

# Swine Disease Reporting System

## Report # 79 (September 03, 2024)

**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](http://www.fieldepi.org/SDRS).

**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, 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 VDL, Ohio ADDL, and Purdue ADDL.

### Collaborators:

*Swine Disease Reporting System office:* Principal investigators: [Daniel Linhares](#) & [Giovani Trevisan](#); Project coordinator: [Guilherme Cezar](#), Extension and Outreach: [Edison Magalhães](#).

*Iowa State University:* Gustavo Silva, Marcelo Almeida, Bret Crim, Kinath Rupasinghe, Srijita Chandra, Eric Burrough, Phillip Gauger, Joseph Thomas, Darin Madson, Michael Zeller, Rodger Main.

*University of Minnesota:* Mary Thurn, Paulo Lages, Cesar Corzo, Stephanie Rossow, Matt Sturos, Hemant Naikare.

*Kansas State University* and *Kansas Dept. of Agr.:* Rob McGaughey, Franco Matias-Ferreyra, Jamie Retallick, Jordan Gebhardt, Sara McReynolds.

*South Dakota State University* and *South Dakota AIB:* Jon Greseth, Darren Kersey, Travis Clement, Angela Pillatzki, Jane Christopher-Hennings, Beth Thompson.

*Ohio Animal Disease and Diag. Lab.* and *The Ohio State University:* Melanie Prarat, Ashley Johnson, Dennis Summers, Andréia Arruda.

*Purdue University* and *Indiana State BOAH:* Craig Bowen, Kenitra Hendrix, Joseph Boyle, James Lyons, Kelli Werling.

**Disease Diagnosis System:** Consisting of reporting disease diagnosis (not just pathogen detection by PCR), based on diagnostic codes assigned by veterinary diagnosticians from ISU-VDL.

**PRRSView** and **FLUture:** Aggregates PRRSV and influenza A virus diagnostic data from the ISU-VDL.

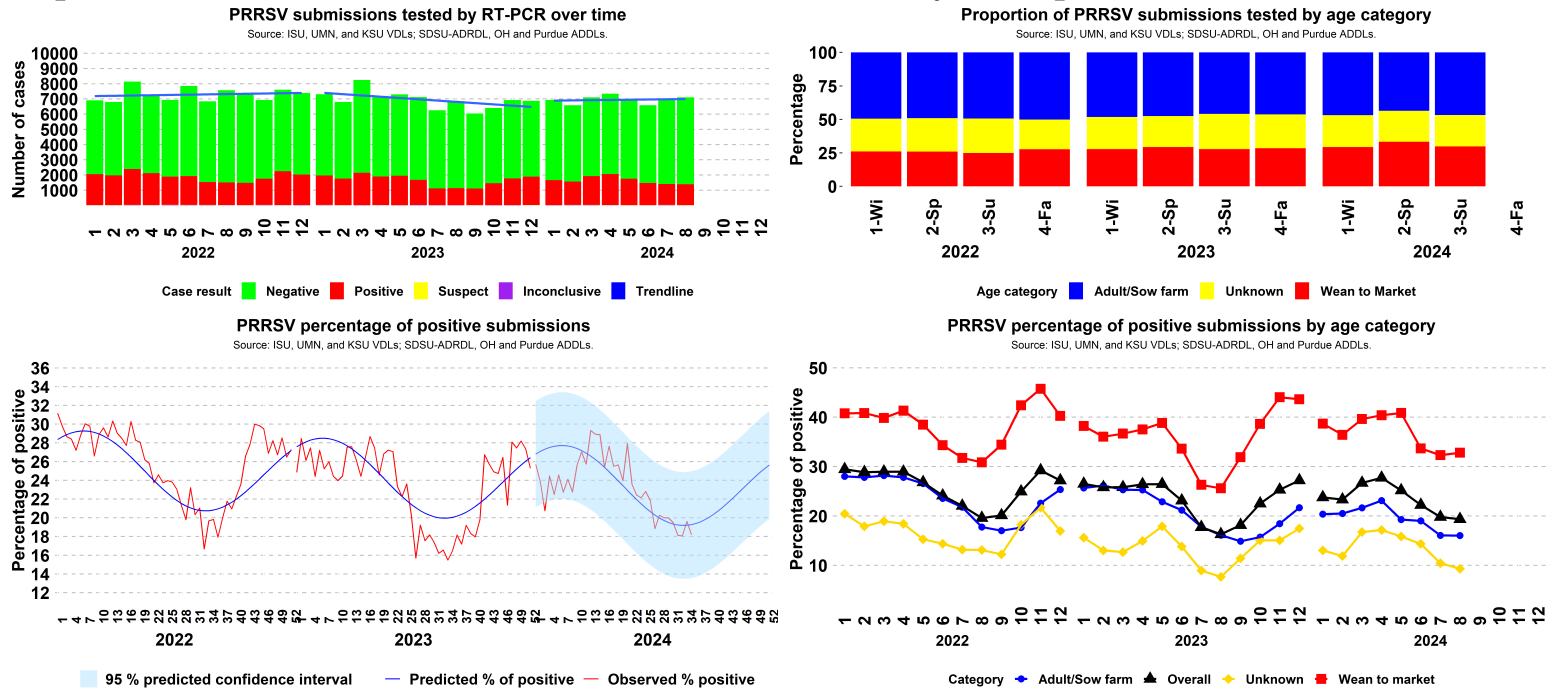
**PRRS virus RFLP/Lineage report** and **BLAST tool:** Benchmark PRRSV ORF5 sequences and compare your PRRSV sequence with what have been detected in the U.S.

