

# Swine Disease Reporting System

## Report # 82 (December 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](#)

*Iowa State University:* Edison Magalhães, 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-Ferreira, 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, 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.

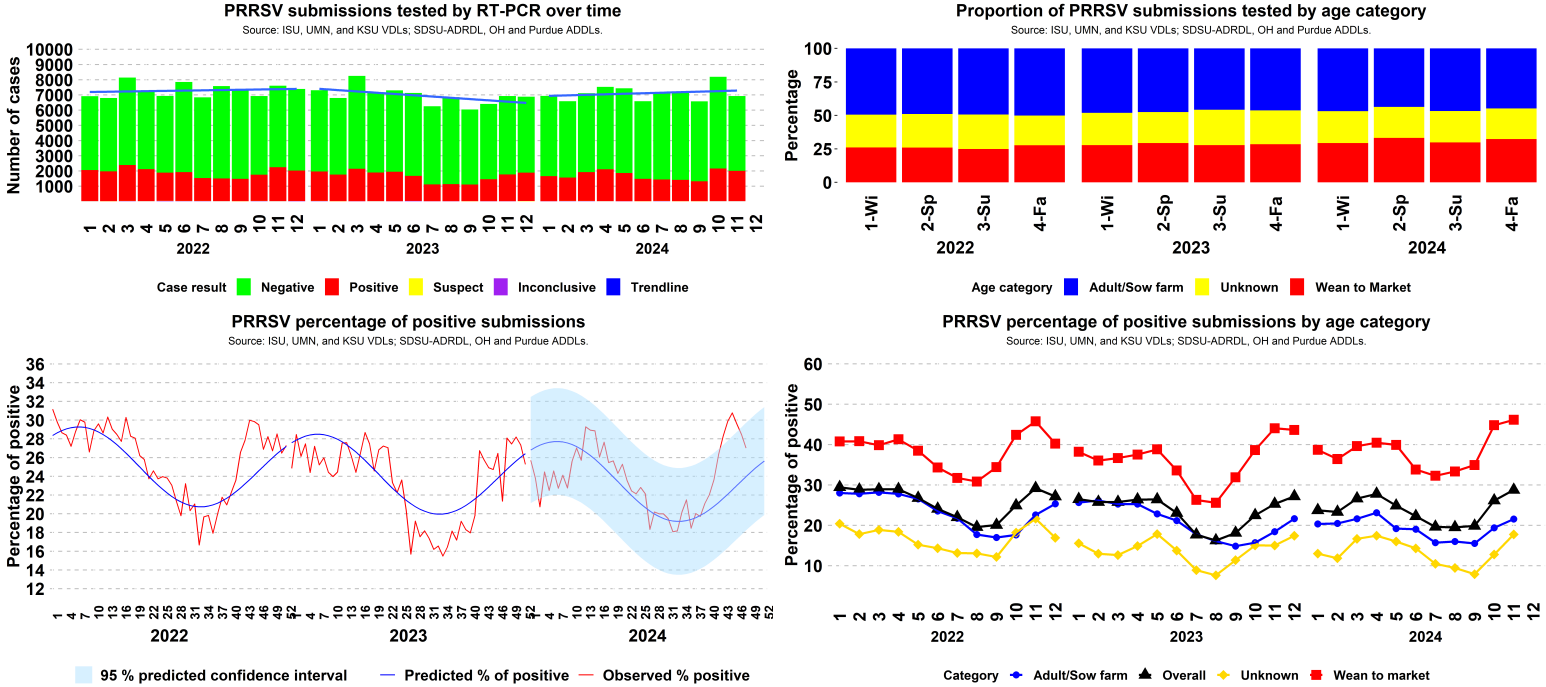
**PRRS virus RFLP/Lineage report** and **BLAST tool:** Benchmark PRRSV ORF5 sequences and compare your PRRSV sequence with what have been detected in the U.S.

