Swine Disease Reporting System





### Swine Disease Reporting System report 6 (August 7<sup>th</sup>, 2018)

### What is the SDRS?

SHIC-funded, veterinary diagnostic laboratories (VDLs) collaborative project, with goal to aggregate swine diagnostic data from participating reporting VDLs, and report in an intuitive format (web dashboards), describing dynamics of disease detection by pathogen or disease syndrome over time, specimen, age group, and geographical space.

For this report, data is from the Iowa State University VDL and South Dakota State University ADRDL. Specifically, for PRRSV PCR results, there was a contribution from the University of Minnesota VDL and Kansas State University VDL.

For all "2018 predictive graphs", the expected value was calculated using a statistical model that takes into account the results from 3 previous years. The intent of the model is not to compare the recent data (2018) to individual weeks of previous years. The intent is to estimate expected levels of percent positive cases based on patterns observed in the past data, and define if observed percentage positive values are above or below the expected based on historic trends.

Collaborators:

*Iowa State University*: Giovani Trevisan\*, Leticia Linhares, Bret Crim; Poonam Dubey, Kent Schwartz, Rodger Main, Daniel Linhares\*\*.

University of Minnesota: Mary Thurn, Paulo Lages, Kimberly VanderWaal, Andres Perez, Jerry Torrison.

Kansas State University: Jamie Henningson, Eric Herrman, Gregg Hanzlicek, Ram Raghavan, Douglas Marthaler.

South Dakota State University: Jon Greseth, Travis Clement, Jane C. Hennings.

\* Giovani Trevisan: Project coordinator. E-mail: trevisan@iastate.edu.

\*\* Daniel Linhares: Principal investigator. E-mail: linhares@iastate.edu.

### **Advisory Council:**

The advisory group reviews the data to discuss it and provide their comments to try to give the data some context and thoughts about its interpretation: Clayton Johnson, Emily Byers, Hans Rotto, Jeremy Pittman, Mark Schwartz, Paul Sundberg, Paul Yeske, Pete Thomas, Rebecca Robbins, Tara Donovan.

### This report is an abbreviated version of the dashboards that are available online.

To access the full data, use your computer, tablet, or phone to:

- 1) Scan the code below, or go to: www.powerbi.com
- 2) Login: sdrs@iastate.edu
- 3) Password: Bacon 100
- 4) On the left bar, click on 'Apps'
- 5) Select your dashboard of interest (e.g. PRRS)





**Figure 1** *Top chart*: Results of PRRS rRT-PCR cases over time. *Bottom right*: expected percentage of positive results for PRRSV RNA by rRT-PCR, with 1 standard deviation above and below the expected value. *Bottom left*: PRRS virus RFLPs detected on 2017, and 2018 for Winter, Spring, and Summer months.

PRRS rRT-PCR data are consolidated from Iowa State University Veterinary Diagnostic Laboratory (ISU-VDL), University of Minnesota Veterinary Diagnostic Laboratory (UMN-VDL), South Dakota State University Animal Disease Research & Diagnostic Laboratory (SDSU-ADRDL), and Kansas State University Veterinary Diagnostic Laboratory (KSU-VDL).

- 1) Processing fluids contributed for an increased percentage of rRT-PCR-positive results in 1.40% on Spring, and 1.91% on Summer of 2018.
- 2) During the Winter, Spring, and Summer of 2018, compared to the same period of 2017, there was an increase in detection for the following RFLP's: decrease of 30% for 1-3-4; decrease of 4% on 1-7-4; increase of up to 15 % for 1-4-2, 1-8-2, and 1-7-3; increase of 15 to 30% for 1-4-4, 1-3-2, and 1-8-4; and increase of 30 to 68% for 2-6-2, 1-1-2, 2-5-2, and 1-10-4.











**Figure 3** Left side: results of PEDV, and PDCoV rRT-PCR cases over time. Right side charts: expected percentage of positive results for PEDV and PDCoV by rRT-PCR, with 1 standard deviation above and below the expected value, respectively.

PED, PDCoV, and TGE rRT-PCR test results include data from SDSU-ADRDL, and ISU-VDL.

- 1) Seasonal pattern of PED is within the predicted values for 2018.
- 2) During recently summer weeks, PDCoV activity is moving towards the predicted values.

# Swine Disease Reporting System



UNIVERSITY OF MINNESOTA VETERINARY DIAGNOSTIC LAB



# Page 4 – Detection of pathogens associated with CNS disease



**Figure 4** Pathogen detection on CNS tissue over time. Each green bar indicates a different agent or syndrome. The red bar accounts for the sum of the green bars. Bottom: summer months of 2016, middle summer months of 2017, top summer months of 2018. Summer months contains results of June, July, and August. 'Multiple agents' represent cases with more than one pathogen detected on CNS tissues.

- a) Streptococcus suis continues to be the predominant agent detected in CNS tissue during summer months.
- b) For the purpose of this report, Summer includes June to August. This report has data from June and July only for 2018. So far, *Haemophilus parasuis* appears to have higher activity for 2018 summer compared with summers of 2017 and 2016: 8 cases in 2018 versus 7, and 6 respectively. Also, salt toxicity has already 4 cases detected, versus 3 in 2017, and 2 in 2016.







# Page 5 – Detection of pathogens in respiratory tissue over time (1 of 2)



**Figure 5** Pathogen detection on respiratory tissues over time. Each green bar indicates a different agent or syndrome. The red line accounts for the cumulative percentage of the green bars. Bottom: summer months of 2016, middle summer months of 2017, top summer months of 2018. Summer months include June, July, and August. 'Multiple agents' represent cases with more than one pathogen detected on respiratory tissues.

- a) PRRSV and Influenza A virus are the 2 main pathogens detected in respiratory tissue, followed by a combination of multiple agents.
- b) *Mycoplasma hyorhinis* is appearing between top 10 more frequent agents detected in respiratory tissue in summer of 2018. This agent did not appear in the top 10 list for 2017 and 2016.







# Page 6 – Detection of pathogens in respiratory tissue over time (2 of 2)



**Figure 6** Multiple agents detected in respiratory tissue per accession ID case level. Each blue bar represents a combination of 2 or more agents.

- a) Multiple detection of PRRSV and Influenza A virus is the most frequent combination on respiratory tissues.
- b) Multiple detection of *Haemophilus parasuis* and *Mycoplasma hyorhinis* seem to be more active for 2018 summer when compared with summer of previous years.