Swine Health Information Center

Swine Health Information Center Update

USAHA Transmissible Diseases of Swine Committee

Paul Sundberg, DVM, PhD

Executive Director

Swine Health Information Center

Mission

Protect and enhance the health of the US 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

- **Board of Directors**
  - NPB Mark Greenwood Brett Kaysen
  - NPPC Howard Hill Bill Luckey
  - AASV Matt Anderson Daryl Olsen
  - At Large Mark Schwartz Mike Terrill Matthew Turner

Monitoring and Analysis Working Group

Practitioners

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- Jer Geiger, Genus PIC
- Steve Henry
- Clayton Johnson
- Gordon Spronk
- Paul Yeske

Pork Producers

- Craig Christensen, Iowa
- Jim Niewold, Illinois
- Ray Summerlin, NC

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- Tom Burkgren, AASV
- Dave Pyburn, NPB
- Harry Snelson, AASV
- Liz Wagstrom, NPPC
- Patrick Webb, NPB

USDA

- Dana Cole, CEAH
- Michael McIntosh, FADDL

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- Marlin Hoogland

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- Christa Goodell, BI (Idexx)
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- Jeff Zimmerman, ISU

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- Tom Burkgren, AASV
- Dave Pyburn, NPB
- Harry Snelson, AASV
- Liz Wagstrom, NPPC
- Patrick Webb, NPB

USDA
- Cecilia Antognoli, CEAH
- Kelly Lager, ARS
- Sabrina Swenson, NVSL

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Monitoring and Analysis

Swine Disease Matrix Project

Representative virus affecting swine	Average
Foot and Mouth Disease (FMD)	8.42
Classical Swine Fever (CSF)	8.26
Aftrican Swine Fever (ASF)	7.83
Influenza A Virus	6.17
Pseudorabies Virus - Pathogenic Chinese Strain	6.08
PRRS	5.95
Nipah Virus	5.87
PRRS - Chinese High Pathogenic	5.51
Porcine Epidemic Diarrhea Virus (PED)	5.31
Swine Vesicular Disease Virus	5.07
Japanese Enchephalitis	4.83
Vesicular Stomatitis Virus	4.50
Porcine Teschovirus (Teschen/PTV1 are exotic)	4.27
Ebola Virus - Restin	4.20
PorcineCircovirus	4.11
Vesicular Exanthema of Swine Virus	3.96
Circovirus 3	3.95
Porcine Rubulavirus (Blue Eye)	3.89
Transmissible Gastroenteritis (TGE)	3.88
Seneca Valley Virus	3.88
Lassa Fever	3.87
Menangle Virus	3.86
Porcine Deltacoronavirus	3.79
Porcine Rotavirus	3.60

Criteria

- **Production Impact**
- **Market and Trade Impact**
- **Likelihood**

June 2016

- **Review and revision underway**
- **Additions/deletions**
- **Survey**
  - **Japan (2); Korea; Philippines (2); China (2)**
  - **Poland/Ukraine/East Europe (2); UK; Spain**
  - **Brazil (2); Chile; Columbia (2)**
  - **U.S.**

Global Swine Pathogen Survey

- SHIC Monitoring and Analysis Working Group
- 5 regions
  - China / SE Asia
  - Europe / Russia
  - South America
  - North America (Canada and Mexico)
- Top (up to 5) pathogens; Why; What; Emerging; Impact on U.S.
- Weighted average based on number of responses within region

Global Swine Pathogen Survey

Far East/China	Pathogen	Weighted Ave
	PRRS	5.23
China x 2	Porcine Epidemic Diarrhea/PED virus	4.55
Philippines	Mycoplasma hyopneumoniae	0.45
Japan x 2	PRV	0.45
Korea	PRDC	0.18
	Swine Erysipelas	0.18
	Actinobacillus pleuropneumoniae	0.14
	TGE	0.14
	Strep suis	0.09
	CSF	0.09
	Bacterial Scouring/E. coli/Clostridia	0.05


