Swine Disease Reporting System
Report # 86 (April 01, 2025)

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.

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 Uni.: Edison Magalhães, Gustavo Silva, Marcelo Almeida, Bret Crim, Kinath Rupasinghe, Srijita Chandra, Eric Burrough, Phillip Gauger, Christopher Rademacher, Darin Madson, Michael Zeller, Rodger Main.

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

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

South Dakota State Uni 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 Uni 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 March 31, 2025.

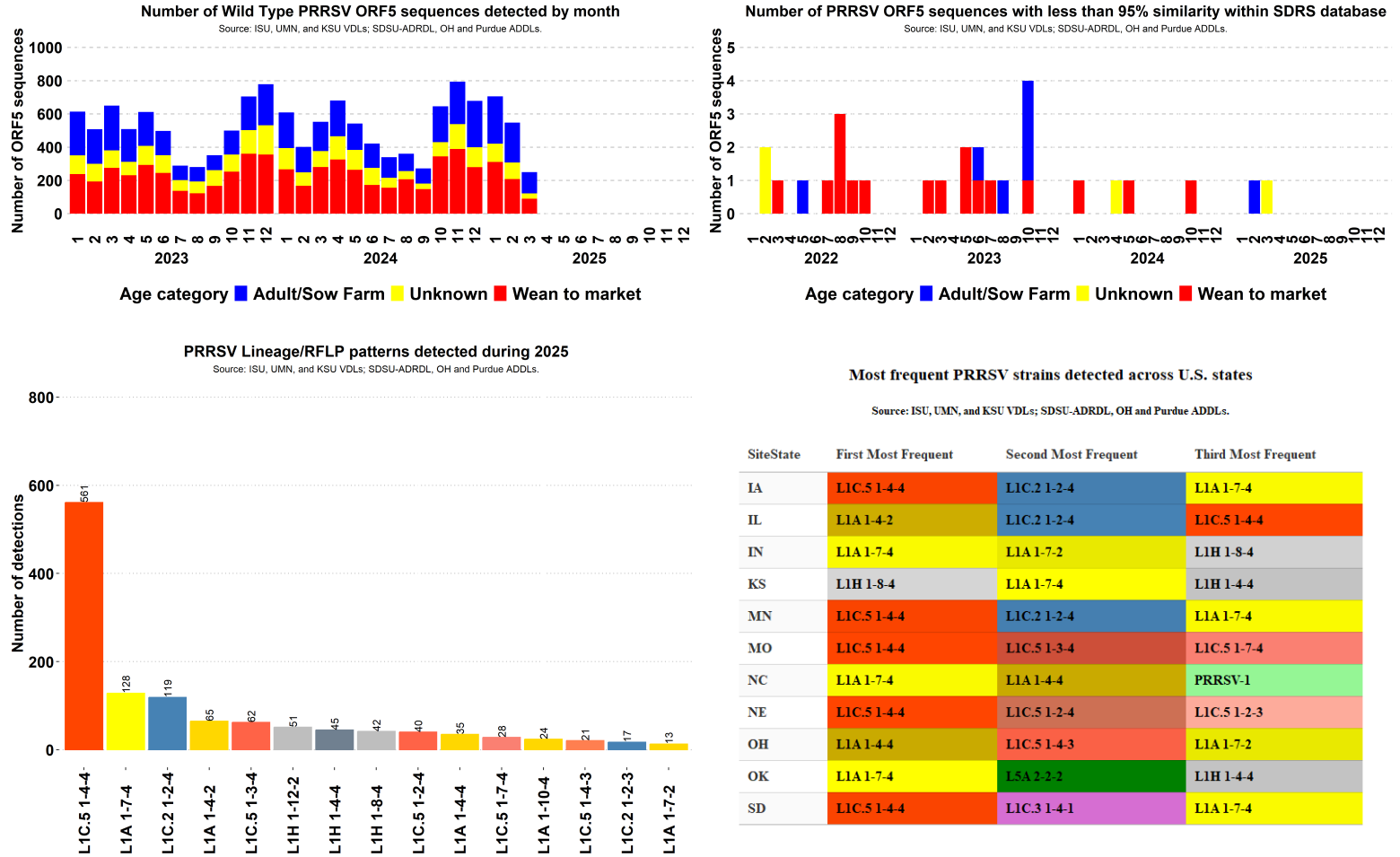# Topic 1 – Detection of PRRSV RNA over time by RT-qPCR.
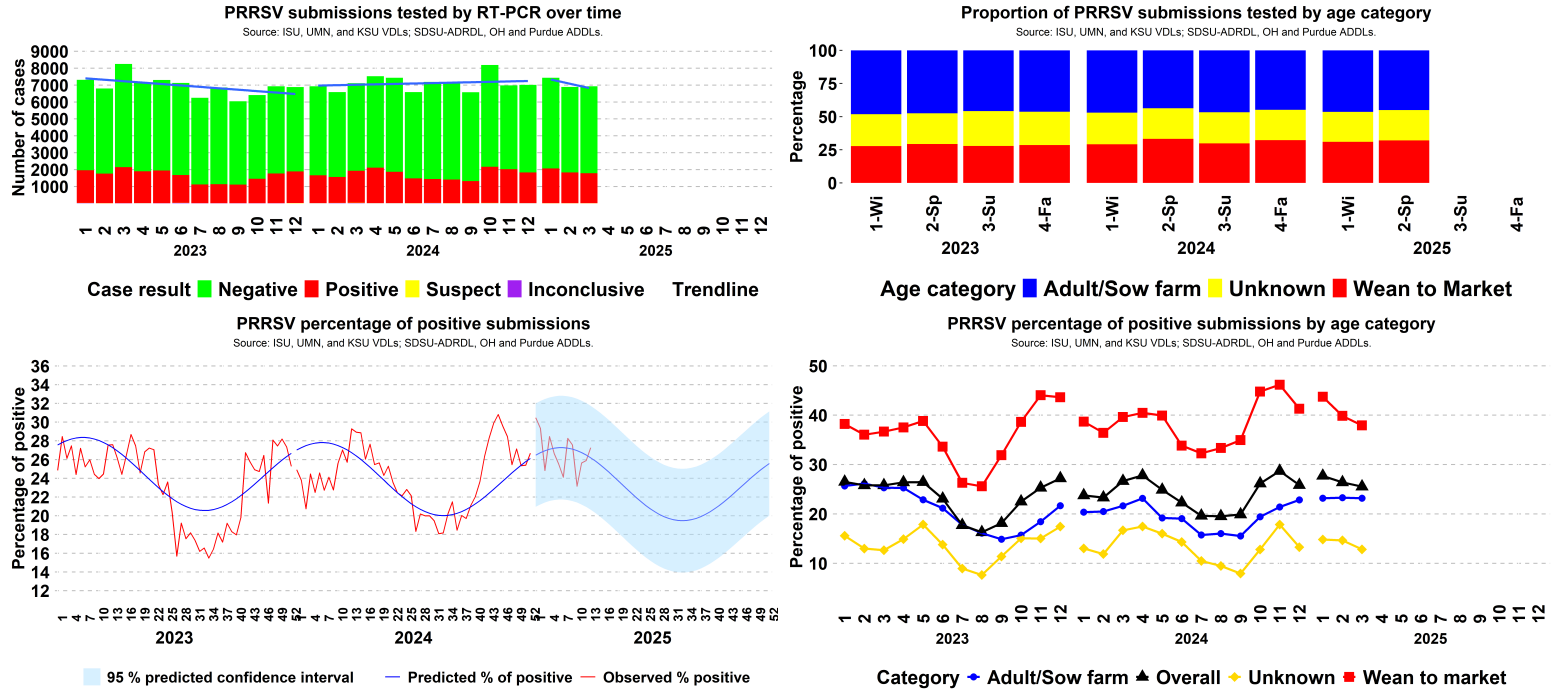
Figure 1. Top: *Left*: Results of PRRSV RT-PCR cases over time; *Right*: Proportion of accession ID cases tested for PRRSV by age group per year and season. **Bottom**: *Left* Expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the