



Swine Disease Reporting System Report # 32 (October 6, 2020)

What is the Swine Disease Reporting System (SDRS)? SDRS includes multiple projects that aggregate data from participating veterinary diagnostic laboratories (VDLs) in the United States of America (USA), and reports the major findings to the swine industry. Our goal is to share information on endemic and emerging diseases affecting the swine population in the USA, assisting veterinarians and producers in making informed decisions on disease prevention, detection, and management.

After aggregating information from participating VDLs and summarizing the data, we ask the input of our advisory group, which consists of veterinarians and producers across the USA swine industry. The intent is to provide an interpretation of the observed data, and summarize the implications to the industry. Major findings are also discussed in monthly podcasts. All SDRS reports and podcasts are available at www.fieldepi.org/SDRS. The SDRS projects are:

Swine Health Information Center (SHIC)-funded Domestic Swine Disease Surveillance Program: collaborative project among multiple VDLs, with the goal to aggregate swine diagnostic data and report in an intuitive format (web dashboards and monthly PDF report), describing dynamics of pathogen detection by PCR-based assays over time, specimen, age group, and geographical area. Data is from the Iowa State University VDL, South Dakota State University ADRDL, University of Minnesota VDL, and Kansas State University VDL.

Collaborators:

Iowa State University: Giovani Trevisan, Edison Magalhães, Leticia Linhares, Bret Crim, Poonam Dubey, Kent Schwartz, Eric Burrough, Phillip Gauger, Pablo Pineyro, Christopher Siepker; Rodger Main, Daniel Linhares.

Project coordinator Giovani Trevisan. Principal investigator Daniel Linhares.

University of Minnesota: Mary Thurn, Paulo Lages, Cesar Corzo, Jerry Torrison.

Kansas State University: Rob McGaughey, Eric Herrman, Roman Pogranichniy, Rachel Palinski, Jamie Henningson.

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

Disease Diagnosis System: A pilot program with the ISU-VDL consisting of reporting disease detection (not just pathogen detection by PCR), based on diagnostic codes assigned by veterinary diagnosticians.

FLUture: Aggregates influenza A virus (IAV) diagnostic data from the ISU-VDL and reports results, metadata, and sequences.

PRRS virus RFLP report: Benchmarks patterns of PRRSV RFLP pattern detected at the ISU-VDL over time, USA state, specimen, and age group.

Audio and video reports: Key findings from SDRS projects are summarized monthly in a conversation between investigators, and available in the form of an 'audio report', and "video report" through SwineCast, YouTube, LinkedIn, and the SDRS webpage.

Advisory Group: Reviews and discusses the data, providing their comments and perspectives on a monthly: Clayton Johnson, Emily Byers, Mark Schwartz, Paul Sundberg, Paul Yeske, Rebecca Robbins, Tara Donovan, Deborah Murray, Scott Dee, Melissa Hensch, Scanlon Daniels.

In addition to this report, interactive dashboards with aggregated test results are available at www.fieldepi.org/SDRS.

Swine Disease Reporting System:

Domestic Swine Disease Surveillance



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Figure 1. Top: *left*: Results of PRRSV RT-PCR cases over time. *Right*: expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the previous 3 years. Middle: *Left* Proportion of accession ID cases tested for PRRSV by age group per year and season. *Right*: percentage of PRRSV PCR-positive results, by age category over time. Wean to market corresponds to nursery and grow-finish. Adult/Sow correspond to Adult, boar stud, breeding herd, replacement, and suckling piglets. Unknown corresponds to not enter the type or farm category. Bottom The 25 most frequently detected RFLP patterns *left* year of 2019; *right* year of 2020. RFLPs indicated as N/A represents not detected, or European PRRSV.

SDRS Advisory Group highlights:

• Overall, 22.46% of 6,140 cases tested PRRSV-positive in September, a moderate increase from 20.12% of 5,441 in August;

• Positivity in adult/sow category in September was 19.61% (564 of 2,876), similar to 19.49% (497 of 2,550) in August;

• Positivity in wean-to-market category in September was 37.66% (632 of 1,678), a substantial increase from 31.91% (448 of 1,404) in August;

• Overall PRRSV-percentage of positive cases was above 3 standard deviations from state-specific baselines in NE, MO, and IN;

• The advisory group pointed out that the increase in PRRSV detection in the wean to market age category is likely in part due to the weather changes observed during this period of the year, lateral breaks, breaks in negative pigs originated from stable sow farms. The advisory group reminds us that more research is needed to understand lateral transmission, and to document the cost-benefit of biocontainment measures. Meanwhile, measures like coordinating where negative piglets are placed and usage of immunological solutions, such as vaccines, may be helpful in control PRRSV.

