Swine Disease Reporting System:
Overview

IOWA STATE UNIVERSITY Veterinary Diagnostic Laboratory

UNIVERSITY OF MINNESOTA VETERINARY DIAGNOSTIC LAB

SOUTH DAKOTA ADRDL ANIMAL DISEASE RESEARCH & DIAGNOSTIC LABORATORY BROOKINGS, SOUTH DAKOTA

Kansas State Veterinary DIAGNOSTIC LABORATORY

SHIC Swine Health Information Center

Swine Disease Reporting System
Report # 30 (August 4, 2020)

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, Leticia Linhares, 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, 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 report: Benchmarks patterns of PRRSV RFLP pattern detected at the ISU-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: Clayton Johnson, Emily Byers, Mark Schwartz, Paul Sundberg, Paul Yeske, Rebecca Robbins, Tara Donovan, Deborah Murray, Scott Dee, Melissa Hensch, Scanlon Daniels.

In addition to this report, interactive dashboards with aggregated test results are available at www.fieldepi.org/SDRS.

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.

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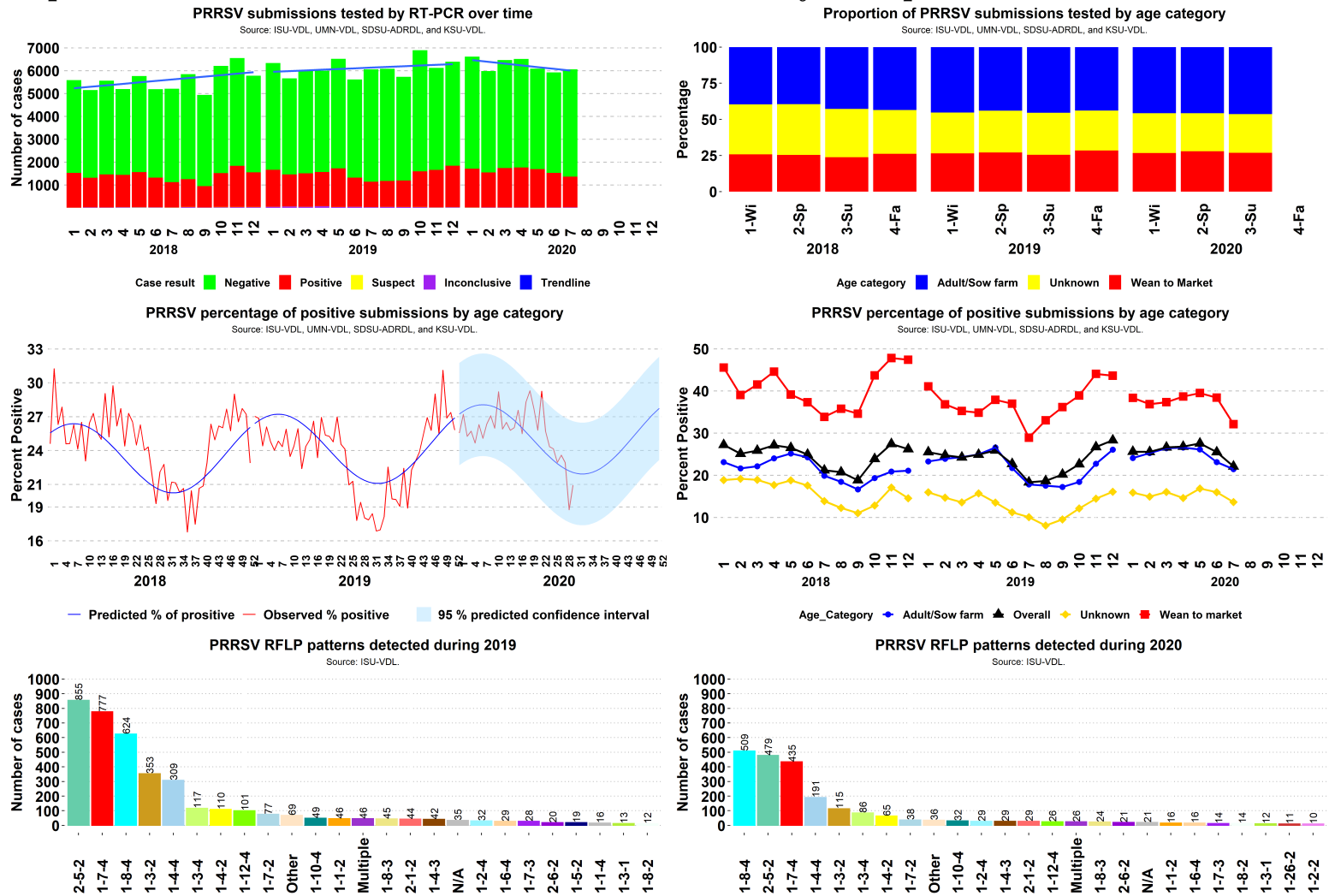# Topic 1 − Detection of PRRSV RNA over time by RT-qPCR.