PRRS
Influenza
PRRS
A. pleuropneumoniae
PRRS
PED
M. hyopneumoniae
Influenza
P. multocida
PRRS
PED
GREENLAND (DENMARK)
ICELAND
NORWAY
RUSSIA
UNITED STATES OF AMERICA
MEXICO
CANADA
UNITED KINGDOM
GERMANY
POLAND
BELARUS
UKRAINE
FRANCE
SPAIN
ITALY
GREECE
TURKEY
KAZAKHSTAN
MONGOLIA
CHINA
JAPAN
IRAQ
IRAN
SYRIA
AFGHANISTAN
PAKISTAN
INDIA
SAUDI ARABIA
EGYPT
LIBYA
ALGERIA
MALI
NIGER
CHAD
SUDAN
ERITREA
YEMEN
ETHIOPIA
SOMALIA
NIGERIA
GUINEA
CENTRAL AFRICAN REPUBLIC
DEMOCRATIC REPUBLIC OF THE CONGO
UGANDA
KENYA
TANZANIA
ANGOLA
ZAMBIA
VENEZUELA
COLOMBIA
PERU
BRAZIL
BOLIVIA
ARGENTINA
AUSTRALIA

Evaluate Risk of Imported Feed Ingredients

Background

- Using a transboundary model, contaminated feed ingredients were demonstrated to be a potential means of PEDV entry from China into the US.
  - SBM-C, SBM-O, Lysine, choline and Vitamin D
  - Dee et al BMC Vet Res 2016

New Project

- Objective: Evaluate trans-Pacific survival of FADs through the use of surrogate viruses and transboundary model.
- Hypothesis: Survival will depend on the correct combination of pathogen and ingredient.

Virus Isolation: D 37 PI (Batch 4 = Beijing to Des Moines)

Ingredient	SVA (FMDV)	BVDV (CSFV)	BHV-1 (PRV)
Soybean meal-Conventional	Pos/Pos	Neg/Neg	Pos/Pos
Soybean meal-Organic	Neg/Neg	Neg/Neg	Neg/Neg
Soy oil cake	Pos/Pos	Neg/Neg	Pos/Pos
DDGS	Pos/Pos	Neg/Neg	Neg/Neg
Lysine	Pos/Pos	Neg/Neg	Neg/Neg
Choline	Neg/Neg	Neg/Neg	Neg/Neg
Vitamin D	Pos/Pos	Neg/Neg	Neg/Neg
Moist dog food	Pos/Pos	Neg/Neg	Neg/Neg
Moist cat food	Pos/Pos	Neg/Neg	Neg/Neg
Dry dog food	Pos/Pos	Neg/Neg	Neg/Neg
Pork sausage casings	Pos/Pos	Neg/Neg	Neg/Neg
Complete feed (positive control)	Pos/Pos	Neg/Neg	Neg/Neg
Complete feed (negative control)	Neg/Neg	Neg/Neg	Neg/Neg
Stock virus (positive control)	Neg/Neg	Neg/Neg	Neg/Neg

PIPESTONE

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Preparedness and Response

SHIC Seneca Valley Research

Assess the needs, Fund the projects, Answer the problems

- Early-July — Georgia, SE U.S.
- Mid-July — Show pigs and state fairs
- ~July 28 — SD finisher outbreak
- August 1 — Begin conference calls
- August 13 — Research coordinating call
- August 23 — Call for research proposals
- September 21 — Proposals received
- October 2 — SHIC Preparedness Working Group selects
- October 9 – November 2 — Contracts final

SHIC Seneca Valley Research

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- Screen oral fluid samples
- Duration of shedding in finishing pigs
- Duration of shedding on sow farms
- Sequencing and characterization of the virus
- Diagnostics
  - ELISA for serology
- Efficacy of disinfectants

Distribution

Manage Movements

What's different?

Tools

Cleaning up

USDA

- Epi surveys on affected farms
- Koch's Postulates
  - Historical US
  - Contemporary US
  - Brazilian

