Swine Health Information Center

PROGRAM REVIEW

RETURN ON PRODUCERS' INVESTMENT

July 2015 – March 2021

The mission of the Swine Health Information Center is to protect and enhance the health of the United States swine herd through coordinated global disease monitoring, targeted research investments that minimize the impact of future disease threats, and analysis of swine health data.

SWINE HEALTH INFORMATION CENTER ORGANIZATION

- **Launched in July 2015 by the National Pork Board (NPB) in response to the porcine epidemic diarrhea virus (PEDV) outbreak in the US**
- **Responsibilities include monitoring and analyzing emerging disease issues and research**
- **Funded by one-time NPB Checkoff investment of $15 million in supplemental funds**
- **Original five-year life span extended to July 2022, using SHIC's existing funds, approved by NPB**
- **Successful monitoring of non-program swine diseases**
- **Working collaboratively with all industry organizations to support producer and veterinarian information and research to enhance the health of the national swine herd:**
  - **American Association of Swine Veterinarians**
  - **National Pork Board**
  - **National Pork Producers Council**
- **Filling gaps in swine disease prevention, preparedness, and response**

Executive Director

Paul Sundberg, DVM, PhD, DACVPM

"In the very short time we've been in existence, we have come to play such a vital role in helping defend the health of our industry. I recommend people read the 2020 Progress Report and evaluate our performance. After you've read it, you're going to understand that since receiving initial funding from the National Pork Board, we have filled a void and been very successful. **We're committed to protecting the US pig population."**

Daryl Olsen, DVM, AMVC,
SHIC Board Chair

Swine Health Information Center

Board of Directors

Named by the National Pork Board

Gene Noem
pork producer and Director, Genus PLC, Iowa
NPB board member

Dr. Russ Nugent
Dogwood Ag Services, LLC, Arkansas
NPB board member

Named by the National Pork Producers Council (NPPC)

Dr. Howard Hill
pork producer and NPPC past-president, Iowa
board vice chair

Dr. Jeremy Pittman
Smithfield Hog Production, North Carolina
NPPC board member

Named by the American Association of Swine Veterinarians (AASV)

Dr. Matt Anderson
Suidae Health and Production and AASV past-president, Iowa

Dr. Daryl Olsen
AMVC and AASV past-president, Iowa
board chair

At-large Producer Members

Mark Greenwood
Compeer Financial, Minnesota
board treasurer

Mark Schwartz
pork producer, Minnesota

Dr. Matthew Turner
JBS USA, Colorado

SHIC CONTRIBUTIONS TO THE US PORK INDUSTRY

SHIC has become a conduit balancing practicality with targeted response to disease outbreak prevention, preparedness, and response. SHIC built and maintains linkages with all stakeholders in such a process. This SHIC-led balance between a more rigid preparedness and response structure and grassroots preparedness and response fulfills the Center's mission to safeguard US swine herd health and serves US pork producers well.

SHIC maintains an intentionally responsive structure. This enables quick action on emerging issues and clear accountability for results.

SHIC collaborates closely with other industry organizations including swine-specific associations, universities, veterinary diagnostic labs, and government agencies. Each has unique priorities yet together the same over-arching mission to advance the pork industry. Collaboration allows for maximizing resources, time, and outcomes without duplication nor territorialism because responsibilities are shared.

In fulfilling the Center's responsibilities, maximizing the financial resources available is essential. Stretching the initial investment by partnering with other agencies, keeping overhead as low as possible, and seeking additional resources, such as the USDA Foreign Agricultural Service Grant funding ASF research in Vietnam, means SHIC is able to deliver consistent, quality results while maintaining sufficient funds to extend the original five-year span by two additional years.

"The consequence of developing a body of work as SHIC has is to earn accountability and responsibility. **For SHIC, this means becoming the coordinator for all aspects of an emerging disease response.** "

Dr. Joe Connor
Carthage Veterinary Services,
SHIC Working Group Member

"SHIC is a wonderful invention. They take a threat and educate us on it, so it becomes a non-threat. **SHIC has been on the cutting edge of several situations I would consider a homerun.** And it's a great value. There's not a lot of huge overhead or ridiculous amount of expenses yet activities on so many fronts, contributing to the health of our swine industry tremendously."

Dr. Russ Nugent
Dogwood Ag Services, LLC,
SHIC Board Member, SHIC Working Group Member

SELECTED ACHIEVEMENTS

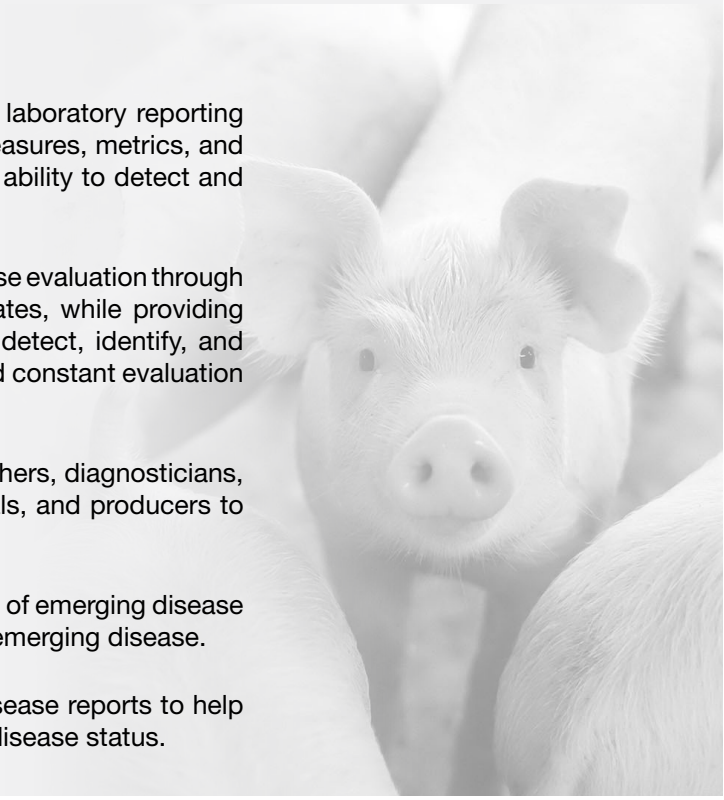
1. Developed standardization of veterinary diagnostic laboratory reporting so all laboratories publish data with comparable measures, metrics, and terminology. This effort means the US now has the ability to detect and analyze emerging disease and disease trends.

2. Built a structure that combines active emerging disease evaluation through continuous Swine Disease Matrix review and updates, while providing a pathway for diagnosticians and veterinarians to detect, identify, and contain emerging and endemic pathogens. Early and constant evaluation prepares producers for early responses.

3. Developed a structure that actively engages researchers, diagnosticians, practitioners, state and federal animal health officials, and producers to protect the health of our swine industry.

4. Funded targeted research to enhance the prevention of emerging disease and strengthen the preparedness to respond to an emerging disease.

5. Coordinates monthly domestic and international disease reports to help veterinarians and producers be aware of changing disease status.



SCOPE OF WORK

Global Swine Health and Issues Identification

Through domestic and international disease monitoring, the Center will manage the Swine Disease Matrix and heighten awareness and actions about emerging diseases. The result will be improvement of US pork industry preparedness and information to enhance the biosecurity and biocontainment ability to protect the US swine herd.

Targeted Research Investments

Through domestic and international disease monitoring, the Center will manage the Swine Disease Matrix and heighten awareness and actions about emerging diseases. The result will be improvement of US pork industry preparedness and information to enhance the biosecurity and biocontainment ability to protect the US swine herd.