previous 4 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, 25.53% of 6,930 cases tested PRRSV-positive in March, similar to 26.4% of 6,891 in February;
  - Positivity in the adult/sow category in March was 23.17% (723 of 3,120), similar to 23.3% (738 of 3,168) in February;
  - Positivity in the wean-to-market category in March was 37.93% (842 of 2,220), similar to 39.86% (847 of 2,125) in February;
- Overall PRRSV-percentage of positive cases was 3 standard deviations above state-specific baseline in IA and NC;
- Even though the percentage of positive submissions of PRRSV is within expected, Iowa had over 50% of positive submissions, a high percentage compared with Iowa historical database for March. Also, Iowa had 26 different PRRSV variants detected based on VanderWaal et al. 2025 new classification in this first trimester, showing an increased PRRSV diversity in the state.
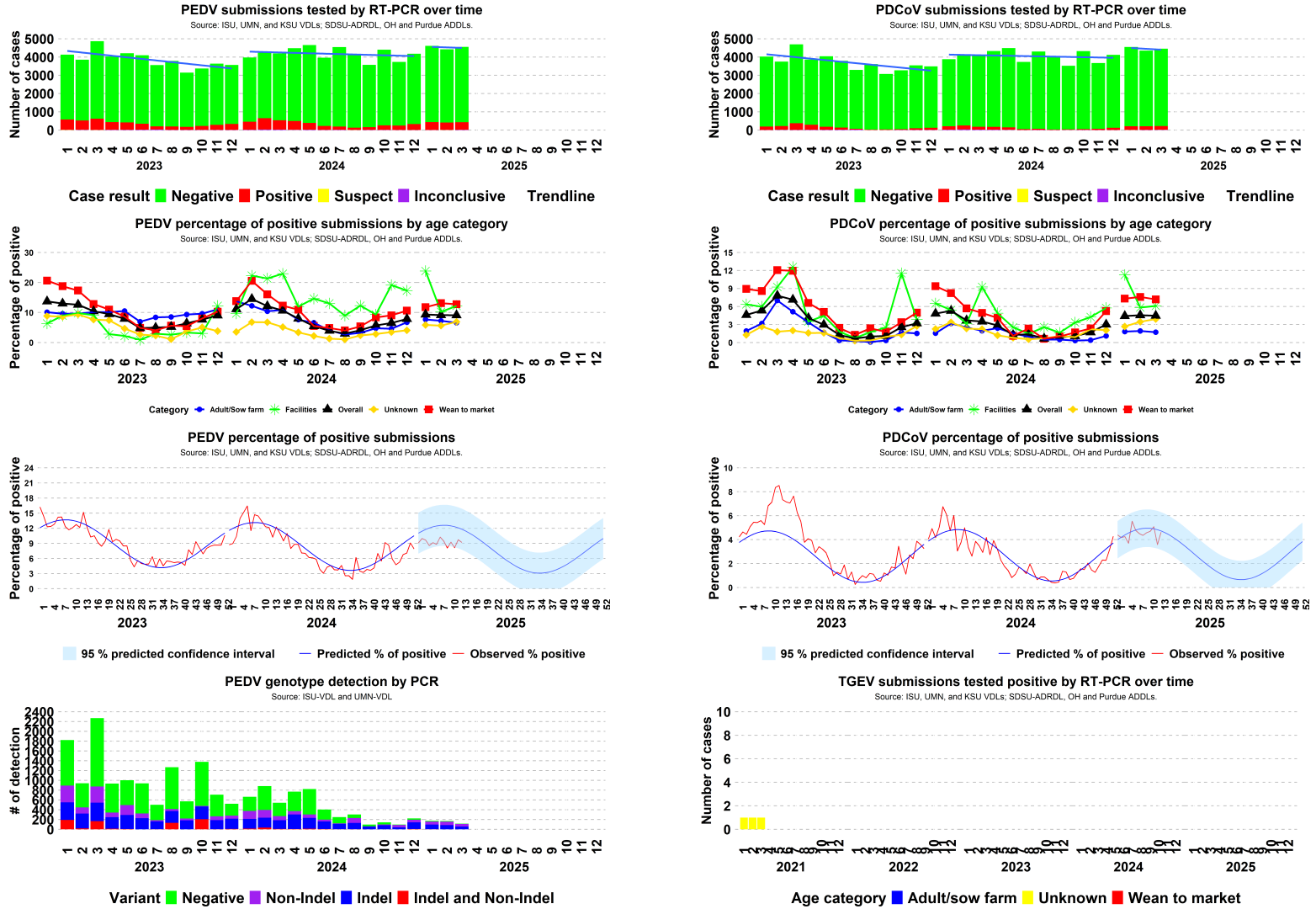
Topic 2 – PRRSV ORF5 sequences detection over time

