

Swine Disease Reporting System

Report # 53 (July 5, 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-Ferreira, 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, Melissa Hensch, 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 June 30, 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.

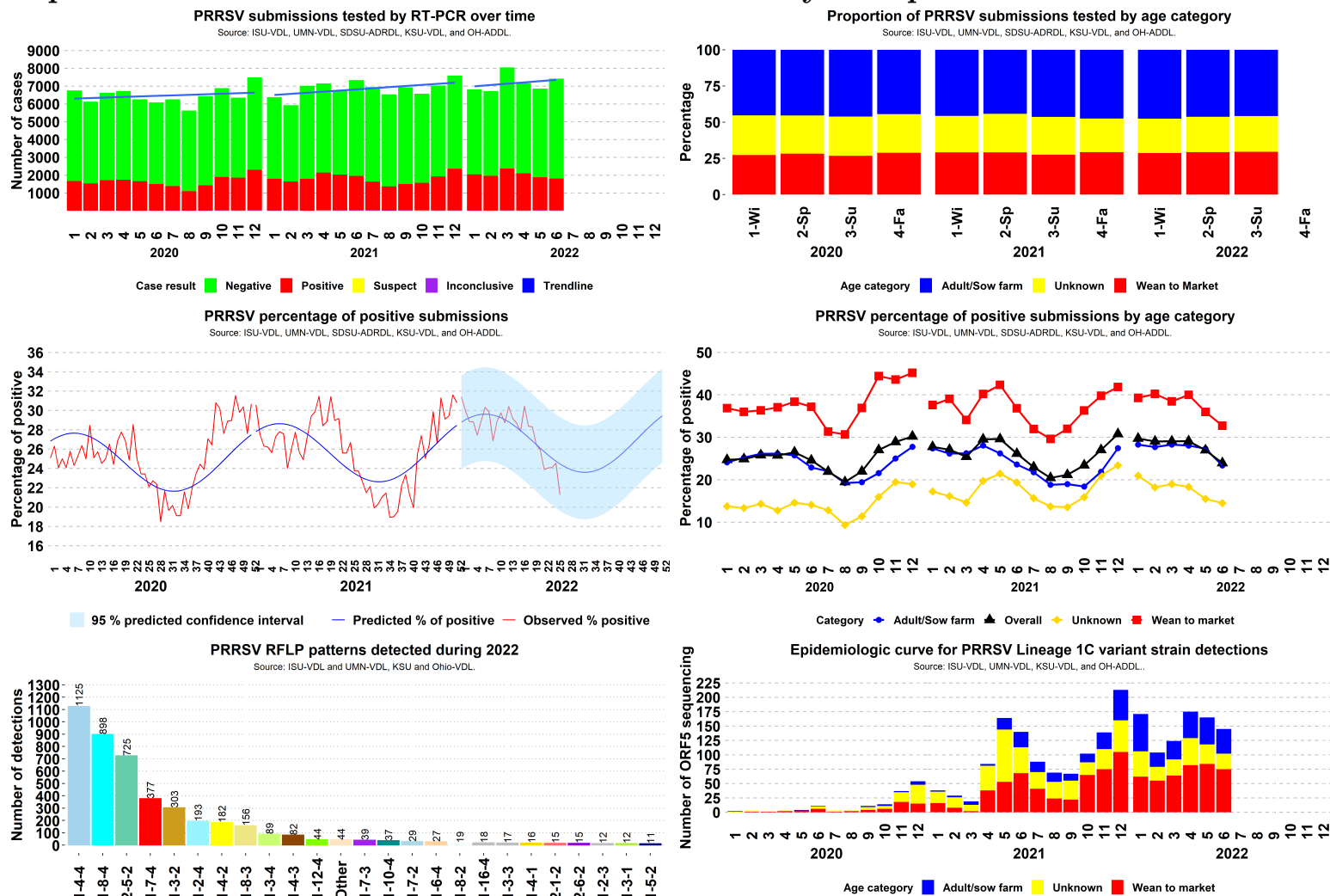


Figure 1. **Top:** *Left:* Results of PRRSV RT-PCR cases over time; *Right:* Proportion of accession ID cases tested for PRRSV by age group per year and season. **Middle:** *Left:* Expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results 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, 23.94% of 7,424 cases tested PRRSV-positive in June, a moderate decrease from 26.96% of 6,865 in May;
 - Positivity in the adult/sow category in June was 23.37% (793 of 3,393), a moderate decrease from 27.34% (847 of 3,098) in May;
 - Positivity in the wean-to-market category in June was 32.72% (717 of 2,191), a moderate decrease from 35.98% (738 of 2,051) in May;
- Overall PRRSV-percentage of positive cases was 3 standard deviations from state-specific baselines in NE and MO;
- The advisory group highlighted that as expected, PRRSV reached the lowest positivity level in 2022. It is time to keep biosecurity and biocontainment practices strict, to mitigate the expected seasonal increase in the Fall.

