

Swine Disease Reporting System

Report # 41 (July 6, 2021)

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 the input of our advisory group, which consists of veterinarians and producers across the USA 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 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, and Kansas State University VDL.

Collaborators:

Iowa State University: Giovani Trevisan, Edison Magalhães, Bret Crim, Poonam Dubey, Kent Schwartz, Eric Burrough, Phillip Gauger, Pablo Pineyro, Christopher Siepker; Rodger Main, Daniel Linhares.

Project coordinator [Giovani Trevisan](#). Principal investigator [Daniel Linhares](#).

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

Kansas State University: Rob McGaughey, Eric Herrman, Roman Pogranichniy, Rachel Palinski, Jamie Henningson.

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

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 and UMN-VDL over time, USA state, specimen, and age group.

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 on a monthly: Mark Schwartz, Paul Sundberg, Paul Yeske, Tara Donovan, Deborah Murray, Scott Dee, Melissa Hensch, Brigitte Mason, Peter Schneider, Sam Copeland, and Luc Dufresne.

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, 2021.

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

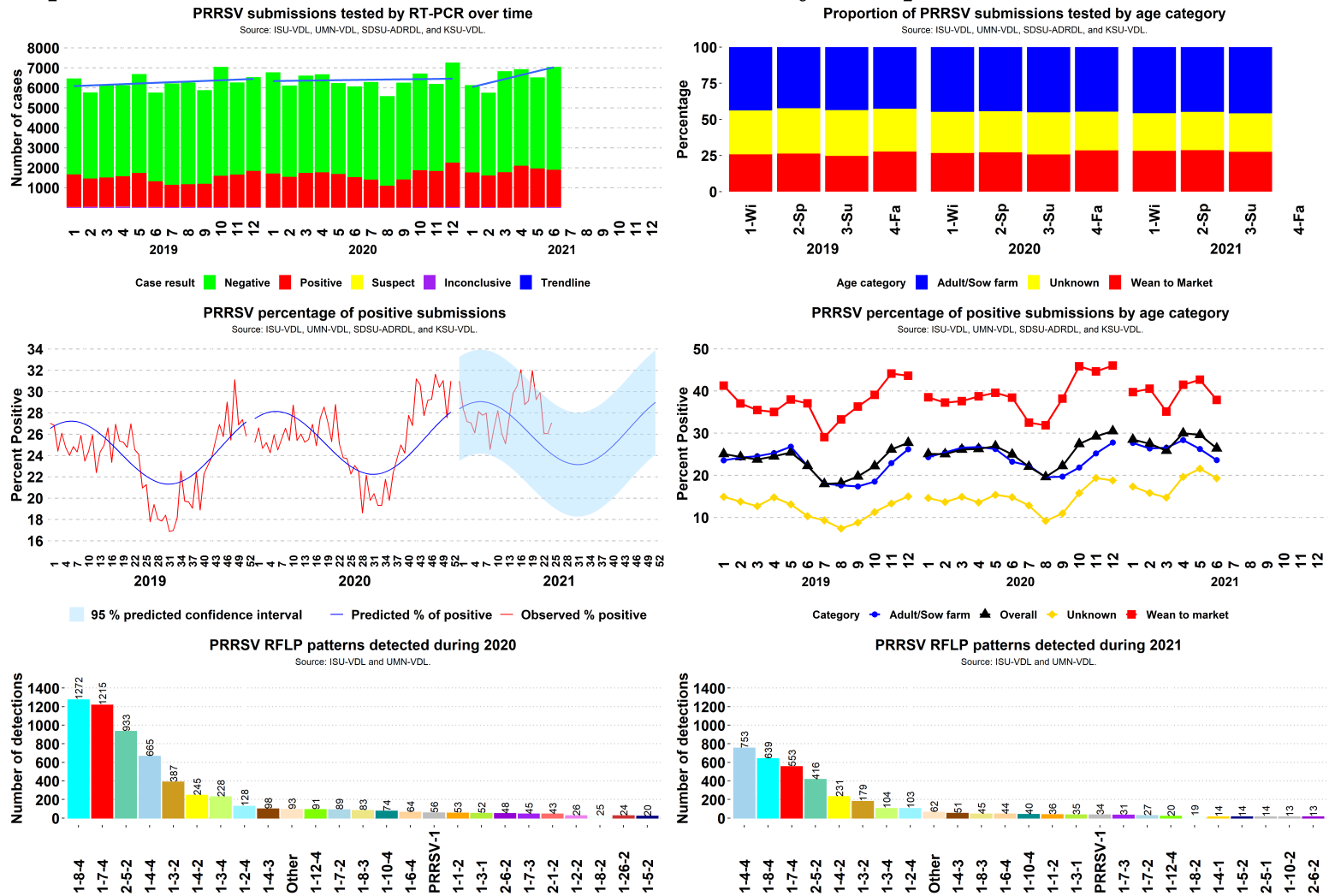


Figure 1. *Top: left:* Results of PRRSV RT-PCR cases over time. *Right:* Proportion of accession ID cases tested for PRRSV by age group per year and season. *Middle: Left* expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on 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* the 25 most frequently detected RFLP patterns *left* year of 2020; *right* year of 2021.