Number of Wild Type PRRSV ORF5 sequences detected by month
Source: ISU, UMN, and KSU VDLs; SDS-ADRDL, OH and Purdue ADDLs.

Number of PRRSV ORF5 sequences with less than 95% similarity within SDRS database
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

PRRSV Lineage/RFLP patterns detected during 2025
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Most frequent PRRSV strains detected across U.S. states

Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

SiteState	First Most Frequent	Second Most Frequent	Third Most Frequent
IA	L1C.5 1-4-4	L1C.2 1-2-4	L1A 1-7-4
IL	L1A 1-4-2	L1C.2 1-2-4	L1C.5 1-4-4
IN	L1A 1-7-4	L1A 1-7-2	L1H 1-8-4
KS	L1H 1-8-4	L1A 1-7-4	L1H 1-4-4
MN	L1C.5 1-4-4	L1C.2 1-2-4	L1A 1-7-4
MO	L1C.5 1-4-4	L1C.5 1-3-4	L1C.5 1-7-4
NC	L1A 1-7-4	L1A 1-4-4	PRRSV-1
NE	L1C.5 1-4-4	L1C.5 1-2-4	L1C.5 1-2-3
OH	L1A 1-4-4	L1C.5 1-4-3	L1A 1-7-2
OK	L1A 1-7-4	L5A 2-2-2	L1H 1-4-4
SD	L1C.5 1-4-4	L1C.3 1-4-1	L1A 1-7-4

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 March 2025, The states with higher number of PRRSV L1C.5 (variant) detections were detected IA, MO, MN, IL, NE, IN, SD (respective number of sequences: 81, 9, 8, 6, 6, 3, 2).
- In March L1C.5 1-4-4 (80) was the PRRSV sequence most detected in the U.S., followed by L1A 1-7-4 (20), and L1C.2 1-2-4 (17);
- 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.

