

Swine Disease Reporting System

Report # 66 (August 1, 2023)

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, and reports the major findings to the swine industry. Our goal is to share information on activity of 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 for the input of our advisory group, which consists of veterinarians and producers across the US 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 it 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, Kansas State University VDL, and Ohio Animal Disease and Diagnostic Lab.

Collaborators:

Swine Disease Reporting System office: Principal investigators: [Daniel Linhares](#) & [Giovani Trevisan](#); Project coordinator: [Guilherme Cezar](#), Communications: [Edison Magalhães](#), Data analyst: [Srijita Chandra](#).

Iowa State University: Gustavo Silva, Marcelo Almeida, Bret Crim, Kinath Rupasinghe, Eric Burrough, Phillip Gauger, Christopher Siepker, Marta Mainenti, Michael Zeller, Rodger Main.

University of Minnesota: Mary Thurn, Paulo Lages, Cesar Corzo, Albert Rovira.

Kansas State University: Rob McGaughey, Franco Matias-Ferreyra, Jamie Retallick, Jordan Gebhardt.

South Dakota State University: Jon Greseth, Darren Kersey, Travis Clement, Angela Pillatzki, Jane Christopher-Hennings.

Ohio Animal Disease and Diag. Lab.: Melanie Prarat, Ashley Johnson, Dennis Summers.

The Ohio State University: Andreia Arruda.

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.

PRRSView and **FLUture:** Aggregates PRRSV and influenza A virus diagnostic data from the ISU-VDL and reports results, metadata, and sequences.

PRRS virus RFLP and Lineage report: Benchmarks patterns of PRRSV RFLP pattern and Lineages detected at the ISU-VDL, UMN-VDL, KSU-VDL, and OH-ADDL over time by specimen, age group, and US State.

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 [Spotify](#), [Apple Podcast](#), [Google podcast](#), [SwineCast](#), [YouTube](#), [LinkedIn](#), and the [SDRS webpage](#).

Advisory Group: Reviews and discusses the data, providing their comments and perspectives monthly: Mark Schwartz, Paul Sundberg, Paul Yeske, Deborah Murray, Brigitte Mason, Peter Schneider, Sam Copeland, Luc Dufresne, Daniel Boykin, Corrine Fruge, William Hollis, Rebecca Robbins, Thomas Petznick and Kurt Kuecker.

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

Note: This report contains data up to July 31, 2023.

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.

Topic 1 – Detection of PRRSV RNA over time by RT-qPCR.