Figure 1. Top: *left*: Results of PRRSV RT-PCR cases over time. *Right*: 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. **Middle**: *Left* Proportion of accession ID cases tested for PRRSV by age group per year and season. *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 2019; *right* year of 2020. RFLPs indicated as N/A represents not detected, or European PRRSV.

SDRS Advisory Group highlights:

- Overall, 22.1% of 6,062 cases tested PRRSV-positive in July, a moderate decrease from 25.5% of 5,930 in June;
  - Positivity in adult/sow category in July was 21.45% (615 of 2,867), similar to 23.13% (623 of 2,693) in June;
  - Positivity in wean-to-market category in July was 32.14% (502 of 1,562), a substantial decrease from 38.43% (636 of 1,655) in June;
- Overall PRRSV-percentage of positive cases was above 3 standard deviations from state-specific baselines in MN, MO and IN;
- Up to July, RFLP's 1-26-4 and 1-2-2 were among the 24 most frequently detected during 2020;
- The advisory group pointed out that the detection of PRRSV during this time of the year is likely to be associated with continued monitoring and constant testing of herds sicking virus elimination, late winter-spring breaks still testing positive and sending positive piglets to nursery-finishing sites. The advisory group reminders that this is the time of the year where more herds stabilize and a decrease in detection is expected to be continually observed.

Swine Disease Reporting System:
Domestic Swine Disease Surveillance

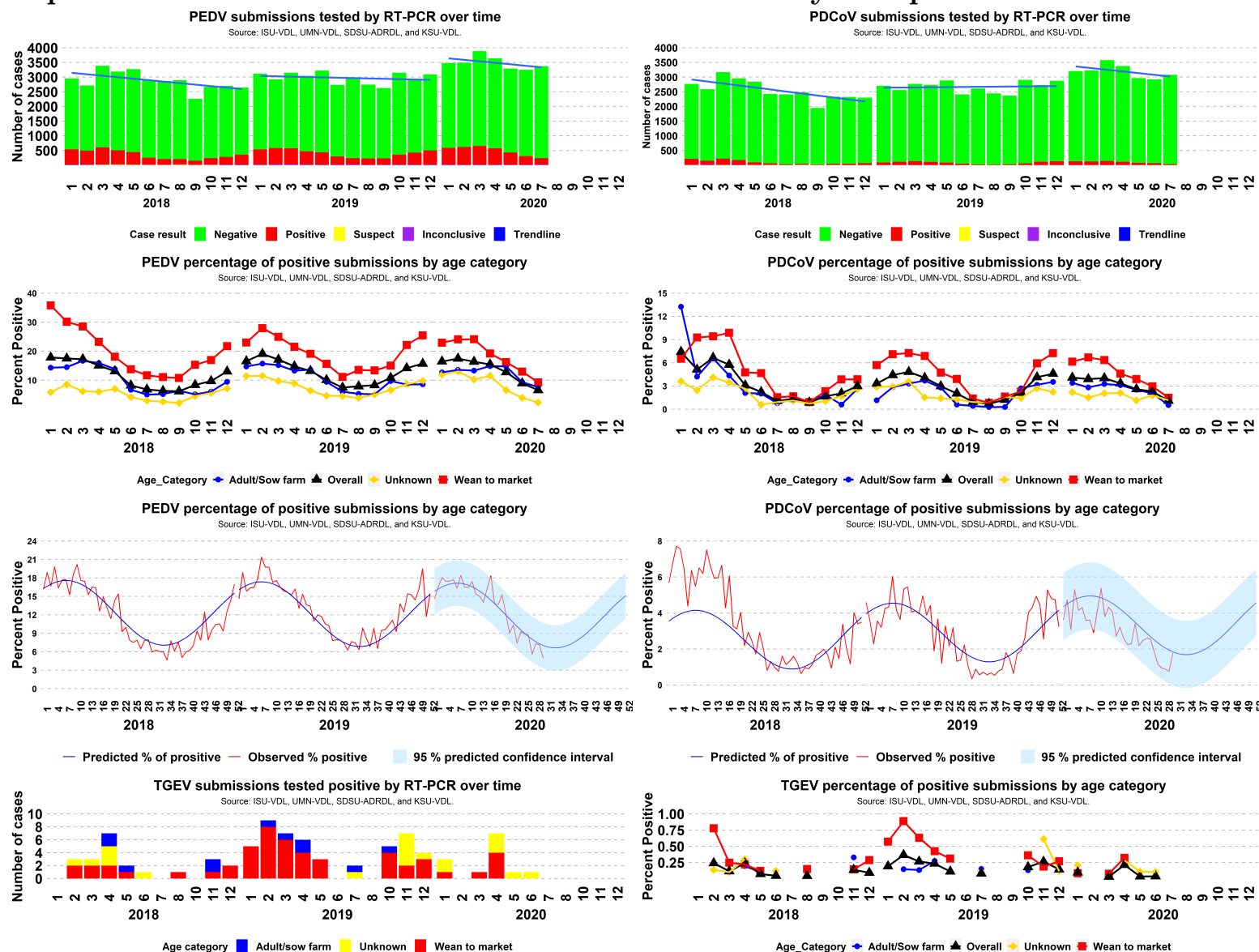# Topic 2 – Detection of RNA of enteric coronavirus by RT-qPCR