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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. Facilities are cases submissions from packing plants, truck washes, and vehicles. **Third from top**: *Left PEDV*; *Right PDCoV* expected percentage of positive results for cases tested by RT-PCR and 95% confidence interval for 2025 predicted value. **Bottom** *Left*: Number of PEDV genotype detection over time; *Right*: Number of TGEV positive cases by age category.
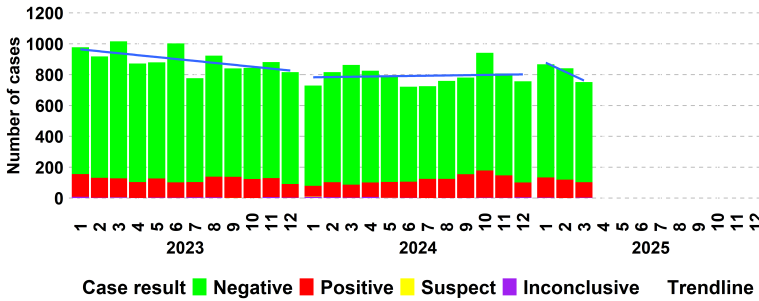
SDRS Advisory Group highlights:

- Overall, 9.11% of 4,555 cases tested PEDV-positive in March, similar to 9.13% of 4,425 in February;
  - Positivity in the adult/sow category in March was 6.6% (104 of 1,576), similar to 7.24% (113 of 1,561) in February;
  - Positivity in the wean-to-market category in March was 12.77% (214 of 1,676), similar to 13.12% (216 of 1,646) in February;
- Positivity in the facilities category in March was 12.21% (16 of 131), similar to 10.22% (14 of 137) in February;
  - Overall PEDV-percentage of positive cases was 3 standard deviations above state-specific baseline in IN;
  - Overall, 0% of 115 samples had mixed PEDV genotype detection in March, similar to 0% of 168 in February;
- Overall, 4.47% of 4,455 cases tested PDCoV-positive in March, similar to 4.55% of 4,349 in February;
  - Positivity in the adult/sow category in March was 1.73% (26 of 1,504), similar to 1.92% (29 of 1,508) in February;
  - Positivity in the wean-to-market category in March was 7.19% (120 of 1,669), similar to 7.59% (124 of 1,633) in February;
- Positivity in the facilities category in March was 6.11% (8 of 131), similar to 5.84% (8 of 137) in February;
- Overall PDCoV-percentage of positive cases was 3 standard deviations above state-specific baseline in IN and MO;
- There was 0 positive case for TGEV RNA-PCR in March, 2025 over a total of 4,334 cases tested. It has been 48 months (with a total of 178,428 cases tested) since the last TGEV PCR-positive result;
- **Advisory Group comment about TGEV in the Bonus page (page 9)**.
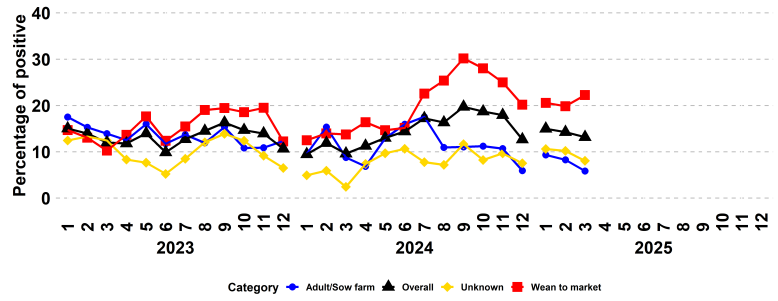
Topic 3 – Detection of *M. hyopneumoniae* DNA by PCR.

Mycoplama hyopneumoniae submissions tested by PCR over time
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Case result: Negative | Positive | Suspect | Inconclusive | Trendline

Mycoplasma hyopneumoniae percentage of positive submissions by age category
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Category: Adult/Sow farm | Overall | Unknown | Wean to market

Mycoplasma hyopneumoniae percentage of positive submissions
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