Risk factors

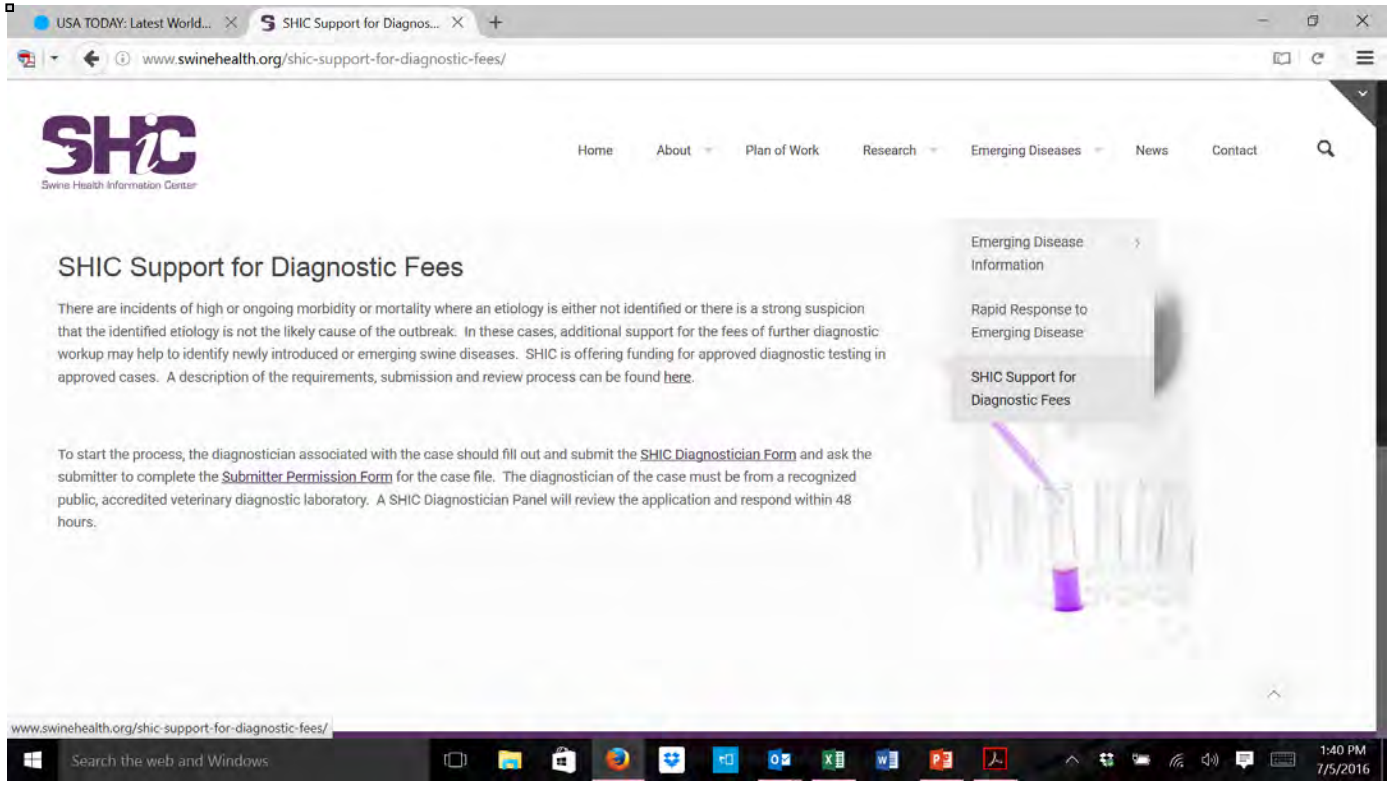
Missing something?

Pilot project for emerging disease discovery support

Dr. Kent Schwartz, ISU

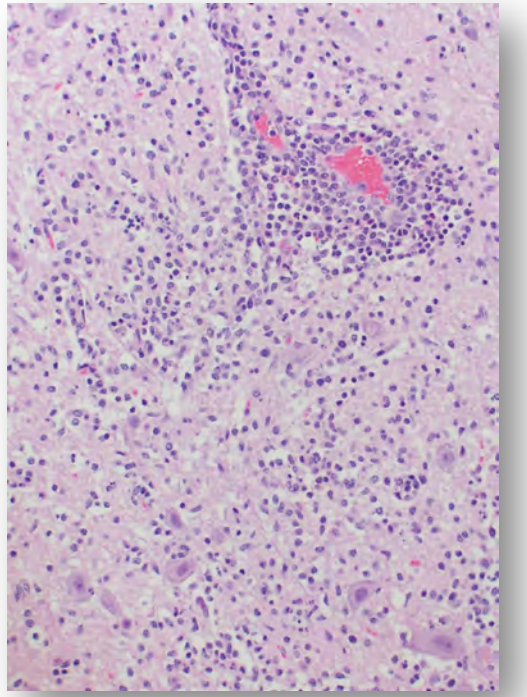
Dr. Albert Rovira, UMN

Dr. Jerome Nietfeld, KSU



- Policies, procedures, communication
  - Requirements
  - Submission
  - Review process
- SHIC VDL Diagnostician Panel