Figure 2. Top: *left* PEDV *right* PDCoV cases tested by RT-PCR over time. **Second from top**: B:*left* PEDV *right* PDCoV percentage of PCR-positive results, by age category over time. **Second from bottom**: *left* PEDV *right* PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2020 predicted value. **Bottom**: *left* number of TGEV positive cases by age category *right* percentage of TGEV PCR-positive cases by age category. Each color represents one distinct age category.

SDRS Advisory Group highlights:

- Overall, 6.58% of 3,375 cases tested PEDV-positive in July, a moderate decrease from 8.96% of 3,249 in June;
  - The overall detection was within the expected boundaries of the forecasted levels for this time of the year;
  - Positivity in adult/sow category in July was 7.63% (78 of 1,022), similar to 9.38% (93 of 992) in June;
  - Positivity in wean-to-market category in July was 9.24% (119 of 1,288), a moderate decrease from 12.99% (156 of 1,201) in June;
  - Overall PEDV-percentage of positive cases was within or below baseline level for all 11 monitored states;
- Overall, 1.1% of 3,079 cases tested PDCoV-positive in July, similar to 2.29% of 2,926 in June;
  - The overall detection was within the expected boundaries of the forecasted levels for this time of the year;
  - Positivity in adult/sow category in July was 0.54% (5 of 920), similar to 2.05% (18 of 880) in June;
  - Positivity in wean-to-market category in July was 1.49% (17 of 1,138), similar to 2.95% (31 of 1,050) in June;
  - Overall PDCoV-percentage of positive cases was within or below baseline level for all 10 monitored states;
- There was 0 positive case for TGEV RNA in July 2020 over a total of 2,543 cases tested;
- The advisory group shared their thoughts on potential measures that could be applied to minimize the increased detection of enteric coronavirus detection during colder months. Listed actions included, continued application of hygiene practices in the farms, clear definition of clean-dirty lines for trucks, staged loading in wean to market (WTM) barns, wash and disinfect all trailers from market pigs, truck drivers stay in the cab at packing plants, whenever possible avoid intentional exposure of replacement gilts, complying with biosecurity practices in sow farms and improve it in WTM sites, and usage of scientifically validated feed mitigants.

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

Mycoplama hyopneumoniae submissions tested by RT-PCR over time
Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.

Mycoplasma hyopneumoniae percentage of positive submissions by age category
Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.