Topic 2 – Enteric coronavirus RNA detection by RT-qPCR

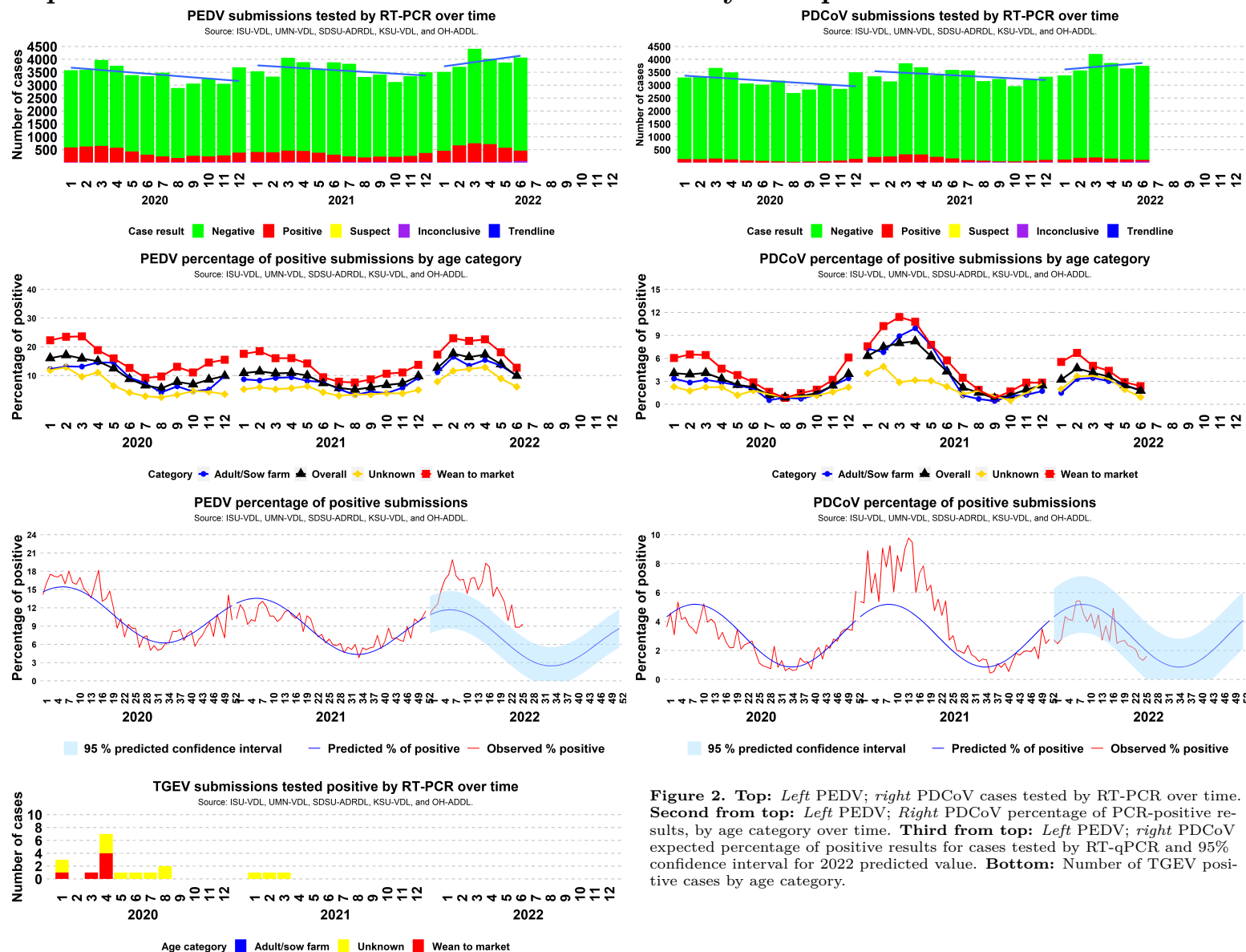


Figure 2. Top: Left PEDV; **right** PDCoV cases tested by RT-PCR over time. **Second from top: Left** PEDV; **Right** PDCoV percentage of PCR-positive results, by age category over time. **Third from top: Left** PEDV; **right** PDCoV expected percentage of positive results for cases tested by RT-qPCR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

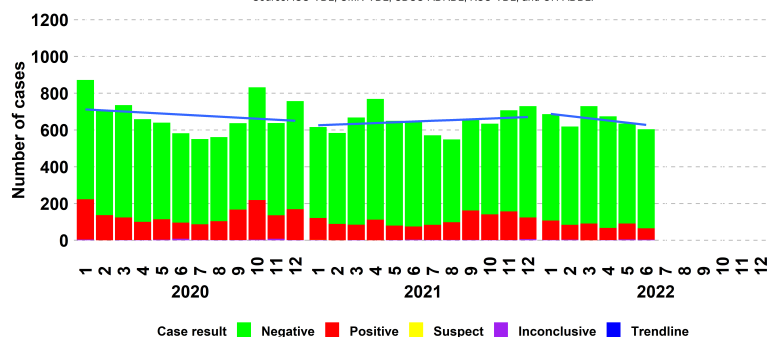
SDRS Advisory Group highlights:

- Overall, 9.95% of 4,070 cases tested PEDV-positive in June, a moderate decrease from 13.92% of 3,878 in May;
 - Positivity in the adult/sow category in June was 9.93% (128 of 1,289), A moderate decrease from 13.49% (171 of 1,268) in May;
 - Positivity in the wean-to-market category in June was 12.74% (206 of 1,617), a substantial decrease from 18.1% (268 of 1,481) in May;
 - The overall PEDV-percentage of positive cases was 3 standard deviations from state-specific baselines in MN, IA, NE, KS, MO and NC;