**Audio and video reports:** Key findings from SDRS projects are summarized monthly in a conversation between investigators and is available in the [Spotify](#), [Apple Podcast](#), [Google podcast](#), [YouTube](#), [LinkedIn](#), and the [SDRS webpage](#). In addition to this report, [interactive dashboards](#) and [educational material](#) are publicly available.

**Advisory Group:** Providing their comments and perspectives monthly: Mark Schwartz, Megan Niederwerder, Paul Yeske, Deborah Murray, Brigitte Mason, Peter Schneider, Sam Copeland, Luc Dufresne, Daniel Boykin, Corrine Fruge, William Hollis, Rebecca Robbins, Thomas Petznick, Kurt Kuecker, and Lauren Glowzinski.

**Note:** This report contains data up to August 31, 2024.

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

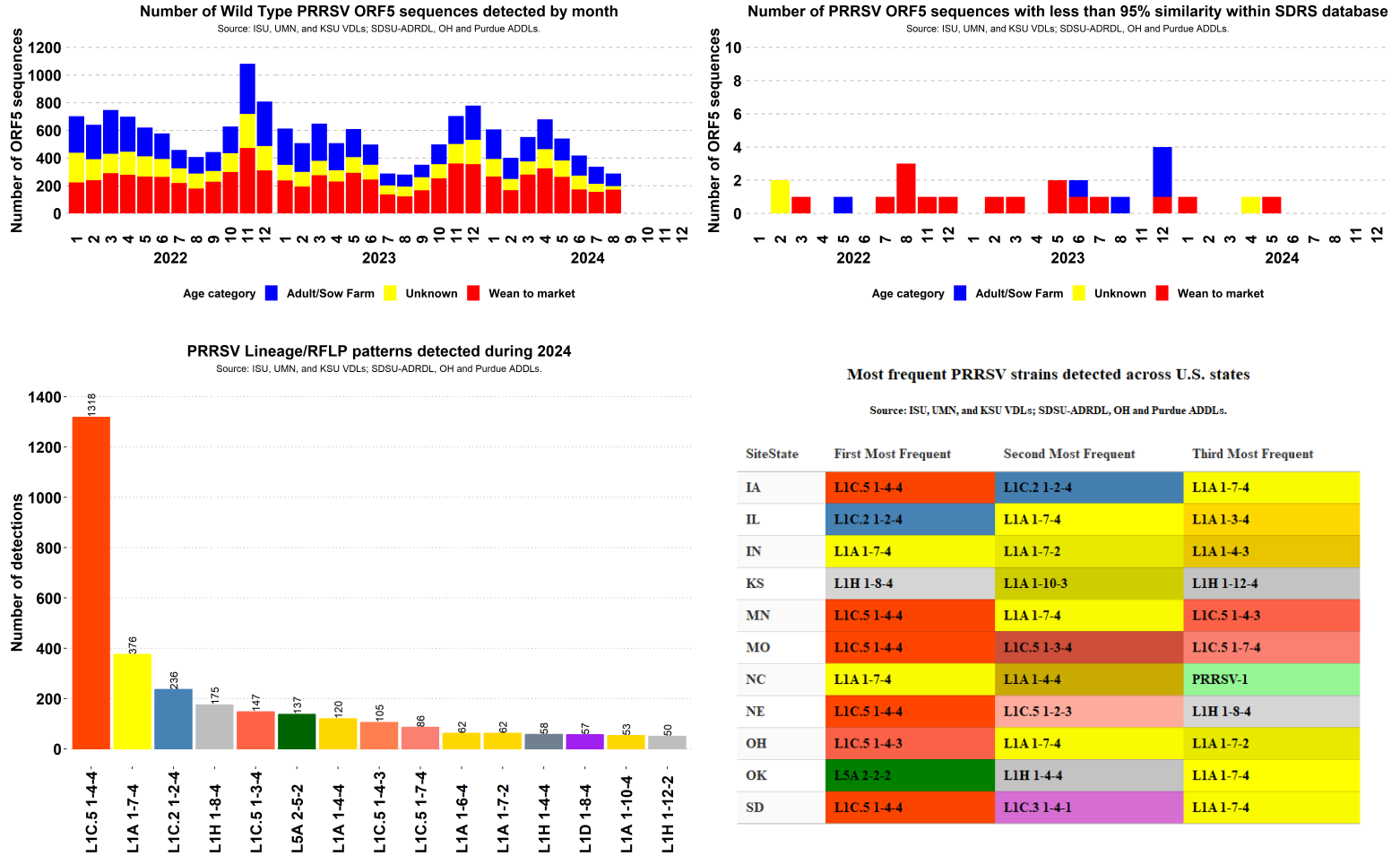


**Figure 1. Top:** *Left:* Results of PRRSV RT-PCR cases over time; *Right:* Proportion of accession ID cases tested for PRRSV by age group per year and season. **Bottom:** *Left* Expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results 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.