SDRS Advisory Group highlights:

- Overall, 26.39% of 7,048 cases tested PRRSV-positive in June, a moderate decrease from 29.62% of 6,527 in May;
 - Positivity in adult/sow category in June was 23.61% (762 of 3,228), a moderate decrease from 26.24% (763 of 2,908) in May;
 - Positivity in wean-to-market category in June was 37.89% (735 of 1,940), a moderate decrease from 42.68% (787 of 1,844) in May;
 - Overall PRRSV-percentage of positive cases was 3 standard deviations from state-specific baselines in OH;
- The advisory group pointed that different regions are facing different scenarios regarding PRRSV detection;
- Regions where the circulation of the PRRSV RFLP 1-4-4 L1C variant strain has been detected are still having high levels of PRRSV activity;
- Other regions are following the expected summer months trend for lowering in the levels of PRRSV detection. Early winter breaks are starting to deliver negative pigs to nursery/finishing sites;
- High level of concerns exists for the following fall months since most of the sow farm breaks that occurred in May are expecting to be still delivering positive piglets to nursery and finishing sites, those may contribute to high levels of PRRSV activity and consequently to a bad PRRSV season;
 - The advisory group reminds us to revisit and, whenever possible, implement relevant biosecurity and biocontainment practices to prevent a new wave of pathogen activity for the upcoming fall and winter months. You can find a list at [SDRS report 40, page 4](#);
- SDRS just launched a **PRRSV Lineage vs. RFLP comparison tool** on its [website under PRRSV genotyping dashboard: RFLP and Lineages](#).