95 % predicted confidence interval | Predicted % of positive | Observed % positive
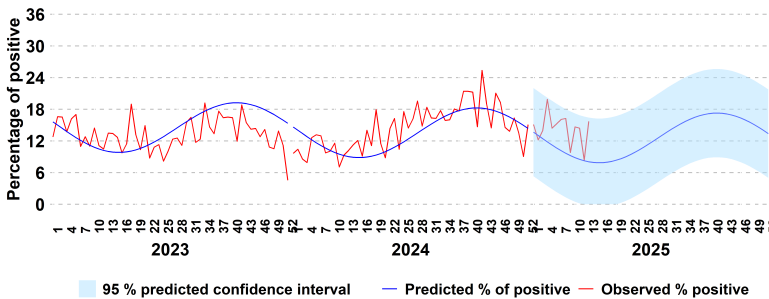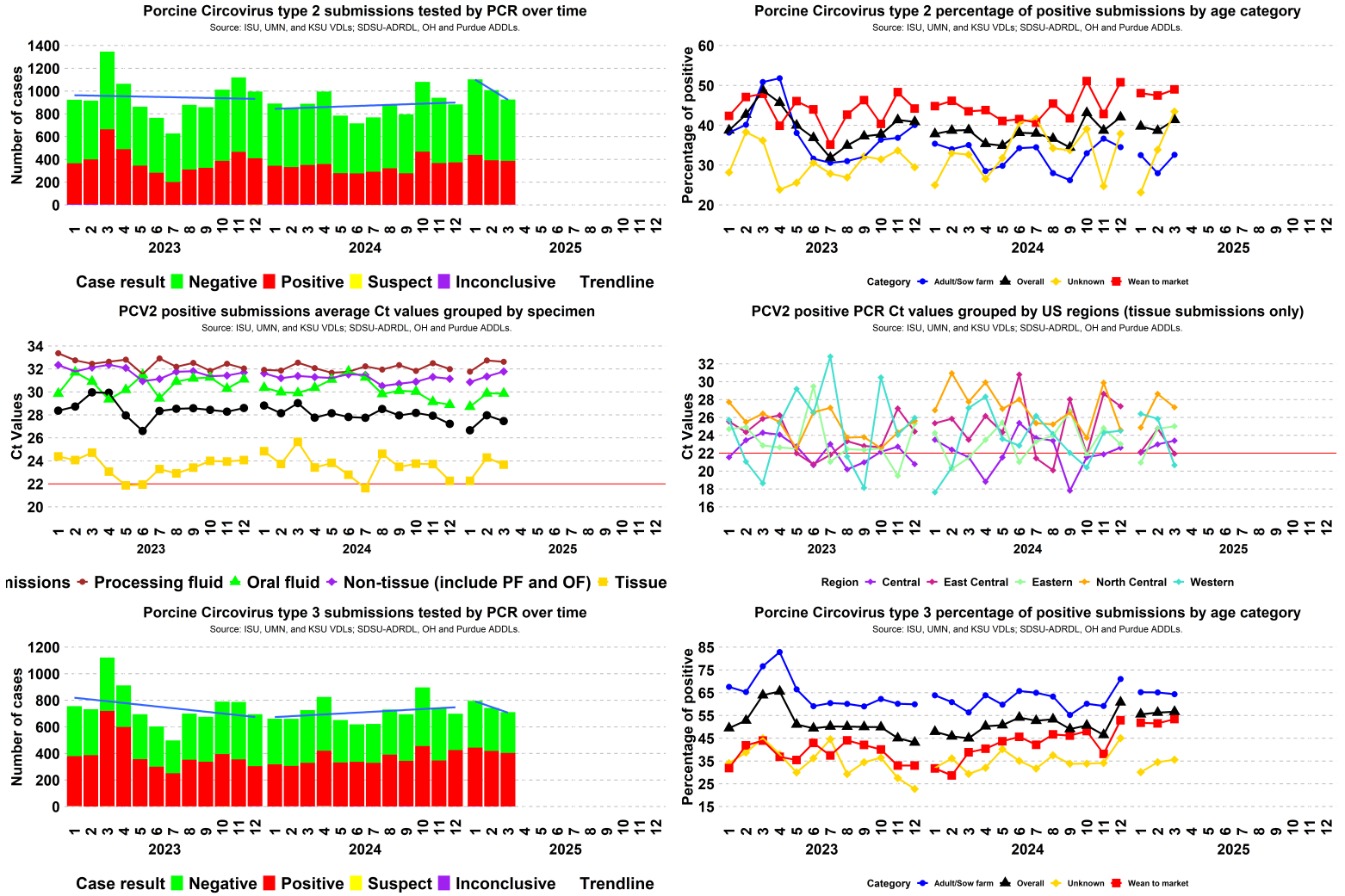
Figure 3. Top: *Left* MHP; MHP Case results tested by PCR over time. *Right* MHP PCR-positive results, by category over time. **Bottom:** expected percentage of positive results for MHP by PCR and 95% confidence interval for 2025 predicted value, based on weekly data observed in the previous 5 years.

SDRS Advisory Group highlights:

- Overall, 13.16% of 752 cases tested *M. hyopneumoniae*-positive cases in March, similar to 14.27% of 841 in February;
- Positivity in the adult/sow category in March was 5.86% (15 of 256), a moderate decrease from 8.26% (20 of 242) in February;
- Positivity in the wean-to-market category in March was 22.26% (69 of 310), a moderate increase from 19.85% (80 of 403) in February;
- Overall MHP-percentage of positive cases was 3 standard deviations above state-specific baseline in MN;