## SDRS Advisory Group highlights:

- Overall, 19.35% of 7,105 cases tested PRRSV-positive in August, similar to 19.78% of 6,992 in July;
  - Positivity in the adult/sow category in August was 16.03% (544 of 3,393), similar to 16.05% (505 of 3,147) in July;
  - Positivity in the wean-to-market category in August was 32.8% (678 of 2,067), similar to 32.31% (704 of 2,179) in July;
- Overall PRRSV-percentage of positive cases was 3 standard deviations above state-specific baselines in IN, IA, OK, and SD;
- The advisory group highlighted that the increased activity of PRRSV in the states of 3 standard deviations above the expected should be due to surveillance tests in herds that broke in the winter of 2024. However, the advisory highlighted if new breaks are occurring in the summer and these animals are going through the fall season, where increased road traffic and pumping season occurs, we might expect a harsh upcoming winter for PRRSV.

## Topic 2 – PRRSV ORF5 sequences detection over time

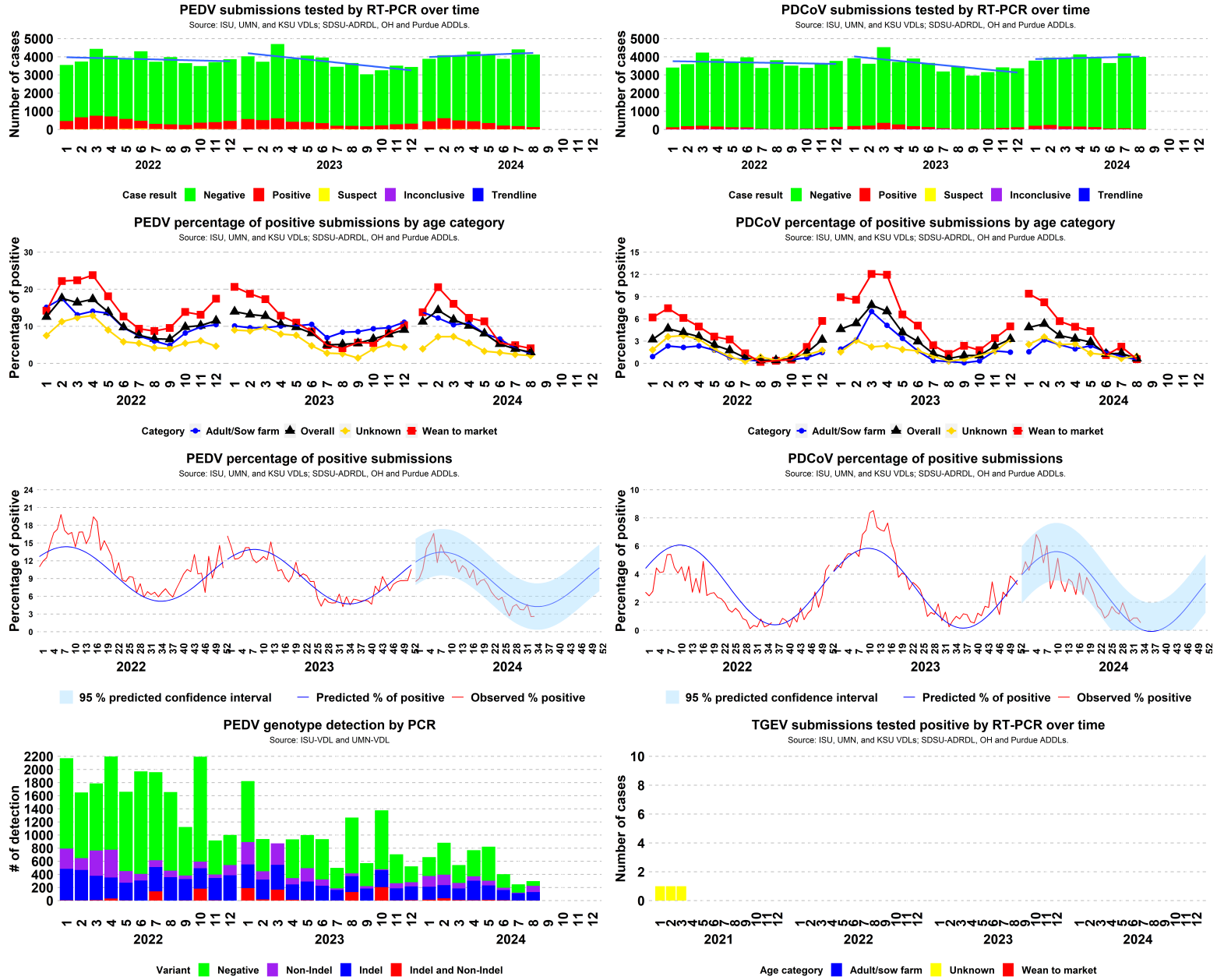


**Figure 1. Top: Left:** Number of PRRSV ORF5 sequences detected by age category; **Right:** Number of PRRSV ORF5 sequences with less than 95% similarity after BLAST analysis with the sequences in the SDRS database (Sequences with more than 6 ambiguities, sequences with less than 597 nucleotides or higher than 606 nucleotides are not included in this analysis); **Bottom Left:** 15 PRRSV ORF5 sequences most frequent detected by Lineage and RFLP; **Right:** Most frequent detected PRRSV ORF5 sequences by lineage and RFLP at U.S. state level.

### SDRS Advisory Group highlights:

- During August 2024, The states with higher number of PRRSV L1C.5 (variant) detections were detected IA, MO, MN, NE, IL, IN, OH, MI, SD (respective number of sequences: 77, 24, 10, 10, 4, 4, 2, 1, 1).
- In August L1C.5 1-4-4 (91) was the PRRSV sequence most detected in the U.S., followed by L1A 1-7-4 (28), and L1A 1-4-4 (26);
- Click on the links here to access the [PRRSV genotype dashboard](#) and the [SDRS Blast tool](#) to compare your PRRSV ORF5 sequence with the SDRS database.

