

Swine Disease Reporting System

Report # 54 (August 2, 2022)

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 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](#).

Iowa State University: Gustavo Silva, Marcelo Almeida, Bret Crim, Eric Burrough, Phillip Gauger, Christopher Siepker, Alyona Michael, Panchan Sitthicharoenchai, Rodger Main.

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

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

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

Ohio Animal Disease and Diag. Lab.: Melanie Prarat, William Hennessy, Ashley Sawyer, 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.

FLUture: Aggregates influenza A virus (IAV) 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 [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, Tara Donovan, Deborah Murray, Scott Dee, Brigitte Mason, Peter Schneider, Sam Copeland, Luc Dufresne, and Daniel Boykin.

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, 2022.

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.

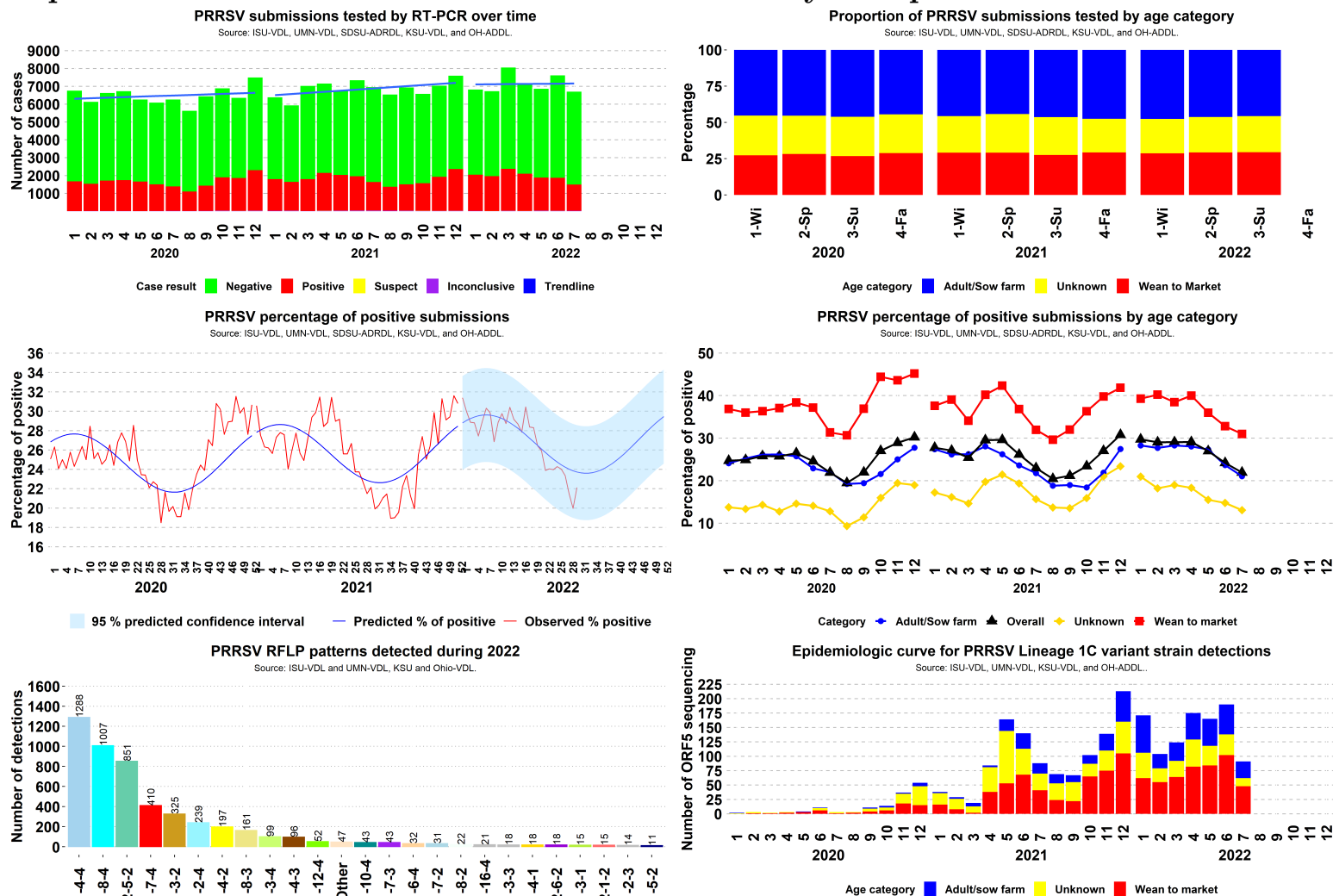


Figure 1. **Top: Left:** Results of PRRSV RT-PCR cases over time; **Right:** Proportion of accession ID cases tested for PRRSV by age group per year and season. **Middle: Left:** Expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results 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 2022; **Right:** Epidemiological curve of detection for PRRSV Lineage 1C variant strain.

