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JSHAP SPOTLIGHT

Dr Alex Ramirez

Iowa State University College of Veterinary Medicine (ISU CVM)

Dr Ramirez earned a BS ('89), DVM ('93), and PhD ('11) from ISU, an MPH ('04) from the University of Iowa, and is a Diplomate of the American College of Veterinary Preventive Medicine. In his current role at ISU CVM, Dr Ramirez is the instructor or co-instructor of 7 courses and the Assistant Dean for Academic and Student Affairs. His research focus is swine infectious disease transmission, diagnosis, and interventions with emphasis on clinical relevance. Dr Ramirez reminds authors that the peer-review process is valuable in helping improve the quality and science of published research. "No study is ever perfect. The key point is to be transparent and recognize the limitations of each study."

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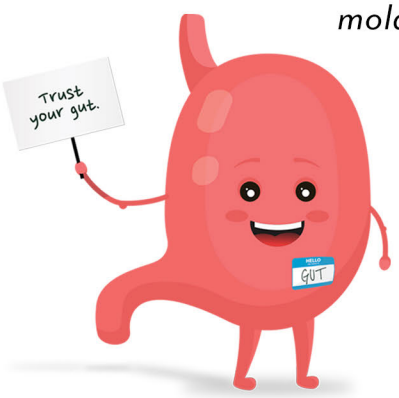

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Have a plan

This is my first message following the AASV Annual Meeting. I know it might feel like a distant memory, but I wanted to take a moment to thank you for participating. I hope you found it informative and useful! Of course, like so many things in our lives, our experiences with the pandemic influenced and shaped the meeting agenda as well as the format. It would be wonderful if COVID-19 is a distant memory by the time this goes to publication, but the knowledge gained from the experience needs to be remembered.

In 1996, hurricane Fran was the first major hurricane North Carolina had seen in decades and my first ever. We were without electricity for a little over a week and very unprepared. Our growers were not well prepared either. Some shared generators and rotated them between farms to provide pigs feed and water. There was a big sigh of relief when a semi load of generators arrived at the warehouse. In addition to the electricity issues, we had left the curtains up on the curtain-sided barns only to find that the hurricane had shredded them and left the remains laying in the tree line. It literally took over a year to get them all replaced as the manufacturers could not meet our demand. We learned the hard way that horizontal rain causes feed to mold in feeders and it takes a lot of extra work to dump, clean, dry, and refill them. Subsequent hurricanes have not produced the strong winds of Fran, but we have seen major flooding instead. Each hurricane has presented its own unique set of challenges, and we have learned from each experience. The last one taught us to have fuel reserves stationed on both sides of major rivers, because yes, every single gas station in a 5-county area can either run out of fuel or remain closed for a week!

There will never be a crisis exactly like the one COVID-19 presented, but history tells us that there will be other challenges. I was hopeful that transmissible gastroenteritis would be the last coronavirus I would ever see. Boy have I been disappointed! One take-home message from the Annual Meeting was to have a plan, prepare for the worst, and pray for the best.

In the last issue of the *Journal of Swine Health and Production*, I talked about the progress that has been made in preparing for a foreign animal disease (FAD). There are still questions to be answered, and probably always will be, but much of the plan is laid out. Are you preparing? Do your producers or production staff understand the importance of early disease recognition and reporting? Do they have a biosecurity or Secure Pork Supply Plan for their farm? Are they prepared to handle at least a 72-hour stop movement? Do they have a plan for mass depopulation and disposal? Do you have a working relationship with your state veterinarian and a firm understanding of their expectations? We are all busy trying to keep pigs healthy, improve production performance, and enhance profitability. It is difficult to set time aside to anticipate and plan for a disaster, be it a hurricane, flood, tornado, infectious disease, feed contaminant, etc, but I would encourage you to do just that. Pick a farm and pretend that it has tested positive for an FAD. Explain what will happen to each pork producer, those caught inside a control zone, and those in a surveillance zone. Discuss how depopulation would occur if necessary or how to obtain a permitted movement if the animals are not infected. Invite your state veterinarian and their staff to participate. Having them there to address questions as they arise will create a better understanding for all involved. There are multiple resources online to assist you in this process.

"One take-home message from the Annual Meeting was to have a plan, prepare for the worst, and pray for the best."

The mental health and well-being of our colleagues and producers is a real concern, especially in times of crisis. One of the best things you can do to help your clients, friends, and family is to have a plan. Help them to be prepared and keep them informed. Some pork production companies have a contingency plan for an FAD that is reviewed and updated annually. I am sure it is not perfect and unforeseen complications will arise should they ever find themselves in that situation, but it is a great start. For example, North Carolina farms have Storm Preparedness Plans for sow, nursery, finishing farms, and support operations with tasks that begin a week prior to the hurricane's expected landfall. Although each hurricane brings its own unique learning experience, North Carolina has managed to save more pigs despite their increased severity. Saving pigs certainly reduces stress on all those involved. Do not misunderstand, hurricanes are still stressful events. We know when Jim Cantore from The Weather Channel comes to town, we better prepare to roll up our sleeves and get to work.

Please get prepared!

Mary Battrell, DVM
AASV President

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The 2021 AASV Annual Meeting – A virtual success

I thought I would take this opportunity to provide you with a review of the 2021 AASV Annual Meeting. As you recall, we just squeaked by in 2020 and were able to complete an in-person meeting in Atlanta as COVID-19 was breaking in the United States. It quickly became evident that it was highly unlikely that our 52nd Annual Meeting was going to be held in person as planned. I began negotiations in June 2020 to modify our contract with the hotel in San Francisco. Obviously, the hotel was reluctant to provide any concessions to the contract until they were certain they were not going to be able to hold our event. After much persistence, in mid-October, we were finally able to secure an agreement to move the 2021 meeting in San Francisco to 2025. This gave the AASV staff approximately 20 weeks to transition our planning from a typical in-person meeting to a virtual format. As it turns out, we needed every minute of that.

Starting way back in July, the staff was attending virtual conferences and interviewing virtual meeting providers to evaluate the format options available and the various capabilities and costs. I found this particularly challenging. The virtual world speaks a whole different language than I do. What I call a "presentation," they call a "session," and a group of sessions becomes a track. Everyone involved is assigned a "role" or "roles" and you cannot do anything your "role" does not allow. I signed a contract with Hubb on December 8th as our virtual event provider.

Even after we finally settled on Hubb as our provider, the learning curve was steep. Working with neophytes like us to adapt a tried and true 51-year-old in-person meeting to fit a virtual format is still a novel undertaking for virtual providers as well. While Hubb provided resources and project managers, a lot of their standard operating procedures just did not always work or really fit our way of conducting a continuing education meeting.

The AASV staff began holding 3 staff meetings a week throughout December, January, and February. Sue, Abbey, and Sherrie each began working on individual pieces of the project, interacting with speakers, attendees, session moderators, technical table representatives, and Hubb personnel to bring it all together. Following the 2020 Annual Meeting, I used this column to compare designing the meeting to making sausage. That analogy was even more true with the 2021 meeting. We took the whole hog, ground it all up, and came out with a brand-new product that none of us had ever tasted before, and then we served it to over 900 of our closest friends and family. Thankfully, from the reviews we have received so far, you consumed what we offered, came away intellectually nourished, and even had a little fun. So, as intellectual sausage-making goes, I think it was a success.

But, how did it stack up against previous years and what does this technology mean for the future? Well, after several years of rising attendance, this year's attendance was down by 15% to 20%. In addition, the number of paid Technical Tables declined from 92 in 2020 to just 55 in 2021. International attendance also declined compared to 2020. The number of student, speaker, and Technical Table representatives attending the meeting all remained about the same as in 2020. So, overall, income from the meeting will be down compared to previous years. On the bright side, however, expenses were significantly decreased compared to a traditional in-person meeting. Thus, in the end, it will still have been a profitable meeting for AASV. That is important because profits from the annual meeting represent one of the three main sources of income supporting our annual operating expenses (the other two being dues and advertising support in the *Journal of Swine Health and Production* and the e-Letter).

"Thankfully, from the reviews we have received so far, you consumed what we offered, came away intellectually nourished, and even had a little fun."

I would like to take this opportunity to sincerely thank those Technical Table companies that stuck with us and supported the association and its members. Please take a minute to reach out to those representatives and express your gratitude for their continued support. A list of those companies can be found on page 154 of this *JSHAP* issue. I realize that every company values their marketing dollars differently and they have to decide how they maximize their return on investment. But, in my opinion, exhibiting during the AASV Annual Meeting is a bargain, particularly in a virtual platform given the decreased costs associated with travel. In addition to a dedicated exhibit site, the Technical Table fee includes registration of up to three representatives for the meeting (with the opportunity to register up to 3 additional representatives for a fee), access to the attendees, and the opportunity to provide an oral presentation and a poster during the Industrial Partners and poster sessions.

Executive Director's message continued on page 121

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Executive Director's message continued from page 119

Overall, I think our experience with a virtual format annual meeting was mixed. It was a huge challenge learning how to make it work and working with a third party to design the platform. Attendance was down, as was support from our allied companies. We also missed out on the opportunity to interact face-to-face with our colleagues and friends. The hallway talk is always a highlight of the meeting and really cannot be duplicated virtually. On the upside, however, this format offers the opportunity to view many more of the presentations than would be possible in a traditional setting. There was no travel to contend with, no one noticed you were attending the sessions in your pajamas, and you did not have to eat hotel food or fight for the last ice cream sandwich. The meeting was less expensive to produce.

Some attendees have expressed a desire that we continue to provide a recorded or virtual component to the meeting in the future. Ultimately, that would be something for the board to decide. It should be noted that a hybrid offering would come with significant additional costs associated with recording and transmission of content as well as likely penalty fees from the hotels for failure to meet our minimum attendance numbers established by the hotel contract.

To wrap this up, I would like to personally thank our staff for their hard work to make this meeting successful. They all went above and beyond what was asked of them. All that work would have been for naught, however, if you guys had not shown up and participated. So, my thanks to you as well for attending the meeting and actively participating to make it the best virtual meeting AASV has ever held! Here is hoping we are together again in person in 2022 in Indianapolis.

Harry Snelson, DVM
Executive Director

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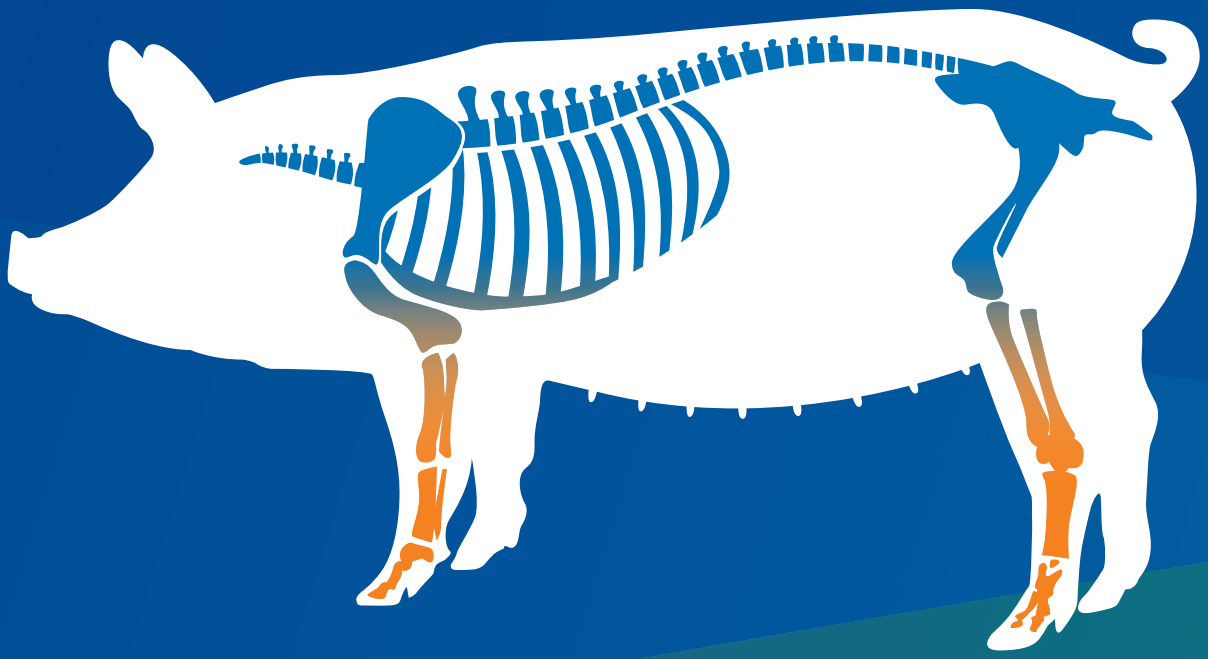

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Themes

I was re-reading all the messages in the March-April 2021 *JSHAP* issue and really appreciated the common underlying theme presented in all the messages: Finding silver linings,[1] Progress during a pandemic,[2] COVID-19 parallels,[3] and my own message, Pivot.[4] All of these messages contained a common theme of navigating the challenges COVID-19 has presented us in our professional roles.

The *JSHAP* Editorial Board typically meets every year at the AASV annual meeting. This year the editorial board met virtually, and the silver lining of the virtual meeting was that we had perfect attendance for the first time! While I would have preferred a face-to-face meeting, it was nice to "see" everyone on my Zoom screen and to have the opportunity to thank all the editorial board members and journal staff for their time and commitment to the journal.

In my message for the March-April 2021 issue I mentioned how many people are doing "more with less" especially in this virtual state we have been in lately.[4] But after the *JSHAP* editorial board meeting, I realized how the virtual environment has also introduced some efficiencies. I also enjoyed embracing the AASV Annual Meeting virtual format. I had a couple of presentations that I wanted to revisit and a couple that I missed. What a nice option that was to be able to revisit a presentation. I did not want to miss out on learning about any progress made during the past year. Revisiting a presentation is something we could not do during our face-to-face meeting other than reaching out for a personal communication and reading the proceedings.

"I hope the information they bring help you navigate the future, find silver linings, identify progress, and recognize COVID-19 parallels."

This issue of the journal contains a nice variety of manuscripts and we have many more in the line-up for upcoming issues. I hope the information they bring help you navigate the future, find silver linings, identify progress, and recognize COVID-19 parallels.

Terri O'Sullivan, DVM, PhD
Executive Editor

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BRIEF COMMUNICATION PEER REVIEWED

The effect of extended storage on virus survival in feed

Scott Dee, DVM, PhD; Apoorva Shah; Roger Cochrane, PhD; Fangzhou Wu, PhD; Travis Clement; Aaron Singrey; Roy Edler, MS; Gordon Spronk, DVM; Megan Niederwerder, DVM, PhD; Eric Nelson PhD

Summary

Extended feed storage to reduce the risk of virus survival has not been tested experimentally. Five ingredients inoculated with porcine epidemic diarrhea virus, porcine reproductive and respiratory syndrome virus-174, and Senecavirus A were stored indoors at 20°C or outdoors in Minnesota winter conditions. After 30 days, outdoor samples contained infectious virus, while indoor samples did not.

Keywords: swine, feed ingredients, extended storage, viral diseases, demonstration project

Received: June 5, 2020
Accepted: December 9, 2020

Resumen - El efecto del almacenamiento prolongado sobre la supervivencia de virus en el alimento

No se ha probado experimentalmente el almacenamiento prolongado de alimentos para reducir el riesgo de supervivencia de virus. Cinco ingredientes inoculados con el virus de la diarrea epidémica porcina, el virus 174 del síndrome reproductivo y respiratorio porcino, y el Senecavirus A se almacenaron al interior a 20°C o al aire libre en condiciones invernales de Minnesota. Después de 30 días, las muestras al aire libre contenían virus infecciosos, mientras que las muestras almacenadas en el interior no.

Résumé - Effet de l'entreposage prolongé sur la survie de virus dans les aliments pour animaux

Un entreposage prolongé des aliments pour réduire le risque de survie de virus n'a pas été testé expérimentalement. Cinq ingrédients inoculés avec le virus de la diarrhée épidémique porcine, le virus du syndrome reproducteur et respiratoire porcin-174, et le Senecavirus A ont été entreposés à l'intérieur à 20°C ou à l'extérieur dans les conditions hivernales du Minnesota. Après 30 jours, les échantillons extérieurs contenaient des virus infectieux, contrairement aux échantillons intérieurs.

In 2014, feed and feed ingredients were proposed as vehicles for the transport and transmission of porcine epidemic diarrhea virus (PEDV) from China to the United States.[1-3] This hypothesis has since been expanded across multiple viruses, such as Senecavirus A (SVA), porcine reproductive and respiratory syndrome virus (PRRSV), classical swine fever virus, pseudorabies virus, and African swine fever virus.[4-6] These studies have also repeatedly confirmed that certain feed ingredients, such as soy-based products, appear to promote virus survival over time.[1-6] To mitigate this risk, the North American swine industry has attempted to reduce virus viability in feed using a variety of approaches, including mechanical reduction (flushing and sequencing),[7,8] heat treatment,[9] pelleting,[10] chemical mitigation,[11,12] and extended storage. This latter approach is a critical component of the policy of Responsible Imports, a science-based protocol to safely introduce essential feed ingredients from high-risk countries using extended periods of storage under climate-controlled conditions to reduce virus viability.[13] Along these lines, import requirements of select feed ingredients from countries endemically infected with African swine fever virus has been adapted by the Canadian Food Inspection Agency[14] and wide-scale voluntary application of Responsible Imports has occurred across the US swine industry.[15] These protocols involve the storage of imported feed ingredients into designated facilities for a predetermined period and held under a controlled temperature, prior to movement to mills and farms. However, while widely applied, these protocols have been primarily based on mathematical estimates of half-life, not experimentally derived data.[16]

To address this limitation, we designed an experiment using an approach taken from the social sciences known as the "demonstration project." A demonstration project is defined as a means of promoting innovations and disseminating best practice through the development and analysis of a live project, undertaken in natural settings that resemble non-experimental, real-world conditions.[17]

SD, RC, FW, RE, GS: Pipestone Applied Research, Pipestone Veterinary Services, Pipestone, Minnesota.