- Overall, 1.79% of 3,753 cases tested PDCoV-positive in June, similar to 2.49% of 3,648 in May;
 - Positivity in the adult/sow category in June was 1.8% (22 of 1,219), similar to 2.52% (30 of 1,190) in May;
 - Positivity in the wean-to-market category in June was 2.37% (35 of 1,474), similar to 2.9% (40 of 1,379) in May;
 - 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 June, 2022 over a total of 3,632 cases tested;
- The advisory group highlighted that even though PEDV percentage of positive submissions are above the expected for this month, the cases are not that severe compared with previous months when sow farm breaks occurred. The cases in sow farms were concentrated in March and April, but still affect the percentage of positive submissions in the wean-to-market category, with 49.94% of positive submissions in May and June coming from wean-to-market.

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

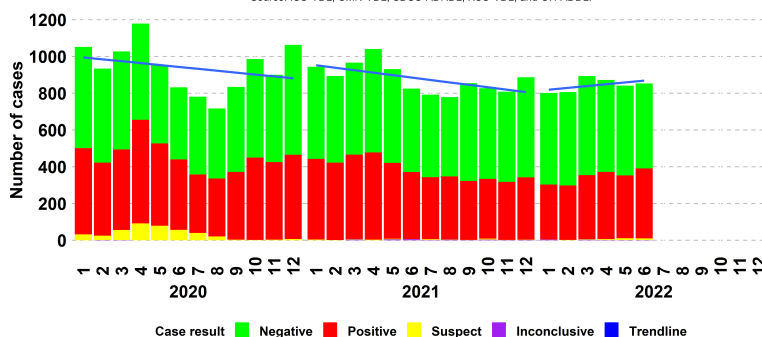
Mycoplasma hyopneumoniae submissions tested by RT-PCR over time