## Topic 2 – Enteric coronavirus RNA detection by RT-qPCR

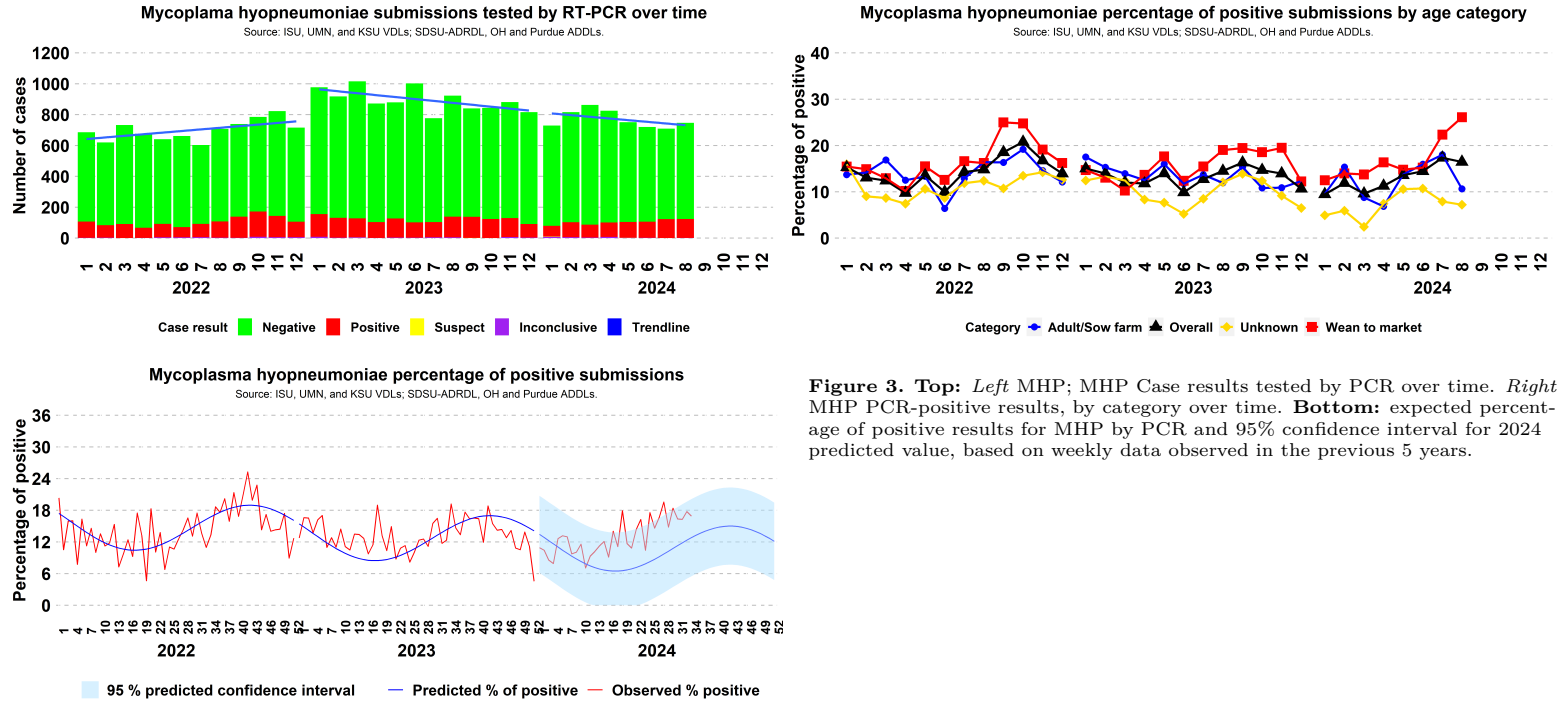


**Figure 1. Top:** Left PEDV; Right PDCoV cases tested by RT-PCR over time; **Second from top:** Left PEDV; Right PDCoV percentage of positive PCR positive results, by age category over time. **Third from top:** Left PEDV; Right PDCoV expected percentage of positive results for cases tested by RT-PCR and 95% confidence interval for 2024 predicted value. **Bottom Left:** Number of PEDV genotype detection over time; **Right:** Number of TGEV positive cases by age category.

### SDRS Advisory Group highlights:

- Overall, 3.01% of 4,122 cases tested PEDV-positive in August, similar to 3.9% of 4,407 in July;
  - Positivity in the adult/sow category in August was 2.71% (40 of 1,476), similar to 4.04% (59 of 1,461) in July;
  - Positivity in the wean-to-market category in August was 4.05% (59 of 1,457), similar to 4.89% (83 of 1,696) in July;
  - Overall PEDV-percentage of positive cases was within state-specific baselines in all 11 monitored states;
  - Overall, 0.67% of 297 samples had mixed PEDV genotype detection in August, similar to 0.8% of 249 in July;
- Overall, 0.65% of 3,992 cases tested PDCoV-positive in August, similar to 1.36% of 4,179 in July;
  - Positivity in the adult/sow category in August was 0.49% (7 of 1,415), similar to 0.94% (13 of 1,381) in July;
  - Positivity in the wean-to-market category in August was 0.56% (8 of 1,430), similar to 2.25% (36 of 1,598) in July;
  - Overall PDCoV-percentage of positive cases was within state-specific baselines in all 11 monitored states;
- There was 0 positive case for TGEV RNA-PCR in August, 2024 over a total of 3,865 cases tested. It has been 42 months (with a total of 144,756 cases tested) since the last TGEV PCR-positive result;