Swine Health Data Analysis and Monitoring for Trends

Enhancing producer communications through programs like the Morrison Swine Health Monitoring Project is a priority of the Center. The Center will also help producers to get information about emerging and endemic disease trends. It will review and provide support to improve active disease introduction risk assessments, which will help producers better design their farms' biosecurity.

SHIC RESPONSIBILITIES

- Help identify the biggest swine health threats around the world
- Help the US industry be better prepared
- Have better diagnostic capabilities in place
- Have better awareness of how to respond to specific diseases
- Inform production decisions
- Share information to see trends and find risks much more quickly
    - o Resulting analysis of information will inform swine health decisions on the farm

> "SHIC and Dr. Paul Sundberg stepped up to plug an important gap in our swine health defenses by providing a fast-moving early warning+response system for emerging and transboundary diseases. **We need them now more than ever!**"
>
> **Dr. Jeff Zimmerman**
> Iowa State University

ANNUAL PLAN OF WORK GUIDES ACTIVITIES

Each year, the SHIC board of directors develops and follows a Plan of Work outlining goals and priorities for the Center's activities. Built collaboratively and modified to meet new and emerging needs, this document reflects the Center's mission and collective expertise.

2016 PLAN OF WORK
2017 PLAN OF WORK
2018 PLAN OF WORK
2019 PLAN OF WORK
2020 PLAN OF WORK

PROGRESS REPORT

Just as SHIC carefully plans its activities for the benefit of the US swine herd, it also reports those efforts in an annual Progress Report. These detailed Reports capture the extraordinary effort of the Center as it continues to efficiently, consistently, and tirelessly works to protect and enhance swine health.

2016 PROGRESS REPORT
2017 PROGRESS REPORT
2018 PROGRESS REPORT
2019 PROGRESS REPORT
2020 PROGRESS REPORT

The goal of the structure of the Swine Health Information Center is to offer pork producer oversight and decision making supplemented and informed by subject matter expertise. To complete the SHIC Scope of Work, two working groups provide insight, expertise, perspective, and counsel.

Members of these working groups include the industry's leading practitioners, academicians, producers, federal and state government officials, and allied industry experts. Each shares their time, expertise, and valuable contributions to assist SHIC in fulfilling its mission to protect the health of the US swine herd.

MONITORING AND ANALYSIS WORKING GROUP

The Monitoring and Analysis Working Group assesses domestic and foreign production disease risk which drives the on-going prioritization of the Swine Disease Matrix. It is also responsible for monitoring and advising the SHIC-funded Morrison Swine Health Monitoring Project at the University of Minnesota, including the use of information technologies to reach the Project's goals. In addition, it is responsible for development and advice for on-going projects to monitor domestic diseases affecting swine health and the data analysis projects that will support on-farm, prospective producer decision making.

Practitioners

Joe Connor, DVM, MS

Jer Geiger, DVM, MS

Steve Henry, DVM

Clayton Johnson, DVM

Gordon Spronk, DVM

Paul Yeske, DVM, MS

Pork Producers

Jim Niewold
Illinois

Russ Nugent, MS, PhD
Arkansas

Ray Summerlin
North Carolina

Universities

Cesar Corzo, DVM, PhD, MS
University of Minnesota

Dick Hesse, PhD, MS
Kansas State University (retired)

Daniel Linhares, DVM, MBA, PhD
Iowa State University

Rodger Main, DVM, PhD
Iowa State University

Chris Rademacher, DVM
Iowa State University

Albert Rovira, PhD, DVM, MS
University of Minnesota

Kent Schwartz, DVM, MS
Iowa State University

Jerry Torrison, DVM, PhD, DACVPM
University of Minnesota

USDA

Dana Cole, DVM, PhD
CEAH

Industry Associations

Lisa Becton, DVM, MS
NPB

Dave Pyburn, DVM
NPB

Harry Snelson, DVM
AASV

Liz Wagstrom, DVM
NPPC

Patrick Webb, DVM
NPB

Pam Zaabel, DVM
NPB

State Animal Health Officials

Tony Forshey, DVM
Ohio

Jeff Kaisand, DVM
Iowa

Bret Marsh, DVM
Indiana

Dustin Oedekoven, DVM
South Dakota

Beth Thompson, DVM, JD
Minnesota

Packers/Processors

Barry Wiseman, DVM, MS, PhD
Missouri

PREPAREDNESS AND RESPONSE WORKING GROUP

The Preparedness and Response Working Group provides oversight of the Swine Disease Matrix and other preparedness or response research. It reviews the analysis of Matrix capabilities and is responsible for funding research to fulfill Matrix objectives. This group is also responsible for advising and oversight of SHIC's role in the emerging swine diseases response plan. That includes the roles and responsibilities of Rapid Response Team deployment in response to an emerging swine health disease and for the information and analysis necessary to support the appropriate pork producer and pork industry response to emerging swine diseases.

Practitioners

Dave Bomgaars, DVM

Joe Fent, DVM

Marlin Hoogland, DVM

Pork Producers

Brad Greenway
South Dakota

Karyn Havas, DVM, PhD, MS, DACVPM
Minnesota

Conley Nelson
Iowa

State Animal Health Officials

Jeff Kaisand, DVM
Iowa

Bret Marsh, DVM
Indiana

Universities

Jane Christopher-Hennings, DVM, MS
South Dakota State University

Giselle Cino Ozuna, DVM, PhD, DACVP
Oklahoma State University

Diego Diel, DVM, MS, PhD
Cornell University

Gene Erickson, DVM, PhD
NC VDL (retired)

Ying Fang, PhD, MS
Kansas State University

Derald Holtkamp, DVM
Iowa State University

Roman Pogranichniy, DVM, MS, PhD
Kansas State University

Jeff Zimmerman, DVM, PhD, DACVPM
Iowa State University

Animal Health Companies

Johnny Callahan, MS, PhD
Tetracore

Christa Goodell, DVM, MS, PhD, DACVPM
BI

John Hardham, PhD
Zoetis

USDA

Celia Antognoli, DVM
VS

Kelly Lager, DVM, PhD
ARS

Rachel Tell Sasek, DVM, PhD
NVSL

Industry Associations

Lisa Becton, DVM, MS
NPB

Dave Pyburn, DVM
NPB

Harry Snelson, DVM
AASV

Liz Wagstrom, DVM
NPPC

Patrick Webb, DVM
NPB

Pam Zaabel, DVM
NPB

SHIC RESEARCH DELIVERABLES

Results of more than 50 SHIC-funded research projects (Appendix A) provide timely information and resources to the swine industry. Presently there are 29 projects funded and still open, all with promise to advance SHIC's mission.

SHIC calls for and supports research on practical topics providing immediately applicable information. The Center keeps researchers on schedule so results are timely and adheres to structure and oversight ensuring wide acceptance of the process and results. Projects are conducted by a diverse group of researchers from a wide variety of universities and other entities around the world.

From evaluating risks via the SHIC Swine Disease Matrix and assessing our current diagnostic needs to be able to quickly identify these pathogens, to funding the development of tests, SHIC has led the pork industry to an additional level of readiness which puts the US industry on a different playing field than it was on prior to SHIC's inception.

SHIC and NPB, with the collaboration of NPPC and AASV, have funded a project to identify gaps in US pork industry national biosecurity. The goal is to prevent entry of foreign animal disease into the country by addressing those gaps. Among the many areas being considered for study are foreign imports, entry of foreign travelers, domestic transportation of animals, common inputs to US production, domestic market channels, and others.

The threat of African swine fever (ASF) drives several projects for SHIC including coordination of international ASF research, collecting data on the use of oral fluids for ASF surveillance and monitoring, and oral fluids PCR sensitivity when testing for ASF. On-going ASF research projects in Vietnam, enabled by a SHIC administered USDA Foreign Agricultural Service grant (received with the assistance of NPPC in the application phase), include strengthening veterinary services capacity for mitigating ASF impact in Vietnam, as well as implementation of field projects to learn preparedness lessons in a country experiencing an ASF outbreak.