AS: SAM Nutrition, Eden Prairie, Minnesota.

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This article is available online at **http://www.aasv.org/shap.html**.

Dee S, Shah A, Cochrane R, Wu F, Clement T, Singrey A, Edler R, Spronk G, Niederwerder M, Nelson E. The effect of extended storage on virus survival in feed. *J Swine Health Prod*. 2021;29(3):124-128.

This approach has been used to help build an evidence base to support industry improvements, as historically, lessons learned from demonstrations, through the rigors of scientific research, have resulted in large-scale adoption and major shifts in aims, styles, and resources. Therefore, the purpose of this study was to design a demonstration project to test the effect of an extended storage protocol on the survival of swine viral pathogens in feed ingredients under real-world conditions. The study was based on the hypothesis that controlling temperature during storage would enhance the success of the protocol.

Materials and methods

Ethical statement

Animals in this study were managed in accordance with the institutional animal care and use guidelines observed by the investigators' ethical review board, Pipestone Applied Research IACUC, trial number 2020-02.

Sample preparation

Viruses selected for this study included PRRSV-174, PEDV, and SVA while ingredients included conventional soybean meal, organic soybean meal, choline chloride (60%, no corn cob carrier), lysine HCL (78.8% minimum lysine, no carrier) and vitamin A (1,000,000 IU with porcine coated gelatin).[1-6] As previously defined, conventional soybean meal contained a low fat (1%-2%) and high protein (46%-47%) content, while the organic product had higher fat (6%-7%) and lower protein content (44%-45%).[3,4] Samples of each ingredient were obtained from local mills and were not irradiated prior to initiating the study. Four, 30-g allotments of the 5 ingredients were weighed into individual 50 mL mini-bioreactor tubes with vented caps (Corning Inc) for a total of 20 samples, providing 4 replicates per each of the 5 ingredients. This was defined as a sample set. For preparation of the viral inoculum to be used to spike ingredients, a single batch of viral inoculum, containing a mixture of all three viruses was prepared. Specifically, each virus was diluted in 100 mL minimum essential medium (MEM, Sigma-Aldrich) to a concentration of 1×10^5 50% tissue culture infectious dose per mL per virus. All 3 viruses were then mixed (three viruses for a total of 300 mL) followed by an addition of 200 mL MEM, to bring the total volume to 500 mL. This concentration was based on a previous publication documenting this level of PEDV in feed bin samples from index farms in 2014.[1] Each of the 20 samples were then individually spiked with a 2 mL aliquot from the viral mixture to measure viral load at the end of the 30-day study period. Inoculums were injected directly into the center of each 30-g ingredient sample using a 3 mL syringe with an 18-gauge, 3.81 cm needle. In addition to the 20 spiked samples, 2 positive controls (stock virus mixture in the tube in the absence of feed), 2 negative controls (30g of conventional soybean meal, no virus), and 1 contamination control (empty tube, no feed, no virus) were included in the design. The purpose of the positive controls was to determine whether viruses could survive in the absence of a feed matrix, while the negative controls and the contamination control were included to validate whether cross-contamination occurred or not. Duplicate sample sets, each consisting of 20 samples (4 tubes of each of the 5 ingredients) plus controls resulting in a total of 25 tubes per sample set, were included in this study. The purpose of the duplicated samples was to assess the repeatability of the results.

Storage conditions

Based on feedback from the US industry (S. Dee, DVM, personal communication, 2018-2019), a protocol involving a 30-day storage period at a temperature of 20°C was selected for this study. The study was conducted in the basement of the principle investigator's home in west-central Minnesota, beginning January 31, 2020 and ending February 29, 2020. For outdoor storage, one sample set (as defined) was placed 2 m outside the home's basement entrance, allowing for exposure to natural conditions. For indoor storage, the second sample set was placed in a designated room inside the home, allowing for exposure to climate-controlled conditions generated by the household heating system. During the indoor evaluation, the thermostat was set at 20°C and was programmed to remain constant 24 hours each day of the 30-day storage period. To record environmental conditions during the 30-day period, a data logger (RC-51H, ELITech) was placed alongside both sample sets and temperature and relative humidity (RH) was recorded every 15 minutes each day.

Diagnostic testing

Following completion of the 30-day storage period, samples were evaluated for the presence of viral RNA by polymerase chain reaction (PCR) and for viability by swine bioassay. For PCR, samples were tested at the South Dakota State University Animal Disease Research and Diagnostic Laboratory (SDSU ADRDL) using published methods.[1-3] For bioassay, pigs were housed in the Pipestone Applied Research biosafety level 2 facility. The bioassay involved 50 three-week old pigs, which were housed in three rooms and originated from a farm known to be naïve for PRRSV, PEDV, and SVA. The first room was designated for outdoor storage assessment and the second for indoor storage assessment. In each room, pigs were penned according to ingredient (5 pens, 4 pigs/pen, 20 pigs/room). Control pigs were housed in the third room. Five pigs were used as outdoor storage controls and placed in the third room which contained 6 pens. The 2 positive-control pigs were placed in the first pen and the 3 negative-control pigs in the second pen. Five additional pigs were designated as indoor storage controls and placed in the third room with 2 positive-control pigs in the fifth pen and 3 negative-control pigs in the sixth pen. The purpose of the positive-control pigs was to determine whether viable virus was present in the positive-control samples (virus, no feed matrix) from outdoor samples and indoor samples. The purpose of the negative-control pigs was to determine whether cross-contamination of the viruses had occurred during sample handling or during storage from outdoor samples and indoor samples. Pen dividers and empty pen spaces between animal groups were used to eliminate nose-to-nose contact and minimize the chances of indirect transmission between pens. For preparation of the bioassay inoculum, each 30-g sample from the 5 feed ingredients in each sample set at 30 days post inoculation was transferred to separate 250 mL conical tubes, followed by the addition of 60 mL of sterile saline. Each sample was then homogenized and centrifuged at 4000*g* for 10 minutes, with supernatant decanted into a clean 50 mL tube and recentrifuged at 4000*g* for 10 minutes. Supernatant was then decanted into 10 mL tubes and frozen at -80°C, in preparation for inoculation. All pigs were inoculated with a 2 mL sample via the intramuscular route for assessment of PRRSV and SVA infectivity and 2 mL via the oral route for assessment of PEDV infectivity. A mixed virus sample was used for ease of handling based on previous experience.[18] Rectal swabs and blood samples were

then collected at days 0, 7, and 14 post inoculation and submitted to the SDSU ADRDL for analysis.

Results

Sample integrity during storage

During the 30-day storage period, outdoor samples quickly froze post placement and remained frozen until processed. In contrast, indoor samples did not freeze, although there appeared to be some loss of volume in the positive-control samples (stock virus in MEM, no feed), possibly due to evaporation and drying, secondary to the warm, dry conditions of the storage area.

Presence of viral nucleic acid in feed

Mean viral load at day 30 post feed inoculation across the 3 viruses and the 5 ingredients, inclusive of controls, are summarized in Figure 1A (outdoor storage) and 1B (indoor storage). In both storage methods, PRRSV, PEDV, and SVA RNA were detected across all 5 ingredients, with some degradation of viral nucleic acid observed. In addition, viral RNA was detected in positive-control samples, but not in negative controls.

Viability assessment

Prior to inoculation, all pigs were confirmed to be naïve to all three viruses via serum samples and rectal swabs collected on day 0. Following inoculation of pigs with 30-day outdoor storage samples, PRRSV and SVA RNA was detected by PCR in serum samples and PEDV RNA in rectal swabs collected at day 7 and day 14 post inoculation from bioassay pigs in the organic soybean meal group (4 of 4 pigs), the conventional soybean meal group (4 of 4 pigs), the vitamin A group (4 of 4 pigs), the lysine group (4 of 4 pigs), and the choline group (4 of 4 pigs). In addition, clinical signs suggestive of PRRSV (dyspnea, hyperthermia), PEDV (diarrhea), and SVA (lameness) were observed across all groups. Positive controls (2 of 2 pigs) were bioassay positive, while negative controls (3 of 3 pigs) were bioassay negative. In contrast, following inoculation of pigs with 30-day indoor storage samples, no evidence of PRRSV, PEDV, or SVA RNA was detected by PCR in serum and rectal swab samples from any of the 20 bioassay pigs. In addition, clinical signs suggestive of PRRSV, PEDV, and SVA were not observed in any groups. Positive controls (2 of 2 pigs) were bioassay negative, as were all 3 negative controls.

Temperature and RH data

Over the course of the 30-day period, the mean outdoor temperature was -8.8°C with a maximum of -4°C and a minimum of -14.7°C. The mean outdoor RH was 77%, with a maximum of 88% and a minimum of 62%. Over the same period, the mean indoor temperature was 20.1°C, with a maximum of 20.4°C and a minimum of 19.8°C, while the mean RH was 35%, with a maximum of 37% and a minimum of 34%.

Discussion

The purpose of this study was to conduct a demonstration project to evaluate whether extended storage in a climate-controlled environment would reduce the risk of virus-contaminated feed versus storage outside during a Minnesota winter. Under the conditions of the study, these data demonstrate that across the 5 feed ingredients evaluated, the indoor storage protocol successfully inactivated 3 significant pathogens of swine, including PRRSV-174, PEDV, and SVA. In contrast, all 3 viruses survived in all 5 ingredients following external storage. Based on the environmental data collected during indoor storage, the storage area remained at a consistently warm temperature (mean = 20.1°C) with a low RH (mean = 35%) throughout the 30 days. In contrast, the outdoor environment was generally cold (mean = -8.8°C) and moist (RH = 77%) and varied over time. These contrasting environmental parameters most likely played a significant role in the ability of the 3 viruses to survive during their respective storage periods.

While the results are promising, this study had its share of acknowledged strengths and limitations. Strengths included the novelty of the demonstration project (real-world storage conditions), the use of multiple replicates per feed ingredient, and the inclusion of negative controls to confirm that cross-contamination did not occur. A significant limitation of the study was that it was conducted only once, and no evaluation of repeatability or consistency of the outcomes can be predicted. This is important as data from a single replication does not allow us to determine the protocol efficacy in all cases, ie, we cannot say that the protocol tested will eliminate virus infectivity 100% of the time. Other limitations include the use of a single viral concentration to inoculate the ingredient samples and the use of a small sample size, and small quantities (30g) of 5 feed ingredients spiked with relatively large volumes of liquid inoculum. While small quantities were used to minimize the risk of false negative results, studies are underway to repeat this project using larger volumes of ingredients inoculated with proportionately representative volumes of liquid inoculum. Finally, this study evaluated an indoor storage protocol that only incorporated one time and one temperature setting, and the study was conducted at one location in the US during one season of the year. Further studies should be conducted utilizing different conditions to develop a database comparing success of varying extended storage protocols across different environments, as well as repeatability of the results.

Under the conditions of this study, the results demonstrated that an extended storage period of 30 days at a temperature of 20°C was effective at reducing the viability of 3 significant viral pathogens of pigs across multiple feed ingredients. It is hoped that this information will support further application of extended storage procedures on farms and in mills. Finally, further studies should be conducted using other significant foreign animal disease pathogens such as African swine fever virus and foot-and-mouth disease virus to further justify the additional costs and logistics of implementing this approach.

Implications

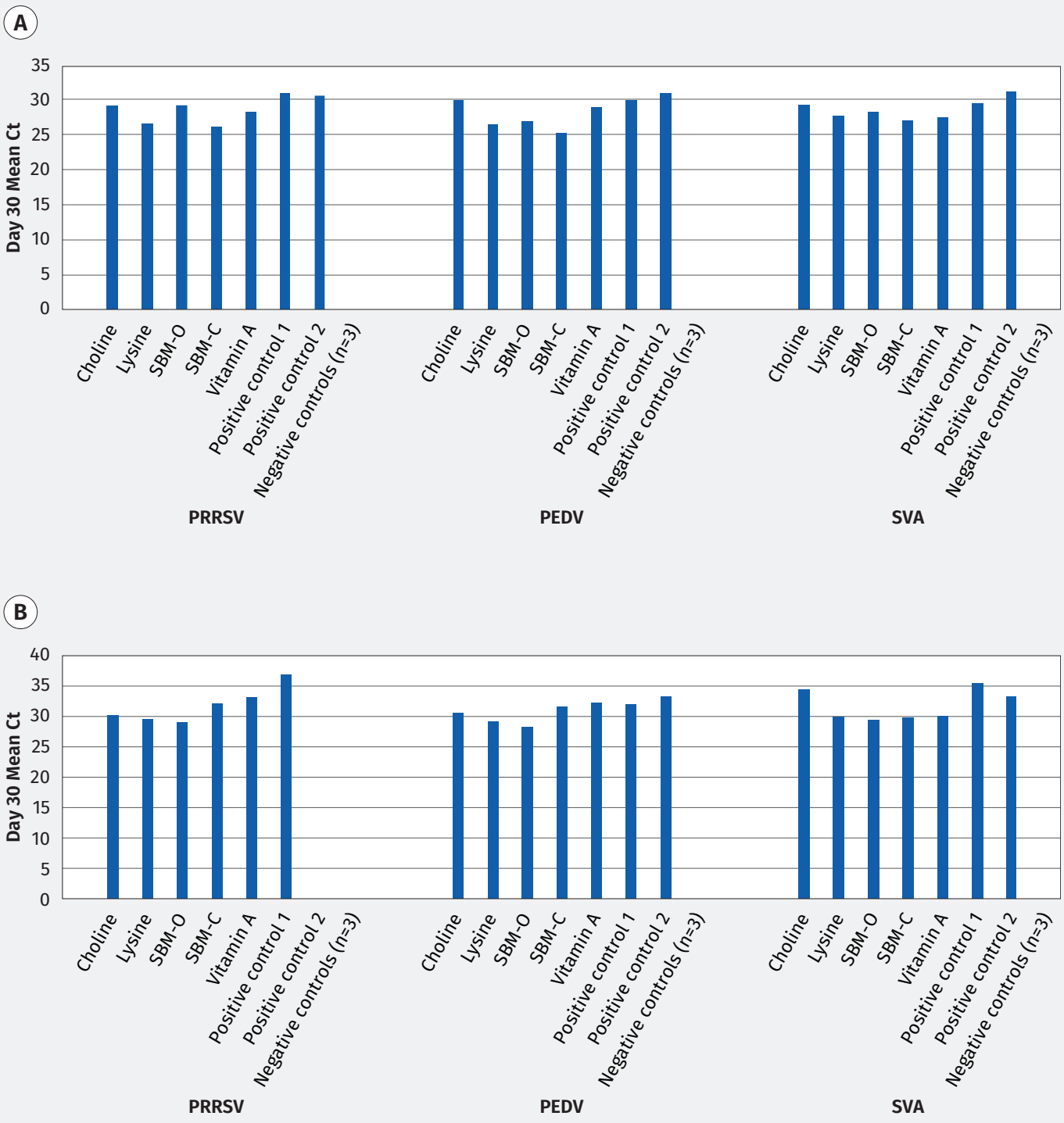
Under the conditions of this study:

- A specific protocol of extended storage inactivated PEDV, PRRSV, and SVA.
- All viruses survived in all 5 ingredients stored in cold weather conditions.
- Extended feed storage should involve a climate-controlled environment.

Acknowledgments

Dr Dee would like to recognize Dr Luke Minion for his vision regarding the Responsible Imports initiative. Resources for this study were provided by SAM Nutrition and Pipestone Applied Research. All data from this study have been disclosed.

Figure 1: Summary of mean Ct values by virus and ingredient on day 30 post inoculation under A) outdoor storage or B) indoor storage, along with positive and negative controls. PCR-negative samples were given a value of "0". Ct = cycle threshold; PCR = polymerase chain reaction; SBM-O = organic soybean meal; SBM-C = conventional soybean meal ; PRRSV = porcine reproductive and respiratory syndrome virus; PEDV = porcine epidemic diarrhea virus; SVA = Senecavirus A.



Conflict of Interest

None reported.

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Peer reviewed **Brief communication**

Comparison of intradermal and intramuscular porcine circovirus type 2 vaccination methods concerning labor, production parameters, and antimicrobial treatments: A randomized field study in a Danish finishing herd

Bjarne Ellegaard, DVM; Jakob Korsgaard, DVM; Gitte Blach Nielsen, DVM, PhD

Summary

Vaccination is time consuming and often labor intensive. This study found that porcine circovirus type 2 vaccination of growing pigs could be performed faster using an intradermal, needle-free vaccination method compared to the traditional, intramuscular needle vaccination method without compromising production parameters and antimicrobial treatments.

Keywords: swine, vaccination, intradermal, intramuscular, labor

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Resumen - Comparación de los métodos de vacunación intradérmica e intramuscular contra el circovirus porcino tipo 2 en relación con el trabajo, los parámetros de producción y los tratamientos antimicrobianos: Un estudio aleatorio de campo en un hato de engorde danés

La vacunación requiere mucho tiempo y, a menudo, requiere mucha mano de obra. Este estudio encontró que la vacunación contra el circovirus porcino tipo 2 en cerdos en crecimiento podría realizarse más rápidamente utilizando un método de vacunación intradérmica sin aguja en comparación con el método tradicional de vacunación con aguja intramuscular sin comprometer los parámetros de producción y los tratamientos antimicrobianos.

Résumé - Comparaison des méthodes de vaccination intradermique et intramusculaire contre le circovirus porcin type 2 concernant le travail nécessaire, les paramètres de production et les traitements antimicrobiens: une étude de terrain randomisée dans un troupeau de finition danois

La vaccination demande du temps et est souvent exigeante en termes de travail. La présente étude a déterminé que la vaccination contre le circovirus porcin type 2 de porcs en croissance pourrait être effectuée plus rapidement en utilisant une méthode de vaccination intradermique sans aiguille comparativement à la méthode traditionnelle de vaccination intramusculaire avec une aiguille sans compromettre les paramètres de production et les traitements antimicrobiens.