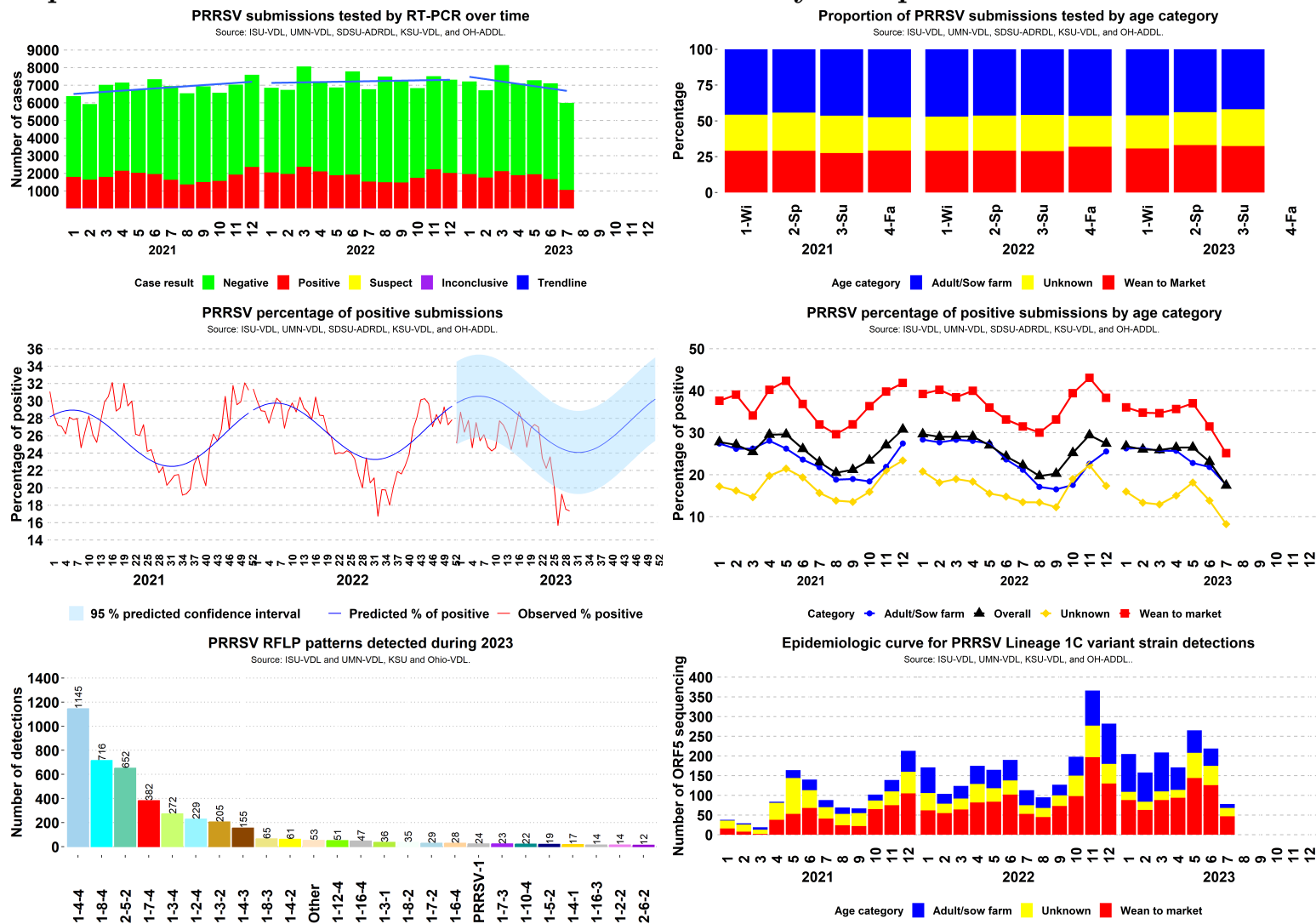


Figure 1. **Top: Left:** Results of PRRSV RT-PCR cases over time; **Right:** Proportion of accession ID cases tested for PRRSV by age group per year and season. **Middle: Left:** Expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the previous 3 years; **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 informed site type or farm category. **Bottom Left:** The 25 most frequently detected RFLP patterns during 2023; **Right:** Epidemiological curve of detection for PRRSV Lineage 1C variant strain.

SDRS Advisory Group highlights:

- Overall, 17.44% of 6,002 cases tested PRRSV-positive in July, a substantial decrease from 23.09% of 7,111 in June;
 - Positivity in the adult/sow category in July was 17.59% (450 of 2,558), a moderate decrease from 21.82% (640 of 2,933) in June;
 - Positivity in the wean-to-market category in July was 25.12% (466 of 1,855), a substantial decrease from 31.49% (756 of 2,401) in June;
- Overall PRRS-percentage of positive was 3 standard deviations from state-specific baselines in OH and IL;
- During July 2023, PRRSV L1C variant strains were detected in IA (38), MN (22), MO (11), OH (3) and NE (2);
- From the 10 most detected PRRSV sequence in 2023, 3 of them belong to the lineage L1C variant with the most predominant RFLPs - 1-4-4 (1st), 1-3-4(2nd), and 1-4-3(3rd).