"The US pork industry has undergone monumental changes in all aspects of producing bacon, if you will, in the last 30 years. The most pronounced, which has created great opportunity, is feeding the world via export markets, with the US going from being a 7% importer in 1990 to now a net exporter north of one in four pigs we raise. With that it creates unprecedented risk for all of us. We have to ship it as we can't eat it all. **Investing our life and all we have into this industry, our family is appreciative of the work of SHIC to help create awareness and bring the best together with science to protect us from FAD entry.** A great example is SHIC's recent work in Vietnam with ASF. Learn and help where the disease is."

Jim Pillen
Pillen Family Farms/DNA Genetics

SHIC-DEVELOPED ASSETS FOR THE INDUSTRY

Each of these assets was developed by SHIC for the benefit of the US pork industry. No other pork-specific organization has taken on these efforts which provide significant return to producers.

RAPID RESPONSE PROGRAM AND CORPS

SHIC's Rapid Response Program is an important part of SHIC-supported emerging disease preparedness. It's designed for epidemiological investigations of transboundary or newly emerging swine diseases and is carried out by the Rapid Response Corps, a volunteer team of specifically-trained industry experts who analyze the patterns and pathways of entry of disease causing pathogens in affected herds. The first training for Corps members began in August 2017 and SHIC recently conducted refresher activities for all RRC Investigators to assure they maintain an understanding of the Program's processes, timelines, and methodologies.

> read more on website

DIAGNOSTIC FEE ASSISTANCE

In cases of high morbidity/high mortality, where an etiology is either not identified or there is a strong supposition the identified pathogen is not the likely cause of the outbreak, there may be a need for further diagnostic work. In these cases, support for the fees of further diagnostic work may help identify newly introduced or emerging swine diseases. SHIC offers funding for additional diagnostic testing in approved cases. There is risk of missing an emerging disease if a definitive diagnosis is not pursued diligently. SHIC recognizes limitations on resources may be a barrier and developed this program to assist at the production level for the benefit of the national herd.

> read more on website

EMERGING DISEASE COMMUNICATIONS ACTION PLAN

To effectively respond to emerging swine diseases, early communication about outbreaks with new or unexpected etiologies is needed. To facilitate this, veterinarians and pork producers must know the actionables and contacts in the event of an emerging disease. The Emerging Disease Communication Plan will inform them of the process that will follow notification and the resources available to respond. Confidentiality of producer, veterinarian or site identifiers will be strictly maintained during the initial calls. Any actions because of those calls will maintain confidentiality to the level requested by the producer or veterinarian unless state or federal swine health regulations dictate otherwise.

> read more on website

VITAMIN SUPPLY CHAIN REPORT

The Swine Health Information Center (SHIC) joined with the University of Minnesota to sponsor a workshop on April 29, 2019, to increase understanding of the vitamin supply chain and identify potential risk factors for introducing foreign animal disease (FAD) to the US. Within the vitamin supply chain meeting report, authors Dr. Gerald Shurson and Dr. Pedro Urriola of the University of Minnesota describe current industry understanding of vitamin manufacturing, transport, and vitamin premix composition/manufacturing processes as well as quality assurance and biosecurity programs. They address the pork producers' need to select reputable suppliers for all feed ingredients and describe the challenges of potential mitigation procedures for vitamin products and premixes. The vitamin supply chain report also includes a detailed listing of vitamin manufacturers in China and their web sites as well details on biosecurity procedures and third-party audits of many of these facilities.

> read more on website

UPDATED DIAGNOSTIC ASSAY CATALOG

When PEDV hit the US in 2013, it could not effectively tested for. The North American pork industry learned a lesson and did something about it. Diagnostic preparedness and readiness for possible new or emerging production diseases has been a focus for SHIC. An updated Diagnostic Assay Catalog (February 2020) for diagnostic laboratories demonstrates how far the pork industry has advanced in ability to test for emerging diseases. The updated publication contains many SHIC-funded ELISA diagnostic tests developed to protect the health of the US swine herd.

> read more on website

"The importance of coordinated global disease monitoring is imperative in the world today; we see diseases spread easily across political borders, and across countries and oceans. **Utilizing experts in many areas, SHIC analyzes the monitoring efforts, and directs funding and efforts into research.** The thoughtful process that has been implemented has provided US swine farmers, veterinarians and associated industries with up-to-date and relevant information. This process has also allowed SHIC to quickly pivot to timely issues with producer oversight."

Beth S. Thompson, JD, DVM
Minnesota State Veterinarian, Minnesota Board of Animal Health, SHIC Working Group Member

SOW MARKET INFORMATION

What is the range of locations of sows that enter a slaughter plant? How many stops along the way do they make? How long do they remain the slaughter channel? This project collected data from a harvest plant to see if such information could lead to answers to those questions allowing the industry and animal health officials to better make decisions to prevent and control animal health emergencies.

> read more on website

SWINE DISEASE MATRIX

SHIC, in collaboration with NPB and NPPC, has developed a prioritized list of endemic and foreign swine pathogens – the Swine Disease Matrix. The complete Matrix includes an assessment of the diagnostic capabilities for selected pathogens based on a review of available literature. The Swine Disease Matrix originated in an USDA literature review looking for a PEDv pathway into the US. AASV reviewed and modified it. Then, in 2015, SHIC took over the responsibility of oversight. It is a living document; a SHIC working group regularly reviews it for content and priority. When a new or emerging disease is identified, there are also ad hoc considerations of content and priority.

> read more on website

SWINE BACTERIAL DISEASE MATRIX

The pork industry has spent millions to better understand viruses, however, it is often bacteria that kills the pig. In addition, current biosecurity practices are primarily devised to keep viruses out and potentially fail to address the endemic nature of bacteria in a herd. To go along with SHIC's Swine Disease Matrix, a prioritized list of endemic and foreign swine viruses, a Bacterial Swine Disease Matrix has been developed. This new tool will guide a focused look at the US pork industry's highest bacterial risks, while SHIC continues to remain focused on emerging viral pathogens. Both are important tools and part of SHIC's mission to protect and enhance the health of the United States swine herd.

> read more on website

SWINE DISEASE FACT SHEETS

Developed by the Center for Food Security and Public Health (CFSPH) at the College of Veterinary Medicine of Iowa State University, swine disease fact sheets on the SHIC website cover the information that a veterinarian and producer need to know right away in the face of an outbreak. Each fact sheet starts with listing the most immediate, needed information followed by a section with more detail and then by a full, referenced, literature review. Examples of information covered include etiology, cleaning and disinfection, epidemiology, transmission, pathogenesis, diagnosis, prevention, and control as well as any gaps in preparedness.

> read more on website

DOMESTIC AND GLOBAL DISEASE MONITORING REPORTS

To implement infectious disease control and management, precise, science-based information is required. SHIC conceptualized and funded two systems for near real-time domestic and global swine disease monitoring. The near real-time information on swine disease made available by these systems will enable better, faster, and more effective response to endemic or foreign infectious diseases. By funding these projects, SHIC helps the industry toward better swine health information to positively impact the long-term sustainability of pork production. The result is a stronger, more vibrant US pork industry.

> read more on website

SHIC OUTREACH

Since 2015, SHIC has been working to protect and enhance the health of the US swine herd, developing a particular expertise and access to information. Because SHIC's mission also includes the sharing of information generated through research and gathered through monitoring, the Center frequently engages in industry meetings, events, and conferences. SHIC is also seated on several task forces and committees, lending its unique perspective for the benefit of the industry. Whether the audience is producers, associations, allied industry, veterinarians, universities, federal/state government, or other stakeholders, SHIC engages regularly to share for the benefit of the US pork industry. The summary presented below is a representative sample from one year of the outreach efforts made by SHIC annually.