Mycoplasma hyopneumoniae percentage of positive submissions by age category
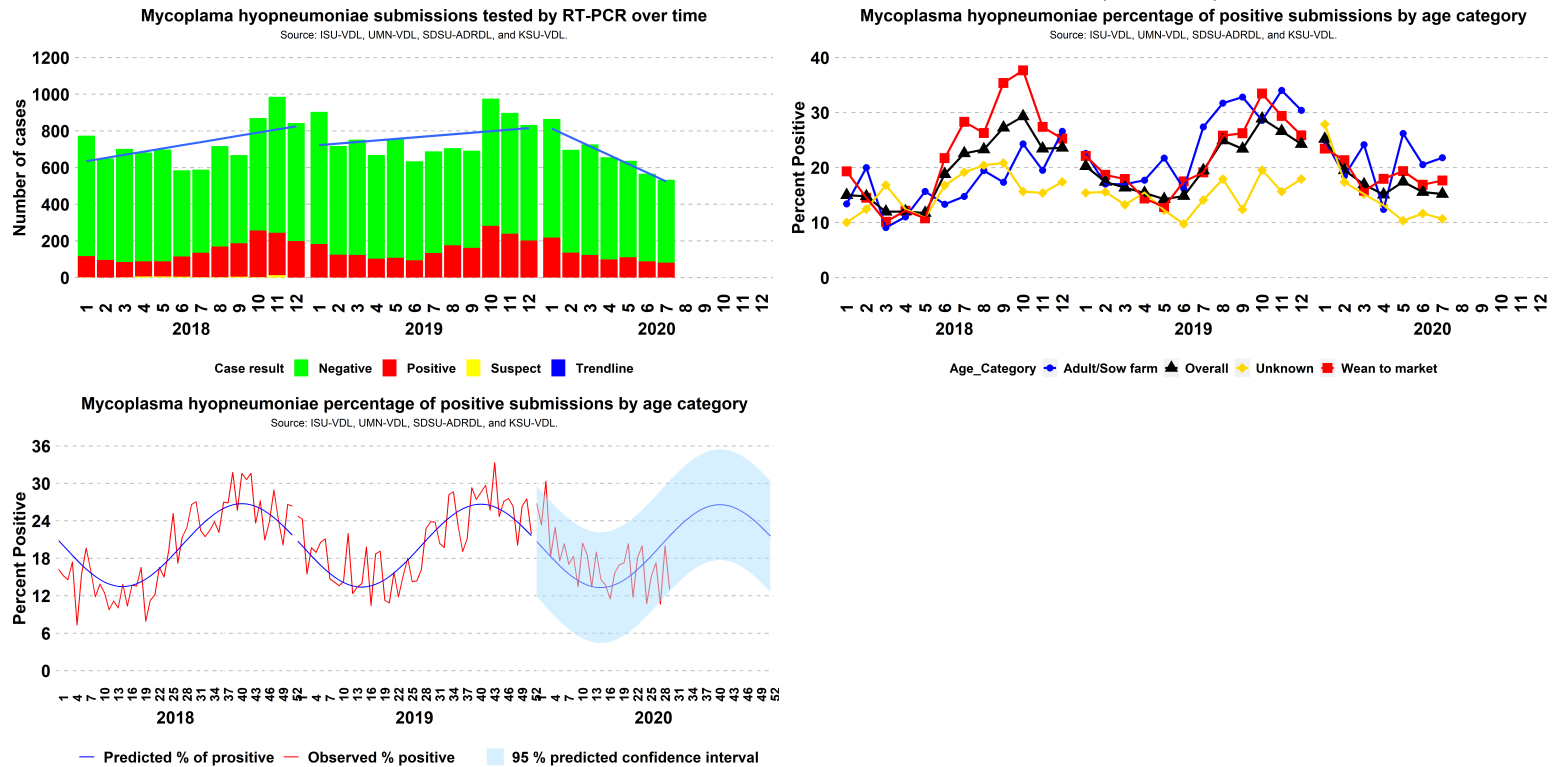Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.

Figure 3. *Left top*: results of MHP PCR cases over time. *Right top*: 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. *Bottom*: percentage of MHP PCR-positive results, by category over time.

SDRS Advisory Group highlights:

- Overall, 15.2% of 533 cases tested *Mycoplasma hyopneumoniae*-positive cases in July, similar to 15.55% of 566 in June;
- The overall detection of *Mycoplasma hyopneumoniae*-positive cases is within the lower expected boundaries of the forecasted levels for this time of the year;
- The advisory group highlights that the lowering in the number of *Mycoplasma hyopneumoniae* testing during recent months when compared with the same months of 2018 and 2019 may be due to lack of testing, for this specific agent, as a consequence of the recently faced market condition.