Topic 2 – Enteric coronavirus RNA detection by RT-qPCR

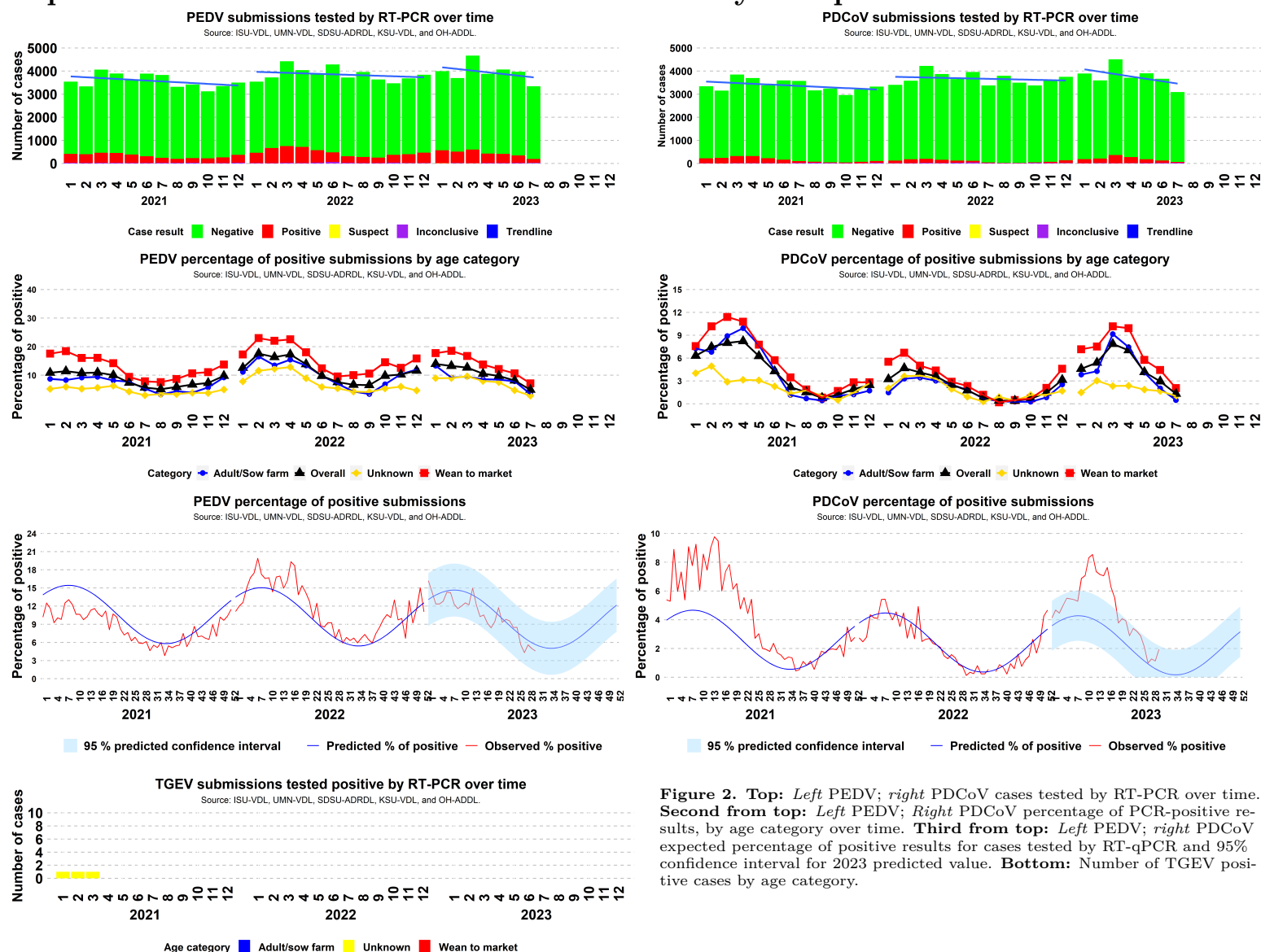
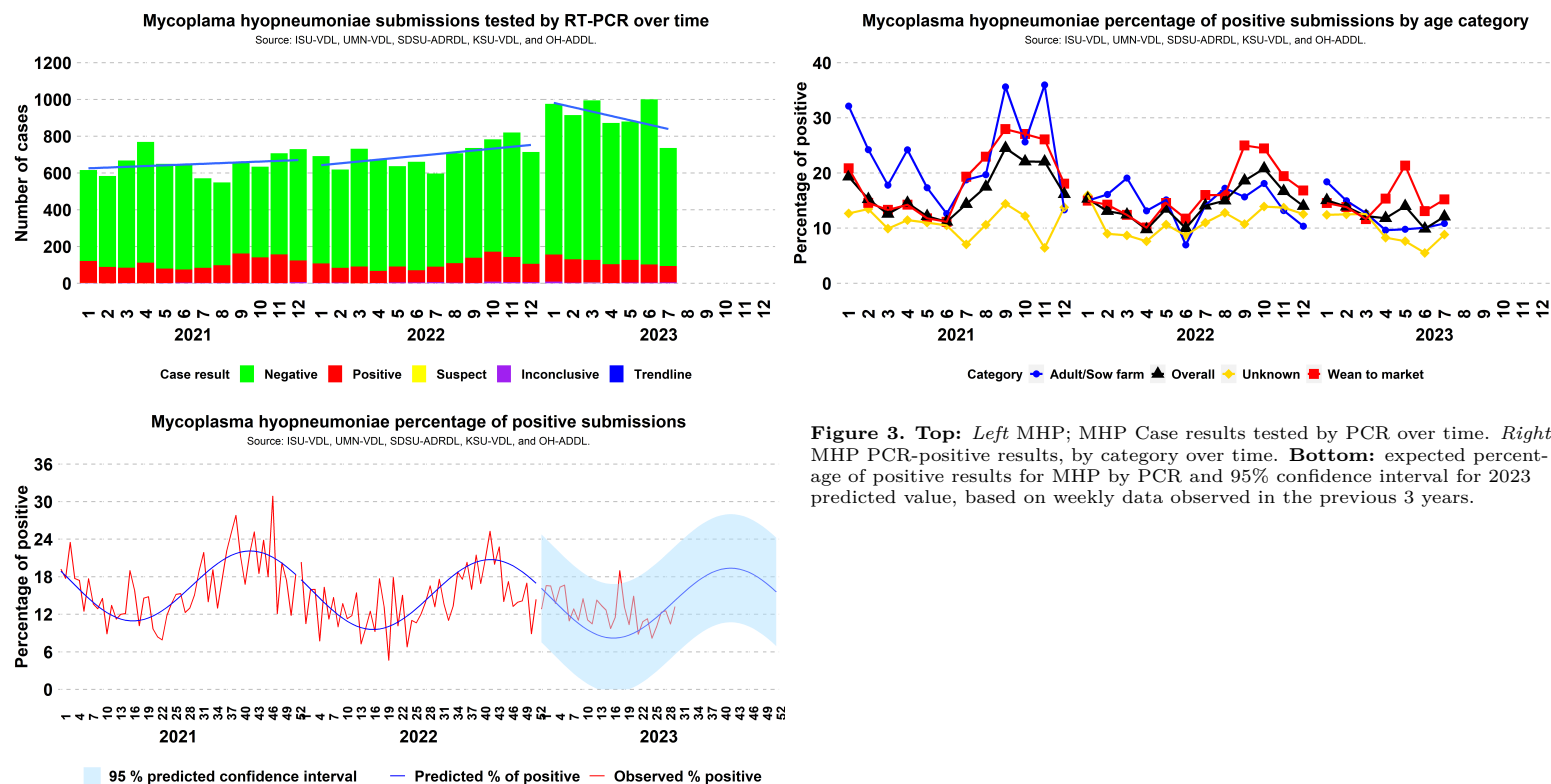