Vaccination procedures in today´s pig production are time consuming and labor intensive. The potential for new inventions in this area therefore warrants consideration. Although the concept of intradermal (ID) vaccination is well-established in veterinary medicine,[1,2] few practical applications have been developed until recently. In 2013, the first generation of a device (IntraDermal Application of Liquids [IDAL]; Henke Sass Wolf for MSD Animal Health) allowing needle-free, ID vaccination of pigs became available in Denmark. Only a small volume can be injected ID, therefore this vaccination method requires specially developed vaccines. In 2016, an ID vaccine for protection against porcine circovirus type 2 (PCV2) infection (PORCILIS PCV ID; Intervet International B.V.) was marketed as demonstrating reduced mortality and improved average daily gain (ADG) compared to unvaccinated pigs.[3] Subsequently, the interest for the method has increased.

A couple of studies have demonstrated improved animal welfare by using the needle-free, ID vaccination method compared to the traditional, intramuscular (IM) method using a needle and syringe.[4,5] Also, farmers' feedback gives the impression that the vaccination procedure duration is shortened

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This article is available online at **http://www.aasv.org/shap.html**.

Ellegaard B, Korsgarrd J, Nielsen GB. Comparison of intradermal and intramuscular porcine circovirus type 2 vaccination methods concerning labor, production parameters, and antimicrobial treatments: A randomized field study in a Danish finishing herd. *J Swine Health Prod.* 2021;29(3):129-132.

with the ID method because injection at a specific site is not required (such as behind the ear for the IM method). This impression was supported by one study demonstrating a 6-second shorter procedure per piglet for ID versus IM vaccination methods.[6] The present study aims to clarify if this advantage of the ID method also exists when vaccinating older pigs for PCV2. Although improved animal welfare and reduced labor costs are important for pig production, the efficacy of the administered vaccine must not be compromised in the pursuit. The study objectives were to compare the duration of ID and IM PCV2 vaccination procedures for growing pigs while monitoring production parameters and antimicrobial treatments in the subsequent growing-finishing period.

Materials and methods

Herd characteristics

All animals were under veterinary oversight and care and feed, water, and environment met the Ministry of Environment and Food of Denmark requirements. Pigs and their environment were monitored daily by caretakers. All feed rations were formulated to meet or exceed normal nutritional recommendations for swine. The genetic line was Landrace-Yorkshire-Duroc with all pigs originating from the same sow herd. The study was conducted from December 2015 to April 2016 in a PCV2-positive Danish finishing herd producing 20,000 pigs per year. Prior to the study, active PCV2 infection was confirmed by a moderate level of viremia (4 to 6 $\log_{10}$ PCV2 copies/mL) analysed by quantitative polymerase chain reaction[7] at Technical University of Denmark, National Veterinary Institute in Copenhagen. The farm had a total of 8 rooms, each containing 16 double pens with 36 to 38 pigs per pen. A liquid feed system was present with 2 adjacent, single pens sharing a feed chute (a double pen). Feed conversion rate (FCR) was an outcome parameter and so double pen was the statistical unit of the study. For simplicity, the double pen statistical unit is hereafter referred to as pen. During the study, standard farm procedures including all-in, all-out management of rooms, weight- and gender-based sorting of pigs on arrival, and a 3-day treatment with tylvalocin (Aivlosin; Salfarm Danmark A/S) against *Lawsonia intracellularis* starting 5 days after arrival were maintained. Apart from this initial group treatment, all antimicrobial treatments were given as individual injection treatments.

Study design

The study was conducted over 6 months as a parallel group study and included 8 batches of pigs, each containing 600 pigs weighing approximately 30 kg, arriving 1 week apart. Each batch was allocated to 1 room and sorted by herd personnel to pens based on gender and weight. The following day, pen total start weight was recorded and pens were allocated randomly by dice rolling to ID or IM treatment groups balanced for gender, start weight, and number of pigs per pen to account for potential confounding effects of these variables.

Then, pens of pigs were vaccinated by the ID or IM method according to group allocation. For ID PCV2 vaccination, 0.2 mL of PORCILIS PCV ID (MSD Animal Health) was administered using the IDAL second generation device. For IM PCV2 vaccination, 1 mL of Ingelvac CircoFLEX (Boehringer Ingelheim Vetmedica GmbH) was administered by needle and automatic syringe (Eco-Matic; Henke Sass Wolf). The same caretaker performed all vaccinations following the same procedure for both methods, one pen at a time. More specifically, all pigs in a pen were restricted to a small area to avoid inexpedient movements during vaccination. Intramuscular vaccination was performed by injecting the vaccine right behind the ear. Intradermal vaccination was performed on the dorsal part of the pig between the neck and the rump. Duration of the vaccination procedure was measured using a stopwatch and comprised the time span between the first and the last pig of the pen being vaccinated and included bottle and needle replacements. For the IM group, routine needle replacement occurred approximately every 20 vaccinations.

During the finishing period, the death or antimicrobial injection treatments of individual pigs were recorded at pen-level by herd personnel daily. Herd personnel also selected pigs for slaughter based on a visual evaluation of live weight (approximately 110 kg). The study period ended when more than 10 pigs in a room had been selected for slaughter, at which point all remaining pigs in the room were weighed pen-wise as a group to obtain a pen total end weight. Pigs selected for slaughter were weighed individually and their weights subsequently added to the pen total end weight. Similarly, individual weights of pigs that died or were moved to the hospital room during the study were added to pen total end weight. All weights were recorded by herd personnel.

Data collection and analysis

Feed consumption during the study period was obtained from the feed computer and measured as feeding units (FU), where one FU represented 7.38 MJ.[8] Hence, FCR = total FUs administered to the pen ÷ (pen total end weight - pen total start weight). For each pen, ADG = pen total weight gain ÷ sum of study days for the individual pigs in the pen. For mortality, transfer to hospital room, and sent to slaughter, the sum of occurrences per pen for each variable was calculated from the pen-level records. Similarly, individual pig antimicrobial injection treatments were recorded daily at pen level and the sum of study days any pig in a pen received an injection treatment was calculated resulting in a unit measurement of d/pen for antimicrobial injection treatments.

Depending on normality distribution of the data, comparisons between groups for quantitative variables were made using the Wilcoxon rank sum test (duration of vaccination procedure and days of antimicrobial injection treatments) and Student *t* test (start weight, FCR, and ADG). Comparisons between groups for qualitative variables were made using the Fisher exact test (mortality, transfer to hospital room, and sent to slaughter). The significance level was set at $P = .05$, however, due to 8 comparisons on the same dataset, the significance level was adjusted to $P = .006$ (Bonferroni adjustment). All statistical analyses were performed in R.[9]

Results

The study included 4732 pigs distributed across 128 pens and arrived in eight batches. Table 1 shows the allocation of pigs to the two groups at study start, the number of pigs that died, were transferred to the hospital room, or sent to slaughter during the study. No significant differences between the ID and the IM groups were found for the number of pigs that died, were transferred to the hospital room, or were sent to slaughter due to a faster growth rate compared to their batch counterparts.

Table 1: Group allocation of pigs at study start and results for qualitative outcome variables in a field study comparing ID and IM PCV2 vaccination methods

	ID group	IM group	*P* value
Total No. of pigs	2363	2369	-
No. of pens	64	64	-
Pigs/pen, mean	36.9	37.0	-
Pen start weight, mean (SD), kg	30.35 (3.90)	30.03 (3.88)	.64*
Mortality, No.	25	26	.99†
No. pigs moved to hospital room	122	113	.58†
No. pigs slaughtered	50	40	.33†

* Student *t* test.

† Fisher exact test.

ID = intradermal; IM = intramuscular; PCV2 = porcine circovirus type 2.

Table 2: Pen-level summary statistics of quantitative outcome variables in a field study comparing ID and IM PCV2 vaccination methods

Quantitative variable	Group	Mean (SD)	Median	Minimum	Maximum	*P* value
Duration of vaccination procedure, s/pen	ID	188 (48)	196	87	323	< .001*
	IM	225 (30)	224	154	299	
Pen FCR, FU/kg	ID	2.50 (0.10)	2.50	2.24	2.76	.68†
	IM	2.51 (0.12)	2.51	2.28	2.88	
Pen ADG, g	ID	1047 (41)	1042	948	1159	.76†
	IM	1044 (47)	1048	915	1158	
Antimicrobial injection treatments, d/pen	ID	32.6 (17.9)	27.5	5.0	84.0	.42*
	IM	30.1 (17.0)	26.5	1.0	78.0	

* Wilcoxon rank sum test.

† Student t test.

ID = intradermal; IM = intramuscular; PCV2 = porcine circovirus type 2; FCR = feed conversion rate; FU = feeding units; ADG = average daily gain.

Quantitative variable results are displayed in Table 2. Only the duration of the vaccination procedure was significantly shorter for the ID group, whereas productivity parameters and days of antimicrobial injection treatments did not differ significantly between the groups.

Discussion

This field study demonstrated that, for growing pigs, vaccination by the ID method using the IDAL device could be performed in less time than by the IM method using needle and automatic syringe without compromising production parameters or days of antimicrobial injection treatments. The mean duration for the ID vaccination procedure was 37 seconds shorter per pen and was likely due to needle changes and higher freedom of choice regarding the injection site. The time savings at pen level correspond to approximately 1 second/pig, which, for this herd, would be around 10 minutes/batch, 6 hours/year, or kr1.400/year (US $220/year) based on standard hourly rates for a Danish farmer. Costs of the different methods are also important to consider. In this particular herd, the cost of having an IDAL was $0.02/pig, which is similar to the cost of automatic syringes and disposable needles ($0.02 to $0.04/pig depending on the lifetime of the syringe and the frequency of needle replacement). Other less cost-driven considerations should also be taken into account when selecting vaccine administration method, such as increased animal welfare and reduced pathogen transfer, which has previously been demonstrated for needleless methods.[4,5,10]

The statistical analyses were kept at a basic level because the study design controlled for most potential confounders, such as gender, weight, and number of pigs per pen. The potential confounding effect of batch was mitigated by distributing groups evenly in every batch. More advanced statistics, such as mixed models, could be relevant, but results are unlikely to be influenced significantly considering the very high *P* values for most outcomes. As the study was only conducted in one herd, however, the results cannot be considered applicable for the pig population in general. Also, comparison of vaccination methods should

preferably be done with the exact same product administered both ID and IM, respectively. However, that was not possible using commercially available PCV2 vaccines. Finally, although the ID method in this study offered a quicker vaccine administration, care should always be taken to ensure correct application of the vaccine.

Implications

Under the conditions of this study:

- Intradermal vaccination method could reduce vaccine-related labor input.
- Intradermal vaccination method could reduce salary expenses.
- Productivity and antimicrobial use did not differ between ID and IM methods.

Acknowledgments

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Conflict of interest

Drs Ellegaard and Nielsen are employed by MSD Animal Health Nordics. Dr Korsgaard was the study initiator and all outcome parameters were objectively measured either by an electronic system (time recorder, weights, feed consumption) or performed by herd personnel.

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Survival and transmission of swine influenza A virus within and between farms

Robert Desrosiers, DVM, Dipl ABVP

Summary

Influenza A virus in swine (IAV-S) survives for a short period within the host, and its survival outside the host does not seem to be a significant obstacle to elimination attempts. Virus circulation within sow farms appears to be related mainly to suckling piglets and recently introduced gilts. Three important ways IAV-S is introduced into sow herds are infected pigs, infected humans, and aerosol. Elimination of IAV-S virus in sow herds should be easier than for porcine reproductive and respiratory syndrome virus, and it is possible to remain negative for IAV-S on a long-term basis.

Keywords: swine, influenza, survival, transmission, prevention

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Resumen - Supervivencia y transmisión del virus de la influenza porcina A dentro y entre granjas

El virus de la influenza A en los cerdos (IAV-S) sobrevive durante un breve período dentro del hospedador, y su supervivencia fuera del hospedador no parece ser un obstáculo significativo para los intentos de su eliminación. La circulación del virus dentro de las granjas de cerdas parece estar relacionada principalmente con los lechones lactantes y las primerizas recientemente introducidas. Tres formas importantes de introducir el IAV-S en las granjas de cerdas son cerdos infectados, los seres humanos infectados, y el aerosol. La eliminación del virus IAV-S en las granjas de cerdas debería ser más fácil que para la del virus del síndrome reproductivo y respiratorio del cerdo, y es posible seguir siendo negativo para el IAV-S a largo plazo.

Résumé - Survie et transmission du virus de la grippe porcine A à l'intérieur et entre les fermes

Le virus de l'influenza A chez le porc (IAV-S) survit pendant une courte période au sein de l'hôte, et sa survie à l'extérieur de l'hôte ne semble pas être un obstacle important aux tentatives d'élimination. La circulation du virus dans les fermes de truies semble être principalement associée aux porcelets allaités et aux cochettes récemment introduites. Les porcs infectés, les humains infectés, et les aérosols sont trois façons importantes d'introduire l'IAV-S dans les troupeaux de truies. L'élimination du virus IAV-S dans les troupeaux de truies devrait être plus facile que pour le virus du syndrome reproducteur et respiratoire porcin, et il est possible de rester négatif à long terme pour l'IAV-S.

Influenza A virus in swine (IAV-S) is one of the most common and significant respiratory pathogens of swine. Most swine herds in North America are infected with IAV-S or will become infected at one point in time. Remaining IAV-S negative is a challenge given current ways of raising pigs. This commentary addresses two aspects related to the epidemiology of IAV-S, survival and transmission of the virus and the possibility to become and remain negative for this virus.

Survival inside the host

On an individual basis, pigs do not shed and remain carriers of IAV-S for long. Most studies could only detect the virus from a few days to about a month after infection.[1-3] Compared to other viruses, this is a short carriage period. Porcine reproductive and respiratory syndrome virus (PRRSV), another important pathogen of swine, could be isolated at 157 days and identified by polymerase chain reaction (PCR) up to 251 days after experimental infection.[4,5] On a group basis, all animals do not become infected at the same time. Consequently, the survival within a population of pigs will be longer than for an individual animal. Allerson et al[6] showed that the virus could be detected by PCR in oral fluids up to 42 days after the first day clinical signs of IAV-S were observed. On another farm where pigs were found to be infected 2 days post weaning, the virus was identified in oral fluids up to day 71 post weaning. Since detection was done by PCR and not virus isolation or bioassay, it is not known if the virus detected was infectious. More work is needed to determine how long groups of pigs can remain a source of infection for negative animals in different field situations.

Survival outside the host

The environmental survival of influenza viruses can differ due to differences in temperature, relative humidity, type of matrices, presence or absence of organic matter, and the strain of virus tested.[7-11] The 2009 novel influenza A (H1N1) virus (H1N1pdm09) survived at least 600 days in water at 4°C, but less than 14 days at 35°C.[9] Using a different strain of the same influenza A H1N1pdm09 virus, Greatorex et al[10] reported that live virus recovery had fallen below the detection

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Desrosiers R. Survival and transmission of swine influenza A virus within and between farms. *J Swine Health Prod*. 2021;29(3):133-138.

level 24 hours after application to surfaces tested, including glass, plastic, and stainless steel. Bøttner and Belsham[11] were able to recover live IAV-S in slurry kept at 5°C for 9 weeks, for 15 days at 20°C, and for > 24 hours (not specified more in the document) at 35°C. Finally, a study comparing the survival time of various swine viruses in feed ingredients showed that IAV-S could not survive a period of 37 days in any of the ingredients tested. However, PRRSV was found to still be alive at that time in conventional soybean meal, and in dried distillers' grains with solubles.[12] Given the large range in data concerning the survival time of the virus in the environment, there is a need for more information specific to farm conditions. Nevertheless, it is possible to eliminate IAV-S without depopulating the herd, which should suggest that survival of the organism in the environment is not a major obstacle in terms of elimination attempts.

Transmission within the farm

Different studies suggest that recently introduced gilts and suckling piglets are the main reservoirs that allow IAV-S circulation to be maintained in sow herds.[13-17] In the case of piglets, it was shown in an experimental study that cross fostering, a procedure used in virtually all sow herds, was a way by which the virus can be transmitted in farrowing barns.[18] Since the virus can survive for a certain period in the environment, contaminated air or fomites would seem to be other possible ways pigs can become infected. Tests conducted in infected herds have shown that oral fluids and air samples were positive for virus by both PCR and virus isolation, while pen railings and doors were found positive for virus by PCR only.[19] In another study where environmental contamination was evaluated, oral fluids, udder wipes, surface wipes, air, and airborne deposited particle samples were positive for virus by both methods of detection.[20] Similarly, Wright et al[21] detected viral RNA on 75 of 400 (18.75%) inanimate surfaces sampled at agricultural fairs during the summer of 2016, and viable virus was recovered from 7 of 75 (9.33%) positive samples. Allerson et al[22] showed in an experimental model that contaminated fomites could transmit the virus between infected and non-infected pigs. The same was shown in a guinea pig model where transmission was achieved using contaminated fomites, and even more easily by aerosol.[23]

Transmission between farms

Transmission of IAV-S between farms has not been thoroughly evaluated. The main potential or theoretical ways by which the virus may be introduced into swine herds would appear to be infected swine, aerosol, other animal species including humans, transport vehicles, fomites, feed, and water. Semen is not considered to be a way the virus can be introduced in a sow herd.[24] Insects could act as mechanical vectors, but evidence up until now is lacking to suggest that they play a significant role in the epidemiology of IAV-S infection in swine. The possible role of transport vehicles and fomites does not seem to have been critically evaluated either. The 2019 edition of *Diseases of Swine* does not mention them as possible sources of transmission.[25] Considering that the virus can survive in the environment for a while, it can be hypothesized that a truck transporting infected pigs just prior to transporting negative pigs could serve as a source of infection if washing and disinfection are not properly executed. Infected pigs are believed to be the most likely source of infection for swine herds.[25] However, some genetic companies have consistently delivered IAV-S-negative gilts from multiplier herds to commercial sow herds, yet many of these commercial herds have become infected in one way or another over the years (Desrosiers, unpublished information, 2020). So, indirect transmission of this virus is frequent, and it is particularly difficult in hog-dense areas to remain IAV-S negative.[26,27]

Some farms become repeatedly infected with different strains of IAV-S over time. In a study conducted over 5 years in 34 breed-to-wean farms of a commercial system, 41%, 18%, and 21% of the farms had 1, 2, and 3 different strains identified, respectively, over the course of the study.[28] One possible reason for this is that aerosol may be a significant source of transmission and different epidemiological studies point in that direction.[29-32] Species other than swine can serve as potential sources of transmission. The virus can infect feral swine, domestic turkeys, free-ranging waterfowl, and most importantly, humans.[25] The first three are not present in modern swine farms and would thus not constitute direct sources of transmission unless the pigs have outdoor access. Theoretically, pigs may indirectly become infected if something coming from the outside became contaminated by one of these other species and was then introduced into the barn. For example, since there are indications that the virus may survive for long periods in water, farms using surface water could introduce the virus if feral swine or waterfowl also had access to the water source.[9] Karasin et al[33,34] suggested that this is what happened in two cases where pigs from the same Ontario farm became infected with avian influenza strains (H4N6 and H3N3) on two different occasions. The farm occasionally used water from a lake where waterfowl had access. At this time, animal species other than swine are not considered significant factors in influenza virus introduction in North American swine farms. Humans, on the other hand, can be.