**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 Glowzenski.

**Note:** This report contains data up to November 30, 2024.

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



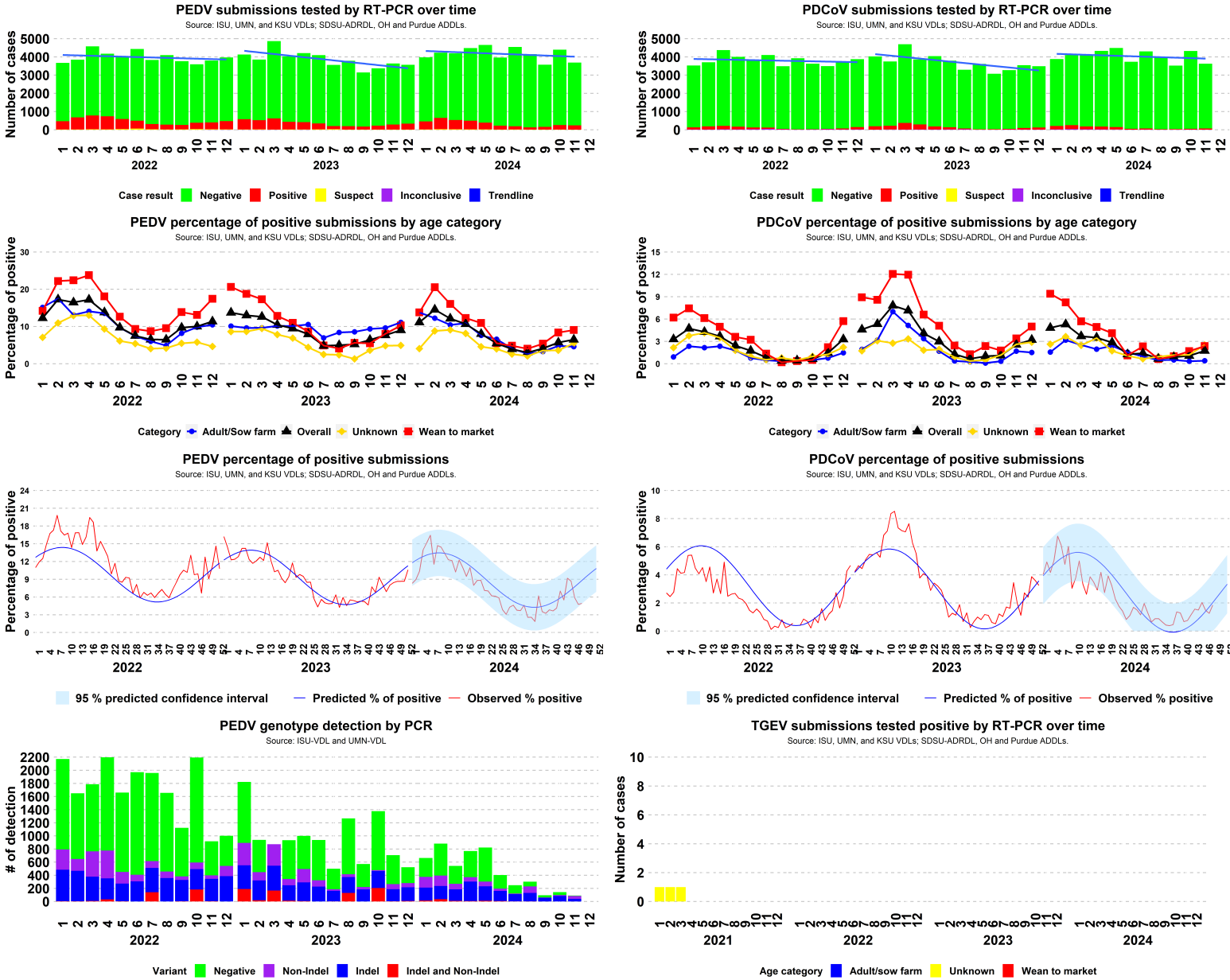
**Figure 1. Top:** *Left:* Results of PRRSV RT-PCR cases over time; *Right:* Proportion of accession ID cases tested for PRRSV by age group per year and season. **Bottom:** *Left* Expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results 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, 28.78% of 6,926 cases tested PRRSV-positive in November, a moderate increase from 26.16% of 8,193 in October;
- Positivity in the adult/sow category in November was 21.59% (664 of 3,076), a moderate increase from 19.41% (707 of 3,643) in October;
- Positivity in the wean-to-market category in November was 46.13% (1,049 of 2,274), similar to 44.79% (1,195 of 2,668) in October;
- Overall PRRSV-percentage of positive cases was 3 standard deviations above state-specific baselines in IA, IN, OK, and SD;
- The wean-to-market PRRSV positivity reached the highest positivity (50.6%) since November 2018 (51%). These values demonstrated the high activity of this pathogen in the field. On the confirmed tissue diagnosis (page 8) PRRSV also reached over 500 cases from October 1st to November 25th. The lineage L1C.5 represents over 50% of the wild-type strains (page 3), which is responsible for most of these positive cases.