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



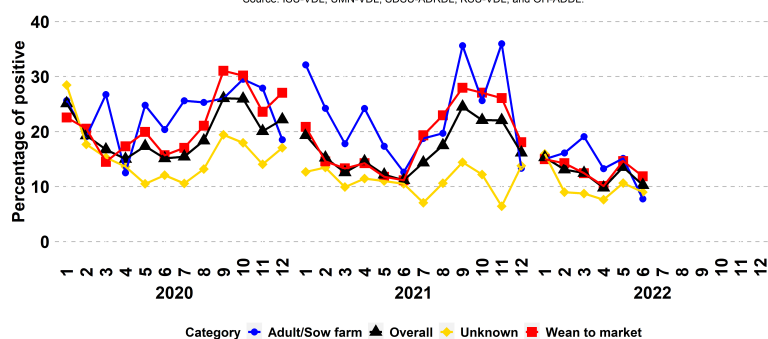
Porcine Circovirus 2 submissions tested by PCR over time

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



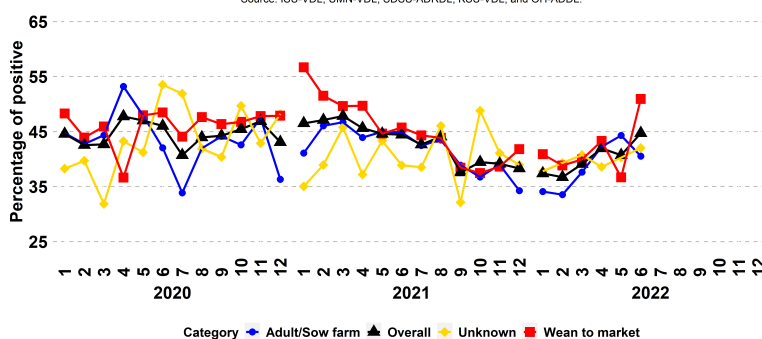
Mycoplasma hyopneumoniae percentage of positive submissions by age category

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



Porcine Circovirus 2 percentage of positive submissions by age category

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



Mycoplasma hyopneumoniae percentage of positive submissions

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

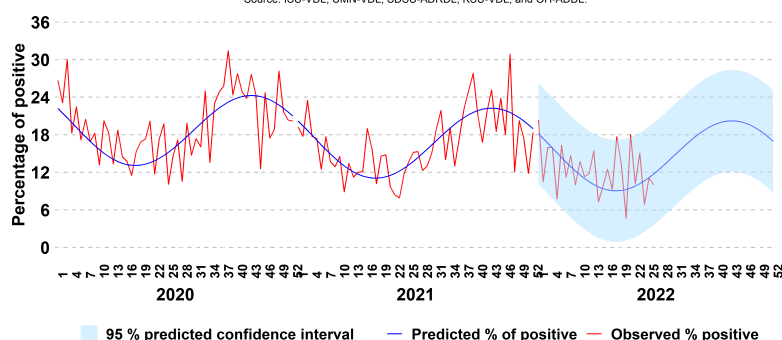


Figure 3. Top: Case results tested by PCR over time. *Left* MHP; *Right* PCV2. **Middle:** percentage of PCR-positive results, by category over time. **Bottom:** expected percentage of positive results for MHP by PCR and 95% confidence interval for 2022 predicted value, based on weekly data observed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

SDRS Advisory Group highlights:

- Overall, 10.26% of 604 cases tested *M. hyopneumoniae*-positive cases in June, a moderate decrease from 13.54% of 635 in May;
- Positivity in the adult/sow category in June was 7.77% (8 of 103), a substantial decrease from 15.13% (18 of 119) in May;
- Positivity in the wean-to-market category in June was 11.86% (37 of 312), a moderate decrease 14.63% (48 of 328) in May;
- Overall MHP-percentage of positive was within state-specific baselines in all 11 monitored states;
- Overall, 44.72% of 852 cases tested PCV2-positive in June, a moderate increase from 40.71% of 840 in May;
- Positivity in the adult/sow category in June was 40.53% (152 of 375), a moderate decrease from 44.3% (167 of 377) in May;
- Positivity in the wean-to-market category in June was 50.94% (163 of 320), a marked increase from 36.68% (117 of 319) in May;
- The advisory group highlighted the increased positivity in the wean-to-market category for PCV2 could be partially attributed to PCV2D genotype, including some vaccine companies submitting more tests for PCV2 to validate their products. However, the advisory also highlighted that they are getting more results from tissues with lymphoid depletion and lower Ct-values in PCV2 cases.