Performing a comprehensive phylogenetic analysis of 1404 whole-genome sequences from IAV-S collected from 1931 to 2013, Nelson et al[35] concluded that human-to-swine transmission occurred frequently over this period. However, it is really since 2009 with the emergence of the influenza A H1N1pdm09 virus that this situation has become much more obvious. Soon after the initial spread of this virus in the human population, the virus was detected in pigs and since then transmitted from humans to pigs throughout the world.[36] Norway has adopted an ongoing annual serosurveillance of IAV-S since 1997, and all results had been negative prior to the incursion of the influenza A H1N1pdm09 virus in October 2009. Cases of influenza A H1N1pdm09 virus in swine occurred soon after the first human cases caused by the same virus were diagnosed in the country.[27] Within a few months, more than one third of the herds had antibodies against the virus. The results of an epidemiological study showed that the most important risk factor associated with introduction of influenza A H1N1pdm09 virus to swine herds in the initial phase of the outbreak was the presence of farm staff with influenza-like illness before the pigs became infected. This was the case in 12 of 14 nucleus and multiplier herds. The authors concluded that the rapid and widespread seroconversion against the virus could be explained by the emergence of a novel virus that is readily transmitted between people and swine in a largely susceptible population of humans and an entirely naïve population of pigs.[37]

While this still needs to be scientifically quantified, the information currently available suggests the 3 important ways IAV-S is introduced into hog barns are infected swine, infected humans, and aerosol. As with several other significant swine pathogens, the relative importance of the various ways swine farms are becoming infected with IAV-S has not been evaluated.[38] Without quantification of the different possible transmission routes, it is difficult to know how to prioritize control efforts.

Discussion

In North America, remaining negative to IAV-S is difficult. The virus can be introduced into swine farms by infected pigs, infected humans, and by different indirect ways.[22,25] Nevertheless, some Canadian herds in Quebec have remained negative to this virus for long periods, some many years or decades. Most if not all these farms are in areas with very few pigs, so location and distance to infected pigs appear to be critical factors to consider. Table 1 shows characteristics associated with some of these herds that have remained free of the virus for many years. (R. Boutin, DVM, email, July 2020; B. Boucher, DVM, email, July 2020; and M. St-Hilaire, DVM, email, July 2020).

Farm A was a single site, farrow-to-finish multiplier. Blood samples were taken at the end of finishing twice a year between 1990 and 2008 and had always been IAV-S negative. It became a commercial herd in 2008 and remained as such until 2015. Blood samples were not taken during this period but based on absence of clinical signs and diagnosis of the condition, both the producer and practitioner believe the negative status was maintained. The farm was changed again in 2015 to a 6000-head finishing site and began introducing pigs from outside sources. The IAV-S status from 2015 to the present is unknown. When sows were present on site, this herd purchased gilts from a nucleus herd 6 times a year, and IAV-S-negative blood samples were requested before the gilts were introduced into the multiplier.

Similarly, farms B to F tested gilts in quarantine before introducing them into the sow herds. On the two occasions where gilts were found to be seropositive, they were kept in quarantine for an extra month to ensure that they would not be infectious at the time of introduction. The IAV-S-negative status of the sow herds was based on absence of clinical signs in the sow herds and progeny, absence of influenza diagnoses from submissions made to the laboratory when health problems occurred, as well as PCR tests in oral fluids, serological tests conducted in late nursery aged piglets, or both.

Farms G to N belong to the same organization, which had a routine IAV-S monitoring program up until 2015 but discontinued the program given the consistent negative results and for cost reasons. From 2015 to the present, the IAV-S-negative status was based on absence of clinical signs in the sow herds and progeny and absence of influenza diagnoses from submissions made to the laboratories when health problems occurred. In the few instances where clinical signs suggestive of IAV-S were observed in the sow herds, serological results confirmed that the farms had remained negative for IAV-S.

The tests used to evaluate the IAV-S status of these farms varied over time. Initially, the serological tests available were inhibition hemagglutination (IHA) or enzyme-linked immunosorbent assay (ELISA) tests specifically targeting H1N1 or H3N2 strains. The practitioners responsible for supervision of the herds in Table 1 switched the test to an ELISA reported to cover all strains of influenza A virus (IDEXX AI Multi-Screen Ab Test; IDEXX) after it became available in Canada in 2011. The exception was farm A, for which H1N1 and H3N2 IHA tests were used during the whole period. As for identification of the organism or its genetic material, virus isolation was replaced by PCR tests when local laboratories began to offer them towards the end of the 2000s.

Table 1: Characteristics of some swine farms in Quebec, Canada that have remained IAV-S-negative for many years

Practitioner	Farm	Type of farm	# sows	Distance to pigs*	IAV-S-negative period
1	A	Farrow-to-finish	500	8 km	1990-2015
2	B	Farrow-to-wean	600	3 km	2005-2017
	C	Farrow-to-wean	600	6 km	2012-2020
	D	Farrow-to-wean	780	4 km	2012-2020
	E	Farrow-to-wean	1200	10 km	2014-2020
	F	Farrow-to-wean	2375	12 km	2016-2020
3	G	Farrow-to-wean	550	> 10 km	2016-2020
	H	Farrow-to-wean	550	> 10 km	2003-2020
	I	Farrow-to-wean	550	> 10 km	2003-2020
	J	Farrow-to-wean	600	> 10 km	2003-2020
	K	Farrow-to-wean	1100	5.4 km	2017-2020
	L	Farrow-to-wean	450	> 10 km	2016-2020
	M	Farrow-to-wean	550	> 10 km	2017-2020
	N	Farrow-to-wean	800	> 10 km	2015-2020

* Distance of the sow herd to the closest positive pigs or pigs of unknown IAV-S status as estimated by the practitioner.

Based on the experience of the individual farms reported in Table 1, it is possible to remain negative for IAV-S on a long-term basis. Remaining IAV-S negative has also been possible on a regional or country basis. Although no active surveillance program is used to prove absence of the virus, no cases of IAV-S have been diagnosed in herds on Prince Edward Island, Canada for several years (D. Hurnik, DVM, email, December 2019). However, it must be acknowledged that the province has fewer than 20 swine production sites and distance between farms is greater than what is observed in hog-dense areas. Norway does not have a large swine industry, but its 85,000 sows remained negative for IAV-S for 12 years (1997-2009).

Remaining negative to IAV-S is possible. While other possibilities for introduction, like transport vehicles, exist and may eventually be shown to be significant, three important ways the virus can be introduced into sow herds would appear to be infected gilts, aerial spread, and infected people. Controlling these sources of infection is feasible. For sow herds considering maintaining an IAV-S-negative status, the three main criteria to consider given the current knowledge are introduction of only non-infected gilts; locating these herds away from hog-dense areas or using efficient air filtration systems; and ensuring that personnel or visitor entrance policies reduce the risk of infected people entering the premises, understanding that subclinically infected people may introduce the virus.

Even if a herd is or becomes IAV-S positive, it should theoretically be easier to eliminate this virus in sow herds than it is to eliminate PRRSV. Pigs can remain carriers of the latter much longer than for IAV-S, so a shorter period of herd closure should be needed to eliminate IAV-S than would be needed for PRRSV elimination. Unlike PRRSV, IAV-S rarely crosses the placental barrier, so pigs do not usually become infected *in utero*. Van Reeth and Vincent[25] stated that IAV-S is unlikely to spread outside the respiratory tract. In a few studies, feces, intestines, or spleen occasionally tested positive by PCR, but virus-positive cells have reportedly not been demonstrated outside the respiratory tract.[25] If virus circulation can be stopped in farrowing, and if a herd closure is implemented, the two main sources of viral maintenance of IAV-S in sow herds would seemingly be addressed.

There are situations where the virus was eliminated from sow herds and from single site, farrow-to-finish operations without using any special strategies. In one such operation, the previously naïve herd became infected. It was closed to any introductions from the outside, but sows farrowing each week were producing piglets that were eventually susceptible to infection. Yet, the virus was eliminated from this single site, farrow-to-finish farm in that particular case and on two other occasions involving different IAV-S strains (R. Boutin, DVM, email, November 2019). This was done without vaccines or any significant changes in management. A similar situation was reported by Mueller and Theis[39] where another small, single site, farrow-to-finish operation that was previously negative became infected in November 2012. Viral circulation stopped in 2013 without any special interventions, and the farm has remained negative since then. In another study, elimination of both porcine respiratory coronavirus and IAV-S was achieved when two sow herds adopted a 4-week batch farrowing system, which allowed having no suckling piglets in the farrowing barn every month, and the use of an autogenous vaccine.[40] Thomson et al[41] were able to eliminate IAV-S in three 5000-sow herds using a program based on whole herd vaccination, herd closure, and partial depopulation. Torremorell et al[42] went from introducing gilts monthly or bimonthly to every four months and, coupled with a partial depopulation program, eliminated IAV-S from a 1200-sow three-site system. Finally, Lower[43,44] described a protocol to eliminate IAV-S from sow herds that included herd closure (12-16 weeks) and management strategies to prevent infection of piglets in farrowing barns. This protocol is reported to have produced good and repeatable results for 8 years.

While both theoretical and practical data suggest that eliminating IAV-S is easier than eliminating PRRSV, more information is needed before conclusions can be reached on the best ways to eliminate the virus, the success rates obtained, the time it takes, and the cost it incurs. Similarly, more data is needed to confirm and quantify the factors, other than location, that may allow some farms to remain negative on a long-term basis.

A last point to consider is the potential for IAV-S to become a significant issue in human health because of mutations or reassortments. Therefore, producing pigs that are not infected with this virus would seem to be a sensible objective not only for performance, but also for public health.

Implications

- Survival and transmission of IAV-S are not insurmountable obstacles.
- It is possible to maintain IAV-S-negative sow herds.
- More consideration should be put on the production of IAV-S-negative pigs.

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Conflicts of interest

None reported.

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* Non-refereed references.

Conversion tables

Weights and measures conversions

Common (US)	Metric	To convert	Multiply by
1 oz	28.35 g	oz to g	28.35
1 lb (16 oz)	0.45 kg	lb to kg	0.45
2.2 lb	1 kg	kg to lb	2.2
1 in	2.54 cm	in to cm	2.54
0.39 in	1 cm	cm to in	0.39
1 ft (12 in)	0.3 m	ft to m	0.3
3.28 ft	1 m	m to ft	3.28
1 mi	1.6 km	mi to km	1.6
0.62 mi	1 km	km to mi	0.62
1 in^2	6.45 cm^2	in^2 to cm^2	6.45
0.16 in^2	1 cm^2	cm^2 to in^2	0.16
1 ft^2	0.09 m^2	ft^2 to m^2	0.09
10.76 ft^2	1 m^2	m^2 to ft^2	10.8
1 ft^3	0.03 m^3	ft^3 to m^3	0.03
35.3 ft^3	1 m^3	m^3 to ft^3	35.3
1 gal (128 fl oz)	3.8 L	gal to L	3.8
0.26 gal	1 L	L to gal	0.26
1 qt (32 fl oz)	0.95 L	qt to L	0.95
1.06 qt	1 L	L to qt	1.06

Temperature equivalents (approx)

°F	°C
32	0
50	10.0
60	15.5
61	16.1
65	18.3
70	21.1
75	23.8
80	26.6
82	27.7
85	29.4
90	32.2
102	38.8
103	39.4
104	40.0
105	40.5
106	41.1
212	100.0

°F = (°C × 9/5) + 32
°C = (°F - 32) × 5/9

Conversion calculator available at: amamanualofstyle.com/page/si-conversion-calculator

Conversion chart, kg to lb (approx)

Pig size	Lb	Kg
Birth	3.3-4.4	1.5-2.0
Weaning	7.7	3.5
	11	5
	22	10
Nursery	33	15
	44	20
	55	25
	66	30
Grower	99	45
	110	50
	132	60
Finisher	198	90
	220	100
	231	105
	242	110
	253	115
Sow	300	136
	661	300
Boar	794	360
	800	363

1 tonne = 1000 kg
1 ppm = 0.0001% = 1 mg/kg = 1 g/tonne
1 ppm = 1 mg/L

PQA Plus v5 – coming June 2022

Program revision work is well underway for the next version of PQA Plus! Subject matter experts will review the handbook content and revise and update as appropriate. Guided by the PQA Plus Task Force, and input from trainers and advisors, additional enhancements will be made to training materials. The format introduced with v4 will remain, that being, training resources geared for new or renewal certifications. Additional modules are in development to enlarge the library of training materials. Training for PQA Plus Trainers will occur in February and March of 2022. Trainers can then plan to train PQA Plus Advisors beginning next March and through the following spring and summer months.

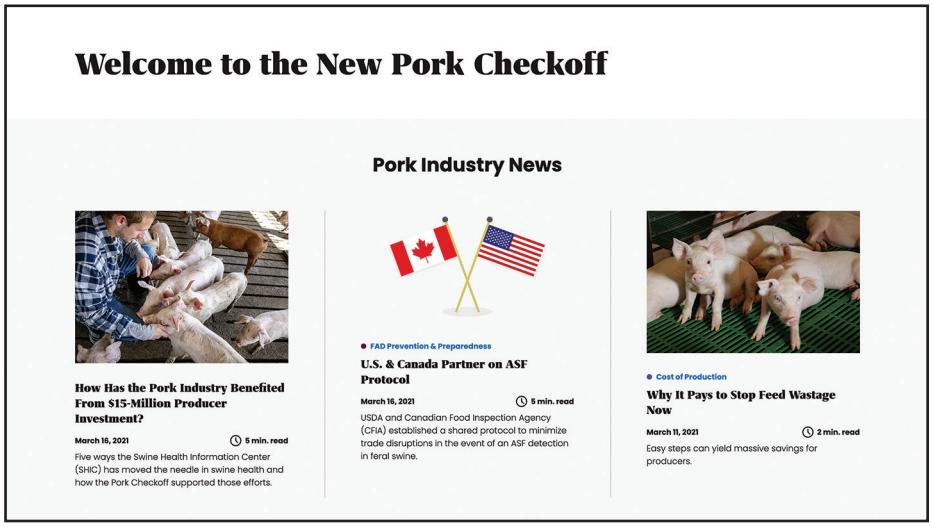
PQAPLUS®
Our Responsibility. Our Promise.

Humane Animal Handling modules available

The Humane Animal Handling online training module series describe the correct methods of handling pigs of all sizes. Real-life scenarios are used to guide the learner step-by-step through common problems that may arise in handling. This resource is available online, in both English and Spanish on the National Pork Board's Learning Management System (LMS). Courses are accessed through self-enrollment and do require a user login for the LMS. The modules are also available in USB format by sending a request to **info@pork.org**.

Pork Checkoff websites get makeovers

The National Pork Board has recently unveiled two new websites. After input from users and various stakeholders, a decision was made to separate pork production information from consumer-focused information. **Porkcheckoff.org** will be the go-to online hub for producers to access certifications, training resources, finding tools for their farms, and paying their Checkoff assessment. Although existing links will be redirected for a time, everyone should update their bookmarks to **porkcheckoff.org**. Meanwhile, consumer-focused pork information will be hosted at **pork.org**. The new look and feel of the site should allow consumers easy access to all things pork. This includes cuts, cooking methods, health and nutrition information, recipes, and more. The Learning Management System, (**lms.pork.org**), which is the comprehensive certification site, is not affected at this time.



NPB news continued on page 141

Introducing

EASE™

Enhanced Antigen Surface Expression

by Phibro Animal Health

A new and improved bacterial growth procedure for Autogenous Vacccines

Phibro is implementing the use of EASE technology to grow bacteria such as *Salmonella spp.*, *E. coli* and other Gram-negative organisms for production of autogenous vaccines.

- EASE results in an upregulation of proteins on the bacterial surface in its natural form.
- EASE ensures a higher ratio of immunogenic proteins to other superficial proteins leading to a more focused immune response from the host animal.
- EASE implementation leads to a more defined vaccine product.

*Potency and efficacy of autogenous biologics have not been established.
Phibro Autogenous Vaccines are developed with MVP Adjuvants®

Phibro ANIMAL HEALTH CORPORATION™

NPB news continued from page 139

AgView to be highlighted at World Pork Expo

AgView, the new software-based technology solution from the National Pork Board, will be featured at the Pork Checkoff booth in the Varied Industries Building at the World Pork Expo in Des Moines in June. Visitors will see how the tool will provide near real-time health and movement status to help the US pork industry to rapidly conduct contact-tracing to contain or regionalize a foreign animal disease outbreak such as African swine fever. Likewise, visitors will see how AgView can help facilitate pig movement among its users during such outbreaks to help achieve business continuity. For more information online, visit **porkcheckoff.org/agview** or go to **agview.com**.