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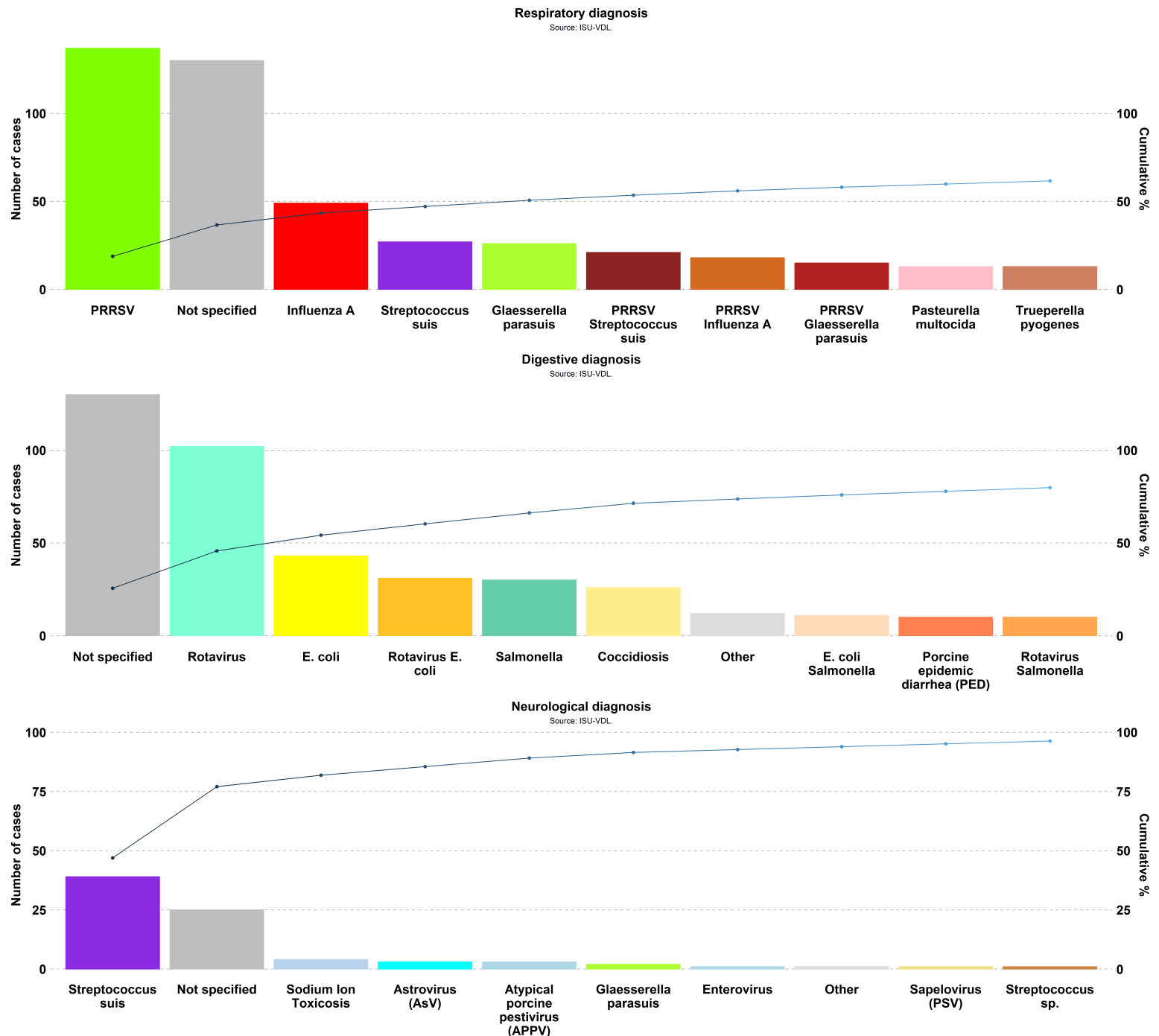
Topic 4 – Disease diagnosis at the ISU-VDL.

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 June 1 to July 19.

SDRS Advisory Group highlights:

- PRRSV (137 of 728) continues to lead the number of respiratory diagnoses. After Not specified (130 of 507), Rotavirus (102 of 507) leads the digestive diagnoses, and *Streptococcus suis* (39 of 83) the neurological diagnosis;
- During June 21 to 27, there was a signal for an increased number of musculoskeletal diagnosis. The most frequent agents under the musculoskeletal diagnosis were *Streptococcus suis* and *Mycoplasma hyosynoviae.*
- During July 12 to 18, there was a signal for an increased number of urogenital diagnosis. The most frequent agent under the urogenital diagnosis was PRRSV.
- During June 27 to July 11, there was a significant increase (signal) in diagnosis of Coccidiosis.