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

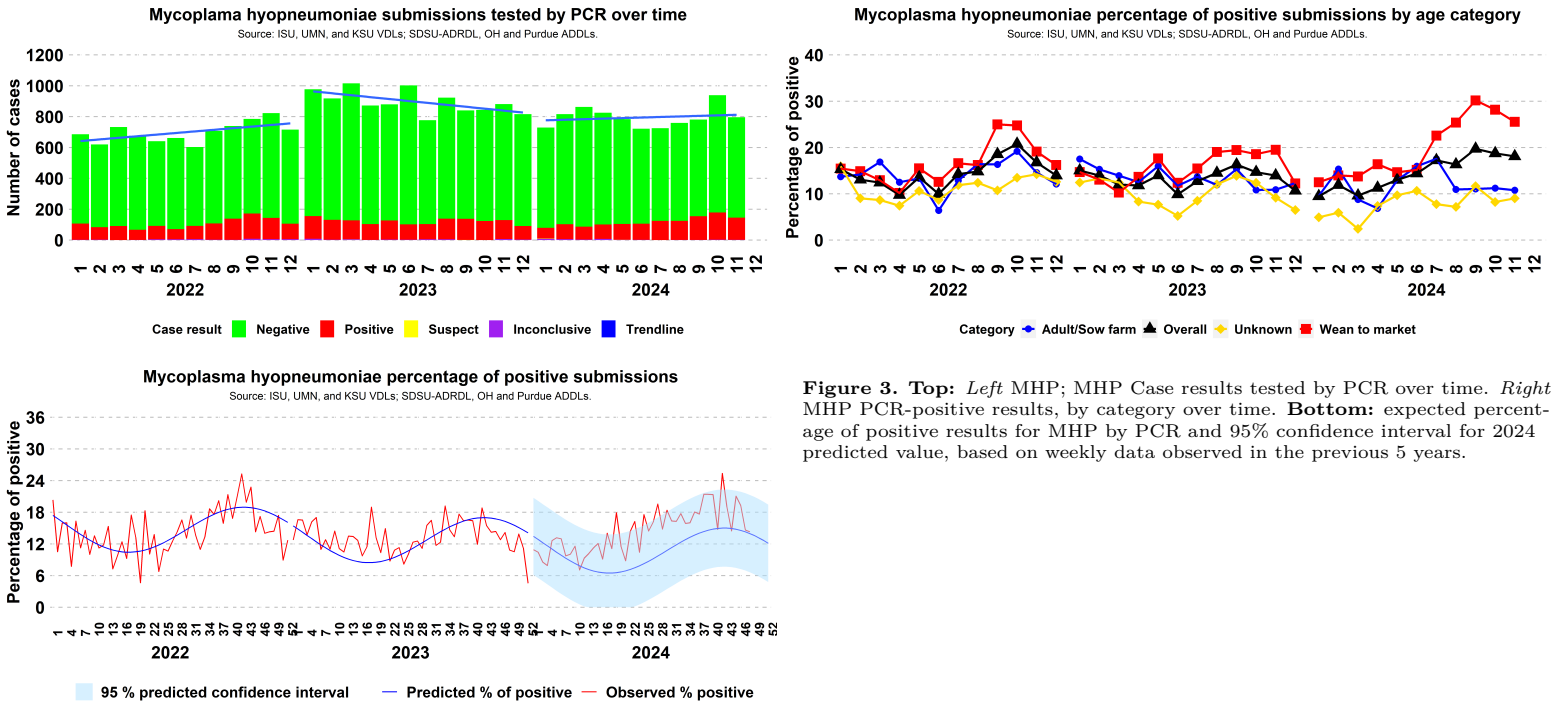


**Figure 1. Top: Left PEDV; Right PDCoV cases tested by RT-PCR over time; Second from top: Left PEDV; Right PDCoV percentage of positive PCR positive results, by age category over time. Third from top: Left PEDV; Right PDCoV expected percentage of positive results for cases tested by RT-PCR and 95% confidence 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, 6.48% of 3,689 cases tested PEDV-positive in November, similar to 5.71% of 4,398 in October;
  - Positivity in the adult/sow category in November was 4.58% (59 of 1,288), similar to 4.78% (75 of 1,570) in October;
  - Positivity in the wean-to-market category in November was 9.06% (123 of 1,358), similar to 8.38% (130 of 1,552) in October;
  - Overall PEDV-percentage of positive cases was within state-specific baselines in all 11 monitored states;
  - Overall, 0% of 91 samples had mixed PEDV genotype detection in November, similar to 0% of 143 in October;