Secure Pork Supply now includes resources for animals with outdoor access

The Secure Pork Supply (SPS) plan is a business continuity plan for pork producers in the event of a foreign animal disease outbreak in the United States. Producers who raise pigs with outdoor access now have new resources available to help them develop site-specific biosecurity plans, which they need to participate in SPS. These resources include a checklist and enhanced biosecurity plan template. For more information, visit **securepork.org**.

WHAT IF ALL THE LITTLE PIGS DON'T MAKE IT TO MARKET?

SPONSORED CONTENT

Dr. Pat Hoffmann, DVM and technical consultant for Elanco Animal Health, recognizes the importance of a proactive approach to swine respiratory disease (SRD) to stave off resulting economic impacts.

"What we forget sometimes is that impacts early on in the nursery will flow all the way to the finisher and to the packer," Hoffmann said. SRD is responsible for 44.2% of nursery mortalities, which equates to fewer pigs reaching finishing.[1] Pigs that do survive SRD can have lasting effects on their average daily gain (ADG) and overall finishing weight.[2] For every 10% of lung area affected, ADG decreases by 37.4 grams.[3] Mortality loss and decreased ADG cause an economic loss for producers in the nursery through to finish.[2] Attached lungs at the packer impact bottom lines, as well.[4]

SRD in the nursery is prevalent due to the stress of weaning, transportation, and co-mingling.[5] Hoffmann stated that, "One of the earliest, objective signs of SRD that I like to watch for is a drop in 24 hour water consumption. Many times that will indicate something is wrong before clinical symptoms become apparent." Those clinical symptoms may include lethargy, coughing, sneezing, nasal and ocular discharge, thumping, fever and reduced feed intake.

According to Hoffmann, the prevalence of SRD means we must be alert. "The first thing I want to understand are any issues with air, water and feed and get that addressed. If the pigs experience stress, they will be more susceptible to pathogens as they move through the barn."

Even with minimal stress, some level of SRD challenge is still likely to appear. When deciding which treatment option is best, Hoffmann recommended looking at the disease situation. "In my experience as a veterinarian, I rely on differential diagnoses that match my clinical experience, the diagnostic history of the flow, and sensitivities to the pathogens that I am addressing." Depending on the clinical signs, incidence rates, and overall sense of urgency, first choice will be injectables for individual pig treatment and then water solubles or feed additives for whole herd treatment.

"An early response to SRD is not only key to minimize morbidity and mortality, but also maximize growth performance and feed conversion of the group all the way to the packer," Hoffmann said.

"Getting ahead of a challenge and making sure you're choosing the right treatment solution is critical. Use every resource at your disposal to get the Full Value out of every pig."

Read more about SRD impacts from nursery to packer at www.porkbusiness.com/opinion/making-every-pig-count

[1]USDA 2007. Swine 2006 Part I: Reference of Swine Health and Management in the United States, 2006. Fort Collins, CO: USDA APHIS: VS, CEAH. Publication N475.1007. [2]Qin, S., et al. Viral communities associated with porcine respiratory disease complex in intensive commercial farms in Sichuan province, China. Sci Rep 8, 13341 (2018). [3]Straw B., et al. Estimation of the cost of pneumonia in swine herds. Jour of Amer Vet Med Assoc. 1989. 195(12):1702-1706. [4]Keenliside, J. 2005. Preventing carcass losses. The Pig Site. Retrieved from: www.thepigsite.com/articles/preventing-carcass-losses. Accessed on Sept 20, 2019. [5]Brockmeier, S., et al. Porcine Respiratory Disease Complex. Polymicrobial Diseases. Washington (DC): ASM Press; 2002. Chapter 13. Accessed on January 19, 2021.

AASV installs 2021 officers

Dr Mary Battrell was installed as president of the American Association of Swine Veterinarians on March 2, 2021, during the association's 52nd Annual Meeting, held virtually. She succeeds Dr Jeffrey Harker, who is now immediate past president. Dr Michael Senn has ascended to president-elect. The newly elected vice president is Dr William Hollis.

AASV President **Dr Mary Battrell** (ISU '95) was born and raised on a diversified crop and livestock family farm in Albany, Ohio. She earned a BS from The Ohio State University, an MS from the University of Tennessee, and her DVM and an additional MS from Iowa State University in 1995. She began her veterinary career in North Carolina working for Dr Fred Cunningham, followed by Brown's of Carolina, and then Pharmacia as a technical services veterinarian. Since 2000, Dr Battrell has worked for Smithfield Hog Production, where she is currently the staff veterinarian for Smithfield Hog Production's Central Region and is responsible for the health and well-being of 92,000 sows farrow-to-finish. She has been actively involved in the development of the Smithfield Animal Care Program and their contingency plan for a foreign animal disease. Dr Battrell has served on the AASV Pig Welfare and Pharmaceutical Issues Committees and was the 2018 recipient of the AASV Swine Practitioner of the Year Award.

When asked to comment on her thoughts about the future of AASV and her tenure as president, Dr Battrell said, "The AASV has a wonderful future. Each member has a voice and is truly empowered to direct the association's focus in our efforts to serve the pigs in our care and support those who produce them. In a year full of doubt and fear, it is great to know we have each other and the AASV creates the perfect opportunity for us to connect, learn, and grow. I am so very honored that you entrusted me to be this year's president and look forward to the association's continued success."

AASV President-elect **Dr Michael Senn** (KSU '91) was involved in agriculture as a youth and raised on a diversified livestock and crop farm in Kansas, where he continues as the 4th generation to operate the farm. Dr Senn credits his participation in 4-H and FFA with his passion for volunteerism and leadership. He has served AASV with two terms on the Board of Directors, as a committee member, as chair of the Foreign Animal Disease Committee (now Committee on Transboundary and Emerging Diseases), and as a student presentation judge. During his nearly 20-year career as a technical services veterinarian, he provided technical support for products and focused on clinical research, antimicrobial resistance monitoring, antibiotic regulatory issues, and emerging infectious disease surveillance. He continues to work as an independent consultant.

AASV Vice President **Dr William Hollis** (UIUC '96) was born in Bushnell, Illinois, where he attended high school. During 1986-1987, Dr Hollis served as the Illinois FFA president, and the National FFA vice president during 1988. He received a Bachelor of Science in agriculture and a Doctor of Veterinary Medicine (1996) from the University of Illinois. Dr Hollis is currently a partner and veterinarian of Carthage Veterinary Service (CVS), which consults in over 10 US states and several other countries. Dr Hollis was named the AASV Swine Practitioner of the Year in 2019. He is a Pork Quality

2021 AASV Officers

Dr Mary Battrell
AASV president

Dr Mike Senn
AASV president-elect

Dr William Hollis
AASV vice president

Dr Jeffrey Harker
AASV past president

Assurance Plus Advisor, served on the National Pork Producers Council Animal Health Food Security Policy Committee, and served on the National Pork Board Swine Health Committee. He has served on the American Veterinary Medical Association House of Delegates representing AASV and on the AASV Board of Directors representing District 5. Dr Hollis is an active participant in the National Pork Board Operation Main Street program giving local presentations to raise awareness about modern pork production.

Commenting on his upcoming role as vice president, Dr Hollis said, "I appreciate the opportunity to serve on the AASV exec team with my friends. With my background, I will speak up for the farmers, private practice veterinarians, and the patients we all serve."

Hollis and his wife, who is also a veterinarian, have been married 25 years and have raised two children.

AASV Past President **Dr Jeffrey Harker** (Purdue '94) grew up on a diversified livestock and grain farm near Waldron, Indiana. Active in 4-H and FFA as a youth, he received his FFA American Farmer degree in 1989. Since graduation from veterinary school, Dr Harker has worked exclusively in swine practice. He first joined Dr Max Rodibaugh at Swine Health Services as an associate veterinarian and then became a partner in 2001. Their practice (now AMVC Swine Health Services) is dedicated to swine and serves a diverse swine clientele ranging from small show pig herds to contract growers in integrated production. Dr Harker has served on the AASV Board of Directors, has represented AASV in the American Veterinary Medical Association House of Delegates, has served on the AASV Annual Meeting Planning Committee, and was the Indiana Pork Producers Association president. Dr Harker has also been involved with the National Pork Board Operation Main Street program since it began. Dr Harker was the 2017 recipient of the AASV Meritorious Service Award. He lives in rural Clinton County, Indiana, with his wife Traci and the younger two of their four children; their older two daughters live nearby, each with daughters of their own.

AASV proceedings online

The proceedings of the 2021 AASV Annual Meeting are available for members to download at **aasv.org/library/proceedings**. Current 2021 dues-paid status is required to access the files.

As in the past, the proceedings are available in the following formats:

- The "big book" of all the regular session papers in a single PDF file with a linked table of contents
- Seminar booklets: a PDF collection of the papers for each seminar
- An individual paper for each presentation is available in the Swine Information Library: **aasv.org/library/swineinfo/**

You will be prompted for your AASV website username and password to access the files. If you have forgotten your password, use the "Reset Password" link in the upper right of the AASV website (**www.aasv.org**) or contact the AASV office for assistance.

AASV holds its best virtual meeting ever

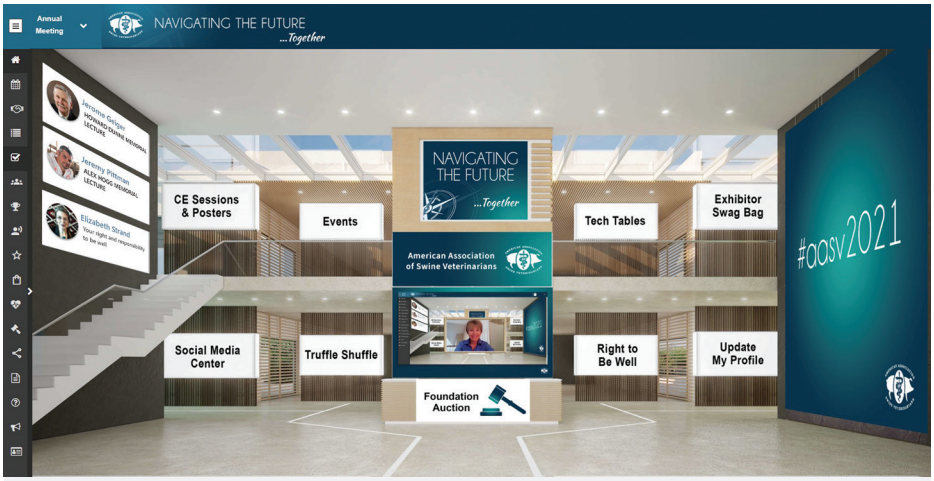
The American Association of Swine Veterinarians (AASV) held its 52nd Annual Meeting in what turned out to be the best virtual meeting the AASV has ever had.

The meeting drew 945 total attendees, including 551 paid registrants and 121 veterinary students. Twenty-seven countries were represented. The total attendance also included 229 exhibit representatives from 63 companies and organizations. Registration for the meeting and all content, available on-demand after the meeting, continued until April 30th.

Meeting participants enjoyed interacting with each other in live chat sessions and were able to ask speakers questions throughout their presentations. Featured presentations during the Monday morning session, including the Howard Dunne and Alex Hogg Memorial Lectures, as well as the AASV Foundation meeting, the AASV scholarship and research awards presentations, the annual AASV business meeting, and the grand finale were presented live.

The virtual format offered special conference bonuses. A single-day preconference registration allowed access to all that day's concurrent preconference seminar presentations, enabling access to the content of five seminars for the price of one. Because all educational sessions were recorded and available until April 30th, meeting participants had the first ever opportunity to attend all educational sessions, including 10 preconference seminars, 2 general sessions, 3 break-out sessions, 1 Research Topics session, 3 Industrial Partners sessions, the Student Seminar, and a poster session featuring posters from students, researchers, and industrial partners – for a total of 80 hours of on-demand continuing education!

Preconference seminars and concurrent sessions included topics about leadership, precision swine health, swine health and herd management through a pandemic, basics of swine production and breeding herd health, and special topics for students and early career veterinarians. The ever-popular practice tips session this year titled "We're all in this together," was judged by volunteers Drs Noel Garbes, Thomas Petznick, and Abby Vennekotter and chaired by Dr Melissa Billing. Dr Max Rodibaugh's inspirational story, "Life upside down: Is it possible to be prepared for a personal crisis," received the top prize, followed by Dr Pat Hoffmann, "Travel tips: A guide for the veterinary vagabond," and Dr Kayla Henness, "Pain in the astrovirus: An overview of clinical PoAstV3."



AASV 52nd Annual Meeting virtual lobby.

Dr Jerome Geiger, health assurance veterinarian with PIC and 2020 AASV Technical Services/Allied Industry Veterinarian of the Year, opened the Monday general session with the Howard Dunne Memorial Lecture. During his presentation, titled "Navigating the future, together," he reminded attendees of the many talented people in the AASV, shared some of AASV's accomplishments, and assured everyone that we will get through these challenging times by working together. He encouraged everyone to recognize and embrace their "why" of being a swine veterinarian and acknowledged his own why as the team of people that surrounds him.

Dr Jeremy Pittman, a veterinarian with Smithfield Hog Production and 2021 AASV Swine Practitioner of the Year, presented the Alex Hogg Memorial Lecture titled "Enhancing your brand: The value of lifelong learning, continuing education, and teaching to the swine industry." He urged attendees to be continual learners and better ourselves for the sake of the association and the swine industry, in remembrance of Dr Alex Hogg.

The Monday afternoon concurrent sessions challenged veterinarians to consider new tools to address persistent pathogens, animal welfare, and African swine fever. The Tuesday general session focused on lessons learned, and lessons we continue to learn, from the COVID-19 pandemic.

The virtual platform provided a quick view of #AASV2021 social media conversations on Twitter, Instagram, and Facebook. The virtual setting also allowed attendees to compete in the Truffle Shuffle to earn badges for their profiles and a chance to win gift cards or a copy of the 5th edition of the *Swine Disease Manual*.

The meeting ended with a special grand finale where the AASV Board of Directors officers reflected on this year's meeting. Dr Nathan Winkelman, 2019 AASV president, noted that this was his 39th consecutive year attending the AASV Annual Meeting, which may have been the best meeting yet.

During the grand finale, Dr Alex Ramirez, 2017 AASV president and 2021 AASV Awards Selection Committee chair, announced the recipients of AASV's prestigious awards: Swine Practitioner of the Year Award (Dr Jeremy Pittman), the Howard Dunne Memorial Award (Dr John Deen), the Meritorious Service Award (Dr Angela Baysinger), the Young Swine Veterinarian of the Year Award (Dr Chris Sievers), and the Technical Services/Allied Industry Veterinarian of the Year Award (Dr James Lehman).

The grand finale and meeting concluded with AASV Foundation Auction Chair Dr Chase Stahl's announcement of the winning bidders for the 15 featured items in the 2021 Foundation Auction.

Swine Practitioner of the Year

Dr Jeremy Pittman was named the 2021 Swine Practitioner of the Year by the American Association of Swine Veterinarians. The award is given to the swine practitioner who has demonstrated an unusual degree of proficiency and effectiveness in the delivery of veterinary service to clients.

Dr Pittman is a staff veterinarian for Smithfield Hog Production – North Region, which manages 140,000 sows farrow-to-finish in Northeastern North Carolina and Virginia. He also serves as adjunct faculty at the North Carolina State University (NCSU) College of Veterinary Medicine.

A Southport, North Carolina native, Dr Pittman graduated from NCSU in 2000 with degrees in zoology and animal science, and minors in nutrition and genetics, followed by a DVM in 2004. Partially funded by the AASV Foundation's Alex Hogg Memorial Scholarship, Dr Pittman received an MS from Iowa State University (ISU) in 2014. Dr Pittman is a Diplomate of the American Board of Veterinary Practitioners (Swine Health Management).

Dr Jeremy Pittman, recipient of the AASV Swine Practitioner of the Year Award.

Without a background in agriculture, Dr Pittman's path to veterinary medicine was inspired by educational opportunities coupled with extraordinary mentorship. Recognizing the impact of others on his own career, Dr Pittman's commitment to student mentorship is unprecedented. He has had a lasting and immense impact on students and early career veterinarians. Students have attributed their decisions to enter swine medicine to the mentorship Dr Pittman provided. Dr Pittman embodies the AASV values of science-based swine health and management, moving the industry forward while shaping future colleagues.

Highly respected and valued for expertise, Dr Pittman is frequently sought after as a volunteer. He serves on the Board of Directors for the Swine Health Information Center and the National Pork Producers Council. An active member of the AASV since joining as a student, Dr Pittman has served on several AASV committees, including program planning committee, and has co-chaired the student preconference session of the annual meeting for almost 10 years.

Dr Pittman has been recognized for his service and dedication by other organizations. He received the Science with Practice Award from ISU (2016), the Allen D Leman Science in Practice Award from the University of Minnesota (2015), the Virginia Pork Industry Service Award (2014), and the NCSU College of Veterinary Medicine Ben Harrington Food Animal Student Mentorship Award (2012). In 2011, he was named one of Pfizer's Top 10 Under 40 swine veterinarians.

Asked to comment about receiving this award, Dr Pittman replied, "I am honored to be recognized by my peers and colleagues in receiving the 2021 AASV Swine Practitioner of the Year Award. I am indebted to anyone and everyone who has mentored, supported, or even challenged me along the way in my career. My success has been largely due to all the people that I have interacted with along the way and the opportunities that I have been fortunate to have been provided by the swine industry and AASV. As I look at the list of past recipients, there are several who have directly had an influence on me, but all of which have had an impact through their contributions to the swine industry and the AASV. I can only hope that I can continue to have a positive influence on the industry, such as they have."

Dr Pittman lives in Wakefield, Virginia, with his wife, Terri, and stepsons Thomas and Trenton.

Howard Dunne Memorial Award

Dr John Deen received the American Association of Swine Veterinarians' 2021 Howard Dunne Memorial Award. The award recognizes an AASV member who has made important contributions and provided outstanding service to the association and the swine industry.