2020 OUTREACH SUMMARY	ENGAGEMENTS
Pork Producers Including production systems and producer groups	15
Associations Including state pork producer associations, working groups, committees, teams, and industry conferences	10
Allied Industry/Associations Including, for example, National Grain and Feed Association and United Soybean Board	22
Veterinary Groups Including American Association of Swine Veterinarians Annual Meeting, Iowa Vet Med Association Winter Conference, Iowa State University James D. McKean Swine Disease Conference, and US Animal Health Association Committees	8
Veterinary Diagnostic Labs/Veterinary Colleges/Academicians Including Conference of Research Workers in Animal Disease	11
USDA/Governmental Agencies Including Ag Research Service, Animal and Plant Health Inspection Service, Center for Epidemiology and Animal Health, National Animal Health Laboratory Network, Customs and Border Protection, Food and Drug Administration Center for Veterinary Medicine, and state animal health officials	19
International Stakeholders Including Canadian producer associations and meetings and the International Organization for Animal Health (OIE)	5

SHIC COMMUNICATIONS

To broadly disseminate SHIC information to stakeholders, a variety of communications tools are employed including the SHIC website, e-newsletter, articles prepared for partners, news releases, interviews, social media, a new SHIC Talk podcast, and webinar series. SHIC also participates in industry events – virtually in 2020 – to provide access to information essential to protection of the US swine herd. Google Analytics of SHIC website traffic are used to measure impact of media efforts.

TOP PAGES ON SWINEHEALTH.ORG FROM JANUARY 1, 2020 - DECEMBER 15, 2020

PAGES	NUMBER OF VISITS
Global Disease Monitoring Reports	5,878
Chinese Swine Acute Diarrhea Syndrome Coronavirus (SADS-CoV) Spurs SHIC Response	3,559
Seneca Valley Virus Summary	2,091

There were over 26,800 individual SHIC website sessions during 2020, a 13% increase over 2019. Most visitors were from the US, Philippines, Canada, India, the UK and Australia with a total of 46,058 page views.

PRESS RELEASES

Press releases are deployed via email and sent to 250 ag news outlets. Farm broadcasters are a very important media outreach for SHIC with follow-up interviews requested after each press release is deployed. Nearly 100% of the press releases are picked up by national editors and farm broadcasters covering the US pork industry, many times resulting in one-on-one interviews with the executive director.

> read more on website

ARTICLES FOR PARTNERS

Each year, SHIC provides dozens articles for publication in the AASV weekly e-letter and for other partners. Additionally, organizations like the US Animal Health Association (USAHA) are using SHIC information gleaned from media and the e-newsletter to share with their audiences. With USAHA, this means distribution to state animal health officials as well as key federal animal health officials.

> read more on website

SHIC TALK PODCAST

In 2020, SHIC Talk was developed and launched. The podcast is hosted by Barb Determan and features guests on “industry chatter” topics as well as comments by SHIC’s executive director. Four episodes have been produced so far with the fifth in production. SHIC Talk is available on the SHIC website as well as Apple Podcasts, Google Podcasts, Spotify, Pandora, Amazon Music/Audible, TuneIn/Alexa, and iHeart Radio. 2020 episodes included ASF Test-and-Remove Protocol for Disease Management in China, Coccidiosis Diagnosis and Management, SHIC Rapid Response Program, and ASF Research in Vietnam Update. The first episode of 2021 was on PRRS 1-4-4, 1c.

> read more on website

SHIC E-NEWSLETTER

A monthly SHIC e-newsletter publication schedule continues. Just under 3,000 subscribers are in the distribution database. Percent opens for the e-newsletter hover near 30% (industry benchmark is 10.0%) and percent clicks through to articles on the SHIC website was 18.4% (industry benchmark is 9.0%).

> read more on website

WEBINARS

TOPIC	PRESENTERS	STATS	LINK
Hemorrhagic tracheitis syndrome	Dr. Joseph Rudolphi - *Rudolphi Veterinary Service Ltd.* Dr. Mike Pierdon - *Lancaster Swine Health Services* Dr. Alyona Michael- *Iowa State University VDL* Dr. Josepha DeLay - *Animal Health Laboratory, University of Guelph*	336 registered 234 unique views	> read more on website
Coccidiosis	Dr. Jeremy Pittman - *Smithfield North Region* Dr. Amber Strickler - *Suidae Health and Production* Dr. Kent Schwartz - *Iowa State University College of Veterinary Medicine/VDL* Dr. Robert Friendship - *University of Guelph, Ontario Veterinary College*	333 registered 201 unique views	> read more on website
Lameness and arthritis	Dr. Mike Eisenmenger - *Swine Vet Center* Dr. Mike Rahe - *Iowa State University VDL* Dr. Stephanie Rossow - *University of Minnesota VDL*	232 registered 146 unique views	> read more on website
Porcine astrovirus type 3	Dr. Kayla Henness - *The Maschhoffs* Dr. Todd Williams - *Pipestone Veterinary Services* Dr. Fabio Vannucci - *University of Minnesota* Dr. Bailey Arruda - *Iowa State University*	292 registered 149 unique views	> read more on website
PRRS 1-4-4, 1c	Dr. Paul Yeske – Swine Vet Center Dr. Stephanie Rossow – University of Minnesota VDL Dr. Giovani Trevisan – Iowa State University SDRS Dr. Daniel Linhares – Iowa State University SDRS Dr. Mariana Kikuti – University of Minnesota MSHMP	485 registered 323 unique views	> read more on website

SOCIAL MEDIA

SHIC maintains a presence on three social media channels, providing links to new and relevant announcements, postings, and events.

FACEBOOK **LINKED IN** **TWITTER**

"Since its inception in 2015, SHIC has provided a much-needed service to pork producers nationwide. I am fortunate to serve on the SHIC Working Groups, and I can personally attest to the careful deliberation that take place on each proposal. Before a project is funded it is critiqued by Working Group members to determine its economic feasibility as well as its value and impact for producers. The SHIC newsletter, which provides on-going updates and details on each project, should be required reading for anyone associated with the US pork industry. **This unique center does not exist with any other livestock commodity, and its ability to provide rapid answers to complex research topics is an essential service.** "

Bret Marsh, DVM
Indiana State Veterinarian, SHIC Working Group Member

A Near-real Time Global Surveillance System for Swine Diseases

Project #:	*Principal Invesigator:*	*Institute:*
19-229	Andres Perez	University of Minnesota

We have developed a private- public-academic partnership to support a system for near real time identification of hazards that will contribute to the mission of assessing risks to the industry. Identified hazards were shared monthly with swine practitioners and the government, to help increase the country awareness and preparedness. Ultimately, the system has kept contributing to identify and early detect or create awareness on key stakeholders to support current prevention and mitigation strategies for introduction of foreign pathogens into the US.

Generating Farm-Level Forecasts of PEDv Risk

Project #:	*Principal Invesigator:*	*Institute:*
19-153	Kimberly VanderWaal	University of Minnesota

The aim of this project was to generate farm-level forecasts of PEDv risk that account for recent animal movements, present disease distribution, and environmental factors. Utilizing data captured by the Morrison Swine Health Monitoring Project, we built machine learning algorithms that predict whether a sow farm will break with PED two weeks in advance.

Ultraviolet C (UVC) Standards and Best Practices for the Swine Industry

Project #:	*Principal Invesigator:*	*Institutes:*	Full Report
19-237	Derald Holtkamp, DVM, MS	Iowa State University, et. al.	