SDRS Advisory Group highlights:

- Overall, 21.94% of 6,704 cases tested PRRSV-positive in July, a moderate decrease from 24.18% of 7,614 in June;
 - Positivity in the adult/sow category in July was 21.05% (643 of 3,055), a moderate decrease from 23.67% (825 of 3,486) in June;
 - Positivity in the wean-to-market category in July was 30.99% (607 of 1,959), similar to 32.8% (739 of 2,253) in June;
 - Overall, PRRSV-percentage of positive cases was three standard deviations from state-specific baselines in NE, MO, and IN;
- The summer months are the period where we expect decreased detection of PRRSV. At an overall level, July PRRSV was within expected baseline levels. However, at a state level, increased activity of PRRSV continued to be seen above state-specific baseline levels;
- The advisory group highlighted that increased regional PRRSV PCR detection in MO and NE is also aligned with increased detection of PRRSV L1C variant strains. Some breeding herd depopulations are occurring in the summer and may decrease the number of positive piglets sent to finishing sites cases for the next months.

Topic 2 – Enteric coronavirus RNA detection by RT-qPCR

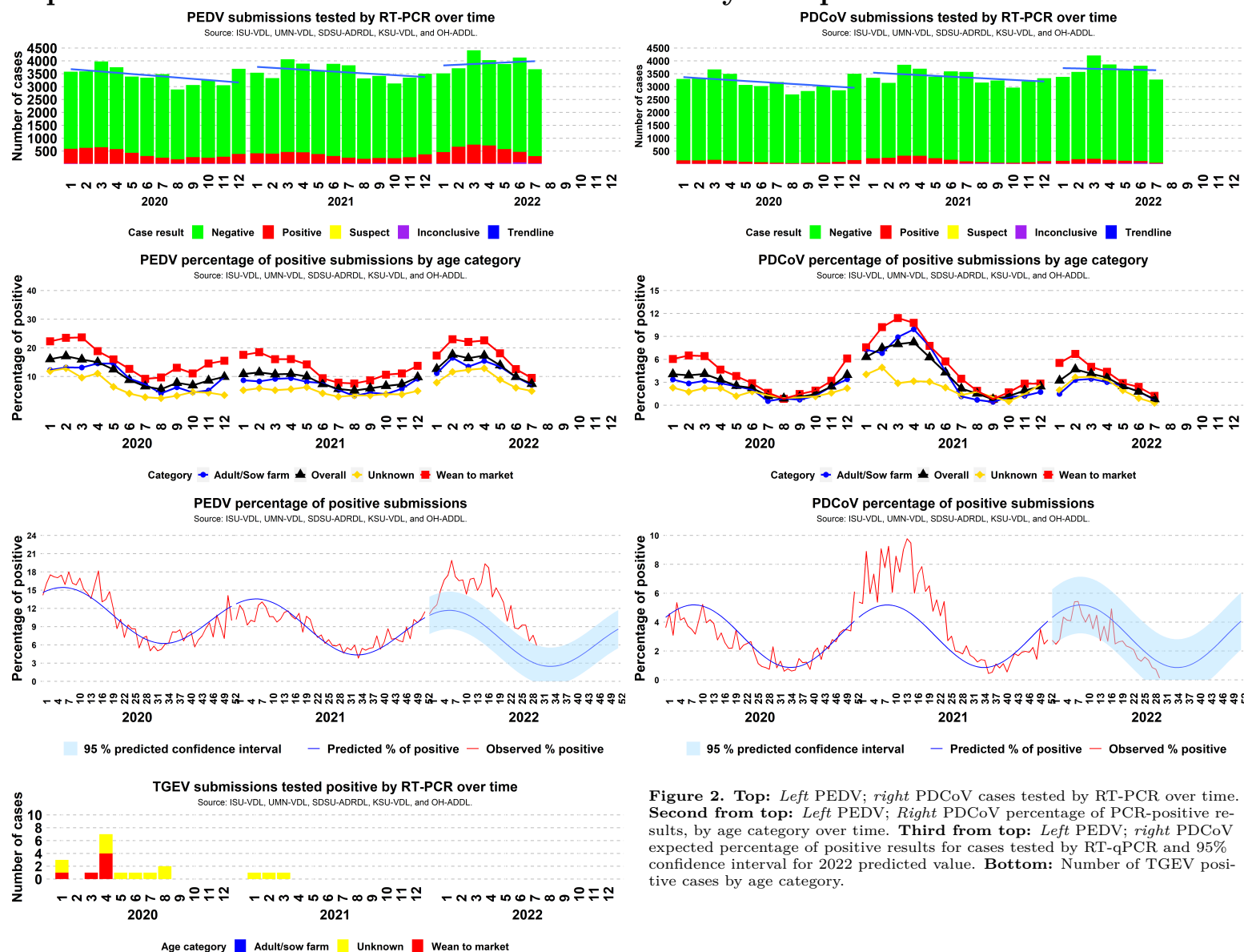


Figure 2. Top: Left PEDV; **right** PDCoV cases tested by RT-PCR over time. **Second from top: Left** PEDV; **Right** PDCoV percentage of PCR-positive results, by age category over time. **Third from top: Left** PEDV; **right** PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2022 predicted value. **Bottom:** Number of TGEV positive cases by age category.