Growing up on a pig farm in southern Ontario near Drayton, Dr Deen was able to continue farming with his family and attend the nearby Ontario Veterinary College where he received a DVM, MS, and PhD. Early in his career as a mixed animal and swine practitioner, he fondly remembers the mentorship of his clients.

For the last 22 years, Dr Deen has been part of the swine group at the University of Minnesota, where he is currently a Distinguished Global Professor in the Department of Veterinary Population Medicine. A true teacher at heart, he dedicates his time to mentoring graduate students and sharing his knowledge through outreach to veterinarians and producers. With his own extensive publication list, Dr Deen has also served as a manuscript reviewer for multiple animal and veterinary science journals. He was recognized as a Diplomate in the American Board of Veterinary Practitioners in 1994.

Dr Deen is respected as a pioneer in animal welfare. In 2012, he was recognized as a Diplomate in the American College

Dr John Deen, recipient of the Howard Dunne Memorial Award.

of Animal Welfare (ACAW). He was a founding board member of ACAW and a board member of the Professional Animal Auditor Certification Organization. He dedicates time to promote pig welfare having served on the National Pork Board Animal Welfare Committee and the AASV Pig Welfare Committee.

With more than 30 years of dedicated service to the AASV, Dr Deen has served the association as a district director, AASV Foundation member, Program Planning Committee member, and member of the Education, Communications, Scholarship, and International Services Committees.

Dr Deen explained that his favorite quote is, "Originality is the ability to forget your sources (and I forget who told me that)." He continued, "Whatever I have done is a reflection of the extraordinary community that has and does make the AASV. The opportunities to explore and improve the ways that we serve the swine industry have always been rewarding."

Dr Deen considers having met and married his wife, Denise, his greatest accomplishment. They are parents and parents-in-law to Tobin and Sia, Bronwyn and Joey, Aiden and Elizbeth, and grandparents to Lucy Deen.

Meritorious Service Award

Dr Angela Baysinger was named the 2021 recipient of the American Association of Swine Veterinarians' Meritorious Service Award. The award recognizes individuals who have provided outstanding service to the AASV.

Baysinger grew up on a livestock and grain farm near Martinsburg, Missouri. Early life experiences, including raising livestock, FFA projects, and encouragement from her hometown veterinarian Dr Don Hudson, drove her passion for a career in veterinary medicine.

Dr Baysinger completed her undergraduate studies in animal science and her doctor of veterinary medicine degree (1992) at the University of Missouri. She received a master of science degree in epidemiology from the University of Nebraska. She is currently working toward a master of science in international animal welfare, ethics, and law at the University of Edinburgh, partially funded by the AASV Alex Hogg Memorial Scholarship she was awarded in 2018.

Outstanding appropriately describes Dr Baysinger's service to the AASV. She has served the association as a committee member (Biologics Committee, Foreign Animal Disease Committee, Pharmaceutical Issues Committee, and Membership Committee), committee chair, and board member. She has represented the AASV on the American Veterinary Medical Association (AVMA) Clinical Practitioners Advisory Committee and the AVMA Council on Biologics and Therapeutic Agents.

With a special interest and expertise in animal welfare, Dr Baysinger is an active member of the AASV Pig Welfare Committee and was part of the volunteer group of experts who wrote the first edition of the On-Farm Euthanasia of Swine Recommendations for the Producer. She has represented AASV on the Professional Animal Auditor Certification Organization (PAACO) board since its inception in 2003, serving as the first PAACO board chair. Additionally, she currently represents the AASV and swine veterinarians on the AVMA Welfare Committee. Further, she has served as a member of the welfare committees for the National Pork Board and the North American Meat Institute.

AASV is not alone in recognizing Dr Baysinger's service. Merck Animal Health presented Dr Baysinger with the inaugural "Unconditional Award" for her animal welfare work during 2020. Additionally, in January, she was awarded the "Feather in Her Cap" award by the nonprofit Feather in Her Cap Association; this is a special recognition where women leaders in the animal health industry are recognized for their achievements and significant contributions to the industry and for mentoring and developing future women leaders.

Her peers describe her as "An incredibly driven person, who truly cares about the profession, the veterinarians, the producers, and most importantly, the pig."

Grateful for the association, Baysinger stated, "I am extremely honored and humbled to receive this award. The AASV has given me much more than I believe I may have contributed. The AASV is more than a professional organization; it represents personal development, networking, and friends that are more like family. My involvement does not measure up to what I have gained from the organization."

Dr Baysinger lives near Bruning, Nebraska, where she is the North American animal welfare lead for all species for Merck Animal Health.

Dr Angela Baysinger, recipient of the AASV Meritorious Service Award.

Dr Baysinger said, "Family is everything." In her spare time, she enjoys riding Harley Davidson touring motorcycles with her husband, Jerry, especially to rallies in Sturgis, South Dakota. They are active in supporting local, state, and national FFA, especially with sons Isaac and Samuel. She is also active in the American Legion Auxiliary (Unit 193) and Boy Scouts (Troop 175) as an assistant scoutmaster.

Technical Services/Allied Industry Veterinarian of the Year

Dr James (Jamie) Lehman received the American Association of Swine Veterinarians' Technical Services/Allied Industry Veterinarian of the Year Award. Established in 2008, the award recognizes swine industry veterinarians who have demonstrated an unusual degree of proficiency and effectiveness in delivery of veterinary service to their companies and their clients, as well as given tirelessly in service to the AASV and the swine industry.

Lehman was introduced to veterinary medicine early by working as a janitor in his hometown veterinary clinic in Sullivan, Illinois, where he was eventually allowed to participate in large animal surgeries.

With a bachelor of science degree, doctor of veterinary medicine degree, and a master of science degree, all from the University of Illinois, Dr Lehman is currently a Technical Service Manager for the Swine Business Unit with Merck Animal Health.

Dr Lehman possesses one of the most important qualities of a technical services veterinarian: trustworthiness. He is respected for leadership and ability to bring people with conflicting opinions together. For example, his graduate research relied upon his ability to sort through science and technology while encouraging veterinarians and producers to collaborate on pseudorabies eradication efforts.

Described by peers and mentees as a fantastic listener, genuine, and "a really great guy," Dr Lehman continues to serve the swine industry tirelessly. He is recognized as having the technical skills and knowledge to offer solutions to industry problems, yet always remains humble and kind.

While Dr Lehman acknowledges the influence of his parents, mentors, and clients, he continues to pay it forward by mentoring and recruiting students into swine veterinary medicine. His inspiration to others leaves a legacy within the swine health industry. One early-career veterinarian credits Dr Leman's mentorship as her motivation to become a swine veterinarian.

Upon acceptance of the award, Dr Lehman commented, "I was stunned to hear that I was the 2021 recipient of the AASV Technical Services/Allied Industry Veterinarian Award. I am humbled to receive this award."

Dr Lehman lives in Sullivan, Illinois, with his wife Erica, daughter Ellie, and sons Rhett and Kent.

Dr James (Jamie) Lehman, recipient of the AASV Technical Services/Allied Industry Veterinarian of the Year Award.

Young Swine Veterinarian of the Year

The American Association of Swine Veterinarian's Young Swine Veterinarian of the Year Award was presented to Dr Chris Sievers. The award is given annually to an AASV member five or less years post graduation who has demonstrated the ideals of exemplary service and proficiency early in his or her career.

Chris grew up outside of Storm Lake, Iowa, on a crop, cattle, and hog farm where he gained his initial livestock experience. He also raised his own calves and pigs for 4-H and FFA projects. Following his passion for animal agriculture, he attended Iowa State University (ISU) where he received a BS in animal science (2012), DVM (2016), and MS in preventative animal medicine (2016).

His path into swine medicine was solidified by internships and the mentorship that accompanied them, especially through the Swine Veterinary Internship Program coordinated by ISU.

Dr Sievers realized during a summer internship at the Swine Vet Center that the clinic was where he wanted to practice after graduation. "I really enjoyed the veterinarians and how they worked with their progressive clients," he recalled. "It was a good match for me and where I wanted to be after veterinary school." Today, Chris continues to enjoy his work at the clinic. Most of his clients have medium-sized swine operations in Iowa. He also helps oversee research for the Swine Vet Center.

Dr Sievers is dedicated to the swine veterinary profession and to the AASV. Recognizing the AASV as a tight-knit community and its members as family, he embraced opportunities to become involved as a student through poster and oral presentations during the annual meeting. He served as the president of the AASV student chapter at ISU and represented all student members as the Student Delegate to the AASV Board of Directors. Currently, he is a member of the AASV Influenza Committee.

Dr Chris Sievers, recipient of the AASV Young Swine Veterinarian of the Year Award.

Nominated for this award by colleagues and clients, Dr Sievers was noted for his resourcefulness, his ability to make science-based recommendations, and his willingness to share what he has learned. Dr Sievers humbly credits his clients with much of his success as a veterinarian.

Upon acceptance of the award, Dr Sievers commented, "I am extremely honored and humbled in being selected for the 2021 AASV Young Swine Veterinarian of the Year Award. I would not be where I am today without all the support of my family and friends, especially my wife Brooke, two sons Gavin and Carter, my parents Todd and Laura Sievers, and the team at Swine Vet Center. I am also very fortunate for all the mentors I have had throughout my journey of becoming and growing as a swine veterinarian starting before vet school and continuing today. This also would not be possible without my amazing clients that push me to further my knowledge and improve my skills daily. I look forward to the many years ahead of consulting with my clients and serving the swine industry."

AASV Annual Business Meeting

American Association of Swine Veterinarians President Dr Jeffrey Harker reported on the association's membership and activities during the annual early morning business meeting on Tuesday, March 2nd. The 2021 AASV officers, Drs Mary Battrell, president; Mike Senn, president-elect; Bill Hollis, vice president; and Jeffrey Harker, past president, were installed. The board welcomed newly elected district directors Drs Megan Inskeep (District 4), Chris Rademacher (District 6), and Christine Mainquist-Whigham (District 8). The board congratulated re-elected district director Dr Melissa Billing (District 1). Dr Harker also welcomed Sydney Simmons (North Carolina State University, class of 2023) as incoming Alternate Student Delegate to the AASV Board of Directors, and thanked outgoing Student Delegate Jamie Madigan (North Carolina State University, class of 2021). Amanda Anderson (Iowa State University, class of 2022) assumes the role of Student Delegate. Honored guests at the business breakfast included Drs Douglas Kratt (AVMA president), Ronald Gill (AVMA Executive Board liaison to the AASV), Patrick Webb (National Pork Board), Liz Wagstrom (National Pork Producers Council), Paul Sundberg (Swine Health Information Center), Yannin Rivas (Asociación Mexicana de Veterinarios Especialistas en Cerdos president), Jessica Law (Canadian Association of Swine Veterinarians president), and Fred Gingrich (American Association of Bovine Practitioners executive director).

Well-being efforts during AASV Annual Meeting

As AASV added additional focus to member well-being in recent years, Dr Elizabeth Strand, a licensed clinical social worker, resiliency coach, and Founding Director of Veterinary Social Work at the University of Tennessee, partnered with AASV to maximize efforts during the spring of 2020. She led several sessions during the AASV Annual Meeting. Thank you to Dr Strand for her partnership and commitment to swine veterinarians' well-being.

General Session: Your Right and Responsibility to Be Well

During the Monday morning general session, Dr Strand offered advice on how we can take care of ourselves so that we can offer support and encouragement to others.

Wellness breaks

Dr Strand led three 15-minute breaks for attendees to learn a new skill to practice their right and responsibility to be well. The mindfulness break encouraged mindfulness by using the skill of counting breaths. The breath, body, mind break consisted of slow tai chi-like movements and paced breathing for finding a healthy pace in body and thinking. The coherent breathing break allowed participants to practice equal breaths in and out at 5.5 breaths per minute, pacing with the sound of bells.

Heard Vet: Swine Vet Peer Social Support Group

With Dr Strand as a moderator, participants used a structured six-question debrief protocol during this virtual peer support meeting. Participants benefited from and offered support by listening to others and answering the following questions honestly.

- What have you been thinking about while you are supposed to be relaxing, sleeping, or spending time in hobbies or with loved ones (ie, is there something you can't quite shake or is bothering your peace of mind)?
- What did you do well in that situation or circumstance?
- What do you wish you had done differently?
- What did you learn from the experience?
- Is there any change you need to implement to your approach in the future based on this experience?
- Is there anything that you feel grateful for in this situation or generally?

Heard Vet offers a safe place for participants to talk about their unique experiences as swine veterinarians. Participants can share how their week has been, get advice if they want it, give advice if they have it, and invest in the strength of everyone's resilience.

Heard Vet is offered every Wednesday at 6:00 PM Central Time. Members of AASV can register at **aasv.org/members**.

Right to Be Well Tech Table

The AASV Right to Be Well Tech Table featured the AASV Golden Anniversary Well-being video and resources with additional information to promote well-being among all AASV members.

Find more well-being resources on the AASV Well-being webpage at **aasv.org/resources/wellbeing**.

Student activities held during AASV Annual Meeting

Once again, the AASV Annual Meeting offered excellent opportunities for students to learn about swine medicine, network with each other, connect with swine faculty, and meet veterinarians and potential mentors.

Student member registration to the Annual Meeting is free with access to all educational sessions and activities, including the preconference seminars on Saturday and Sunday. As usual, AASV's Student Recruitment Committee offered several conference activities designed especially for veterinary students, including the Swine Medicine for Students preconference seminar, a vet hunt, a speed networking opportunity for upper-class students, and the Swine Student Trivia event.

Student Trivia

Merck Animal Health creatively hosted and sponsored prizes for a "pub-style" trivia event via Webex breakout rooms. Thirty-one students from eight veterinary schools participated, and all teams competed extremely well! The team OSU#1, included The Ohio State University students Corvin Mull, Justin Moeller, Lucas Buehler, Rachel Patton, and Alex Amador, won the top prize: Merck logoed jackets, Bluetooth speakers, and tumblers. The second-place team, Full Boar, included Iowa State University students Amanda Anderson, Emily Pratt, Calie Burgart, Juli Henderson, and Maddi Herring, received Bluetooth speakers, and tumblers. The third-place team, Pig Eye USA, included University of Minnesota students Megan McMahon, Tyler Dick, Seth Melson, Lindsay Miller, and Leyton Becker, received tumblers. AASV student delegate Amanda Anderson coordinated the sign-ups, and AASV Student Recruitment Committee chair Dr Chelsea Hamilton and member Dr Corinne Bromfield emceed the event. While only student teams were eligible to participate, anyone attending the Annual Meeting was welcome to observe and cheer on the teams.

Vet Hunt

The virtual Vet Hunt encouraged veterinary students to participate in the educational sessions by asking a speaker a question in the chat box. Sharing the question and an explanation of what was learned provided each student a chance to win swine swag or other prizes, sponsored by Merck Animal Health.

Speed Networking

Students yearned to connect with mentors this year more than ever, and the AASV Student Recruitment Committee was able to offer an efficient networking activity for veterinarians and veterinary students. The one-hour interview session took place March 2nd via Zoom breakout rooms. It was a relaxed and enjoyable way to meet swine-savvy students and mentors, future interns, or even potential new employees or employers. Fourteen upper-class veterinary students met with fourteen veterinarians, spending 3 minutes to visit with each other in speed-dating style.

Students made meaningful connections and appreciated the opportunity to practice their interviewing and networking skills even if participating veterinarians were not hiring. In addition to helping students become more proficient at discussions with potential employers, veterinarians also used the opportunity to screen potential candidates for jobs or preceptorships.

AASV Foundation announces Student Seminar awards

The American Association of Swine Veterinarians Foundation awarded scholarships totaling $25,000 to 15 veterinary students.

Erin Kettelkamp, University of Illinois, received the **$5000 scholarship** for top student presentation. Her presentation was titled "Effect of particle size and H_2O_2/PAA concentration on the efficacy of an aerosol decontamination system for items entering swine farms." Zoetis provided the financial support for the Top Student Presenter Award.

Additional scholarships totaling $20,000 were funded by Elanco Animal Health.

Four veterinary student presenters received **$2500 scholarships**: Mindi Bracy, Oklahoma State University; Sabra McCallister, North Carolina State University; Zack Talbert, University of Illinois; and Allyson Witt, Iowa State University.

Five veterinary student presenters received **$1500 scholarships**: Selena Clark, University of Illinois; Hunter Everett, North Carolina State University; Paige Haenig, University of Illinois; Kris Kovach, Iowa State University; and Andrew Shulman, University of Pennsylvania.

Those student presenters receiving **$500 scholarships** were: Sarah Botkin, University of Illinois; Brian Johnson, University of Illinois; Hannah Lathom, North Carolina State University; Rachel Patton, The Ohio State University; and Emily Pratt, Iowa State University.

Forty-two veterinary students from 10 universities submitted abstracts for consideration by student abstract volunteer judges Drs Darryl Ragland, Jordan Gebhardt, Bethany Heitkamp, Larry Rueff, Thomas Painter, and Patrick Hoffmann. From those submissions, 15 students were selected to present during the annual meeting. Zoetis, sponsor of the Student Seminar, provided a $750 stipend to each student selected to participate.

Erin Kettelkamp, University of Illinois, was the recipient of the Zoetis $5000 scholarship for Top Student Presentation.

AASV Student Seminar Awardees

$2,500 Scholarship Winners

Mindi Bracy
Oklahoma State University

Sabra McCallister
North Carolina State University

Zack Talbert
University of Illinois

Allyson Witt
Iowa State University

$1,500 Scholarship Winners

Selena Clark
University of Illinois

Hunter Everett
North Carolina State University

Paige Haenig
University of Illinois

Kris Kovach
Iowa State University

Andrew Shulman
University of Pennsylvania

$500 Scholarship Winners

Sarah Botkin
University of Illinois

Brian Johnson
University of Illinois

Hannah Lathom
North Carolina State University

Rachel Patton
The Ohio State University

Emily Pratt
Iowa State University

STUDENT SEMINAR SPONSORED BY ZOETIS
SCHOLARSHIPS SPONSORED BY ELANCO ANIMAL HEALTH

Student Seminar session chairs: Drs Andrew Bowman and Perle Zhitnitskiy

Student Seminar judges: Drs Darryl Ragland, Jordan Gebhardt, Bethany Heitkamp, Thomas Petznick, Thomas Painter, and Patrick Hoffman

Student Podcast Award

Tyler Dick, a third-year student in the College of Veterinary Medicine at the University of Minnesota, was awarded the Student Podcast Award for the most accessed podcast from the 2020 AASV Annual Meeting. Tyler interviewed Dr Craig Rowles about his presentation titled "Use of precision livestock farming (PLF) in poultry." Tyler was announced as the winner of the $400 award, sponsored by Huvepharma, during the 2021 AASV Annual Meeting.