UVC germicidal chambers are mostly used for small to medium items like lunch boxes, cell phones, small tools, and medications. Food and semen bags can also be passed through the chamber without negative effects. Repeat exposure of plastics to UVC light may lead to a change in the color or smell of the object. Paper and cardboard cannot be disinfected in a UVC germicidal chamber. Larger UVC chambers, or UVC rooms, can be built for larger items.

Porcine Epidemic Diarrhea Virus Spatial Dynamics: a Modelling Comparison

Project #:	*Principal Invesigator:*	*Institutes:*
19-211	Gustavo Machado	College of Veterinary Medicine, Raleigh, North Carolina, et. al.

Accurate forecasts of PEDV spread are feasible to be generated within a decision making timeframe, but the predictability across all models depends on the stage of the epidemic.

Case Investigation and Development of Improved Diagnostics for Porcine Sapovirus

Project #:	*Principal Invesigator:*	*Institute:*
19-220	Ganwu Li	Iowa State University

To our best knowledge, this is the first evidence that porcine SaV likely serves as the sole etiological agent causing enteritis and diarrhea of piglets in the field in the United States. In addition, a highly sensitive and specific real-time RT-PCR for detecting porcine sapovirus of genogroup III was established

Triplex Real-time PCR for Detection of Chinese Strains of Pseudorabies Virus

Project #:	*Principal Invesigators:*	*Institutes:*
19-220	Orlando Perez, Mathieu Pinette, et. al.	National Centre for Foreign Animal Disease, Canadian Food Inspection Agency, et. al.

This single-tube triplex assay can be used for routine diagnostics and epidemiological studies for detection and differentiation of classical strains from variant strains of PRV, and as a differentiation of infected and vaccinated animals (DIVA) assay when PRV gE- deletion mutant marker vaccines are used.

Development of a Web-based Application for Rapid Response Epidemiological Investigations, Risk Assessments and Biosecurity Benchmarking

Project #:	*Principal Invesigator:*	*Institute:*	
19-149	Derald Holtkamp, DVM, MS	Iowa State University College of Veterinary Medicine	Full Report

This single-tube triplex assay can be used for routine diagnostics and epidemiological studies for detection and differentiation of classical strains from variant strains of PRV, and as a differentiation of infected and vaccinated animals (DIVA) assay when PRV gE- deletion mutant marker vaccines are used.

Assessing Distribution and Mitigation of Senecavirus A, a Foot and Mouth Disease Surrogate, in a Swine Feed Mill

Project #:	*Principal Invesigator:*	*Institute:*	
19-148	Cassandra Jones, PhD	Kansas State University Department of Animal Sciences & Industry	Full Report

The purpose of this study was to identify Enterobacteriaceae presence in the feed manufacturing facilities of a multi-farm system experiencing a viral outbreak as a method of identifying biosecurity gaps.

Evaluation of a Staged Loading Procedure for the Load-out of Market Pigs to Prevent the Transfer of Swine Pathogen-Contaminated Particles from Livestock Trailers to the Barn

Project #:	*Principal Invesigator:*	*Institute:*	
19-219	Derald Holtkamp, DVM, MS	Iowa State University College of Veterinary Medicine	Full Report

One risk event that has the potential to introduce virus into grow-finish pigs is load-out during marketing. In order for the remaining pigs in the group to become infected during load-out, viral contamination must be transferred from the contaminated livestock trailer, driver or other carrying agents to the pigs in the barn.

Genetic Characterization of Streptococcus *equi subspecies zooepidemicus* Associated with High Swine Mortality in the United States

Project #:	*Principal Invesigators:*	*Institute:*	
19-236	Xuhua Chen, et. al.	Iowa State University	Full Report

In September and October 2019, outbreaks with swine mortality up to 50% due to *S. zooepidemicus septicaemia* were reported in Ohio and Tennessee. Genomic epidemiological analysis revealed that the eight outbreak isolates were clustered together with ATCC 35246, a Chinese strain caused outbreaks with high mortality, also closely related to three isolates from human cases from Virginia, but significantly different from an outbreak-unrelated swine isolate from Arizona and most isolates from other animal species. These findings have implications for understanding, tracking and possibly preventing diseases caused by *S. zooepidemicus* in swine. PCV3 may cause death in fetuses and myocarditis and systemic vasculitis in pigs.

Investigation of the Clinical Signs and Lesions Associated with PCV3

Project #:	*Principal Invesigator:*	*Institute:*
18-201	Albert Rovira	University of Minnesota

Porcine circovirus type 3 was discovered in 2016 in the US associated with cases of systemic disease and reproductive disorders. PCV3 is a very common virus that circulates in healthy populations and can be detected in around 20% of the pigs submitted to the diagnostic laboratory. Therefore, it is important to differentiate when PCV3 plays a significant role and when it does not. The results from this study support previous studies that suggested that PCV3 may cause death in fetuses and myocarditis and systemic vasculitis in pigs.

Use of a Demonstration Project to Evaluate Viral Survival in Feed: Proof of Concept

Project #:	*Principal Invesigator:*	*Institute:*	
20-072	Scott Dee	Pipestone Applied Research	Full Report

In 2014, contaminated feed was identified as a vehicle for the transport and transmission of PEDV. This novel approach did demonstrate that three significant viral pathogens of pigs could survive in select feed ingredients during an actual shipping event, involving diverse environmental conditions and realistic transit periods. It is hoped that the information derived from this study will help to unify opinions across the swine industry, the veterinary profession, and governmental agencies regarding the risk of feed.

Enhancing Universally Recognized Diagnostic Data Standards and Systems of Electronic Messaging Necessary for Transcending Inter-laboratory Connectivity and the Next Generation of Web-based Swine Health Information Management Tools for Both Non-program Disease and Program Disease Applications

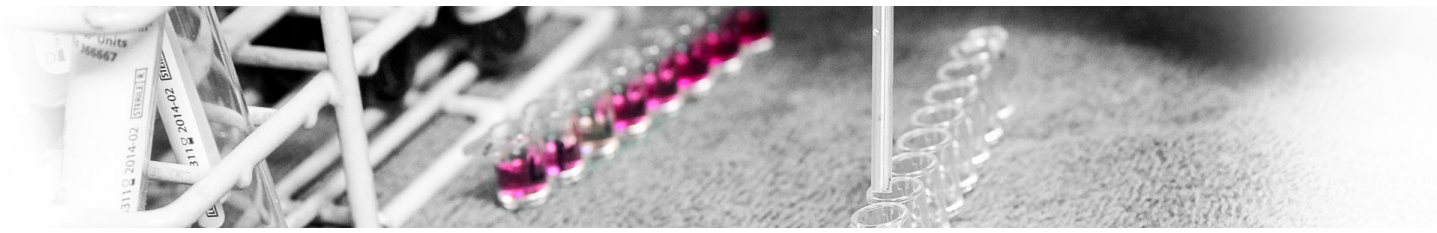
Project #:	*Principal Invesigator:*	*Institutes:*	
16-262	Rodger Main	Iowa State University Veterinary Diagnostic Laboratory, et. al.	Full Report

Seamless integration of diagnostic data from any number of veterinary diagnostic laboratories (VDLs) into third-party database applications for further analytical and reporting purposes has long been recognized as a critical element necessary for proficient detection, monitoring, response, and/or management of significant diseases across a region, state, or nation. Albeit these developments centered at the four VDLs collaborating on this project and were specifically focused on diagnostic tests conducted on US swine, this precedent-setting work could readily be expanded and emulated for use across any number of animal species and VDLs.