- Overall, 1.74% of 3,629 cases tested PDCoV-positive in November, similar to 1.06% of 4,324 in October;
  - Positivity in the adult/sow category in November was 0.4% (5 of 1,248), similar to 0.33% (5 of 1,518) in October;
  - Positivity in the wean-to-market category in November was 2.37% (32 of 1,350), similar to 1.69% (26 of 1,541) in October;
  - 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 November, 2024 over a total of 3,512 cases tested. It has been 44 months (with a total of 161,293 cases tested) since the last TGEV PCR-positive result;

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



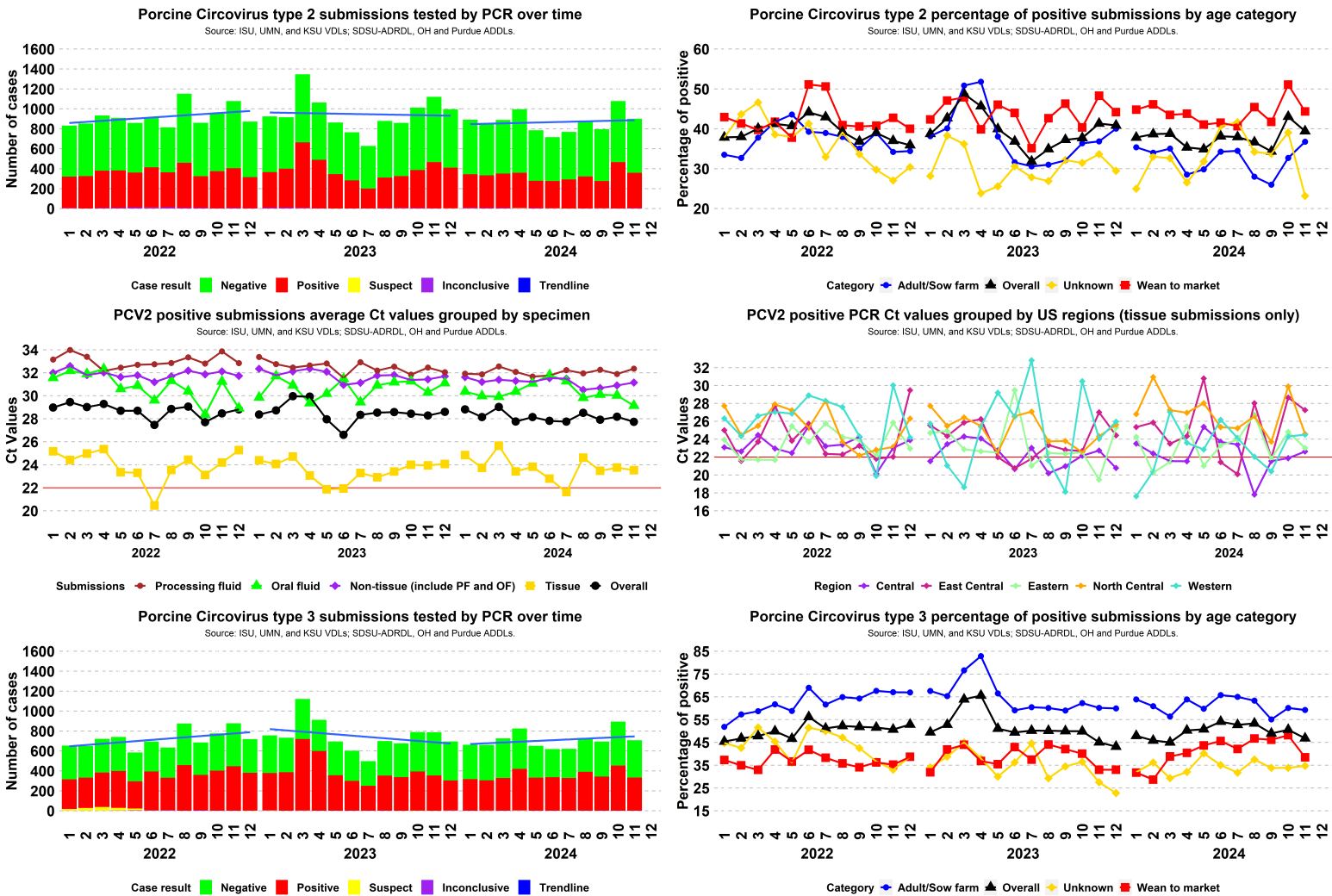
**Figure 3. Top:** *Left* MHP; MHP Case results tested by PCR over time. *Right* MHP PCR-positive results, by category over time. **Bottom:** expected percentage of positive results for MHP by PCR and 95% confidence interval for 2024 predicted value, based on weekly data observed in the previous 5 years.