Conclusions



- Novel sapelovirus (genetically divergent) was the only pathogen detected in association with a unique clinical presentation and severe polioencephalomyelitis
- Virus was demonstrated within lesions by *in situ* hybridization
- Neurologic disease has not been reported to be associated with sapelovirus from other animal species in the US

Iowa State University Veterinary Diagnostic Laboratory

University of Minnesota Driven to Discover℠

Kansas State University

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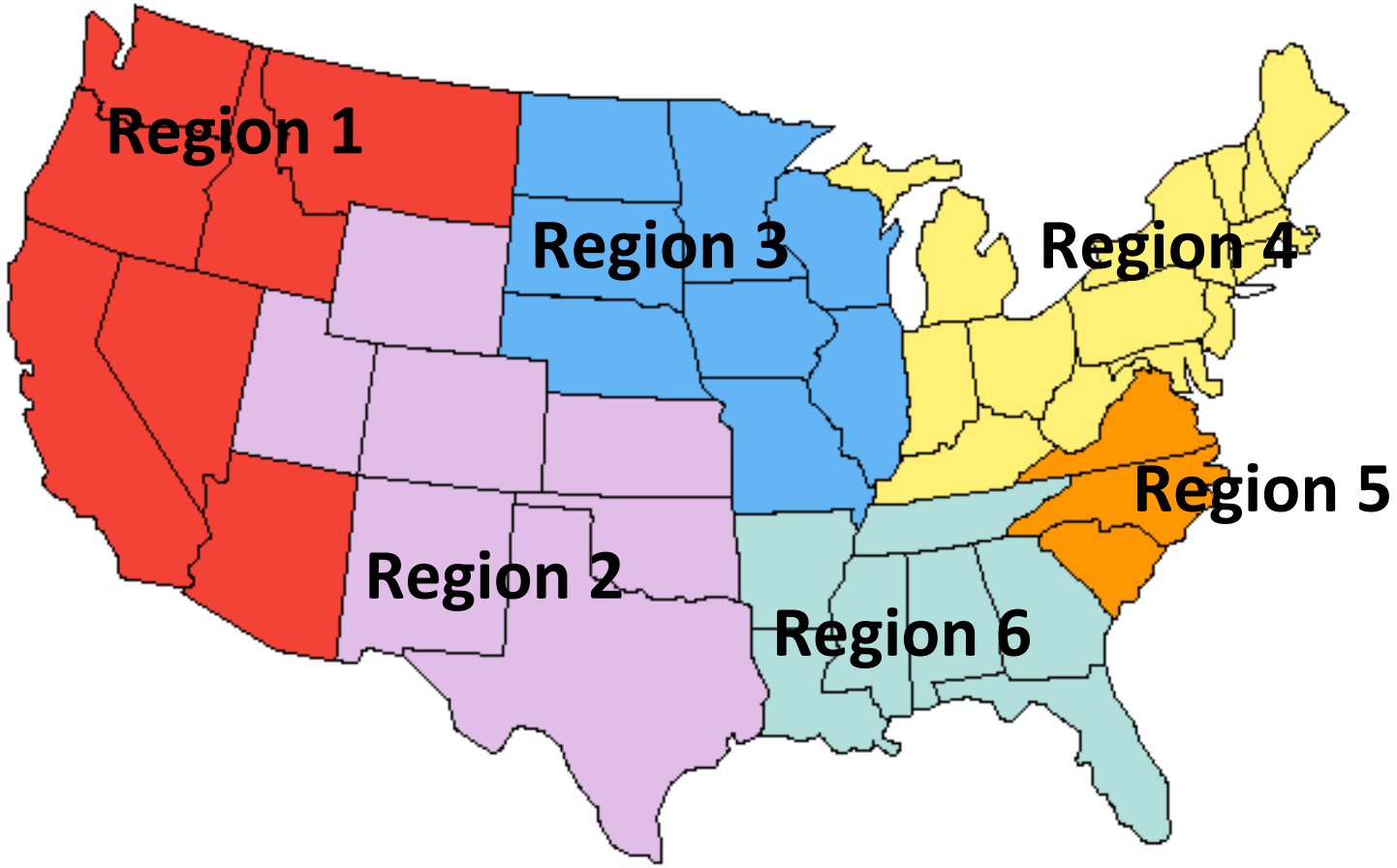
global disease monitoring, targeted research investments and analysis of swine health data