Topic 2 – Detection of RNA of enteric coronavirus by RT-qPCR

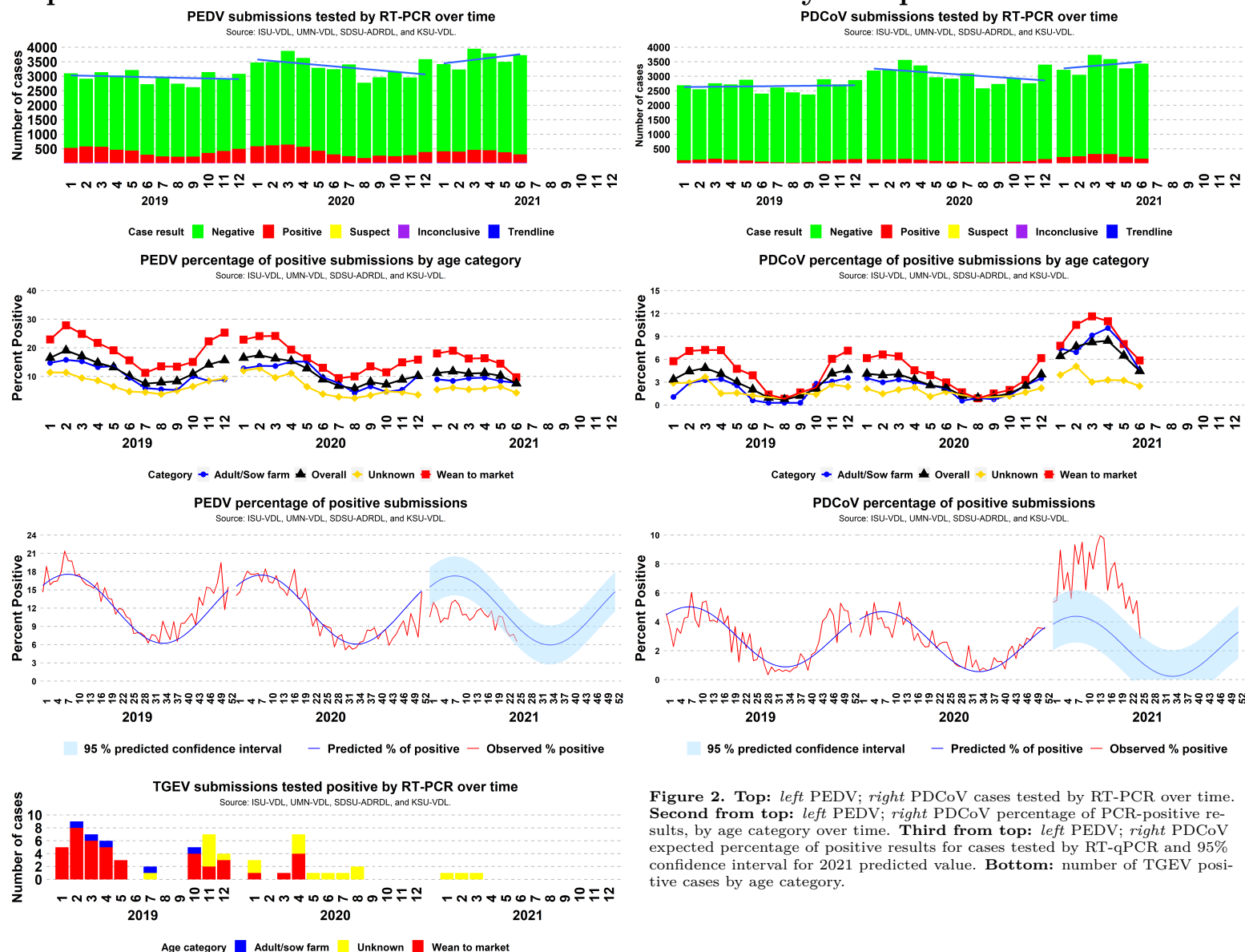


Figure 2. Top: left PEDV; right PDCoV cases tested by RT-PCR over time. Second from top: left PEDV; right PDCoV percentage of PCR-positive results, by age category over time. Third from top: left PEDV; right PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2021 predicted value. Bottom: number of TGEV positive cases by age category.

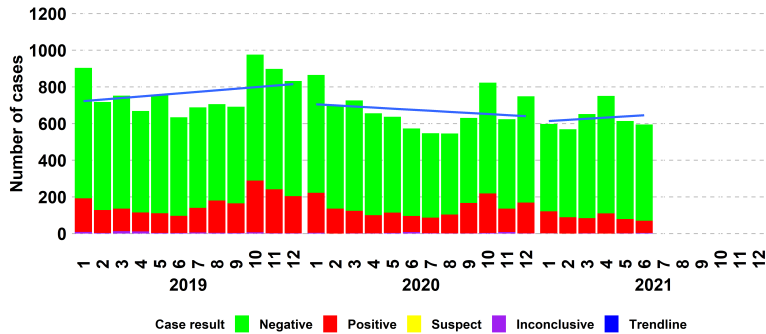
SDRS Advisory Group highlights:

- Overall, 7.56% of 3,728 cases tested PEDV-positive in June, a moderate decrease from 10.24% of 3,495 in May;
 - Positivity in adult/sow category in June was 7.78% (89 of 1,144), similar to 8.38% (86 of 1,026) in May;
 - Positivity in wean-to-market category in June was 9.69% (147 of 1,517), a moderate decrease from 14.46% (204 of 1,411) in May;
 - The overall PEDV-percentage of positive cases was 3 standard deviations from state-specific baselines in IL and NE;
- Overall, 4.45% of 3,436 cases tested PDCoV-positive in June, a moderate decrease from 6.48% of 3,270 in May;
 - The overall PDCoV detection was outside of the upper boundaries of the forecasted levels since January;
 - Positivity in adult/sow category in June was 4.55% (49 of 1,076), a moderate decrease from 7.9% (76 of 962) in May;
 - Positivity in wean-to-market category in June was 5.85% (79 of 1,351), a moderate decrease from 8% (103 of 1,288) in May;
 - Overall PDCoV-percentage of positive cases was 3 standard deviations from state-specific baselines in OK, KS, MO, and NC;
- There was 0 positive case for TGEV RNA in June, 2021 over a total of 3,333 cases tested;
- The advisory group pointed out that the less aggressivity of PDCoV, when compared with PEDV, may have contributed to delay in detection and early spread across farms. Additionally, routine testing for monitoring may have contributed to for high detection of PDCoV;
- Similar to the reported under the PRRSV page, the advisory group reminds us to revisit and, whenever possible, implement relevant biosecurity and biocontainment practices to prevent a new wave of pathogen activity for the upcoming fall and winter months. You can find a list at [SDRS report 40, page 4](#);

Topic 3 – Detection of *Mycoplasma hyopneumoniae* (MHP) DNA by PCR.

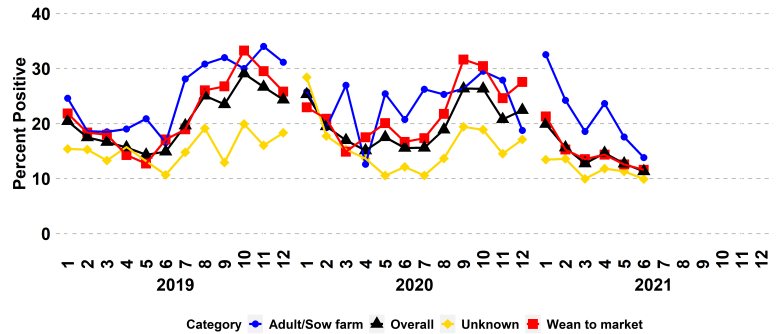
Mycoplasma hyopneumoniae submissions tested by RT-PCR over time

Source: ISU-VDL, UMN-VDL, SDSU-ADRD, and KSU-VDL.



Mycoplasma hyopneumoniae percentage of positive submissions by age category

Source: ISU-VDL, UMN-VDL, SDSU-ADRD, and KSU-VDL.



Mycoplasma hyopneumoniae percentage of positive submissions

Source: ISU-VDL, UMN-VDL, SDSU-ADRD, and KSU-VDL.

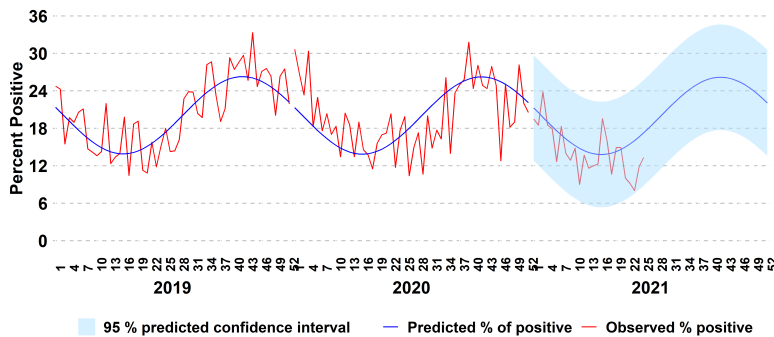


Figure 3. *Left top:* results of MHP PCR cases over time. *Right top:* percentage of MHP PCR-positive results, by category over time. *Bottom:* expected percentage of positive results for MHP by PCR and 95% confidence interval for 2020 predicted value, based on weekly data observed in the previous 3 years.

