigate risk will be explored.
- 263 • Use Swine Viral Disease Matrix research to enhance swine disease diagnostic capabilities.
- 264 ○ Continue diagnostic capabilities for selected viruses in the Swine Viral Disease Matrix.
- 265 ▪ Thirty-three Swine Viral Disease Matrix pathogens have new or updated PCRs from
- 266 SHIC-funded since 2016 or USDA support. Six pathogens have ELISAs finished and
- 267 added to the SHIC diagnostic tools catalog. As new information or emerging
- 268 pathogens are discovered, through SHIC's surveillance and discovery plans or other
- 269 means, there may be a need to continue to support improving diagnostic
- 270 capabilities.
- 271 ○ Consider diagnostic sensitivity and specificity validation for prioritized viruses in the Swine
- 272 Viral Disease Matrix.
- 273 ▪ Matrix research thus far has been with a goal of validation to "fit for purpose",
- 274 which ensured performance under laboratory conditions. For these tests to be
- 275 operational in the face of an outbreak, they may also need to be validated for
- 276 sensitivity and specificity using clinical samples and tissues. Diagnostic sensitivity
- 277 and specificity validation could be considered and may need to be funded for
- 278 specific tests in 2021.