Efficacy of Chemical Mitigants in Reducing the Risk of Pathogen Transmission via Contaminated Feed

Project #:	*Principal Invesigator:*	*Institute:*	
18-137	Diego G. Diel	South Dakota State University	Full Report

The goal of this study was to evaluate the mitigation potential of chemical feed additives following natural consumption of contaminated and mitigated feed. Results here, under conditions in which each animal ingested contaminated and mitigated feed, show that that chemical mitigation alone (with mitigants A, B, and C) may not be able to prevent transmission of pathogens through feed. Therefore, alternative strategies such as storage time and importation of feed ingredients from known and trusted sources should also be carefully considered to safeguard the US swine industry from unwanted viral pathogens that are endemic in other regions of the world.



Detection of PRV Shedding by PCR: Nasal Swab vs Oral Fluid Samples

Project #:	*Principal Invesigator:*	*Institute:*
18-215	Luis Giménez-Lirola	South Dakota State University

The goal of this study was to evaluate the mitigation potential of chemical feed additives following natural consumption of contaminated and mitigated feed. Results here, under conditions in which each animal ingested contaminated and mitigated feed, show that that chemical mitigation alone (with mitigants A, B, and C) may not be able to prevent transmission of pathogens through feed. Therefore, alternative strategies such as storage time and importation of feed ingredients from known and trusted sources should also be carefully considered to safeguard the US swine industry from unwanted viral pathogens that are endemic in other regions of the world.

Development of Multiplex Real-time PCR and Antibody Reagents for the Detection of Swine Acute Diarrhea Syndrome Coronavirus

Project #:	*Principal Invesigator:*	*Institute:*	
18-146	Diego G. Diel	Cornell University	Full Report

The swine acute diarrhea syndrome coronavirus (SADS-CoV) RT-PCR assay was incorporated into the EZ-PED/TGE/PDCoV MPX 1.1 RT-PCR assay. The SADS RT-PCR assay replaced the TGE RT-PCR assay in the multiplex. A comparison was completed between EZ-PED/TGE/PDCoV MPX 1.1 vs EZ-PED/SADS/PDCoV MPZ. As shown in the report, results between the two assays was very similar, indicating that the newly developed SADS-CoV is compatible and does not interfere with the PED and PDCoV assays.

Developing the Swine Health Monitoring Project (SMHP) to Build Capacity and Enable the Swine Health Information Center

Project #:	*Principal Invesigator:*	*Institute:*
18-213	Cesar A Corzo	University of Minnesota

Objective 1: Monitor trends in pathogens incidence and prevalence. Objective 2: To conduct prospective monitoring of PRRSv sequence evolution and impact. Objective 3: Develop capacity to capture and analyze movement data. Objective 4: To expand participation of producers to allow for all to be involved.

Development of Regional Surveillance Systems For Emerging and Foreign Animal Diseases of Swine

Project #:	*Principal Invesigators:*	*Institute:*	
18-198	J Zimmerman, C Wang, R Main	Iowa State University	Full Report

Effective surveillance should efficiently collect data for production and/or business planning, document freedom from specific pathogens, and guide a rapid, effective response to emerging and/or FADs. Current on-farm or regional surveillance programs routinely fail to meet these targets. In part, this is because the industry has changed over time and no longer conforms to the assumptions under which our surveillance systems were originally designed. As a result, surveillance either is not done or is done ineffectively.

Machine-learning Algorithms to Identify Key Biosecurity Practices and Factors Associated with Breeding Herds Reporting PRRS Outbreak

Project #:	*Principal Invesigator:*	*Institute:*	
16-273,19-154	Gustavo S. Silva	Iowa State University	Full Report

The objective of this study was to evaluate the use of machine learning (ML) algorithms to identify key biosecurity practices and factors associated with breeding herds self reporting (yes or no) a PRRS outbreak in the past 5 years. Our proposed methodology has the potential to facilitate producer's and veterinarian's decisions while enhancing biosecurity, benchmarking key biosecurity practices and factors, identifying sites at relatively higher risk of PRRSv introduction to better manage the risk of pathogen introduction.

Sampling Validation for Detecting Swine Viruses in Bulk Ingredients

Project #:	*Principal Invesigators:*	*Institute:*	
18-24	Dr. Cassandra Jones, et. al.	Kansas State University	Full Report

The purpose of this experiment was to determine the best type of sample to collect to determine if an ingredient is contaminated with porcine epidemic diarrhea virus (PEDV). In summary, sampling bulk feed or ingredients for PEDV should include compositing at least 10 individual samples.

Assessing Tools for the Mitigation of Foreign Animal Disease Introduction and Transmission in Feed

Project #:	*Principal Invesigator:*	*Institute:*	
17-189	Megan Niederwerder, DVM, PhD	Kansas State University	Full Report

The objective of the current study was to investigate the efficacy of medium-chain fatty acid and formaldehyde-based feed additives in inactivating ASFV. Feed additives were tested in cell culture and in feed ingredients under a transoceanic shipment model. Both chemical additives reduced ASFV infectivity in a dose-dependent manner. This study provides evidence that chemical feed additives may potentially serve as mitigants for reducing the risk of ASFV introduction and transmission through feed.

Validation of a FMDV 3ABC Indirect ELISA (iELISA) for Swine Oral Fluid Specimens

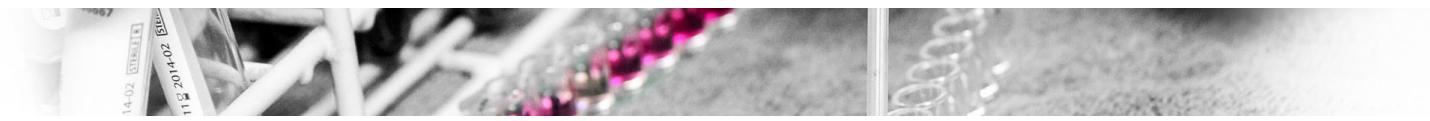
Project #:	*Principal Invesigators:*	*Institute:*
18-197	K. Poonsuk, DVM PhD, et. al.	Iowa State University

In this study, prototype serum and oral fluid FMDV 3ABC ELISAs were developed using samples from animals of precisely known FMDV status. Diagnostic testing of swine oral fluid samples has proven to be an effective and reliable method for the surveillance of endemic infectious diseases. Expanding this methodology to include FMDV will help provide FMDV-infected countries a new tool to control the infection and prepare the U.S. industry for a "worst-case" scenario.

Case Study: Is it Time for an NPIP Like Program for the US Pork Industry?

Project #:	*Principal Invesigator:*	*Institute:*	
18-189	Rodger Main	Iowa State University	Full Report

A study was commissioned in 2018 with the aim of seeking a more in-depth understanding of the National Poultry Improvement Plan (NPIP) and assessing the potential for an NPIP like program to support the US pork industry.



Development and Evaluation of a Dual Matrix Derum/Oral Fluid Atypical Porcine Pestivirus ELISA Using Known Status Samples

Project #:	*Principal Invesigator:*	*Institute:*
18-136	Bailey Arruda	Iowa State University

This is the first study to experimentally infect swine with APPV and monitor the infection dynamics overtime out to 70 DPI. This project provided important foundational knowledge concerning the infection dynamics of APPV in experimentally infected swine while also providing the necessary samples to develop and evaluate serologic assays that will assist in furthering our understanding APPV and preventing congenital tremor litters.

Development and Evaluation of a Real-Time RT-PCR and a Field-Deployable RT-Insulated Isothermal PCR for the Detection of Seneca Valley Virus

Project #:	*Principal Invesigators:*	*Institute:*	
16-271	Jianqiang Zhang, et. al.	BMC Veterinary Research	Full Report

Sensitive and specific RT-PCR assays for the SVV detection is necessary for differential diagnosis. Real-time RT-PCR (rRT-PCR) has been used for the detection of many RNA viruses. The insulated isothermal PCR (iiPCR) on a portable POCKIT™ device is user friendly for on-site pathogen detection. In the present study, SVV rRT-PCR and RT-iiPCR were developed and validated.