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

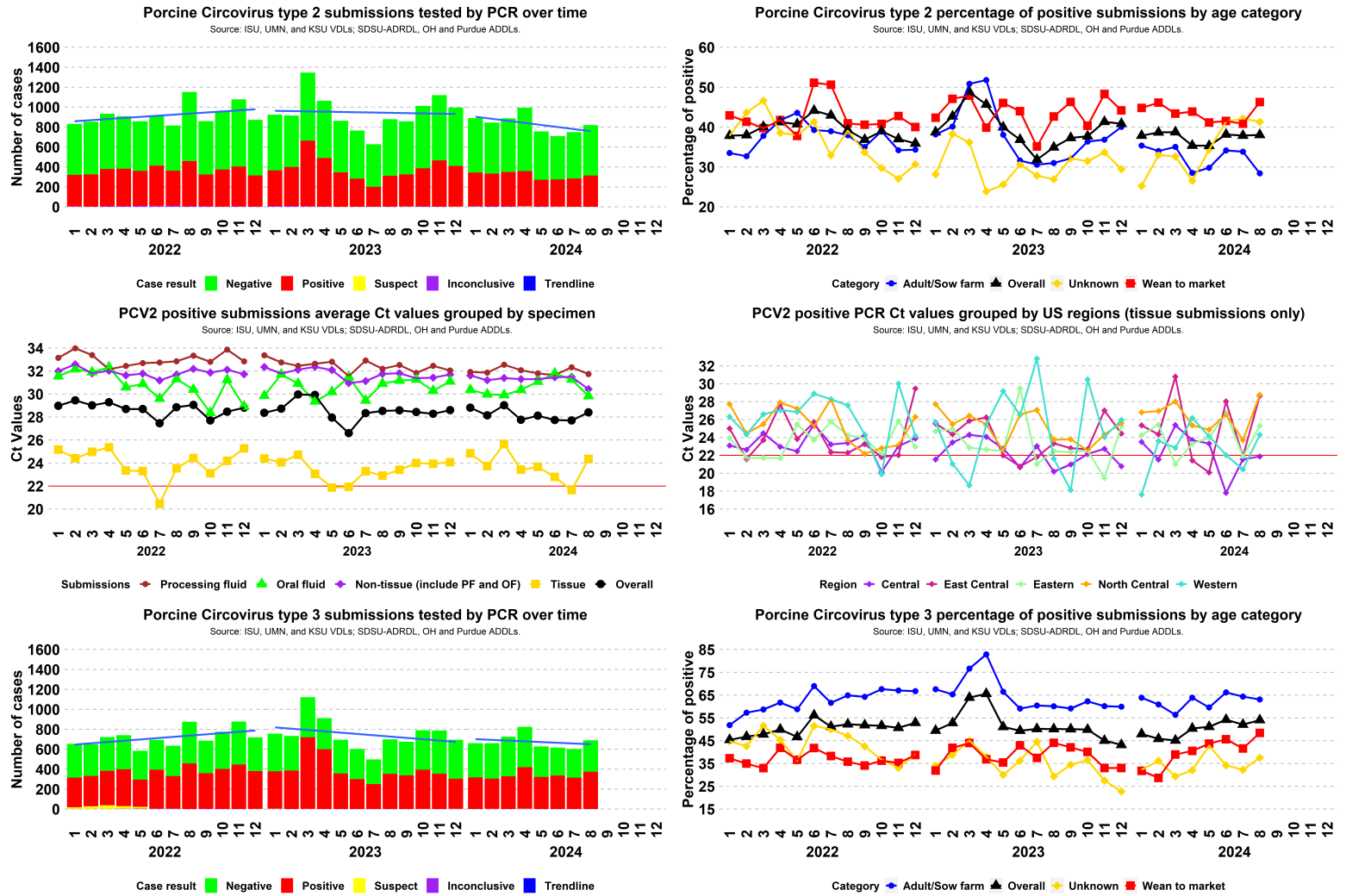


**Figure 3. Top:** *Left* MHP; MHP Case results tested by PCR over time. *Right* MHP PCR-positive results, by category over time. **Bottom:** expected percentage of positive results for MHP by PCR and 95% confidence interval for 2024 predicted value, based on weekly data observed in the previous 5 years.

#### SDRS Advisory Group highlights:

- Overall, 16.47% of 747 cases tested *M. hyopneumoniae*-positive cases in August, similar to 17.35% of 709 in July;
  - Positivity in the adult/sow category in August was 10.65% (28 of 263), a substantial decrease from 18.01% (49 of 272) in July;
  - Positivity in the wean-to-market category in August was 26.1% (83 of 318), a moderate increase from 22.34% (61 of 273) in July;
- Overall MHP-percentage of positive cases was 3 standard deviations above state-specific baselines IA, IL, and OK;
- The advisory group highlighted that part of this high positivity is due to more surveillance tests performed in positive herds for *Mycoplasma hyopneumoniae*. However, 35% of the wean-to-market positive cases are lung samples, which can be associated with more clinical cases in finishing sites. This increased activity in the summer raises an alert for the fall season.