#### SDRS Advisory Group highlights:

- Overall, 18.09% of 796 cases tested *M. hyopneumoniae*-positive cases in November, similar to 18.74% of 939 in October;
  - Positivity in the adult/sow category in November was 10.79% (26 of 241), similar to 11.22% (33 of 294) in October;
  - Positivity in the wean-to-market category in November was 25.55% (105 of 411), a moderate decrease from 28.16% (127 of 451) in October;
- Overall MHP-percentage of positive cases was 3 standard deviations above state-specific baselines MN, SD, IL, KS and OK;



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

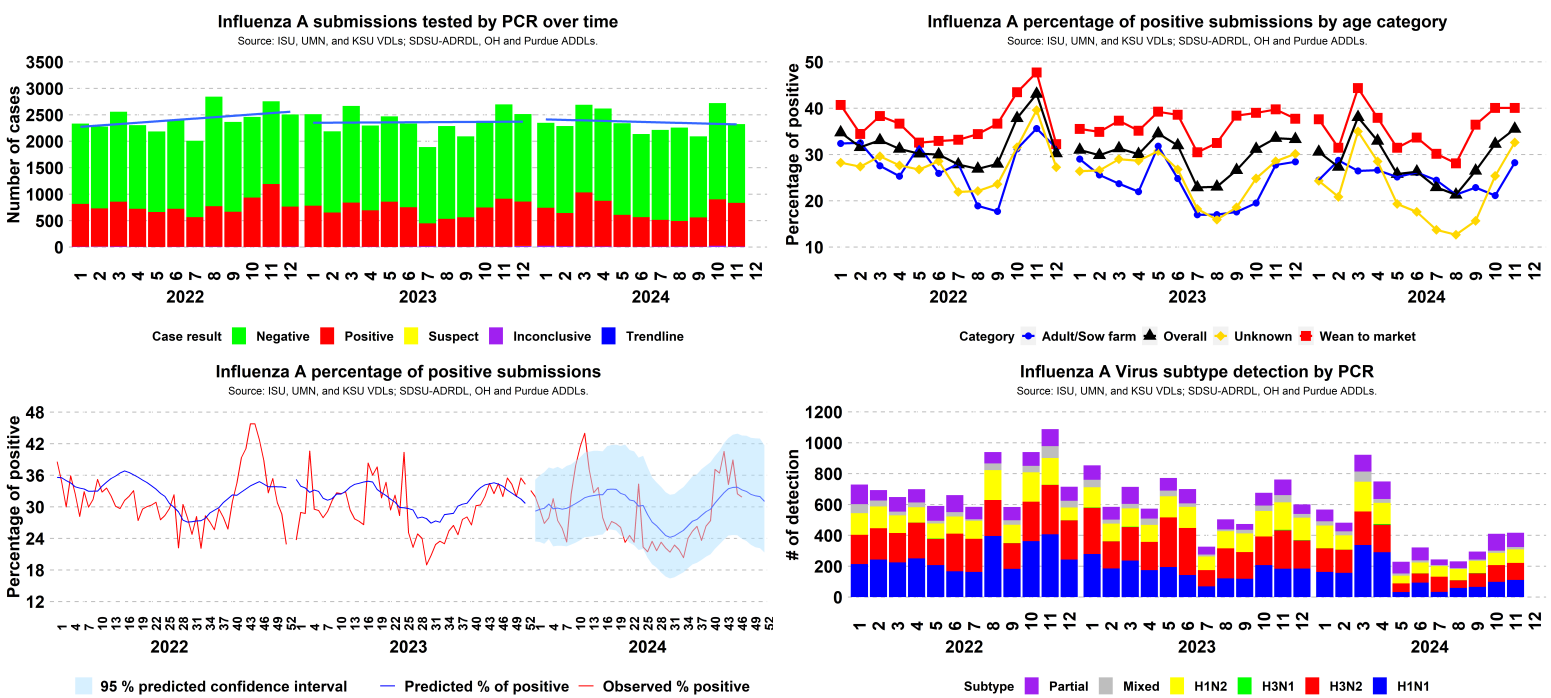


**Figure 1. Top: Left:** Results of PCV2 PCR cases over time; **Right:** PCV2 PCR-positive results, by category over time. **Middle: Left:** Average Ct values of PCV2 submissions by specimen; **Right:** Average Ct values of PCV2 tissue submissions by U.S. region; Central (IA), East Central (IL, IN, MO 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, 39.4% of 901 cases tested PCV2-positive in November, a moderate decrease from 43.04% of 1,078 in October;
- Positivity in the adult/sow category in November was 36.77% (132 of 359), a moderate increase from 32.71% (122 of 373) in October;