Figure 2. Top: Left PEDV; right PDCoV cases tested by RT-PCR over time. Second from top: Left PEDV; Right PDCoV percentage of PCR-positive results, by age category over time. Third from top: Left PEDV; right PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2023 predicted value. Bottom: Number of TGEV positive cases by age category.

SDRS Advisory Group highlights:

- Overall, 4.91% of 3,341 cases tested PEDV-positive in July, a moderate decrease from 8.17% of 3,968 in June;
 - Positivity in the adult/sow category in July was 3.43% (31 of 903), a moderate decrease from 7.88% (88 of 1,117) in June;
 - Positivity in the wean-to-market category in July was 7.13% (106 of 1,487), a moderate decrease from 10.66% (182 of 1,708) in June;
- Overall PEDV-percentage of positive cases was 3 standard deviations from state-specific baselines in IN, MO, and NC;
- Overall, 1.33% of 3,090 cases tested PDCoV-positive in July, similar to 2.95% of 3,665 in June;
 - Positivity in the adult/sow category in July was 0.48% (4 of 838), similar to 2.02% (21 of 1,040) in June;
 - Positivity in the wean-to-market category in July was 2.06% (28 of 1,361), a moderate decrease from 4.43% (69 of 1,557) in June;
- Overall PDCoV-percentage of positive cases was 3 standard deviations from state-specific baselines in KS;
- There was 0 positive case for TGEV RNA-PCR in July, 2023 over a total of 2,974 cases tested. It has been 28 months (with a total of 97,464 cases tested) since the last TGEV PCR-positive result;

Topic 3 – Detection of *M. hyopneumoniae* DNA by PCR.