## Topic 4 – Detection of Porcine Circoviruses type 2 and 3 DNA by PCR.

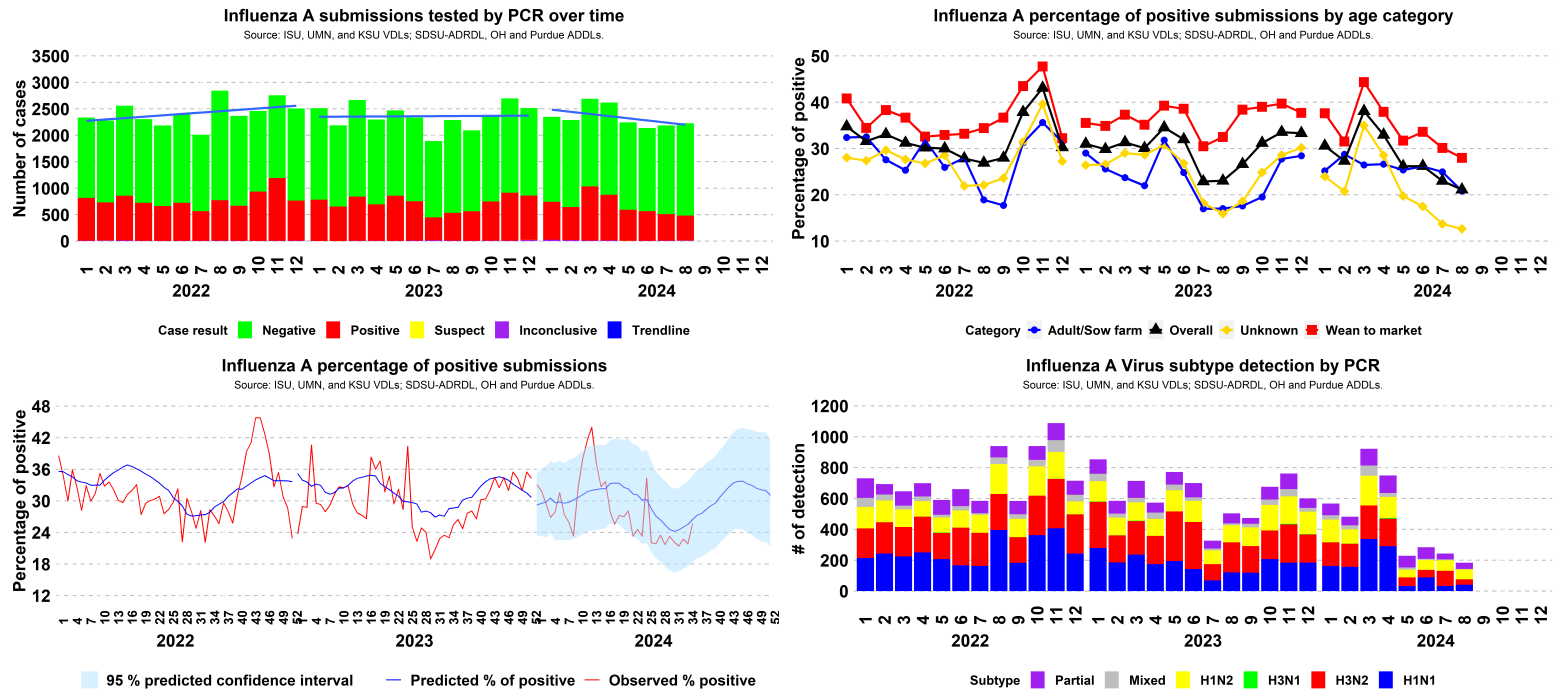


**Figure 1. Top:** *Left:* Results of PCV2 PCR cases over time; *Right:* PCV2 PCR-positive results, by category over time. **Middle:** *Left:* Average Ct values of PCV2 submissions by specimen; *Right:* Average Ct values of PCV2 tissue submissions by U.S. region; Central (IA), East Central (IL, IN, MO 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). **Bottom Left:** Results of PCV3 PCR cases over time; *Right:* PCV3 PCR-positive results, by category over time.

### SDRS Advisory Group highlights:

- Overall, 38.05% of 820 cases tested PCV2-positive in August, similar to 37.87% of 750 in July;
  - Positivity in the adult/sow category in August was 28.41% (100 of 352), a substantial decrease from 33.83% (113 of 334) in July;
  - Positivity in the wean-to-market category in August was 46.28% (174 of 376), a substantial increase from 40.84% (136 of 333) in July;