SDRS Advisory Group highlights:

- Overall, 11.32% of 592 cases tested *M. hyopneumoniae*-positive in June, similar to 12.72% of 613 in May;
- Positivity in adult/sow category in June was 13.83% (13 of 94), a moderate decrease from 17.57% (13 of 74) in May;
- Positivity in wean-to-market category in June was 11.59% (32 of 276), similar to 12.58% (40 of 318) in May;
- Overall MHP-percentage of positive was within state-specific baselines in all 11 monitored states.

Topic 4 – Disease diagnosis at the ISU-VDL.

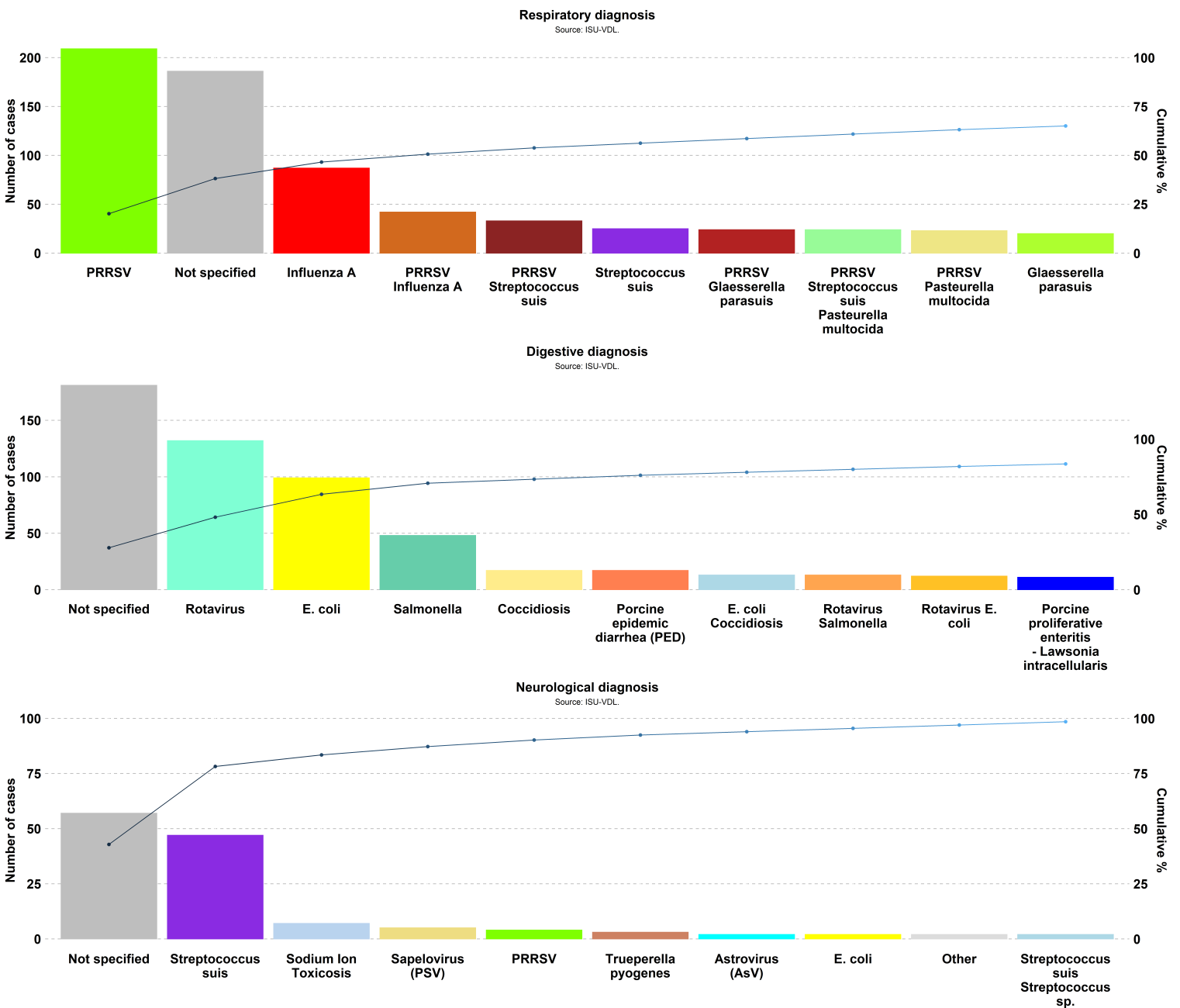


Figure 4. Most frequent disease diagnosis by physiologic system at ISU-VDL . Presented system is described in the title of the chart. Colors represent one agent and/or the combination of 2 or more agents. Only the physiologic systems with historic number of cases per season above 100 are presented in the report.

Note: Disease diagnosis takes one to two weeks to be performed. The graphs and analysis contain data from May 1, 2021 to June 19,2021.

SDRS Advisory Group highlights:

- PRRSV (209 of 1034) continues to lead the number of respiratory diagnoses. After not specified (181 of 650), Rotavirus (137 of 650) continues to lead the number of digestive diagnoses. After not specified (57 of 133) *S. suis* (47 of 133) continues to lead the number of neurological diagnoses;
- From May 17 to 23, there was a significant increase (signal) in the diagnosis of agents classified as nervous, musculoskeletal, and integument. And from May 24 to June 12 of agents classified as systemic;