SHIC Facilitated Rapid Response Teams



- Dr. Joe Connor
- Dr. Scanlon Daniels
- Dr. Gene Erickson
- Dr. Noel Garbes
- Dr. Perry Harms
- Dr. Steve Henry
- Dr. Derald Holtkamp
- Dr. Clayton Johnson
- Dr. Daniel Linhares
- Dr. Doug Meckes
- Dr. Montserrat Torremorell
- Dave Wright
- Dr. Paul Yeske

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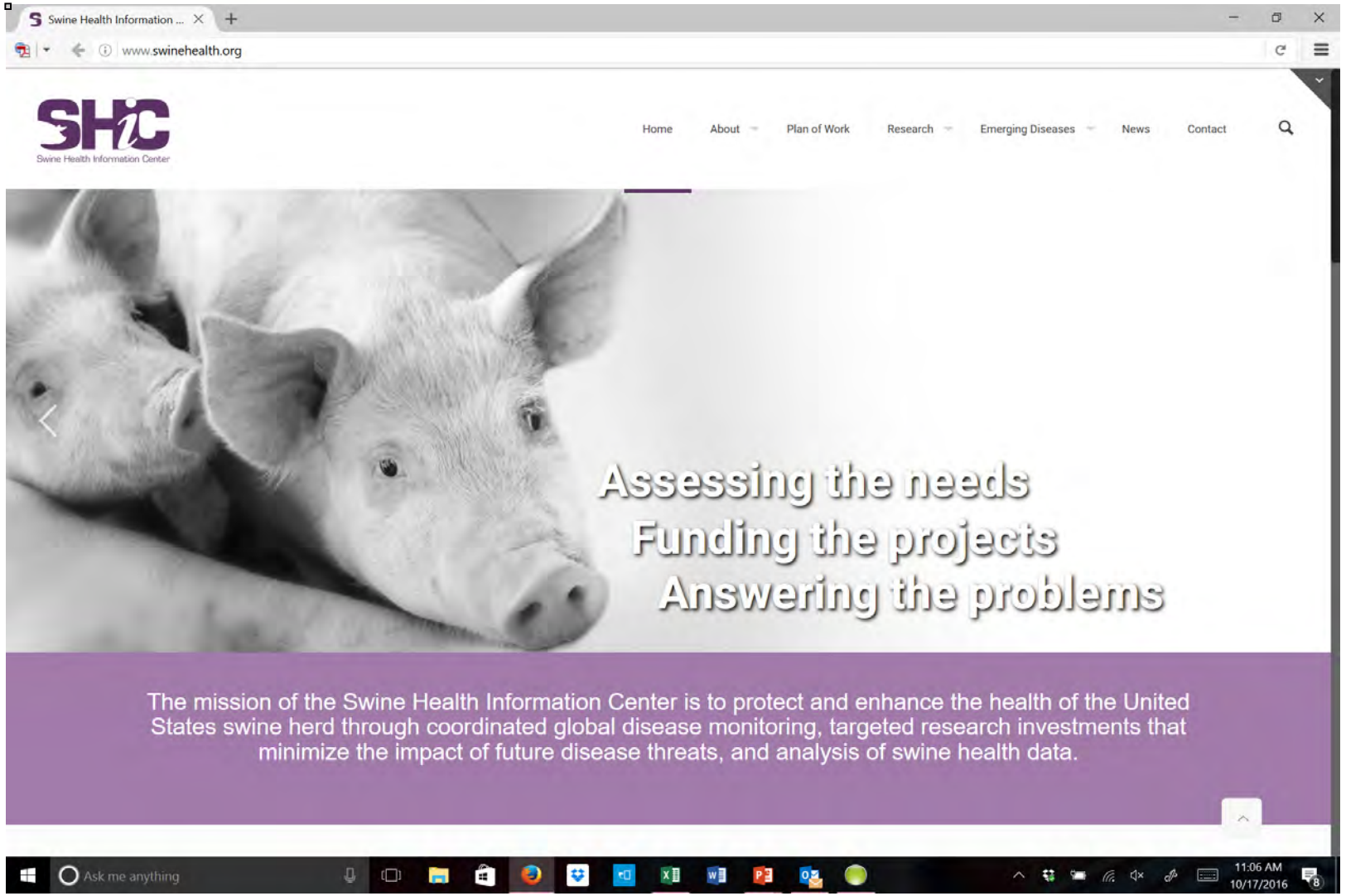

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