Characterization of United States Breeding-Stock Companies International Transport Biosecurity Practices

Project #:	*Principal Invesigator:*	*Institute:*	
18-193	Cesar A Corzo	University of Minnesota	Full Report

A total of 8 breeding-stock companies were invited to participate in this study, 50% of these accepted the invitation by sharing import/export protocols. Biosecurity procedures are across companies are similar which assure the maintenance of the health status of these pigs. The results of this study show that exports/imports are a frequent event. Imports from outside North America occurs less frequently.

Development and Validation of ELISA to Detect IgA, IgM, IgG in Serum and Oral Fluids to Porcine Teschovirus (PTV)

Project #:	*Principal Invesigator:*	*Institute:*
17-199	Douglas Marthaler	Kansas State University

We developed and validated an indirect PTV ELISA for use in diagnostics. In addition, we measure the antibody response to PTV in weaned piglets and determined the PTV antibodies in oral fluids was variable.

Developing Surveillance Systems for Emerging and Foreign Animal Diseases of Swine

Project #:	*Principal Invesigator:*	*Institute:*	
17-141	Jeff Zimmerman, DVM PhD	Iowa State University	Full Report

Our research has provided a better understanding of the spatiotemporal nature of disease spread. Initial assessment showed that use of a spatially balanced sampling scheme improved the power of disease detection and the efficiency of the disease surveillance.

Pilot Study to Evaluate the Use of a Fluorescent Powder (Glo Germ) to Study the Transfer of Contamination from Livestock Trailers to the Center Alleyway and Pens in the Barn During Marketing Events

Project #:	*Principal Invesigators:*	*Institutes:*	
19-147	Chelsea Ruston, DVM, et. al.	Iowa State University College of Veterinary Medicine, et. al.	Full Report

The livestock trailer, truck and driver returning directly from a swine slaughter plant are likely frequently contaminated with live infectious PRRSv or PEDv or both when they enter a growing pig site to haul the next load.

Half-Life for Feed Holding Time

Project #:	*Principal Invesigator:*	*Institute:*
18-211	Diego G. Diel	South Dakota State University

Results from these studies confirm that common swine feed ingredients such as SBM and DDGS provide a good environment for virus survival, increasing the overall stability of SVA, an important swine pathogen and surrogate for FMDV to survive for long periods of time. A clear effect of temperature was observed, with higher environmental temperatures resulting in rapid virus decay even in the most favorable feed ingredients.

Evaluation of Chemical Mitigants for Neutralizing the Risk of Foreign Animal Diseases in Contaminated Feed Ingredient

Project #:	*Principal Invesigators:*	*Institute:*
17-187	Diego G. Diel and Scott Dee	South Dakota State University

These results demonstrate that a select group of feed additives have the potential to be used as chemical mitigants to reduce viral contamination levels in feed. Further studies are warranted to assess the mechanism of action of those products and to assess their efficacy following natural ingestion of contaminated and mitigated feed.

Development and Validation of a Scoring System to Assess the Relative Vulnerability of Swine Breeding Herds to the Introduction of PRRS Virus

Project #:	*Principal Invesigators:*	*Institutes:*	
-	Gustavo S. Silva, et. al.	Iowa State University, et. al.	Full Report

The objective of this study was to develop a biosecurity vulnerability score (BVS) that represents the relative vulnerability of swine breeding herds to the introduction of PRRSv. To validate the BVS, a survey of biosecurity practices and PRRS outbreak histories in 125 breed-to-wean herds in two different populations in the U.S. was used.

Validation of a Low-cost Tool for Senecavirus A Detection, and Surveillance of Viral Prevalence in United States Feed Mills

Project #:	*Principal Invesigator:*	*Institute:*
17-188	Cassandra Jones	Kansas State University

Our research has provided a better understanding of the spatiotemporal nature of disease spread. Initial assessment showed that use of a spatially balanced sampling scheme improved the power of disease detection and the efficiency of the disease surveillance.

Development of a FMDV 3ABC Antibody ELISA for Swine Oral Fluid Specimens

Project #:	*Principal Invesigators:*	*Institute:*	
17-191	J. Zimmerman, DVM, PhD, et. al.	Iowa State University	Full Report

Foot-and-mouth disease virus (FMDV) remains uncontrolled in most of the world, with circulation of multiple serotypes in endemic areas. Actually, North America is among the few “FMDV-free without vaccination” areas of the world. The current massive level of global trade and traffic means that FADs anywhere in the world present a credible risk to U.S. agriculture. Our recent experience with PEDV is witness to that fact.

Development and Validation of a Single-tube,Triplex RT-PCR Assay for Differential Detection of Highly Virulent Chinese Strains of Pseudorabies Virus

Project #:	*Principal Invesigator:*	*Institute:*	
16-250	Aruna Ambagala	National Centre for Foreign Animal Disease - Winnipeg, MB	Full Report

Pseudorabies virus (PRV) causes pseudorabies or Aujeszky’s disease in livestock and wild mammals; however pigs are the main host and reservoir for this virus. It causes deadly disease in newborn piglets, respiratory problems in growing and fattening pigs, and reproductive problems in pregnant sows.

North American Domestic Pigs are Susceptible to Experimental Infection with Japanese Encephalitis Virus

Project #:	*Principal Invesigators:*	*Institutes:*	
16-258	So Lee Park, et. al.	Kansas State University, et. al.	Full Report

Our findings indicate that domestic pigs can potentially become amplification hosts in the event of an introduction of JEV into the U.S. Vector-free transmission to immunologically naïve vertebrate hosts is also likely through nasal shedding of infectious viruses.

Validation of a Real-Time Reverse Transcription PCR Assay for Detection of Porcine Kobuvirus (PKV) in Porcine Diagnostic Samples

Project #:	*Principal Invesigators:*	*Institute:*
17-144	Dr. Phil Gauger DVM, PhD, et. al.	Iowa State University

The objective of this research was to validate a real-time reverse transcriptase PCR (rRT-PCR) that would detect US strains of PKV in feces, fecal swabs and oral fluids collected from swine. Overall, the large number of positive samples suggest PKV is widespread in US swine and further research is needed to learn if pigs with or without diarrhea are infected with PKV or if different strains of the virus are more likely to cause diarrhea in swine.

Final Report: Description of Biosecurity Aspects of Herds With Low or High PRRS Incidence and Comparison Within and Between Production Systems

Project #:	*Principal Invesigator:*	*Institutes:*	
16-273	Daniel Linhares	Iowa State University, University of Minnesota	Full Report

In a nutshell, this study demonstrated the importance of number of events on the biosecurity risk. In other words, we encourage producers to evaluate possibility of reducing the number of pig animal movements (e.g. reducing number of weaning events per month), and number of people entry in the farm (e.g. reducing number of re-entry events).

Development of Sensitive and Reliable Diagnostic Assay to Detect Atypical Procine Pestivirus (APPV) in Swine

Project #:	*Principal Invesigator:*	*Institutes:*
16-256	Lalitha Peddireddi	Kansas State Veterinary Diagnostic Laboratory, Kansas State University

The main aim of this study is to develop a real-time RT-PCR (qRT-PCR) assay, capable of detecting all currently known genetically divergent APPV strains, and fully validate its use in diagnosing APPV infections in the US swine herds.

Assessment of Slaughter Surveillance Based on Oral Fluids Samples

Project #:	*Principal Invesigator:*	*Institute:*
16-175	Daniel Linhares	Iowa State University

The objective of this study was to determine whether monitoring and surveillance systems (MOSS) can be done using oral fluid samples collected in an US abattoir. Anti-PRRSV antibodies, and PRRSV and SVA RNA were successfully detected in abattoir oral fluids from pigs. There was a perfect agreement of PRRSV and SVA ELISA results between locations. There is opportunity to improve the between locations agreement of PRRS and SVA PCR testing.