SDRS Advisory Group highlights:

- Overall, 12.09% of 736 cases tested *M. hyopneumoniae*-positive cases in July, a moderate increase from 9.89% of 1,001 in June;
 - Positivity in the adult/sow category in July was 10.85% (23 of 212), similar to 10.08% (24 of 238) in June;
 - Positivity in the wean-to-market category in July was 15.21% (47 of 309), a moderate increase from 13.07% (57 of 436) in June;
 - Overall MHP-percentage of positive cases was 3 standard deviations from state-specific baselines in MO and NC;
- Monthly submissions of *Mycoplasma hyopneumoniae* are increased compared with the historical data. Most of these increased number was due to deep tracheal swabs submissions, reflecting efforts to monitor MHP activity in herds undergoing control & elimination. A good sign is that there is no apparent increase in positivity.

Topic 4 – Detection of Porcine Circovirus-2 DNA by PCR.

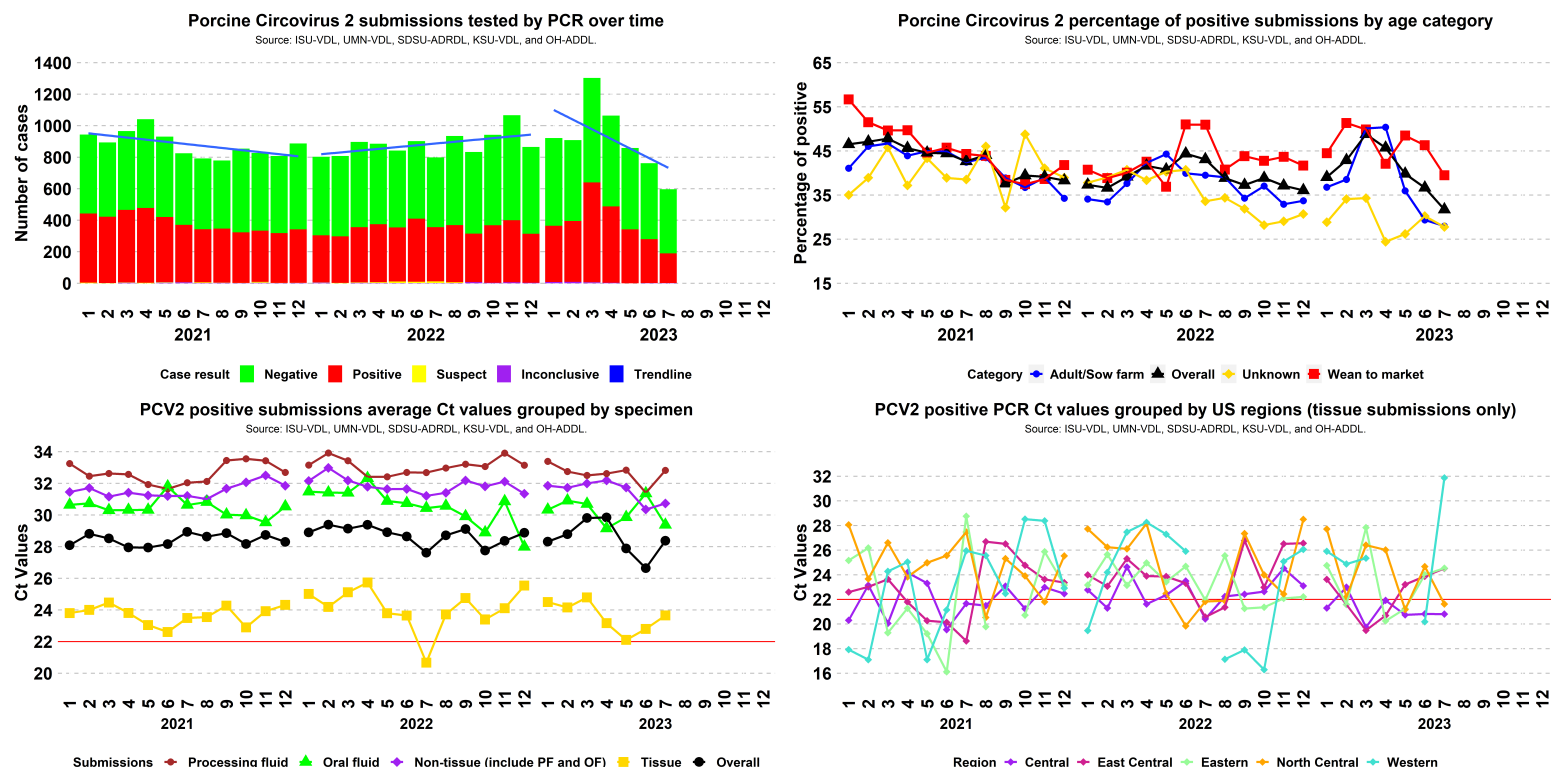


Figure 1. Top: Left: Results of PCV2 PCR cases over time; Right: PCV2 PCR-positive results, by category over time. Bottom Left: Average Ct values of PCV2 submissions by specimen; Right: Average Ct