

Dr. Morrison's Swine Health Monitoring Project (MSHMP) Annual Summary

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Key Points:

- Monitoring pathogens
 - PRRS incidence (26%) remained stable over the last 2 years.
 - PEDv incidence remained low (7%), at the same level as last year.
 - Seneca Valley virus incidence appears to have a seasonal pattern.
 - Monitoring of VDL atypical CNS cases has been restarted.
- Analyzing PRRS virus sequences
 - It appears that there are several characteristic features that would signal emerging PRRSv strains, which may be used for early detection of significant emerging events.
 - Analyzed sequences coming from 3 systems to detect new emerging strains on a monthly basis.
- Capturing movement data and incorporating into data management capacity
 - Developed an app to capture truck movement. Tested a first version of the app. A second improved version will be tested shortly.
- Expanding enrollment
 - Added 4 production companies.
 - Currently 33 systems with 1,092 sow farms & 2.96 million sows.
 - 161 non participants receive weekly report.

This year the Swine Health Monitoring Project was struck by the sudden and unexpected loss of Bob Morrison in a car accident in Prague. This was a major setback for the group and is a difficult challenge to overcome. However, we received the support of the industry to continue carrying on Bob's legacy. Since last May the SHMP was renamed after him to Dr. Morrison's SHMP (MSHMP).

The MSHMP project is funded by the National Swine Health Information Center (SHIC), which is a 5-year initiative funded by the National Pork Board and led by Dr. Paul Sundberg. Our project has 4 objectives:

Objective 1 – Monitoring incidence & prevalence.

As of June 30, our pathogen-year came to a close.

PRRS - PRRS incidence ended up in 26% after two consecutive years at 28%. There are concerns that we have reached a threshold and that for overcoming it and going into lower levels of incidence we will have to improve collectively as an industry and make efforts to better understand how the disease spreads. One of the lessons learned during this year is that a given region and its features (weather and landscape) may shape disease incidence e.g. having a different pattern in the Midwest and the Southeast of USA.

PED –This year the cumulative disease incidence was 7%. For third year in a row, incidence was below 10%. A moderate proportion of farms (around 20%) is using PEDv for acclimation.

Seneca Valley virus (SVv) –This is the second year of following SVv. Incidence seems to have a seasonal pattern with cases going up at the end of July. However, we have to keep in mind that these data are coming from VDLs and representativeness may be biased. The Kansas State University VDL has joined in reporting SVv.

Atypical Central Nervous System Cases (CNS) - We have restarted reporting atypical CNS cases from four VDLs (ISU, KSU, SDSU, UMN). However, the number of reported cases is low and it is too early to extract any conclusion. Information on CNS cases and the virus causing them can be found in a previous science page.

Objective 2 – Prospective monitoring of PRRS viruses.

In a large scale analysis of sequences (3582 ORF5) coming from 1 system from the Midwest we detected different characteristics that could help to differentiate endemic and epidemic strains. More information can be found on Alkhamis et al., 2017, Novel approaches for Spatial and Molecular Surveillance of Porcine Reproductive and Respiratory Syndrome Virus (PRRSv) in the United States.

Another of our efforts is to gather all the sequences from 3 different systems and analyze them monthly in an attempt to detect emerging strains and understand their spread in one area.

Objective 3 -To develop capacity to capture and analyze movement data in real-time.

A first version of an app to collect truck movement and farm visit was developed and tested with promising results. Collection of data has been temporarily paused to reinforce data storage, processing and security. A second version of the app with improvements is ready and will be tested in the following months.

Objective 4 - To expand participation of producers to allow all to be involved.

Four production companies came on board during the last year, all of which share their logo announcing their participation. This means that today, SHMP includes close to 3 million sows or approximately 50% of the sows in United States.

Following Bob's loss, a new plan for communication with the industry has been outlined and will be implemented in the second part of the year to sustain MSHMP's mission and producers collaboration with the ultimate objective of contribute to the industry resilience and protection.

Going forward, we are continuing our 4 objectives as listed above. In addition, we increased our data security to the higher standards while setting the channels to storage and to process data coming from different sources. Please feel free to contact us at shmp@umn.edu (Emily Geary) or cvilalta@umn.edu (Carles Vilalta) with any questions or comments.