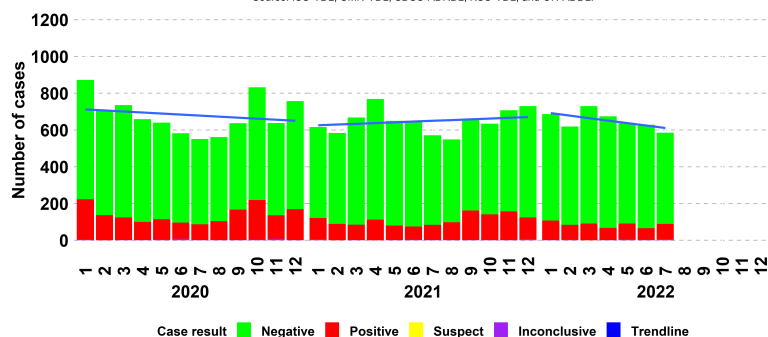
SDRS Advisory Group highlights:

- Overall, 7.45% of 3,676 cases tested PEDV-positive in July, a moderate decrease from 9.85% of 4,130 in June;
 - Positivity in the adult/sow category in July was 7.06% (76 of 1,077), a moderate decrease from 9.82% (128 of 1,304) in June;
 - Positivity in the wean-to-market category in July was 9.52% (144 of 1,513), a moderate decrease from 12.58% (207 of 1,645) in June;
 - The overall PEDV-percentage of positive cases was 3 standard deviations from state-specific baselines in MN, IA, NE, KS, MO and NC;
- Overall, 0.79% of 3,275 cases tested PDCoV-positive in July, similar to 1.78% of 3,814 in June;
 - Positivity in the adult/sow category in July was 0.72% (7 of 975), similar to 1.78% (22 of 1,234) in June;
 - Positivity in the wean-to-market category in July was 1.22% (16 of 1,308), similar to 2.4% (36 of 1,503) in June;
 - Overall PDCoV-percentage of positive cases was within state-specific baselines in all 11 monitored states;
- There was 0 positive case for TGEV RNA in July, 2022 over a total of 3,228 cases tested.

Topic 3 – Detection of *M. hyopneumoniae* and Porcine Circovirus-2 DNA by PCR.

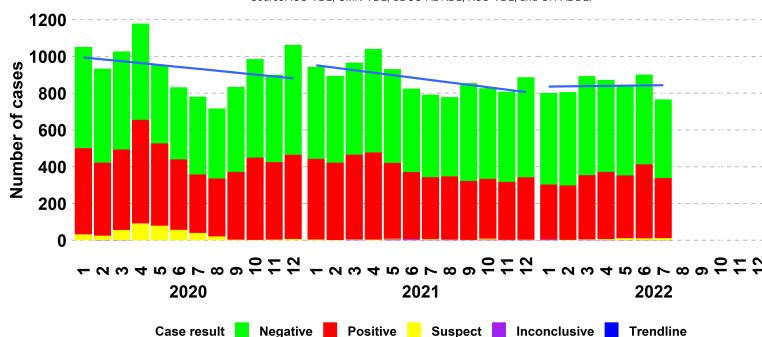
Mycoplasma hyopneumoniae submissions tested by RT-PCR over time

Source: ISU-VDL, UMN-VDL, SDSU-ADRL, KSU-VDL, and OH-ADL.