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Figure 2. Top: left PEDV right PDCoV cases tested by RT-PCR over time. Second from top: B:left PEDV right PDCoV percentage of PCR-positive results, by age category over time. Second from bottom: left PEDV right PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2020 predicted value. Bottom: left number of TGEV positive cases by age category right percentage of TGEV PCR-positive cases by age category. Each color represents one distinct age category.

SDRS Advisory Group highlights:

- Overall, 8.07% of 2,963 cases tested PEDV-positive in September, a moderate increase from 5.76% of 2,778 in August;
 - The overall detection was within the expected boundaries of the forecasted levels for this time of the year;
 - Positivity in adult/sow category in September was 6.39% (56 of 877), a moderate increase from 4.18% (35 of 837) in August;
 - Positivity in wean-to-market category in September was 13.46% (149 of 1,107), a moderate increase from 9.96% (102 of 1,024) in

August;

- Overall PEDV-percentage of positive cases was within or below baseline level for all 11 monitored states;
- Overall, 1.14% of 2,729 cases tested PDCoV-positive in September, similar to 0.93% of 2,586 in August;
 - The overall detection was within the expected boundaries of the forecasted levels for this time of the year;
- Positivity in adult/sow category in September was 0.74% (6 of 806), similar to 0.89% (7 of 786) in August;
- Positivity in wean-to-market category in September was 1.51% (15 of 994), similar to 0.88% (8 of 914) in August;
- Overall PDCoV-percentage of positive cases was within or below baseline level for all 10 monitored states;
- There was 0 positive case for TGEV RNA in September 2020 over a total of 2,672 cases tested;

• The advisory group pointed out that and increased number of breaks in wean to market farms are associated with contaminated trailers. Additionally, the group reminds us that avoiding visitors even outside of site, and enforcing biosecurity measures including clear demarcation of clean vs. dirty areas, and requirement to change clothes to access the sites should be in place in all farms.

Communications and information contained in this report are for general informational and educational purposes only and are not to be construed as recommending or advocating a specific course of action.

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Figure 3. Left top: results of MHP PCR cases over time. Right top: expected percentage of positive results for MHP by PCR and 95% confidence interval for 2020 predicted value, based on weekly data observed in the previous 3 years. Bottom: percentage of MHP PCR-positive results, by category over time.

SDRS Advisory Group highlights:

• Overall, 26.91% of 602 cases tested *M. hyopneumoniae*-positive cases in September, a substantial increase from 18.9% of 545 in August;

• As expected the observed overall detection of M. hypopneumoniae-positive cases is following the forecasted expected increase in the levels of detection for this time of the year.

Swine Disease Reporting System: Disease Diagnosis Reports



Topic 4 – Disease diagnosis at the ISU-VDL.



Figure 4. Most frequent disease diagnosis by physiologic system at ISU-VDL . Presented system is described in the title of the chart. Colors represent one agent and/or the combination of 2 or more agents. Only the physiologic systems with historic number of cases per season above 100 are presented in the report.

Note: Disease diagnosis takes one to two weeks to be performed. The graphs and analysis contain data from August 1 to September 19.

SDRS Advisory Group highlights:

• After Not specified (123 of 683), PRRSV (100 of 683) continues to lead the number of respiratory diagnoses. After Not specified (137 of 523), Rotavirus (74 of 523) leads the digestive diagnoses, and *Streptococcus suis* (52 of 124) the neurological diagnosis;

- During August 23 to 29, there was a significant increase (signal) in the number of disease diagnosis at ISU-VDL, mostly contributed by increased diagnosis for agents classified as respiratory, nervous, integument, and systemic;
- During August 9 to September 12, there was a significant increase (signal) in diagnosis of *M. hyopneumoniae*;
- During August 2 to 22, there was a significant increase (signal) in diagnosis of Coccidiosis;
- During August 23 to September 12, there was a significant increase (signal) in diagnosis of S.suis;
- Even though there were a restricted number of cases with *Bordetella bronchiseptica* there was a signal for respiratory disease caused by this agent between August 16 to 22;
- Even though there were a restricted number of cases with Clostridiosis diagnosis there was a signal between August 2 to 29;