  - In the month of August, the regions with the lowest PCV2 average Ct values in tissue submissions was Central (42 submissions; average Ct 21.9), Western (11 submissions; average Ct 24.3), Eastern (15 submissions; average Ct 25.3), East Central (11 submissions; average Ct 28.6), and North Central (13 submissions; average Ct 28.8);
- Overall, 54.06% of 690 cases tested PCV3-positive in August, similar to 52.07% of 603 in July;
  - Positivity in the adult/sow category in August was 63.08% (205 of 325), similar to 64.36% (195 of 303) in July;
  - Positivity in the wean-to-market category in August was 48.42% (138 of 285), a substantial increase from 41.6% (99 of 238) in July.

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



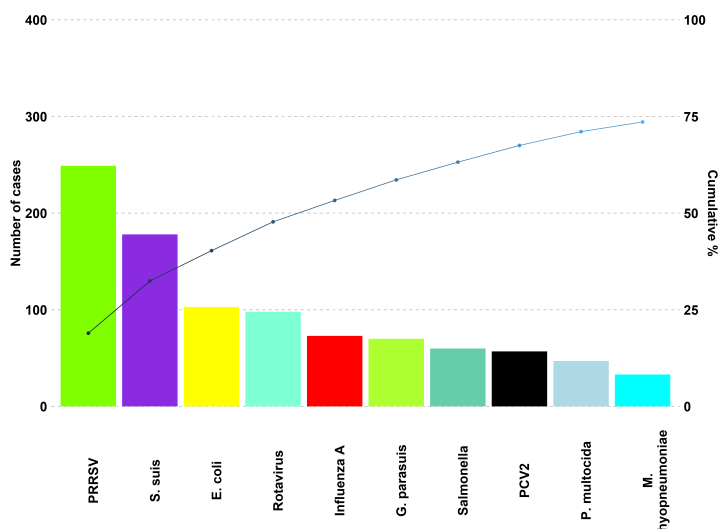
**Figure 3.** *Top: Left* Results of IAV PCR cases over time. *Right* Percentage of IAV PCR-positive results, by category over time. *Bottom: Left* expected percentage of positive results for IAV by PCR and 95% confidence interval for 2024 predicted value, based on weekly data observed in the previous 5 years. *Right* Number of IAV subtyping PCR detection over time; (Partial - only hemagglutinin or neuraminidase region detected; Mixed - 3 or more haemagglutinin and neuroamnidase regions detected. i.e., “H1 H3 N1”).