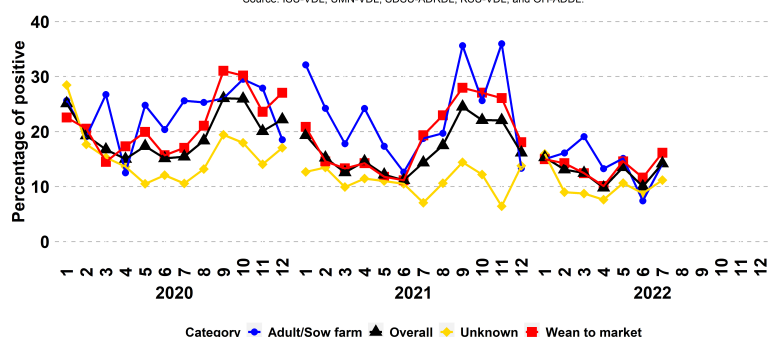
Porcine Circovirus 2 submissions tested by PCR over time

Source: ISU-VDL, UMN-VDL, SDSU-ADRL, KSU-VDL, and OH-ADL.



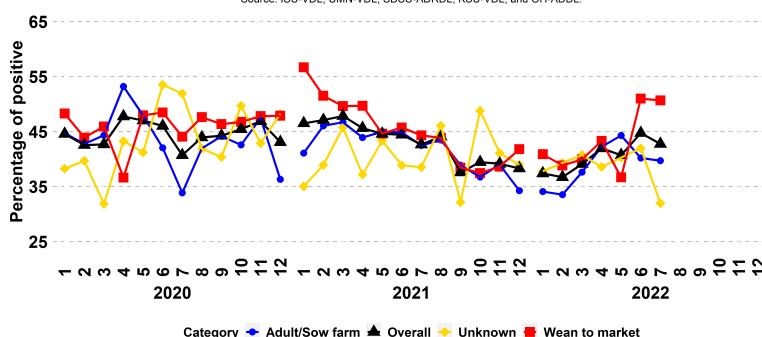
Mycoplasma hyopneumoniae percentage of positive submissions by age category

Source: ISU-VDL, UMN-VDL, SDSU-ADRL, KSU-VDL, and OH-ADL.



Porcine Circovirus 2 percentage of positive submissions by age category

Source: ISU-VDL, UMN-VDL, SDSU-ADRL, KSU-VDL, and OH-ADL.



Mycoplasma hyopneumoniae percentage of positive submissions

Source: ISU-VDL, UMN-VDL, SDSU-ADRL, KSU-VDL, and OH-ADL.

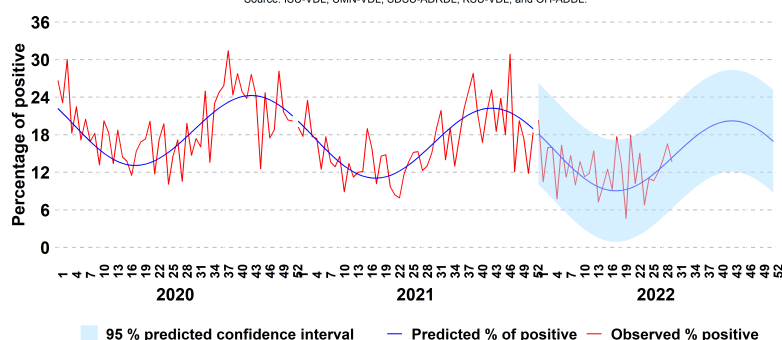


Figure 3. Top: Case results tested by PCR over time. *Left* MHP; *Right* PCV2. **Middle:** percentage of PCR-positive results, by category over time. **Bottom:** expected percentage of positive results for MHP by PCR and 95% confidence interval for 2022 predicted value, based on weekly data observed in the previous 3 years.