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

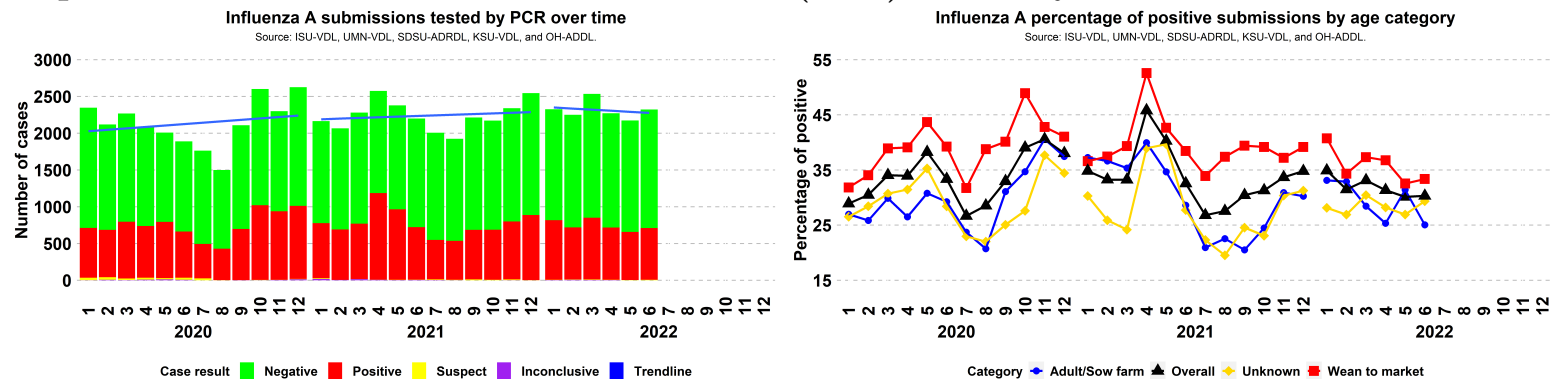


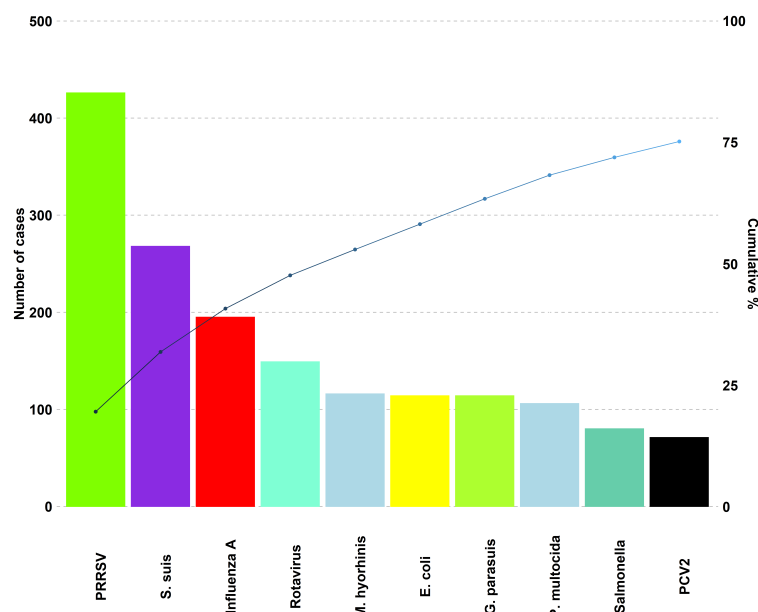
Figure 3. Left: Results of IAV PCR cases over time. Right: Percentage of IAV PCR-positive results, by category over time.