- Positivity in the wean-to-market category in November was 44.35% (204 of 460), a substantial decrease from 51.08% (283 of 554) in October;
- In the month of November, the regions with the lowest PCV2 average Ct values in tissue submissions was Central (55 submissions; average Ct 22.6), Eastern (20 submissions; average Ct 23), Western (21 submissions; average Ct 24.5), North Central (27 submissions; average Ct 24.6), and East Central (19 submissions; average Ct 27.3);
- Overall, 46.82% of 707 cases tested PCV3-positive in November, a moderate decrease from 50.56% of 894 in October;
- Positivity in the adult/sow category in November was 59.26% (176 of 297), similar to 60.12% (199 of 331) in October;
- Positivity in the wean-to-market category in November was 38.46% (130 of 338), a substantial decrease from 48.17% (210 of 436) in October.

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



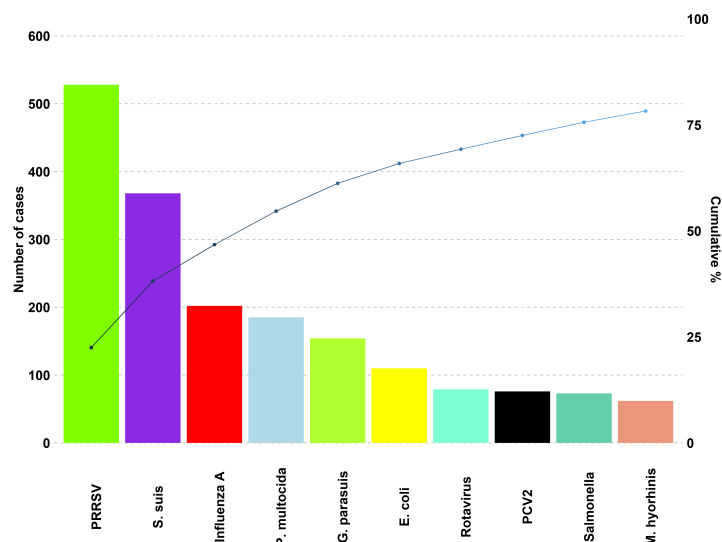
**Figure 3. Top:** *Left* Results of IAV PCR cases over time. *Right* Percentage of IAV PCR-positive results, by category over time. **Bottom:** *Left* expected percentage of positive results for IAV by PCR and 95% confidence interval for 2024 predicted value, based on weekly data observed in the previous 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:

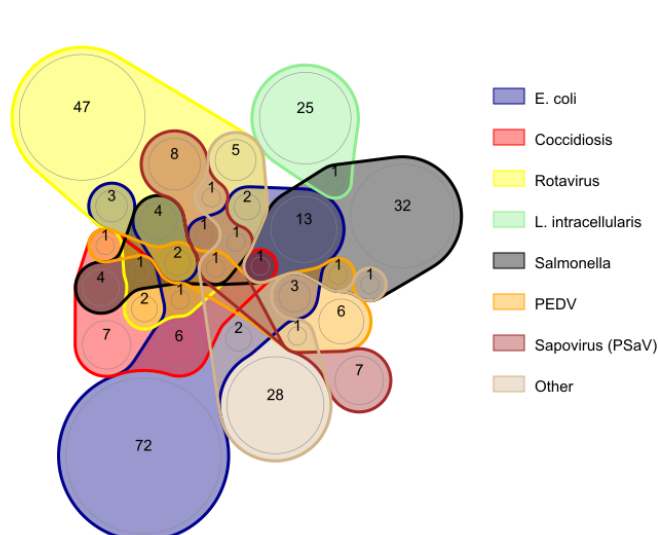
- Overall, 35.53% of 2,325 cases tested IAV-positive cases in November, a moderate increase from 32.27% of 2,721 in October;
- Positivity in the adult/sow category in November was 28.24% (144 of 510), a substantial increase from 21.15% (121 of 572) in October;
- Positivity in the wean-to-market category in November was 40.07% (484 of 1,208), similar to 40.07% (577 of 1,440) in October.
- Overall IAV-percentage of positive cases was 3 standard deviations above state-specific baselines in MN and MO;
- Overall, 3.6% of 417 samples had mixed subtype detection in November, similar to 3.41% of 410 in October.
- The advisory group highlighted an increased activity of Influenza A virus in some regions, but nothing abnormal compared with previous years. Of the total positive cases, 57% are in oral fluids samples, followed by 32% of in lung samples.

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

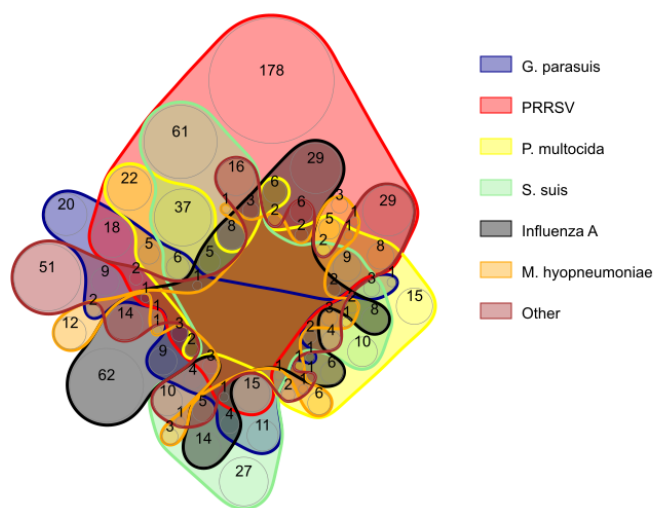
### Overall diagnosis



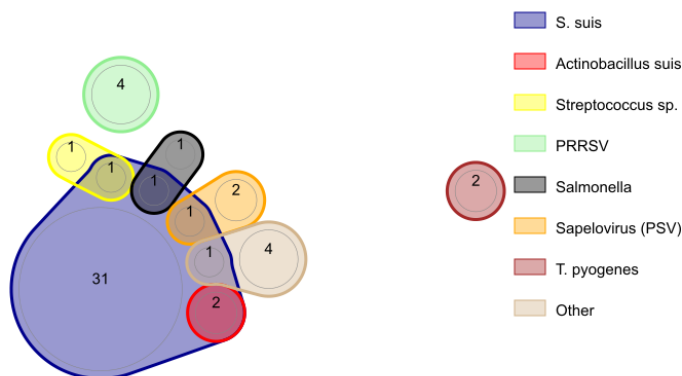
### Digestive



### 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 October. 1 to November. 25, 2024.

### SDRS Advisory Group highlights:

- PRRSV (528) led cases with confirmed etiology, followed by *S. suis* (368), and Influenza A (202). PRRSV (493 of 1542) led the number of confirmed respiratory diagnoses, *E. coli* (106 of 373) lead the number of confirmed digestive diagnoses, and *S. suis* (37 of 57) led the number of confirmed neurological diagnoses.
- There were consecutive alarms for increased number of respiratory and systemic cases on November. Also, there were consecutive alarms for an increase in confirmed Influenza A virus, PRRSV, *Pasteurella multocida*, and *Streptococcus suis* diagnoses.
- The advisory group highlighted that even though there was more activity of the endemic pathogens in November, this is expected for this period of the year when the cold temperatures start, increasing the activity of respiratory/systemic pathogens.