values of PCV2 tissue submissions by U.S. region; Central (IA), East Central (IL, IN, MO and WI), Eastern (AL, AR, CT, DE, FL, GA, KY, LA, MA, ME, MD, MI, MS, NC, NH, NJ, NY, OH, PA, RI, SC, TN VA, VT and WA), North Central (MN, ND and SD), Western (AK, AZ, CA, CO, HI, ID, KS, MT, NM, NV, OK, OR, TX, UT, WA and WY).

SDRS Advisory Group highlights:

- Overall, 31.71% of 596 cases tested PCV2-positive in July, similar to 36.66% of 761 in June;
 - Positivity in the adult/sow category in July was 27.96% (92 of 329), similar to 29.34% (103 of 351) in June;
 - Positivity in the wean-to-market category in July was 39.49% (77 of 195), a substantial decrease from 46.3% (150 of 324) in June;
- In the month of July, the regions with the lowest PCV2 average Ct values was Central (21 submissions; average Ct 20.8), North Central (11 submissions; average Ct 21.6), East Central (8 submissions; average Ct 24.5), Eastern (11 submissions; average Ct 24.5), and Western (5 submissions; average Ct 31.9);

Topic 5 – Detection of Influenza A Virus (IAV) RNA by RT-PCR.

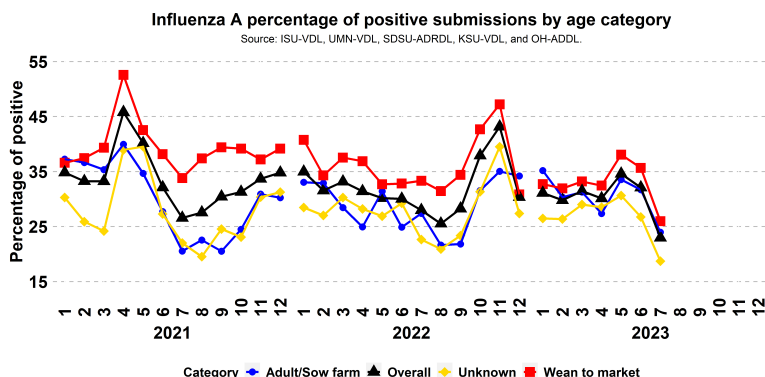
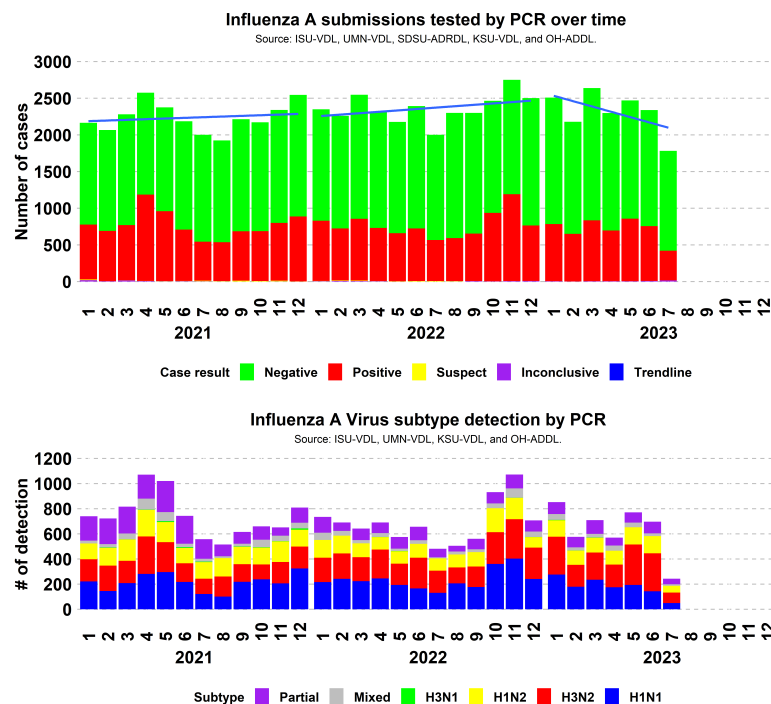