Detection and Differentiation of PCV3 from PCV2a, PCV2b and the Highly Prevalent PCV2d Mutant Strains

Project #:	*Principal Invesigator:*	*Institute:*	
16-257	Jianfa Bai	Kansas State University	Full Report

One objective of this study was to develop a molecular diagnostic assay that can detect and differentiate the majority of the field strains of PCV3 and PCV2. The other objective was to sequence about 50 PCV3 genomes to study how fast the PCV3 genome is changing, and to use the new sequence information to guide the development, or modification of the detection assay developed in this study.

Describing the Cull Sow and Cull Hog Market Networks in the US: A Pilot Project

Project #:	*Principal Invesigators:*	*Institutes:*	
16-275	Benjamin Blair and James Lowe	Integrated Food Animal Medicine Systems, et.al.	Full Report

This project set out to collect data from a harvest plant to see if such information could allow the industry and animal health officials to better make decisions to prevent and control animal health emergencies. Being able to understand the way not only sows but diseases move through the slaughter chain holds great value in making the correct decisions to effectively control and prevent disease outbreaks, and why further work must be completed to effectively and efficiently track culls sows through harvest plans to prepare for such an event.

SHIC – Final Research Grant Report

Project #:	*Principal Invesigators:*	*Institute:*	
15-195	Pablo Pineyro, DVM PhD and Luis Gimenez-Lirola, PhD	Iowa State University	Full Report

The specific aims of this proposal are to develop a set of diagnostic tools that allows direct detection of SVA. We successfully developed a set of reagents that can be used in different diagnostic techniques for virus identification in tissue. These techniques will have a great impact on SVA diagnosis in cases of vesicular disease, providing and supporting the differential diagnosis with other causes of vesicular disease such as foot and mouth disease.

Final Report: Duration of Senecavirus A Shedding From Clinically Affected and Non-affected Sows and Piglets After a Breeding Herd Infection

Project #:	*Principal Invesigator:*	*Institute:*	
15-206	Dr. Chris Rademacher	Iowa State University	Full Report

This study was designed to evaluate the length of shedding of Senecavirus A (SVA) from a sow farm undergoing an outbreak of SVA in the fall of 2015. These findings may suggest that SVA is most likely a short-term risk to other herds and the risk of transmitting Senecavirus A may be lower after 30 days.

Characterization of Seneca Valley Virus Circulating in the US and in Brazil

Project #:	*Principal Invesigator:*	*Institutes:*	
15-192	Diego G. Diel	South Dakota State University, EMBRAPA Swine and Poultry	Full Report

Since November 2014, there have been increased reports of SVV associated with vesicular disease in swine in Brazil and since July 2015 in the US. The significance of this newly emerging virus lies on its association with vesicular lesions that are indistinguishable from those observed in other high consequence foreign animal diseases (FAD) of swine (i.e foot-and-mouth disease virus, FMDV). Thus, any evidence of vesicular disease in pigs requires a complete diagnostic investigation to rule out the possibility of a FAD.

Final Report: Development of Reagents and Serological Assays for Seneca Valley Virus

Project #:	*Principal Invesigator:*	*Institute:*	
15-188	Steven Lawson	South Dakota State University	Full Report

The overall objective of this proposal was to develop and validate diagnostic reagents and tests for Senecavirus A (SVA) antigen and antibody detection.

Interim Report: Development of Direct Detection Methods for in situ Diagnostic of Seneca A Virus

Project #:	*Principal Invesigators:*	*Institute:*	
15-195	Pablo Pineyro, DVM PhD and Luis Gimenez-Lirola, PhD	Iowa State University	Full Report

The specific aims of this proposal are to develop a set of direct diagnostic tools that allows direct detection of SV-A in situ.

Interim Report: Pineyro in situ Diagnostic of Seneca A Virus

Project #:	*Principal Invesigatosr:*	*Institute:*	
15-195	Pablo Pineyro, DVM PhD and Luis Gimenez-Lirola, PhD	Iowa State University	Full Report

The specific aims of this proposal are to develop a set of direct diagnostic tools that allows direct detection of SV-A in diagnostic tissues.

Final Report: SHIC Emerging Disease Fact Sheet

Project #:	*Principal Invesigator:*	*Institute:*	
15-181	James Roth	College of Veterinary Medicine, Iowa State University	Full Report

Perform a literature review and develop a one-to-two page overview for each of the diseases listed that includes etiology; cleaning and disinfection; epidemiology; transmission; pathogenesis, clinical signs, and postmortem lesions associated with infection in swine; diagnostic tests; immunity; prevention and control; and gaps in preparedness. Develop a summary matrix, with information on available diagnostic tests for each of the transboundary production diseases listed in objective, as well as gaps in diagnostic preparedness.

Final Report: Expedited Look Into the Prevalence of Senecavirus A in U.S.

Project #:	*Principal Invesigators:*	*Institute:*	
15-185	Main R, Rossow S, et. al.	Iowa State University	Full Report

Expeditiously obtain some insight to better understanding the prevalence of Senecavirus A (Seneca Valley Virus) currently (8/24/2015 – 9/01/2015) circulating in U.S. swine herds that are not known to be exhibiting clinical signs of acute lameness accompanied by the presence of vesicular lesions on the snout, coronary band, and/or hoof.

Final Report: Evaluation of Disinfectants Against Seneca Valley Virus

Project #:	*Principal Invesigator:*	*Institute:*	
15-187	Goyal, Sagar M.	University of Minnesota	Full Report

The overall objective is to evaluate the efficacy of certain disinfectants on the inactivation of Seneca Valley Virus (SVV) applied to various surfaces including cured cement, aluminum, stainless steel, and plastic and rubber boots at two different temperatures (40C and ~250C).

Final Report: Seneca Valley Virus Outbreak Investigations

Project #:	*Principal Invesigators:*	*Institutes:*	
-	Holtkamp, Derald, et al.	Iowa State University, et.al.	Full Report

Epidemiological investigations were conducted on a case series of six Senecavirus A (SVA)-affected breeding herds in the United States to determine potential routes of introduction and enhance the swine industry's knowledge of SVA's clinical presentation and spread. Each SVA-affected herd was evaluated using a standard form to ensure that all relevant data were collected.

Interim Report: Seneca Valley Virus Genetic Diversity Project Summary

Project #:	*Principal Invesigator:*	*Institutes:*	
15-193	Diel, Diego G.	South Dakota State University, et.al.	Full Report

To determine the complete genome sequence of SVA strains currently circulating in the United States and in Brazil and to compare SVA complete genome sequences and to identify genetic signatures that might affect the specificity of SVA diagnostic tests.

Final Report: Seneca Valley Virus Shedding Pattern on One Sow Farm in Minnesota

Project #:	*Principal Invesigators:*	*Institute:*	
15-199	Tousignant, Steve, et al.	Swine Vet Center, P.A.	Full Report

The objectives of this study are to first identify an affected case herd, then conduct an epidemiological investigation and social network analysis, as well as perform longitudinal sample collection on the sow farm to asses shedding patterns of sows, gilt pens and suckling piglets, and develop an archive of samples to be made available for future diagnostic investigations.

Published: Longitudinal Study of Senecavirus A Shedding in Sows and Piglets on a Single United States Farm During an Outbreak of Vesicular Disease

Project #:	*Principal Invesigators:*	*Institute:*	
15-199	Tousignant, Steve, et al.	Swine Vet Center, P.A.	Full Report

The study illustrates the variation of SVA shedding patterns in different sample types over a 9 week period in sows and piglets, and suggests the potential for viral spread between piglets at weaning.