**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.

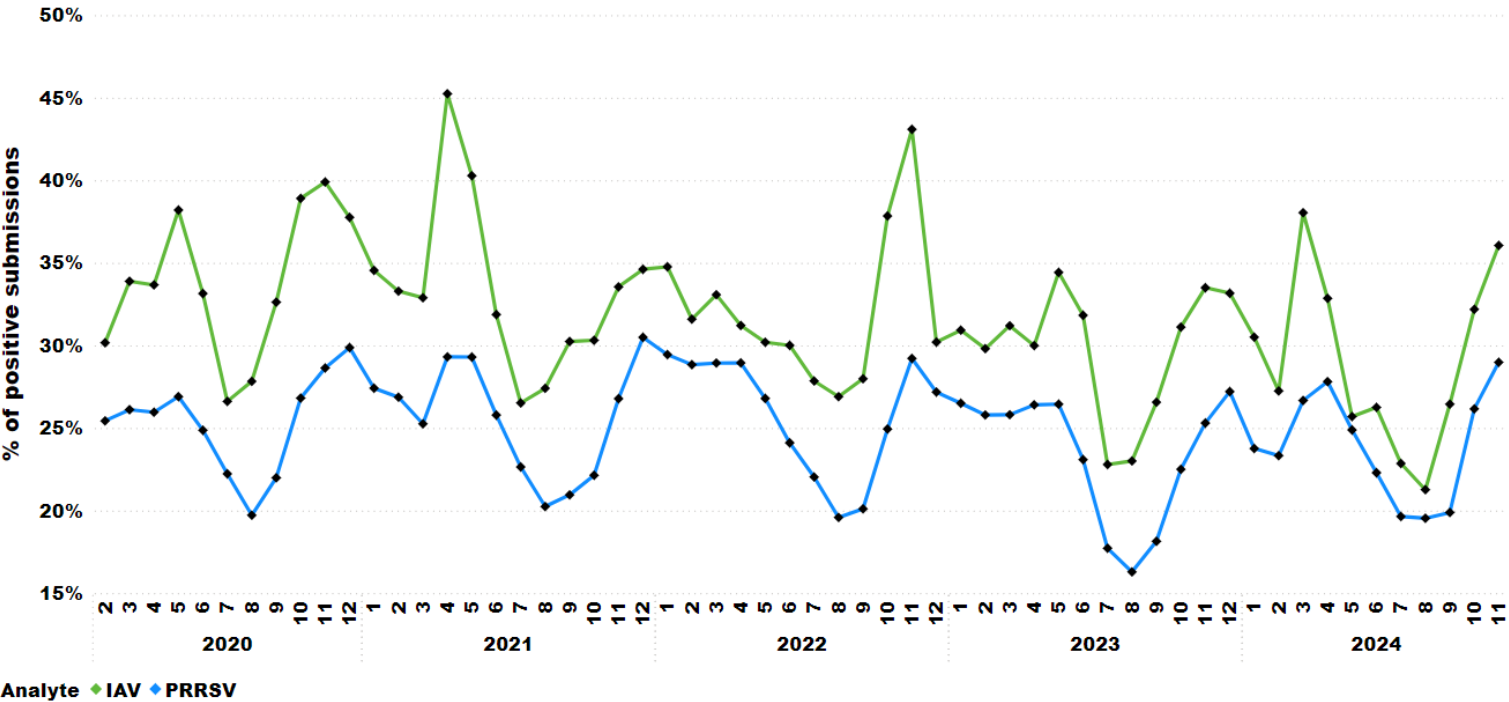
# Influenza A virus and PRRSV detection: similar trends over time

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The porcine respiratory disease complex (PRDC) is a significant swine health issue, leading to higher mortality rates and substantial economic losses. Influenza A virus (IAV) and PRRSV are two major PRDC pathogens. IAV infection has been shown to boost PRRSV replication and increase the disease’s severity (1). SDRS keeps track of both viruses. The percentage of positive submissions over time for IAV and PRRSV follows a strikingly similar detection pattern for its tops and valleys. It is essential to highlight that in November 2024, an increase in both percentages of positive submissions occurred, potentially resulting in more respiratory clinical signs.

The advisory group highlighted the synergy between PRRSV and IAV in the field - one triggering or exacerbating the clinical manifestation of the other. Also, they highlighted that both pathogens are frequently tested together by RT-PCRs. SDRS will keep investigating the co-detection of these two pathogens in cases throughout the laboratory network to better understand this dynamic, considering specimen, age category, and regional trends.



**Figure 1.** Overall percentage of PCR-positive PRRSV and IAV submissions over time.