SDRS Advisory Group highlights:

- Overall, 14.19% of 585 cases tested *M. hyopneumoniae*-positive cases in July, a moderate increase from 10.02% of 629 in June;
- Positivity in the adult/sow category in July was 14.15% (15 of 106), a substantial increase from 7.41% (8 of 108) in June;
- Positivity in the wean-to-market category in July was 16.15% (47 of 291), a moderate increase from 11.62% (38 of 327) in June;
- Overall MHP-percentage of positive was within state-specific baselines in all 11 monitored states;
- Overall, 42.75% of 765 cases tested PCV2-positive in July, similar to 44.73% of 901 in June;
- Positivity in the adult/sow category in July was 39.71% (137 of 345), similar to 40.21% (156 of 388) in June;
- Positivity in the wean-to-market category in July was 50.67% (151 of 298), similar to 51% (179 of 351) in June.

Topic 4 – Detection of Swine Influenza A Virus (IAV) RNA by RT-PCR.

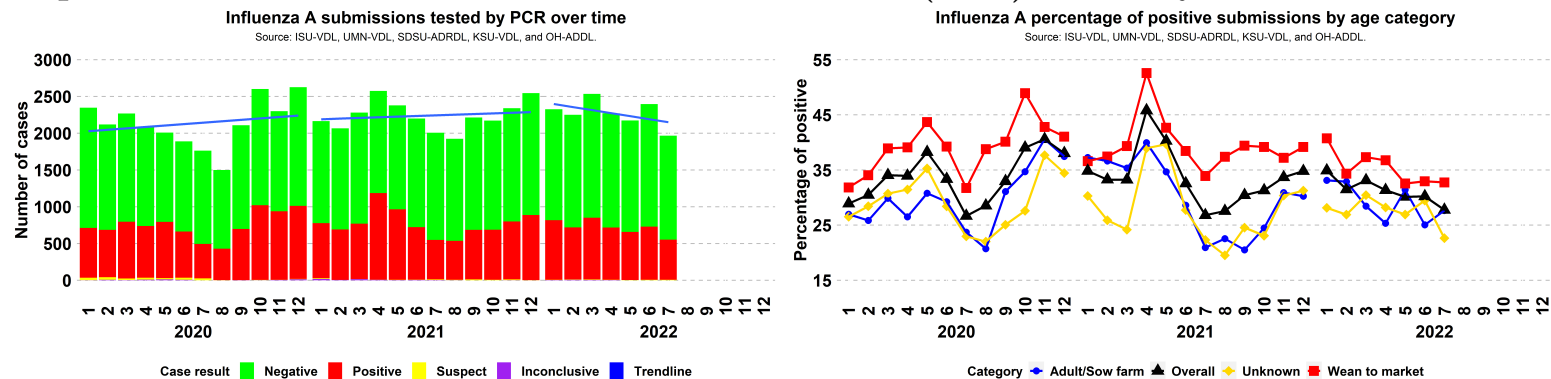


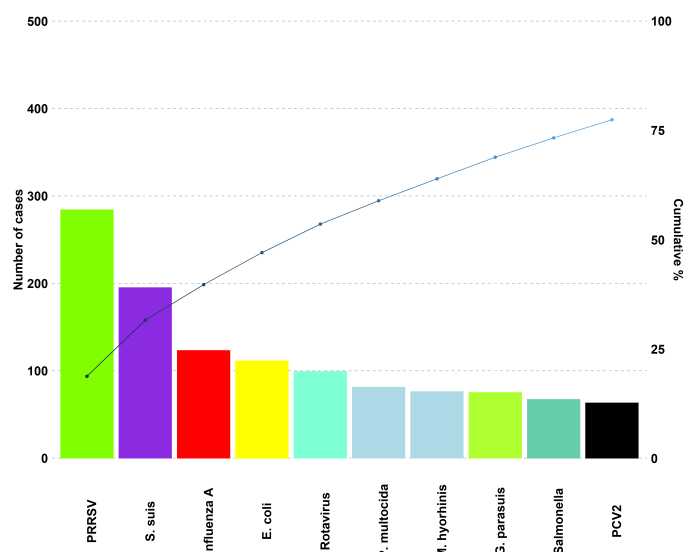
Figure 3. Left: Results of IAV PCR cases over time. Right: Percentage of IAV PCR-positive results, by category over time.