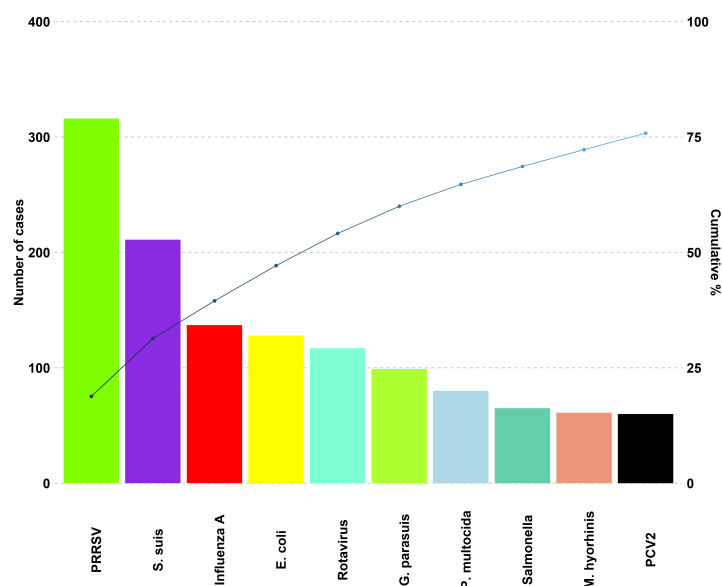
Figure 3. Top: *Left* Results of IAV PCR cases over time. *Right* Percentage of IAV PCR-positive results, by category over time. **Bottom:** Number of IAV subtyping PCR detection over time; (Partial - only hemagglutinin or neuraminidase region detected; Mixed - 3 or more haemagglutinin and neuraminidase regions detected. i.e., "H1 H3 N1").

SDRS Advisory Group highlights:

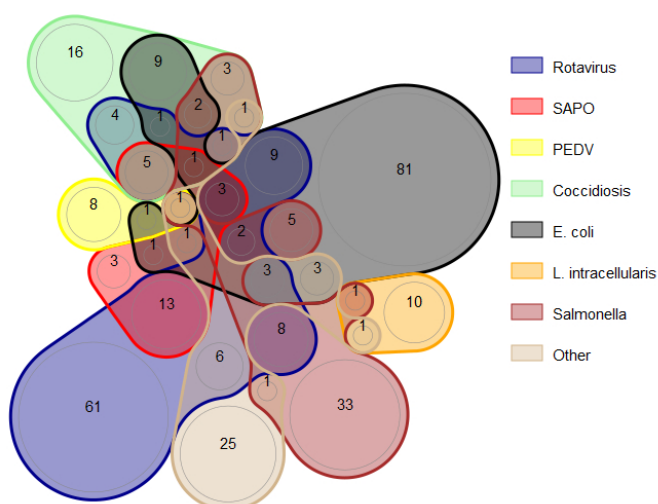
- Overall, 22.98% of 1,767 cases tested IAV-positive cases in July, a substantial decrease from 32.1% of 2,330 in June;
 - Positivity in the adult/sow category in July was 23.97% (76 of 317), a substantial decrease from 31.71% (117 of 369) in June;
 - Positivity in the wean-to-market category in July was 25.97% (200 of 770), a substantial decrease from 35.67% (417 of 1,169) in June.
- Overall, 4.94% of 243 samples had mixed subtype detection in July, similar to 3.16% of 697 in June;

Topic 6 – Confirmed tissue cases etiologic/disease diagnosis at the ISU-VDL.