### SDRS Advisory Group highlights:

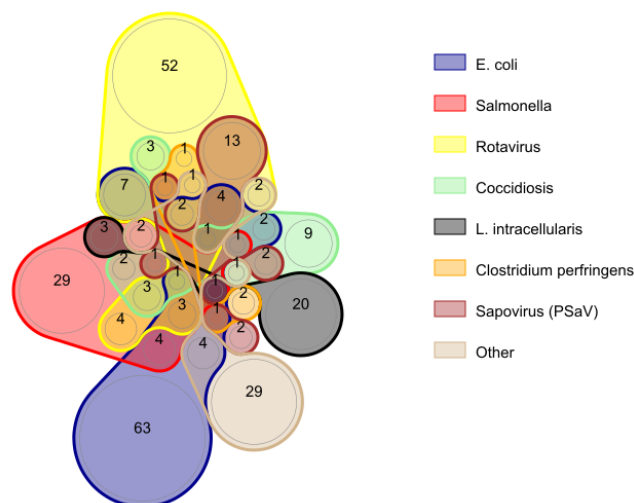
- Overall, 21.11% of 2,226 cases tested IAV-positive cases in August, similar to 23.01% of 2,186 in July;
  - Positivity in the adult/sow category in August was 20.81% (103 of 495), a moderate decrease from 24.95% (114 of 457) in July;
  - Positivity in the wean-to-market category in August was 27.98% (270 of 965), a moderate decrease from 30.13% (279 of 926) in July.
- Overall IAV-percentage of positive cases was 3 standard deviations above state-specific baselines in MO;
- Overall, 1.63% of 184 samples had mixed subtype detection in August, similar to 2.47% of 243 in July.

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

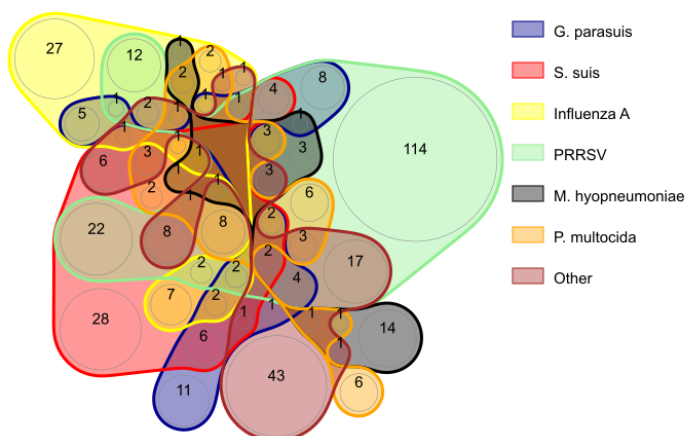
### Overall diagnosis



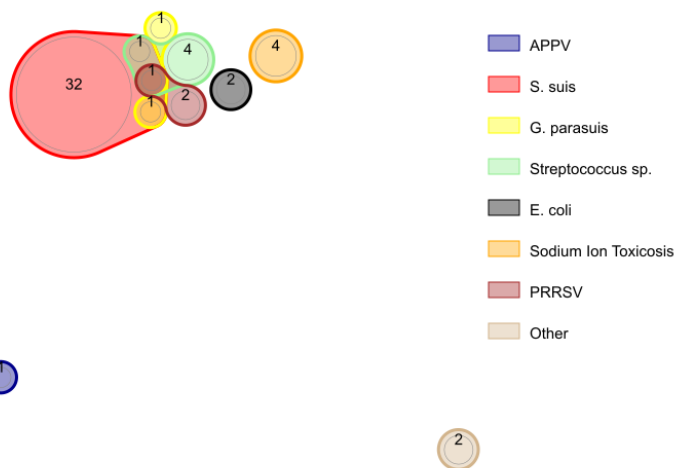
### Digestive



### 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, Magstadt, Mainenti, Michael, Piñeyro, Siepker, Madson, Thomas 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 July. 1 to August. 23, 2024.

### SDRS Advisory Group highlights:

- PRRSV (249) led cases with confirmed etiology, followed by *S. suis* (178), and *E. coli* (103). PRRSV (231 of 657) led the number of confirmed respiratory diagnoses, Rotavirus (98 of 370) lead the number of confirmed digestive diagnoses, and *S. suis* (35 of 55) led the number of confirmed neurological diagnoses.



**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 the New PRRSV ORF5 sequence charts? Educational video material is 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 6 VDLs part of this collaborative project. Due to the addition of the PRRSV ORF5 sequences chart, an educational material was created to aid the interpretation of PRRSV ORF5 sequence data presented in the report.

The video contains information about the four new PRRSV ORF5 sequence charts added in the SDRS report and can be accessed in the link below:

[Education material - PRRSV ORF5 sequence charts;](#)

If you want to understand the content of other SDRS charts, more educational material is available on YouTube explaining step by step how to read the charts, facilitating the understanding, interpretation, and communication with the general audience, regardless of their educational background.

All SDRS education material is published on YouTube and can be accessed on the [SDRS YouTube channel](#) or by scanning the QR code on the bottom of this page.