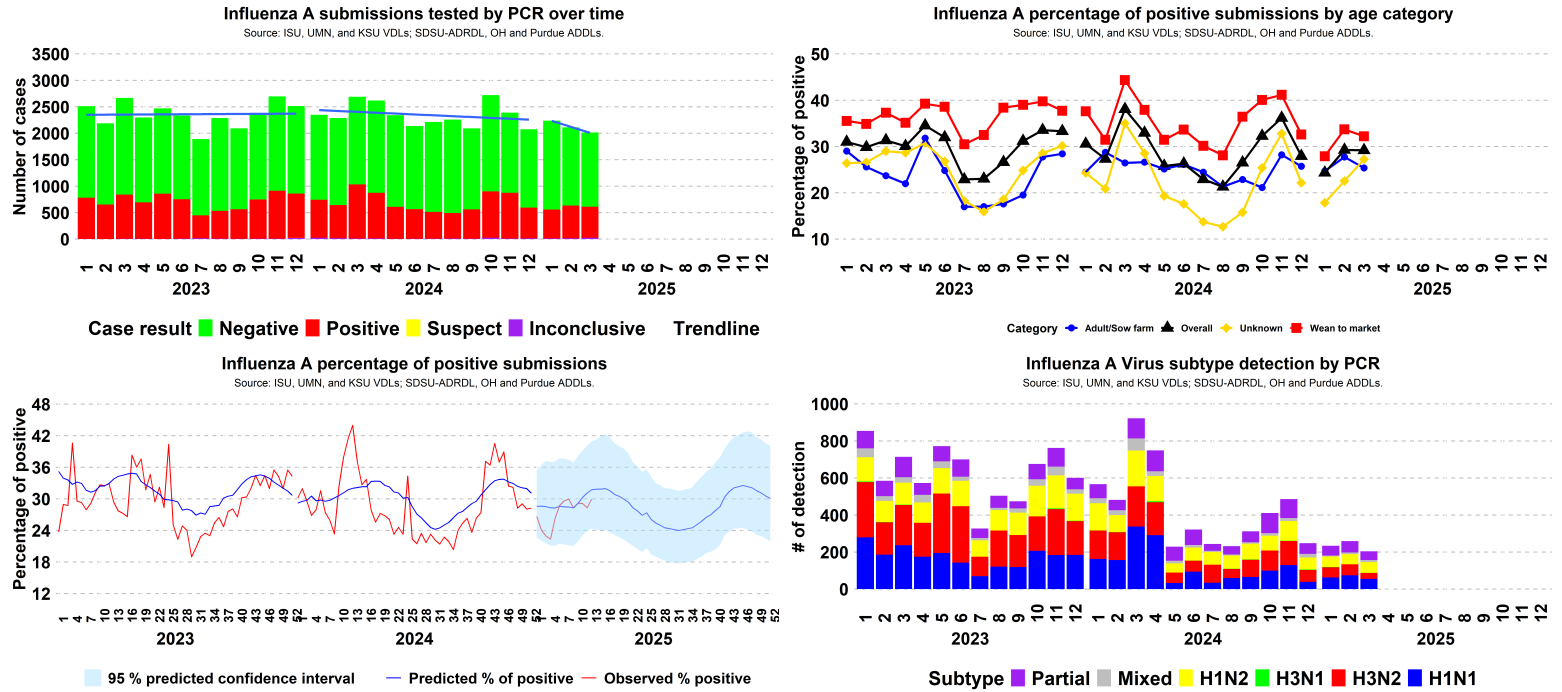# Topic 4 – Detection of Porcine Circoviruses type 2 and 3 DNA by PCR.

Porcine Circovirus type 2 submissions tested by PCR over time
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Case result: Negative, Positive, Suspect, Inconclusive, Trendline

Porcine Circovirus type 2 percentage of positive submissions by age category
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Category: Adult/Sow farm, Overall, Unknown, Wean to market

PCV2 positive submissions average Ct values grouped by specimen
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

...nissions, Processing fluid, Oral fluid, Non-tissue (include PF and OF), Tissue

PCV2 positive PCR Ct values grouped by US regions (tissue submissions only)
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Region: Central, East Central, Eastern, North Central, Western

Porcine Circovirus type 3 submissions tested by PCR over time
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Case result: Negative, Positive, Suspect, Inconclusive, Trendline

Porcine Circovirus type 3 percentage of positive submissions by age category
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Category: Adult/Sow farm, Overall, Unknown, Wean to market

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). Red line represent Ct threshold calculated using methodology based on Dx codes. **Bottom** *Left*: Results of PCV3 PCR cases over time; *Right*: PCV3 PCR-positive results, by category over time.

SDRS Advisory Group highlights:

- Overall, 41.36% of 926 cases tested PCV2-positive in March, a moderate increase from 38.65% of 1,009 in February;
  - Positivity in the adult/sow category in March was 32.59% (132 of 405), a moderate increase from 27.98% (115 of 411) in February;
  - Positivity in the wean-to-market category in March was 48.99% (218 of 445), similar to 47.47% (253 of 533) in February;
  - In the month of March, the regions with the lowest PCV2 average Ct values in tissue submissions was Western (19 submissions; average Ct 20.7), East Central (25 submissions; average Ct 22), Central (75 submissions; average Ct 23.4), Eastern (26 submissions; average Ct 25), and North Central (38 submissions; average Ct 27.1);
- Overall, 56.68% of 711 cases tested PCV3-positive in March, similar to 56.26% of 743 in February;
  - Positivity in the adult/sow category in March was 64.35% (213 of 331), similar to 65.15% (215 of 330) in February;
  - Positivity in the wean-to-market category in March was 53.42% (164 of 307), similar to 51.55% (183 of 355) in February.
- PCV2 has consecutive months with a high percentage of positive submissions in wean-to-finish sites. Of the 727 positive cases in wean-to-finish sites in 2025, 65% are tissue cases, with lung and spleen being the primary positive tissue samples. However, Ct values with these submissions were not as low, as in previous historical data.