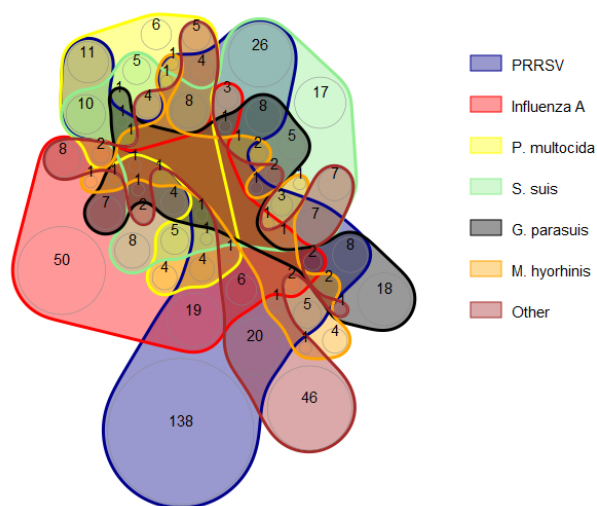
Overall diagnosis



Digestive



Respiratory



Nervous

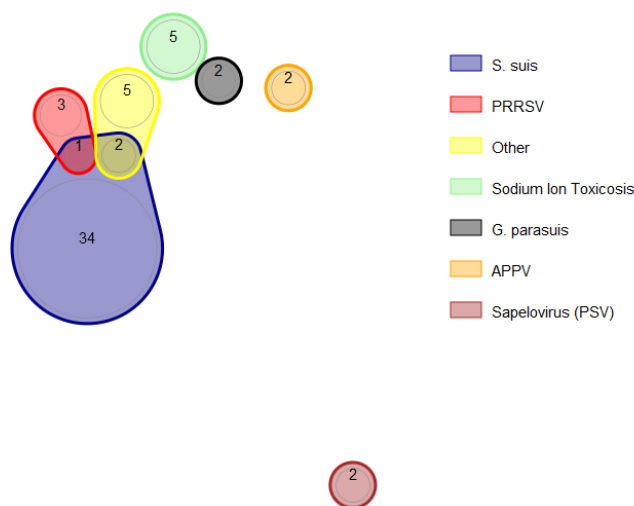


Figure 4. ISU-VDL most frequent overall confirmed tissue disease diagnosis. The presented system is described in the title of the chart. Colors represent one agent; line intersections present diagnosis of 2 or more agents within a submission. Only the most frequent etiology/disease are presented. Less frequent etiology/disease are grouped as “other”. Non-confirmed diagnoses are not presented.

This work is made possible due to the commitment and teamwork from the ISU-VDL diagnosticians who assign standardized diagnostic codes to each case submitted for histopathology: Drs. Almeida, Burrough, Derscheid, Gauger, Harm, Magstadt, Mainenti, Michael, Piñeyro, Schumacher, Siepker, and previous VDL diagnosticians who have contributed to this process.

Note: Disease diagnosis takes 1 to 2 weeks to be performed. The graphs and analysis contain data from June. 1 to July. 21, 2023.

SDRS Advisory Group highlights:

- PRRSV (316) led cases with confirmed etiology, followed by *S. suis* (211), and Influenza A (137). PRRSV (299 of 898) led the number of confirmed respiratory diagnoses, *E. coli* (122 of 435) lead the number of confirmed digestive diagnoses, and *S. suis* (37 of 59) led the number of confirmed neurological diagnoses.
- Even though was a small number of cases, between the weeks of June 19th and 26th, there were spikes in the number of Coccidiosis confirmed diagnosis.

Note: The SDRS is a collaborative project among multiple VDLs in the US swine industry. The VDL collaborators and industry partners are all invited to submit content to share on this bonus page related to disease prevention, control, and management. Stay tuned for more content in future editions.

How to interpret SDRS charts? Video educational material(s) are available online!

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The Swine Disease Reporting System (SDRS) aims 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. The monthly reports include several charts with information regarding diagnostic data tested in the 5 VDLs part of this collaborative project. In response to a request from stakeholders, and the SDRS audience, a series of educational materials was created to aid in interpreting the diagnostic data presented in the report.

The first series of videos contained information about five charts from the SDRS:

- (1) [What is SDRS](#);
- (2) [Number of submissions over time](#);
- (3) [Percentage of positive submissions by age category](#);
- (4) [Weekly prediction of pathogen detection results](#);
- (5) [Influenza A virus subtype by PCR detection](#);
- (6) [Confirmed tissue diagnosis](#).

The educational content unravels the charts explaining step by step how to read and interpret the charts facilitating the understanding, interpretation, and communication with the general audience, regardless of their educational background.

The 6-part video is published on YouTube and can be accessed on the [SDRS YouTube channel](#) or by clicking on the titles above or scanning the QR code on the bottom of this page. The video content will aid the audience in interpreting the main charts contained in the report.