Each year, 30 AASV student members select a speaker to interview during the AASV Annual Meeting for a podcast. The podcasts are then posted to the AASV website and promoted by the students in a friendly competition to gain the most traffic leading up to the following year's annual meeting. This is a great networking opportunity for students that also helps develop a wonderful AASV member resource. We would like to thank AASV student members for their continued involvement and Huvepharma for their continued support of the Student Podcast Award. We look forward to hosting more student podcasts in 2022.

These and other podcasts can be found in the AASV Podcast Library at **aasv.org/podcast/**.

Tyler Dick, University of Minnesota, was the recipient of the Huvepharma $400 award for the Student Podcast Award.

AASV announces student poster competition awardees

The American Association of Swine Veterinarians (AASV) provided an opportunity for 15 veterinary students to compete for awards in the Veterinary Student Poster Competition. United Animal Health sponsored the competition, offering awards totaling $4000.

Forty-two veterinary students from 10 universities submitted abstracts for consideration by student abstract volunteer judges Drs Darryl Ragland, Jordan Gebhardt, Bethany Heitkamp, Larry Rueff, Thomas Painter, and Patrick Hoffmann. Based on scores received in the original judging of abstracts submitted for the AASV Student Seminar, the top 15 abstracts not selected for oral presentation at the annual meeting were eligible to compete in the poster competition.

United Animal Health announced the following awards during the AASV Annual Meeting March 1st.

$500 scholarship: Luke Daniels, University of Illinois – Top student poster titled "Use of computer-aided design to optimize swine facility airflow."

$400 scholarships: Nicholas Benge, Iowa State University; and Melanie Boucher, University of Guelph.

$300 scholarships: Matthew Boulanger, University of Pennsylvania; Kyle Nisley, Iowa State University; and Sydney Simmons, North Carolina State University.

$200 scholarships: Lucas Buehler, The Ohio State University; Kate Edmunds, Michigan State University; Isaac Goldner, University of Illinois; Katyann Graham, Iowa State University; Ashley Hallowell, University of Pennsylvania; Kelly Hewitt, Iowa State University; Dayna Kinkade, University of Illinois; Brooke Kitting, University of Pennsylvania; and Rachel Weidmayer, University of Minnesota.

In addition to the poster competition awards, each student poster competition participant, along with the rest of the student poster presenters, received a $250 stipend from Zoetis, sponsor of the Student Poster Session.

Luke Daniels, University of Illinois, was the recipient of the United Animal Health $500 award for the Top Student Poster.

AASV Student Poster Awardees

$400 SCHOLARSHIP WINNERS

Nicholas Benge
Iowa State University

Melanie Boucher
University of Guelph

$300 SCHOLARSHIP WINNERS

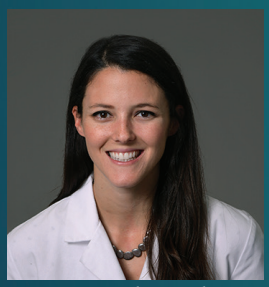
Matthew Baulanger
University of Pennsylvania

Kyle Nisley
Iowa State University

Sydney Simmons
North Carolina State University

$200 SCHOLARSHIP WINNERS

Lucas Buehler
The Ohio State University



Kate Edmunds
Michigan State University

Isaac Goldner
University of Illinois

Katyann Graham
Iowa State University

Ashley Hallowell
University of Pennsylvania

Kelly Hewitt
Iowa State University

Dayna Kinkade
University of Illinois

Brooke Kitting
University of Pennsylvania

Rachel Weidmayer
University of Minnesota

STUDENT POSTER SESSION SPONSORED BY ZOETIS
SCHOLARSHIPS SPONSORED BY UNITED ANIMAL HEALTH

Student Poster Competition Chairs: Drs Andrew Bowman and Perle Zhitnitskiy
Student Poster Competition Judges: Drs Laura Batista, R.C. Ebert, and Clayton Johnson

Tech Tables add value to AASV Annual Meeting

The switch to the virtual conference format for this year's AASV Annual Meeting posed challenges for everyone, including exhibitors. While several companies decided to bow out of this year's Annual Meeting, many companies stayed the course by adjusting to the conditions and making the most of the new opportunities presented by the virtual meeting format. These resilient Tech Table exhibitors enhanced the educational value of the meeting, not only with their exhibit content, but also through their participation in the Industrial Partners sessions.

Inside each exhibit space, conference attendees were greeted with a brief welcome video and written description providing a quick overview of the products and services offered by the company, along with downloadable product literature and links to the company's website, social media platforms, and email address. The virtual platform provided attendees with the perfect opportunity to explore the many innovative products and technologies available to swine practitioners and producers.

AAF Flanders

AgCreate Solutions & Pork Avenue Training Portal

Allflex Livestock Intelligence/ Destron Fearing

Alltech - Hubbard

American Board of Veterinary Practitioners

American College of Veterinary Preventive Medicine

Animal Biotech

AP

APC

Apiam Solutions

ARKO Laboratories

Aurora Pharmaceutical

BarnTools

BioChek

Biomin America

Boehringer Ingelheim

Cambridge Technologies

Camfil Clean Air Solutions

Central Life Sciences

Choice Genetics

Chr Hansen

Christian Veterinary Mission

Diamond V

DNA Genetics

DSM Nutritional Products

Elanco Animal Health

Fast Genetics

Gallant Custom Laboratories

GVL

Huvepharma

Insight Wealth Group

iSperm mCASA

Kemin Animal Nutrition & Health

LANXESS Corporation

Maximum Ag Technologies

Medgene Labs

Merck Animal Health

Minitube USA

National Pork Board

Neogen

Newport Laboratories

Norbrook

NOVUS International

Nutriquest

Pharmacosmos

Pharmgate Animal Health

Phibro Animal Health Corporation

PIC (Pig Improvement Company)

PMI

PrairiE Systems

Ralco

Swine Health Information Center

TechMix

Tetracore

Topigs Norsvin USA

United Animal Health

USDA APHIS VS

VetNOW

Virox Animal Health

Zinpro Corporation

Zoetis

If you have not already done so, be sure to thank these faithful sponsors for their continued support of AASV!

AASV Foundation announces recipients of Hogg Scholarship

Drs Melissa Billing, Kate Dion, and Joseph Thomas were named the 2021 recipients of AASV Foundation Hogg Scholarships on February 28 during the AASV 52nd Annual Meeting.

Established in 2008, the scholarship is named for Dr Alex Hogg, who was a leader in swine medicine and pursued a master's degree in veterinary pathology after 20 years in a mixed-animal practice. The scholarship is awarded annually to an AASV member who has been accepted into a qualified graduate program to further his or her education after years as a swine practitioner. Former Hogg Scholarship recipients Drs Alex Ramirez, Angela Baysinger, and Meghann Pierdon reviewed the 2021 applications.

Dr Melissa Billing earned her doctor of veterinary medicine degree from The Ohio State University College of Veterinary Medicine in 2005. After 10 years with Smithfield Foods as a swine production veterinarian, she joined Boehringer Ingelheim Animal Health as a swine key account veterinarian. Dr Billing has been active in the AASV since veterinary school. For the past three years, she has served on the AASV Board of Directors, representing the northeastern part of the United States. She has chaired the Operation Main Street Committee and served on the Annual Meeting Planning Committee. She plans to apply the Hogg Scholarship to help fund her master's of veterinary science degree with a concentration in livestock systems health at the University of Illinois.

After receiving her doctor of veterinary medicine degree in 2011 from Iowa State University College of Veterinary Medicine, Dr Kate Dion joined Hanor Company, where she serves as a veterinarian and the animal well-being/quality assurance manager. Because of her continued interest in learning, she began taking online classes through the Graduate Certificate Program in Veterinary Preventive Medicine through Iowa State University. She formally transferred her credits into a full master's degree program at Iowa State University, under the direction of Drs Daniel Linhares and Derald Holtkamp, in 2019. Her current research concentrates on biosecurity and understanding how pathogens enter negative herds. In the true spirit of Dr Hogg, Dr Dion works hard to disseminate her findings to help support swine veterinarians.

Dr Joseph Thomas earned his master's of science and doctor of veterinary medicine degrees from Iowa State University in 2016. As Dr Hogg served his country in the US Navy, Dr Thomas served in the US Army Veterinary Corps during 2016–2019. After his uniformed service duty, Dr Thomas joined AMVC as an associate veterinarian. He returned to Iowa State University as a post-doctoral research associate and diagnostician trainee in 2020, where he began his work toward a PhD in veterinary microbiology in January 2021. Dr Thomas plans to use the scholarship to help him quickly and efficiently complete his PhD.

2021 AASV Foundation Hogg Scholarship Awardees

Dr Melissa Billing

Dr Kate Dion

Dr Joseph Thomas

AASV Foundation increases research funding to $100,000; funds four proposals

In recognition of the value and need for research with direct application to the swine veterinary profession, the AASV Foundation increased the amount of funding available for research proposals in 2021 from $60,000 to $100,000. Dr Lisa Tokach, chair of the AASV Foundation, announced the selection of 4 research proposals for full or partial funding during the AASV Foundation Luncheon Meeting on February 28th, held during the AASV Annual Meeting. The foundation granted funds to support efforts by researchers at the University of Minnesota, Iowa State University, and South Dakota State University, in addition to an independent researcher.

The Foundation granted $25,111 to Dr Guilherme Milanez Preis and co-investigator Dr Cesar Corzo from the University of Minnesota to fund the proposal, "Assessing Senecavirus A shedding and transmission in growing pig populations." The two objectives of the study are to describe Senecavirus A (SVA) shedding patterns over time in growing pig populations and assess the state of infection in piglets after comingling in the nursery. This project will expand current knowledge on the epidemiology of SVA, especially during the grow-finishing phases, and be key to enabling swine veterinarians to build the next steps toward controlling and eliminating SVA. Results will be shared as a summary in producer-oriented publications, in a peer-reviewed journal, and as oral presentations at swine veterinary conferences (eg, AASV Annual Meeting and Allen D. Leman Swine Conference).

Dr Jianqiang Zhang and co-investigators from Iowa State University received $30,000 to fund the proposal "Generation of antisera against six commercial PRRSV modified live virus vaccines to evaluate their in vitro cross-neutralization against genetically diverse field and laboratory isolates of PRRSV." They plan to generate antisera against six commercial PRRSV-2 MLV vaccines in experimentally vaccinated pigs and conduct in vitro cross-neutralization assays to determine the neutralizing antibody titers of each vaccine antisera against PRRSV-2 field isolates representing different genetic lineages and sublineages. Investigators will share results at various swine meetings and expect one publication in a peer-reviewed journal.

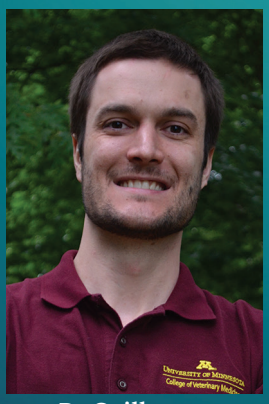
Drs Ben Hause, Chun-Ming Lin, and Eric Nelson at South Dakota State University along with their co-investigators were awarded $27,700 to fund the project, "Etiological role of rotavirus infection in enteritis and porcine respiratory disease complex." The overarching goal of this project is to understand the nature of porcine rotavirus infections and associated pathological changes in porcine lungs. Results will be shared in the form of a peer-reviewed scientific manuscript, submitted for consideration for presentation at conferences, and shared in trade publications.

The Foundation granted $17,189 to partially fund Dr Darwin Reicks' project, "Investigating differences in the source of *Serratia* and other bacteria in boar semen." The objective of this project is to build on previous studies and identify the differences between boars who are part of a batch of semen where *Serratia* was identified and boars who were not. In addition, further comparisons will be made between boar studs that have never identified *Serratia* in extended semen and those that frequently identify *Serratia* and experience downstream fertility losses. Results will be shared at the 2022 AASV meeting and through peer-reviewed publication.

Dr Teddi Wolff chaired the scientific subcommittee responsible for reviewing and scoring the proposals received for consideration, and she joins the Foundation in thanking Drs Deb Murray, Tom Petznick, Joe Rudolphi, Jess Waddell, and Mike Eisenmenger for their participation on this important subcommittee. Each of the 14 proposals submitted was given careful consideration.

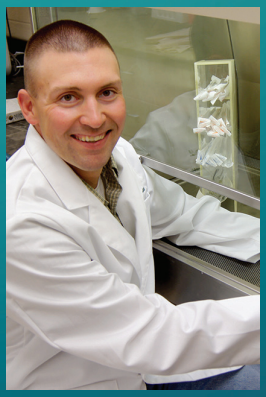
An overview of past and current projects funded by the foundation is available at **aasv.org/foundation/research.htm**. The foundation will issue its next call for research proposals in the fall of 2021.

2021 AASV Foundation Research Proposal Awardees



Dr Guilherme Milanez Preis

Dr Jianqiang Zhang



Dr Ben Hause

Dr Darwin Reicks

Three AASV members receive Dr Conrad and Judy Schmidt Family Student Debt Relief Scholarship

During 2021, the AASV Foundation increased the number of student debt-relief scholarships. Three $5000 scholarships were awarded to early-career swine practitioners through the Dr Conrad and Judy Schmidt Family Student Debt Relief Endowment, which was renamed to honor the donors who established the scholarship program. Recipients Drs Claire LeFevre, Henry Johnson, and Daniel Gascho were announced February 28 during the American Association of Swine Veterinarian's 52nd Annual Meeting.

The purpose of the $5000 scholarship is to help relieve the student debt of recent veterinary graduates engaged in swine practice who still have significant debt burden. Qualified applicants must have been engaged in private practice with at least 50% of their time devoted to swine, providing on-farm service directly to independent pork producers.

All three recipients were 2017 graduates and have been continuous members of the AASV since joining as students. As students, all had attended the AASV Annual Meeting multiple times.

Dr Claire LeFevre, a University of Wisconsin-Madison School of Veterinary Medicine graduate, is the commercial farm veterinary lead at Carthage Professional Swine Management, LLC. Approximately 31,000 sows are under her direct care. She is responsible for herd health, development of herd health protocols, and on-farm employee training through programs such as PQA Plus. Dr LeFevre explained that opportunities provided by the AASV were critical to her education, professional development, and success as a swine veterinarian. She is an active member of the newly formed AASV Early Career Committee and enjoys giving back to the association.

Dr Henry Johnson, a University of Illinois graduate, is a veterinarian with the Swine Vet Center in Saint Peter, Minnesota. He works with various sized family farms to better the health and production of their animals to ensure a safe and reliable food product for consumers. He strives to teach production staff how important they are in maximizing day one piglet care and identifying sick animals. He enjoys supporting students, providing the same mentorship he received through the AASV, and fostering the next generation of swine veterinarians.

Dr Daniel Gascho, a graduate of Purdue University College of Veterinary Medicine, is the top associate veterinarian at Four Star Veterinary Service, LLC, Swine Health Care, in Indiana. His clients range from potbellied and show pigs to large commercial herds. He almost exclusively serves private and family farm clients. Taking advantage of the multiple student events and opportunities offered at the AASV Annual Meetings, Dr Gascho made long-lasting connections he continues to rely on.

The AASV Foundation thanks Drs Ross Kiehne, Lisa Tokach, and Nathan Winkelman for reviewing the applications.

The scholarship was initiated with a generous $110,000 contribution to the foundation by the Conrad Schmidt and Family Endowment. Dr Schmidt, a charter member of AASV, explained, "Together, Judy and I noticed that many new DVM graduates interested in swine medicine begin their professional life with heavy educational debt obligations. As a long-time AASV member and animal industry supporter, it was our desire to help AASV members who have dedicated their professional skills to swine herd health and production. We hope that this endowment will grow over time to assist in reducing the educational debt load of AASV members as they begin their professional journeys."

2021 Debt Relief Scholarship Awardees

Dr Claire LeFevre

Dr Henry Johnson

Dr Daniel Gascho

Oklahoma State University veterinary student receives David A. Schoneweis Scholarship

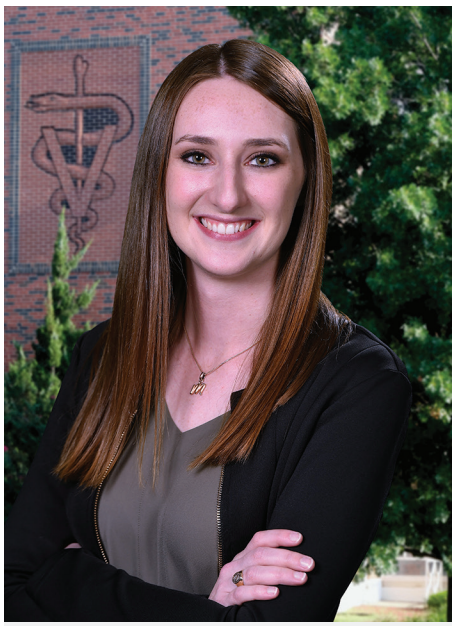
Mindi Bracy, a third-year student at Oklahoma State University's College of Veterinary Medicine, was awarded the David A. Schoneweis scholarship during the AASV Annual Meeting.