SDRS Advisory Group highlights:

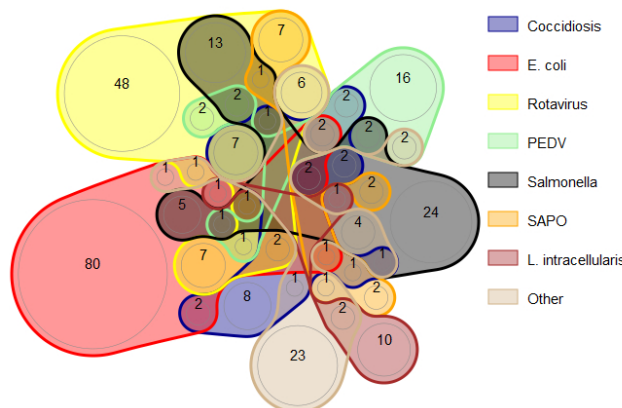
- Overall, 27.77% of 1,966 cases tested IAV-positive cases in July, a moderate decrease from 30.22% of 2,396 in June;
 - Positivity in the adult/sow category in July was 27.65% (112 of 405), a moderate increase from 25.06% (105 of 419) in June;
 - Positivity in the wean-to-market category in July was 32.75% (261 of 797), similar to 32.95% (344 of 1,044) in June.
- The advisory group highlighted that some pontual IAV cases, with mild clinical presentation have occurred in finishing barns during July.

Topic 5 – Confirmed tissue cases etiologic/disease diagnosis at the ISU-VDL

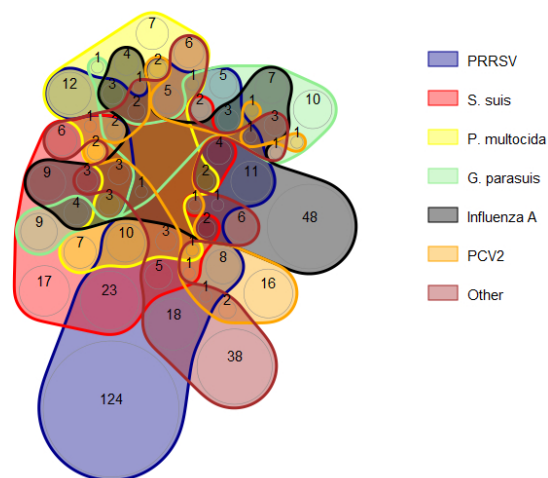
Overall diagnosis



Digestive



Respiratory



Nervous

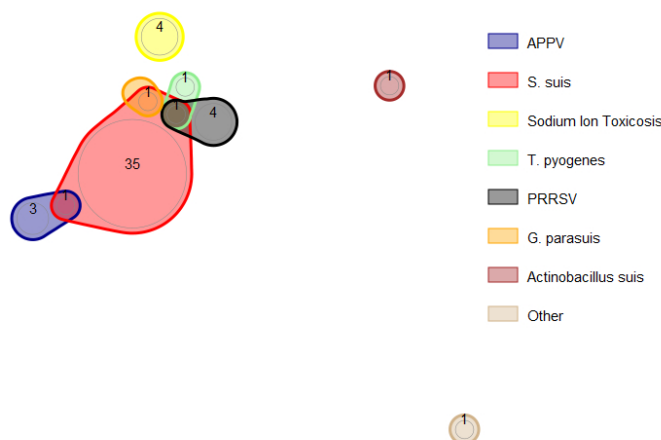


Figure 4. ISU-VDL most frequent overall confirmed tissue disease diagnosis. The presented system is described in the title of the chart. Colors represent one agent; line intersections present diagnosis of 2 or more agents within a submission. Only the most frequent etiology/disease are presented. Less 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, Rahe, Schumacher, Siepker, Sitthicharoenchai, 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 17, 2022.

SDRS Advisory Group highlights:

- PRRSV (284) led cases with confirmed etiology, followed by *S. suis* (195), and Influenza A (123). PRRSV (252 of 791) led the number of confirmed respiratory diagnoses, *E. coli* (107 of 402) lead the number of confirmed digestive diagnoses, and *S. suis* (38 of 56) led the number of confirmed neurological diagnoses;
- During the weeks of June 06 and 27, there were spikes in tissue diagnosis of *Salmonella* cases;
- Even though there is a restricted number of cases, during the weeks of July 04 and 11, there were spikes in tissue diagnosis of Mulberry heart disease cases;
- The advisory group highlighted the increased number of *Salmonella sp.* confirmed tissue case diagnosis was consistent with field occurrence. Even though the number *E. Coli* cases in July was similar to June, this agent is leading the number of enteric cases, which was also reported by the advisory group as aligned with increased nurseries colibacillosis clinical cases.