- Even though the number of cases was low, there was a significant increase (signal) in the diagnosis of coccidiosis and Mulberry Heart Disease;
- The advisory group has pointed that warm weather associated with seasonal factors may favor coccidiosis. For Mulberry Heart Disease, it was anecdotal raised concerns with the potential influence of diets on the appearance of this disease.

Update on sample types been submitted for testing for the SDRS reported agents

Across the volunteered reported data to the Swine Disease Reporting System, there is information on the sample types submitted for testing. This month we bring to the bonus page an update on the sample type been submitted for PRRSV, PEDV, PDCoV, and *M. hyopneumoniae* at participant Veterinary Diagnostic Laboratories.

Notable changes occurred over time. Oral fluid is currently the predominant sample type used for testing for all SDRS reported agents. PRRSV submission using processing fluids (PF) has consistently increased over the last 4 years, and in 2021 this sample type has been the second most frequently submitted for PRRSV testing. PF represents 2/3 of suckling piglet age category submissions. For enteric coronavirus (PEDV, PDCoV, and TGEV), feces and fecal swabs have been the second most frequently submitted for testing. A change for increased usage of environmental samples for enteric coronavirus testing has been noticed in the last 3 years. Lung samples have still been the second most frequently sample type submitted for *M. hyopneumoniae* testing..