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

Influenza A submissions tested by PCR over time
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Influenza A percentage of positive submissions by age category
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Case result ■ Negative ■ Positive ■ Suspect ■ Inconclusive — Trendline

Category ◆ Adult/Sow farm ▲ Overall ◆ Unknown ■ Wean to market

Influenza A percentage of positive submissions
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

Influenza A Virus subtype detection by PCR
Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

■ 95 % predicted confidence interval — Predicted % of positive — Observed % positive

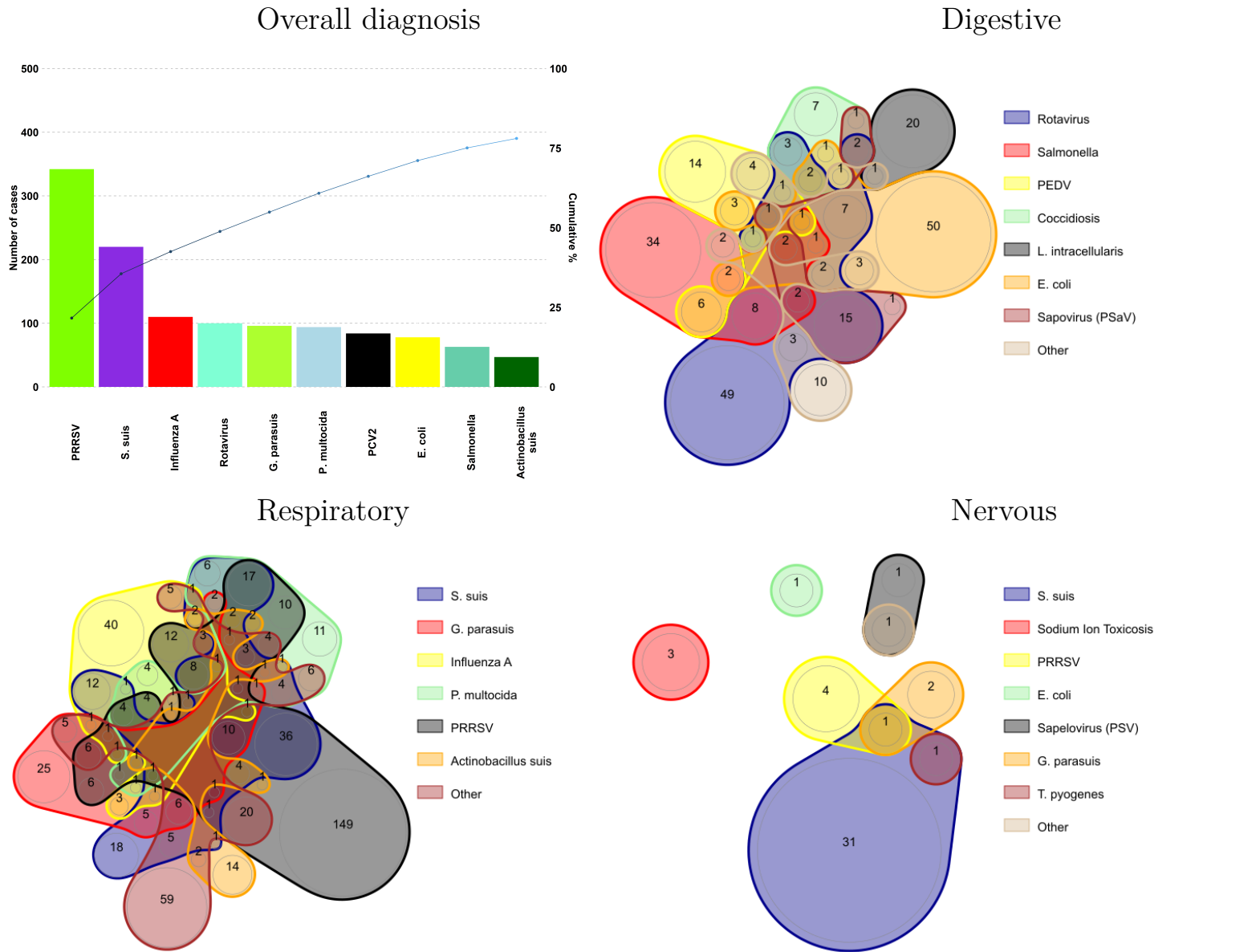**Subtype** ■ Partial ■ Mixed ■ H1N2 ■ H3N1 ■ H3N2 ■ H1N1

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 2025 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, 29.18% of 2,015 cases tested IAV-positive cases in March, similar to 29.26% of 2,112 in February;
  - Positivity in the adult/sow category in March was 25.39% (115 of 453), a moderate decrease from 27.74% (124 of 447) in February;
  - Positivity in the wean-to-market category in March was 32.21% (307 of 953), similar to 33.71% (358 of 1,062) in February.
- Overall IAV-percentage of positive cases was within state-specific baselines in all 11 monitored states;
- Overall, 5.39% of 204 samples had mixed subtype detection in March, similar to 3.47% of 259 in February.