SDRS Advisory Group highlights:

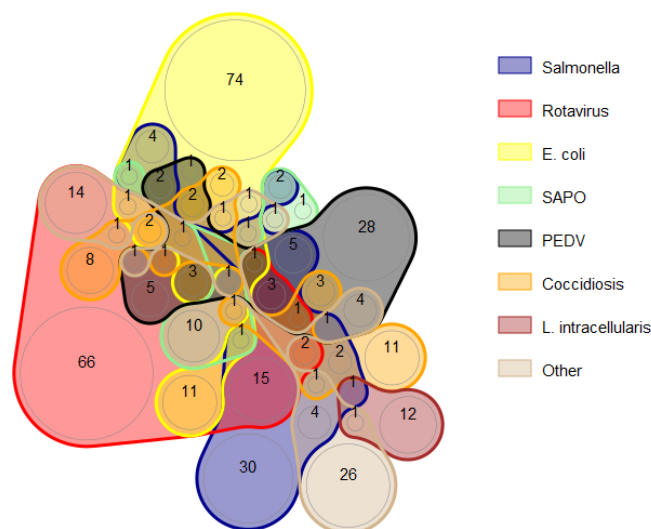
- Overall, 30.31% of 2,323 cases tested IAV-positive cases in June, similar to 30.13% of 2,174 in May;
 - Positivity in the adult/sow category in June was 25.06% (103 of 411), a substantial decrease from 31.43% (121 of 385) in May;
 - Positivity in the wean-to-market category in June was 33.37% (331 of 992), similar to 32.55% (303 of 931) in May.

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

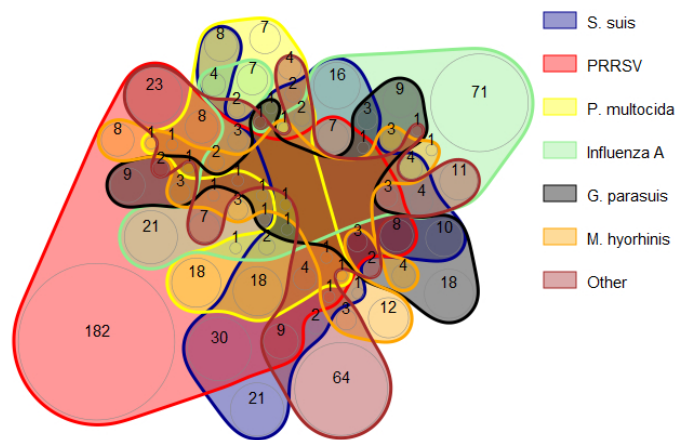
Overall diagnosis



Digestive



Respiratory



Nervous

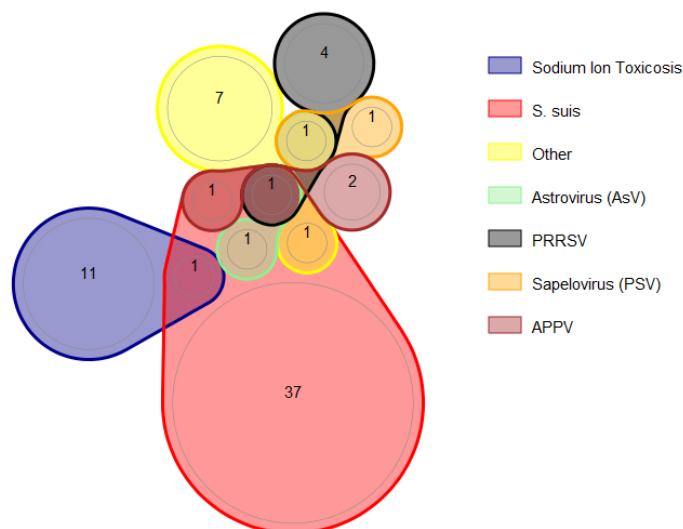


Figure 4. ISU-VDL most frequent overall confirmed tissue disease diagnosis. The presented system is described in the title of the chart. Colors represent one agent; line intersections present diagnosis of 2 or more agents within a submission. Only the most frequent etiology/disease are presented. Less 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, Sithicharoenchai, 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 May. 1 to June. 30, 2022.

SDRS Advisory Group highlights:

- PRRSV (426) led cases with confirmed etiology, followed by *S. suis* (268), and Influenza A (195). PRRSV (387 of 1173) led the number of confirmed respiratory diagnoses, Rotavirus (149 of 530) lead the number of confirmed digestive diagnoses, and *S. suis* (42 of 74) led the number of confirmed neurological diagnoses;
- During the weeks of April 25 and May 9, there were small spikes in tissue diagnosis of Coccidiosis cases;
- The advisory group highlighted that they are seeing more *E.coli* and *Salmonella* clinical cases on the farms, but nothing too frightening. In the advisory group’s opinion, Rotavirus is still the main enteric endemic disease in sow farms.

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