The children of the late Dr David Schoneweis established a scholarship in his memory to benefit swine-interested students from Kansas State University (KSU) and Oklahoma State University (OSU). The $1000 scholarship is awarded to a student or students from KSU or OSU who participate in the student oral or poster presentations during the meeting, based upon a selection rubric prepared with the oversight and approval of the Schoneweis family.

Bracy presented her research, "Risk factors for umbilical hernias in commercial pigs," during the AASV Student Seminar. She was one of 15 students participating in the seminar competition.

Dr Schoneweis was born in Clay Center, Kansas and earned his doctor of veterinary medicine degree from Kansas State University in 1956. He served two years in the US Army Veterinary Corps before teaching clinical sciences at Oklahoma State University for six years. After two years in private practice in Lawrence, Kansas, he joined the KSU College of Veterinary Medicine faculty in 1966, where he received his master's degree in surgery and medicine in 1971 and taught food animal medicine for 30 years. Dr Schoneweis was a charter member of the American Association of Swine Practitioners (AASP) and served on the association's Board of Directors in the late 1970s and early 1980s. In 1997, he received the AASP Meritorious Service Award for his lifetime of support for the association and in recognition of his work with students as a professor of food animal medicine at KSU and OSU.

Thankful for the scholarship, Bracy said, "I am honored to receive the David A. Schoneweis Scholarship. It is encouraging and exciting to be a part of a career that supports veterinary students and invests in their futures. I cannot thank the family of Dr Schoneweis enough for their generosity toward me and my passion for the swine industry."



Mindi Bracy, an Oklahoma State University veterinary student, was the recipient of the David A. Schoneweis scholarship.

Veterinary students receive $5000 scholarships from AASV Foundation, Merck Animal Health

Merck Animal Health, known as MSD Animal Health outside the United States and Canada, continued its commitment to the swine industry's next generation of veterinarians by partnering with the American Association of Swine Veterinarians Foundation (AASVF) to sponsor the 2021 recipients of the AASVF/Merck Animal Health Veterinary Student Scholarships, awarded March 1 at the 52nd Annual AASV Meeting.

"At our core, we are committed to investing in veterinary students who are the future leaders in advancing *The Science of Healthier Animals*," said Justin Welsh, DVM, Executive Director, Livestock Technical Services, Merck Animal Health. "Through our partnership with AASVF, we are helping to build students' knowledge of swine health and well-being as they prepare for a career in this important field."

"The Merck Veterinary Student Scholarship Program has been instrumental in expanding the AASV Foundation's mission to develop veterinary students into swine veterinarians," said Harry Snelson, DVM, AASV Executive Director. "The scholarships have a direct and immediate impact on the awardees by helping veterinary students address the financial challenges related to the tuition and fees involved in veterinary education. It is especially rewarding for the members of the AASV Foundation to see that Merck Animal Health shares their values of support for future swine veterinarians."

The 2021 recipients of the $5000 scholarship are:

- Hayley Bowling, University of Saskatchewan, class of 2023
- Tyler Dick, University of Minnesota, class of 2022
- Isaac Goldner, University of Illinois, class of 2023
- Katyann Graham, Iowa State University, class of 2023
- Anthony Holowka, Lincoln Memorial University, class of 2022
- Madison Kapraun, University of Illinois, class of 2022
- Kristofer Kovach, Iowa State University, class of 2023
- Seth Melson, University of Minnesota, class of 2023
- Rachel Patton, The Ohio State University, class of 2022
- Sydney Simmons, North Carolina State University, class of 2023

The scholarship program assists the Foundation's mission to support the development and scholarship of veterinary students interested in the swine industry. Second- and third-year students enrolled in American Veterinary Medical Association-accredited or recognized colleges of veterinary medicine in the United States, Canada, Mexico, South America, and the Caribbean Islands are eligible for the scholarship. The AASV Foundation thanks Drs Lisa Tokach, Teddi Wolff, Brian Roggow, and Jordan Gebhardt for judging this year's applications. Learn more at **aasv.org/foundation**.

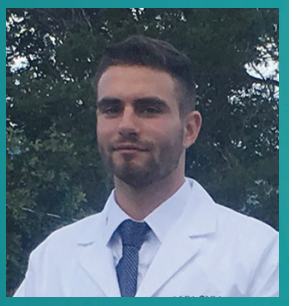
2021 AASV Foundation - Merck Veterinary Student Scholarships

Hayley Bowling
University of Saskatchewan

Tyler Dick
University of Minnesota

Isaac Goldner
University of Illinois

Katyann Graham
Iowa State University



Anthony Holowka
Lincoln Memorial University

Madison Kapraum
University of Illinois

Kris Kovach
Iowa State University

Seth Melson
University of Minnesota

Rachel Patton
The Ohio State University

Sydney Simmons
North Carolina State University

AASV Foundation news continued on page 161

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AASV Foundation news continued from page 159

Leman and Heritage Fellows recognized

The American Association of Swine Veterinarians Foundation (AASVF) is committed to fund research, scholarships, externships, tuition grants, and other programs and activities that benefit the profession of swine veterinary medicine. The Foundation relies on the generous support of donors to fulfill this commitment.

During the recent AASV Foundation Luncheon held February 28, 2021, during the AASV Annual Meeting, AASVF chair Dr Lisa Tokach announced new Leman and Heritage fellows.

This year, Drs Larry Coleman and W. Shamus Brown were recognized as Leman Fellows. Drs Brad and Eileen Thacker were recognized as Heritage Fellows. Four Star Veterinary Service honored and memorialized the late Dr Dale Hendrickson as a Heritage Fellow.

Leman

Named for the late industry leader and former AASV President Dr Allen D. Leman, this giving program confers the title of Leman Fellow upon those who make a contribution of $1000 or more to the foundation endowment.

Heritage

The Heritage Fellow program recognizes contributions of $5000 or more. In addition to monetary donations, other giving options such as life insurance policies, estate bequests, and retirement plan assets may be used.

Legacy

A donor, multiple donors, or a veterinary practice may establish and name a Legacy Fund with a gift of $50,000 or more. The fund may be named after the donor or another individual or group. The donor designates which of three foundation mission categories the fund's proceeds will support: 1) research, 2) education, or 3) long-range issues.

If you are ready to lend your support and help build the endowment to ensure future support of the swine veterinary profession, visit **aasv.org/foundation** or contact the foundation by phone, 515-465-5255, or email, **aasv@aasv.org**.

AASV Foundation auction exceeds $100,000

Thanks to generous donors and competitive bidders, the hard work invested by the AASV Foundation Auction Committee paid off to the tune of $100,006! The annual fundraiser supports the many scholarships, swine research grants, debt-relief awards, swine externship grants, and other programs funded by the AASV Foundation each year. This year's auction was entirely virtual, with two groups of donations. The silent auction items raised $11,296, while the 15 featured auction items brought $36,550. Cash contributions designated towards the auction provided another $52,160.

The 2021 Auction Committee was led by co-chairs Drs Chase Stahl, John Waddell, and Butch Baker. Many thanks to all who contributed to the success of this important fundraiser!

And the winners are...

Thank you to ALL who made a contribution or placed a bid on items in the auction.

Thanks to your generosity, the auction raised $100,006 for the AASV Foundation!

We are pleased to recognize the winning bidders who purchased one or more items at the auction:

Gary Althouse
Paul Armbrecht
Angela Baysinger
David Bomgaars
Mark Brinkman
Justin Brown
Carthage Veterinary Service Ltd
George Charbonneau
Tom Gillespie
Fred Gingrich
Dwain Guggenbiller
Jeffrey Harker
Peggy Anne Hawkins
Lynette Holman
Sara Hough
Jeff Husa
Clayton Johnson
Kerry Keffaber
Keith Kinsley
John Kolb
Scott Kramer
Douglas Kratt
Chris Kuster
Merlin Lindemann
Aaron Lower
Mike Meade
Dale Mechler
Miranda Medrano
Michelle Michalak
Rob Musser
Gene Nemechek
Thomas Petznick
Phibro Animal Health
Michael Pierdon
Doug Powers
Alex Ramirez
Jessica Risser
Brian Roggow
Paul Runnels
Rachel Schulte
Jessica Seate
Mike Senn
Paul Sundberg
David Tieman
Mark Titus
John Waddell
Ron White
Warren Wilson
Paul Yeske
Pam Zaabel

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[1] Radke, S.L., Olsen, C.W., Ensley, S.M., (2018) Elemental impurities in injectable iron products for swine. *The Journal of Swine Health and Production*, 26(3).

[2] Gaddy H et al. A review of recent supplemental iron industry practices and current usage of Uniferon® (iron dextran complex injection, 200 mg/mL) in baby pigs. *AASV*. 2012; 167–171.

[3] Haugegaard J et al. Effect of supplementing fast-growing, late-weaned piglets twice with 200 mg iron dextran intramuscularly. *The Pig Journal*. 2008. 61; 69–73.

[4] Olsen C and Fredericks L. Impact of iron dose and hemoglobin concentration on wean-finish weight gain. *IPVS*. 2018; 910.

PHARMACOSMOS

 PM-048-00

AASV committees met virtually to plan work for 2021

Fourteen issue- and membership-based committees met virtually during the 2020-2021 winter months. These well-attended virtual meetings replaced the in-person meetings typically held during the AASV Annual Meeting. The AASV Board of Directors establishes committees to address specific issues associated with swine veterinary medicine and provide recommendations for actions to the AASV leadership. The AASV committees are an integral part of the leadership structure within AASV, and they also serve as a great way for members to participate in developing positions for the association, learn about critical issues, network with other members, and develop their own leadership skills. Despite the challenges COVID-19 brought to 2020, committees accomplished many of their goals and responded to emergent and urgent needs in swine health and welfare.

The following are some highlights from the committee meetings:

- The **AASV Porcine Reproductive and Respiratory Syndrome (PRRS) Task Force** has completed the PRRS herd classification guidelines, which are pending publication. The task force proposed to develop a PRRS case definition for breeding herds and to distribute a survey regarding PRRS virus control and elimination in breeding herds.

- The **Boar Stud Biosecurity Committee** recommended changing the committee's name and mission statement to broaden the scope beyond biosecurity. During 2021, the committee plans to update the AASV Boar Stud Guidelines.

- During the **Committee on Transboundary and Emerging Diseases** meetings, the committee reviewed AASV's position statement on the permanent identification of swine and a proposed position statement on the risk of foreign animal disease introduction through feed and feed ingredients. The committee plans to work with USDA Center for Epidemiology and Animal Health to provide input on how oral fluids are used for endemic disease surveillance and describe how they could be used for foreign animal disease surveillance.

- The **Collegiate Activities Committee** discussed veterinary student instruction during the COVID-19 pandemic, the 2021 AASV Annual Meeting student presentations, and the 2020 AASV Annual Meeting General Session presentation, "Current and future vision of swine medicine education."

- The **Communications Committee's** discussions centered around member services, including the AASV website update and adding more member recollections to the AASV Heritage Video series. The committee continues to explore ways to fill gaps in the AASV photo library.

- The **Early Career Committee** continued to identify resources needed by early career veterinarians. The committee has been developing a podcast series highlighting topics for early career veterinarians and a forum for early career veterinarians to exchange dialogue. The committee proposed a mentor directory and an early career conference to be held in conjunction with another swine conference, modeled after the American Association of Bovine Practitioners' early career conference.

- The **Human Health and Safety Committee** is proposing a modification to the committee's name and mission statement to emphasize the committee's commitment to human well-being.

- The **Influenza Committee** recommended an influenza preconference session at the 2022 AASV Annual Meeting. They proposed changes to the AASV position statement on influenza A viruses.

- Discussions of the **Nutrition Committee** centered around potential topics for a preconference session, and recommended inclusion at the 2022 annual meeting. They also discussed the potential for continued education nutrition topics throughout the year.

- The **Operation Main Street (OMS) Committee** is planning to host AASV member OMS speaker training sessions virtually during 2021. The OMS program will expand its reach to additional veterinary schools, including St George University, Ross University, and the five AVMA-accredited veterinary schools in Canada.

Advocacy in action continued on page 165

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Advocacy in action continued from page 163

- During 2020, the **Pharmaceutical Issues Committee** updated the Basic Guidelines of Judicious Use of Antimicrobials in Swine. During 2021, they plan to discuss and develop guidelines for the implementation of the five pillars of antimicrobial stewardship.

- The **Pig Welfare Committee** reviewed AASV's position statements on castration of swine, tail docking and teeth clipping of swine, pig welfare, antiabuse, and sow housing. The committee heard updates about the USDA National Animal Disease Preparedness and Response Program-funded and AASV-led project to capture the first-hand experiences gained by veterinarians and farmers faced with depopulation and improve AASV resources or build new tools to meet the needs of the AASV membership.

- The **Pork Safety Committee** continues to monitor and participate in pork safety issues, including the development of the National Veterinary Accreditation Program's module on the veterinarian's role in preharvest microbial food safety, the New Swine Inspection System, and other policies regarding pork safety.

- The **Student Recruitment Committee** recommended AASV continue supporting The Swine Medicine Talks: An AASV series for Veterinary Students. The committee plans to participate in the 2021 Student American Veterinary Medical Association's Symposium, the National FFA Convention, and the Ohio State University Food Animal Symposium.

Full reports and work plans from each committee are available at **aasv.org/members/only/committee**.

The AASV committee leaders met virtually March 11 to update each other about committee activities and goals, strategize and identify collaboration opportunities across committees, and discuss committee structure. The leaders elected to hold biannual meetings; all committees will meet during the annual meeting and virtually during the late summer or early fall.

Abbey Canon, DVM, MPH, DACVPM
Director of Public Health and Communications

Join a committee and make a difference

Almost all committees need additional members who are swine veterinary practitioners.

The committees are a critical part of the AASV leadership, and AASV members, leaders, and staff appreciate the efforts of the volunteer members. If you are interested in learning more about the committee activities, visit the committee web pages on the AASV web site (**aasv.org/members/only/committee/**).

Contact the committee chair or the AASV office to join a committee.

FIGHT ENTERIC DISEASE ON THE FRONT LINE: **THE GUT.**

The health of the intestinal tract plays a crucial role in the health and overall performance of the pig. By itself, the digestive tract contains more immune cells than any other organ. What's more, the mucosal immune response in the intestine is especially key to triggering a robust immune response to disease threats.

That's why it's important to prevent pathogenic bacteria, such as *Lawsonia* and *Salmonella*, from becoming established in the gut. Prevention of bacterial infection helps to maintain gut and pig health, reduce the need for antibiotics, and improve herd performance.

THREE COMPONENTS OF A HEALTHY GUT

A healthy epithelial lining is critical for proper nutrient absorption. By knitting themselves closely together, enterocytes also help create a physical barrier to prevent pathogens from entering the rest of the body.

Closely associated with the epithelial lining is the healthy mucus layer, which provides antibodies and peptides that are important to help fight infection and consequent inflammation.

A healthy microbiome, or the collection of microorganisms inside the intestines, helps influence the immune response of the pig and performs biologic activities, such as the fermentation of dietary fiber. It also produces short-chain fatty acids, including butyrate, which serves as a nutrient source and can have an anti-inflammatory effect on the epithelium.

PROTECT THE GUT WITH SOLID PREVENTION

Count on Enterisol® Enteric Solutions to provide direct protection against *Lawsonia* and *Salmonella* with effective, oral, modified-live vaccines. To know more about how you can help pigs maintain a healthy balance of microorganisms in the microbiome, contact your Boehringer Ingelheim sales or technical service representative.

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UPCOMING MEETINGS

Animal Agriculture Alliance 2021 Virtual Summit

April 28 - May 6, 2021 (Wed-Thu)
A virtual conference

For more information and to register:
Web: **whova.com/web/stake_202105**

2021 Virtual International Symposium on Animal Mortality Management

May 18 - 19, 2021 (Tue-Wed)

Tabletop exercise on May 13 (Thurs)

For more information and to register:
Web: **animalmortmgmt.org**

2021 World Pork Expo

June 9 - 11, 2021 (Wed-Fri)
Iowa State Fairgrounds
Des Moines, Iowa

For more information:
Lauren Swanson
National Pork Producers Council
Tel: 515-864-7985
Email: **swansonl@nppc.org**
Web: **worldpork.org**

Allen D. Leman Swine Conference

September 18 - 21, 2021 (Sat-Tue)

For more information:
Email: **vetmedccaps@umn.edu**
Web: **ccaps.umn.edu/allen-d-leman-swine-conference**

US Animal Health Association 125th Annual Meeting

October 21 - 27, 2021 (Thu-Wed)
Gaylord Rockies Hotel
Denver, Colorado

For more information:
United States Animal Health Association
4221 Mitchell Ave
Saint Joseph, MO 64507
Tel: 816-671-1144
Web: **usaha.org/meetings**

International Conference on Pig Survivability

October 27 - 28, 2021 (Wed-Thu)
Omaha, Nebraska

For more information:
Dr Joel DeRouchey
Email: **jderouch@ksu.edu**
Web: **piglivability.org/conference**

ISU James D. McKean Swine Conference

November 4 - 5, 2021 (Thu-Fri)
Scheman Building
Iowa State University
Ames, Iowa

For registration information:
Registration Services
Iowa State University
1601 Golden Aspen Drive #110
Ames, Iowa 50010
Tel: 515-294-6222
Email: **registrations@iastate.edu**

For questions about program content:
Dr Chris Rademacher
Conference Chair
Iowa State University
Email: **cjrdvm@iastate.edu**

American Association of Swine Veterinarians 53rd Annual Meeting

February 26 - March 1, 2022 (Sat-Tue)
JW Marriott Indianapolis
Indianapolis, Indiana USA

For more information:
American Association of Swine Veterinarians
830 26th Street
Perry, Iowa 50220 USA
Tel: 515-465-5255
Email: **aasv@aasv.org**
Web: **aasv.org/annmtg**

26th International Pig Veterinary Society Congress

June 2022 - Date to be determined
Rio de Janeiro, Brazil

For more information:
Tel: +55 31 3360 3663
Email: **ipvs2020@ipvs2020.com**
Web: **ipvs2020.com**

For additional information on upcoming meetings: aasv.org/meetings

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