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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, Piñeyro, Siepker, Madson, Thomas, Gris 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 February. 1 to March. 24, 2025.

SDRS Advisory Group highlights:
• PRRSV (342) led cases with confirmed etiology, followed by *S. suis* (220), and Influenza A (110). PRRSV (313 of 939) led the number of confirmed respiratory diagnoses, Rotavirus (100 of 354) lead the number of confirmed digestive diagnoses, and *S. suis* (33 of 49) led the number of confirmed neurological diagnoses.

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Transmissible Gastroenteritis Virus (TGEV) completes 4 years without a positive RT-PCR case in the U.S.
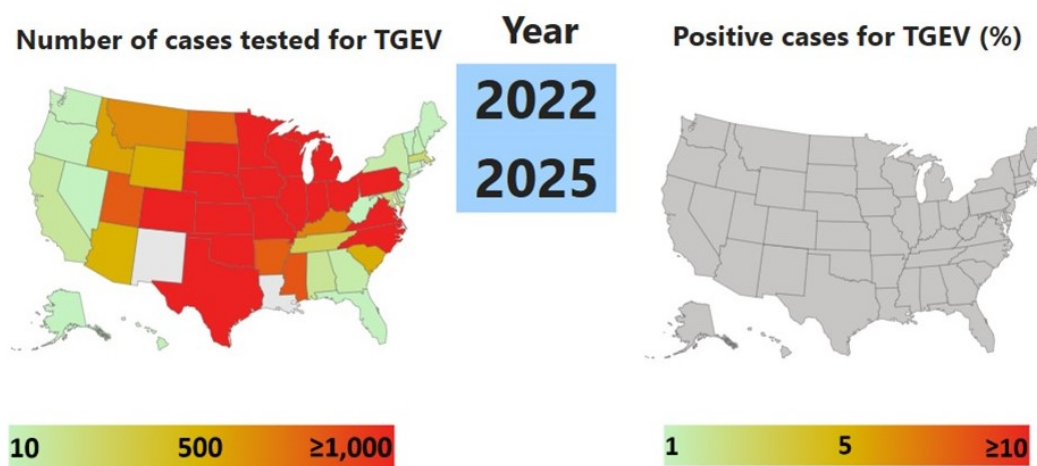
Guilherme Cezar[1], Kinath Rupasinghe[1], Daniel Linhares[1], Giovani Trevisan[1]

1 - Iowa State University, Ames, IA, USA.

Transmissible gastroenteritis (TGE) is a highly contagious viral illness affecting swine of all ages, marked by symptoms such as diarrhea and vomiting. The disease is triggered by the TGE virus (TGEV), which belongs to the Coronaviridae family. Piglets younger than two weeks often experience high mortality rates, though the fatality rate decreases as they age. The Swine Disease Reporting System (SDRS) aggregates swine enteric coronavirus cases, including TGEV, from 6 veterinarian diagnostic laboratories. TGEV has not had a single positive RT-PCR case since March 22nd of 2021, when the last detection of this virus occurred in Iowa. Since then, more than 177,000 cases have been tested with an average of 3 RT-PCRs per case. Therefore, more than 500,000 PCRs from multiple sample types including environmental and biological samples from all age groups and farm types were tested since 2021 coming from 47 U.S. states. Figure 1 shows the distribution of the TGEV testing and the number of positive cases since 2022, represented by a heat map with the PCR cases performed from 2022 until 2025. In absolute numbers, Iowa, Minnesota, and Oklahoma are the states with a higher number of submissions. Also, Figure 2 shows the evolution of TGEV testing and positivity over time, describing the snapshot of the number of cases performed and the percentage of positivity coming from each state since 2008. In 2014, the endemicity of PEDV in the U.S. influenced the amount of surveillance performed for TGEV. In 2020, the usage of triplex PCR for testing TGEV, PEDV, and PDCoV adopted by the VDLs contributed to the testing of TGEV continues to be performed on a large scale since usually producers and veterinarians are testing for PDCoV and PEDV, they are also testing for TGEV as a differential diagnosis. The SDRS projects keep monitoring TGEV and other endemic pathogens affecting the swine industry, with the capability of generating a rapid alert in case a positive TGEV case occurs.

Advisory Comment: The advisory group highlighted that they doubt that TGEV is present in any commercial herd, suggesting that it would be difficult to detect even if a mild variant exists because it is circulating in low prevalence. Also, the SDRS advisory group hypothesized that cross-protection from Porcine Respiratory Coronavirus (PRCoV) or the prevalence of PEDv might have contributed to TGEV's decline. Improved biosecurity measures, such as cleaning and disinfection, better entry control, covered chutes, and bird netting, were also mentioned as important factors. Additionally, there was a curiosity about whether testing more outdoor swine and hobby/show pigs might reveal presence of TGEV.

Figure 1. Distribution of TGEV RT-PCR tested cases and percentage of positive submissions since 2022 until 2025.

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Figure 2. Snapshots of TGEV RT-PCR cases and percentage of positive submissions by state from 2008, 2014, and 2021.