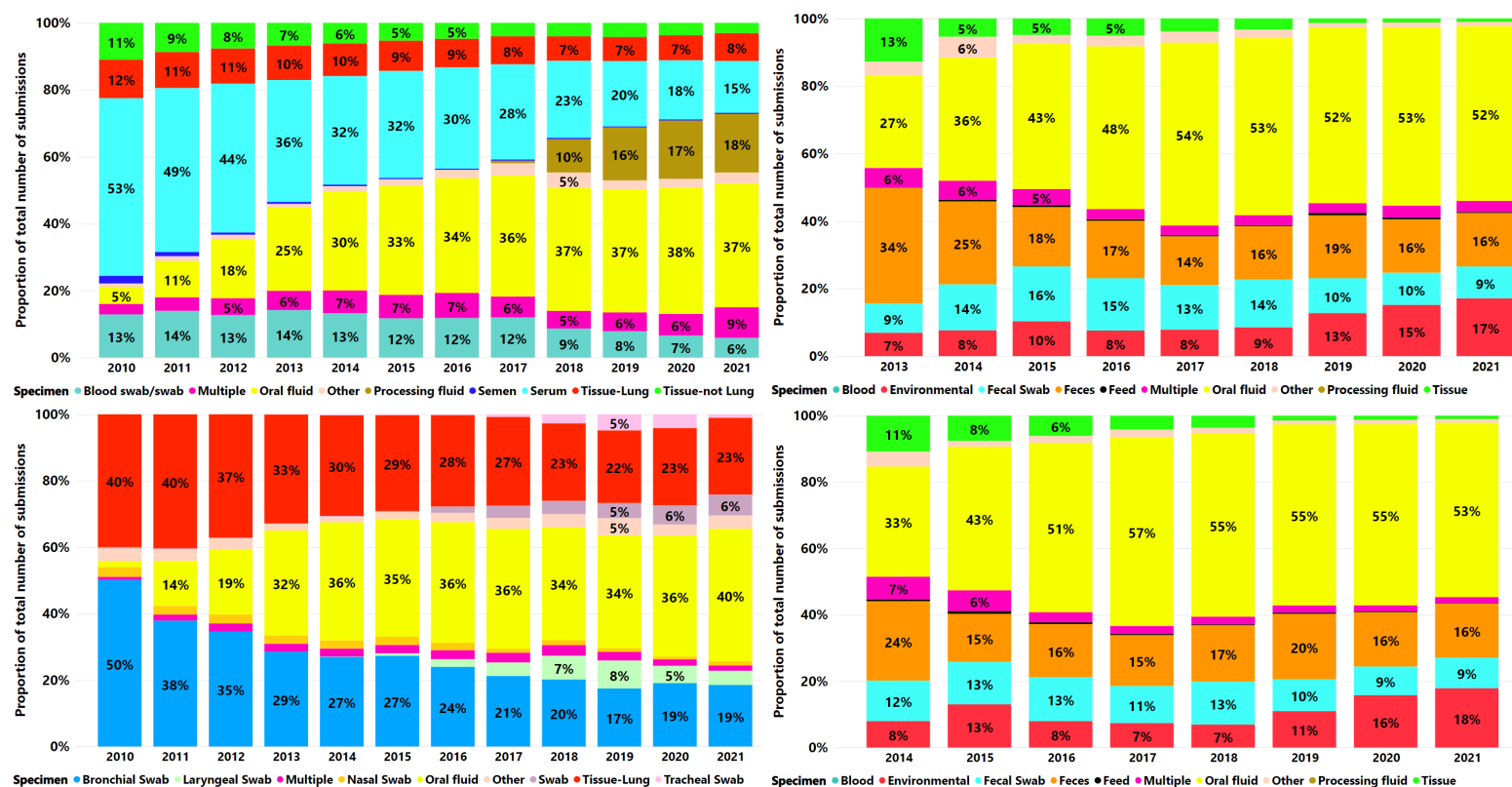


Figure 1: Bar chart for the proportion of sample types submitted for testing for different agents. Data is aggregated at a submission level. **Upper Left:** PRRSV. **Upper right:** PEDV. **Lower Left:** *M. hyopneumoniae*. **Lower Right:** PDCoV.

Highlights:

- Oral fluid is the sample type most frequently submitted for testing for all SDRS reported agents;
- Processing fluid samples are the second most frequently used for PRRSV testing;
- Increased usage of environmental samples for enteric coronavirus testing (PEDV, PDCoV, and TGEV) has been observed.

References

PRRSV and enteric coronavirus charts are updated from:

- Trevisan, *et al.*, 2019. Macroepidemiological aspects of porcine reproductive and respiratory syndrome virus detection by major United States veterinary diagnostic laboratories over time, age group, and specimen. PLoS One.
- Trevisan, *et al.*, 2021. Data standardization implementation and applications within and among diagnostic laboratories: integrating and monitoring enteric coronaviruses. J Vet Diagn Invest.

Note: Contact the SDRS project if you would like to share your work on the bonus page.