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Transition from one PRRS MLV vaccine to another in a breeding herd

Risser J, Ackerman M, Lape D, et al

The evolving US swine industry

Tarasiuk G, Zaabel P, Remmenga MD, et al

The Journal of the American Association of Swine Veterinarians





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JSHAP SPOTLIGHT

Sarah Albers

2023 Student Podcast Award Winner

University of Wisconsin-Madison

Sarah Albers earned a BS (’21) in Animal Science with a meat-animal emphasis and is currently a third-year veterinary student at the University of Wisconsin-Madison. After graduation, Sarah plans to work in her home community in Wisconsin as a general food-animal practitioner. When asked what she has gained as an AASV student member, Sarah said “AASV has connected me to countless industry professionals through various networking socials and hallway conversations, and in a one-on-one setting doing the podcast interviews. There is no doubt how much AASV wants their students to succeed, and I am proud to be part of this organization!” Sarah was the Student Podcast Award winner at the 2023 AASV Annual Meeting.

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Back to the Future: Learning from our past and leading into the future

In preparation for writing the President's Message, I often read the messages that previous AASV presidents imparted to the AASV membership. The March-April 2011 President-elect Message discussed opportunities for involvement by Dr Randy Jones.¹ He noted that AASV and the National Pork Board (NPB) had committed themselves to eliminating porcine reproductive and respiratory syndrome virus (PRRSV) from the swine population. Dr Jones went further to highlight regional control projects that were underway and learning from the projects to fuel further progress. Indeed, the industry has learned about PRRSV diagnostics, control, and management since 2011.

At the 55th AASV Annual Meeting in Nashville, a significant amount of the agenda focused on the potential control and elimination of pathogens from the swine herd, regionally and nationally. Dr Joel Nerem highlighted several topics:

- Understanding the cost of disease. The PRRSV is costing the domestic swine industry approximately \$663 million annually in production losses and increased costs.²



- Implementing next generation biosecurity for breeding herds,^{3,4} defined as 1) well executed industry standard mechanical transmission interventions, 2) air filtration to block aerosol transmission, and 3) year-round use of an appropriate feed mitigant. Also, dramatic improvement in wean-to-market biosecurity must move from “we know what to do – we just aren’t doing it.”
- The need for a “next generation” traceability system. The industry must work toward a traceability system that has 100% compliance. The system would be 1) real time, 2) accurate – as it happens, 3) easy to do, 4) mandatory, and 5) inexpensive. Dr Nerem advocated for use of the US Swine Health Improvement Plan⁴ for future endemic disease monitoring and elimination.

One of the Monday afternoon concurrent sessions focused entirely on Disease Elimination: Theory to Move us Forward. Pathogens discussed included *Mycoplasma*, porcine epidemic diarrhea virus, PRRSV, and influenza. This session successfully incorporated a cross-species comparison with poultry.

So, my question for you: Where are you engaged in the disease elimination challenge? In thirteen years, will the AASV president be writing their message about the need for disease elimination or the successes of disease elimination?

Hopefully, you can see the historical successes we have had as a swine industry. Even more so, we must realize that those successes and our future success will depend on the combined efforts of the AASV, NPB, National Pork Producers Council, American Association of Bovine Practitioners (AABP), American Association of Avian Pathologists (AAAP), and American Veterinary Medical Association (AVMA). These organizations are only successful if they have active membership. Are you active in AASV as a

committee member, engaged as a board representative for your region, active as an AASV representative to an AVMA committee, have a dual membership in AASV and AABP or AAAP to encourage communication and collaboration?

If you have questions, please contact your AASV staff or AASV board members to get started. The AASV organization needs you as part of its success for our industry!

Angela Baysinger, DVM, MSc
AASV President

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Editorial Note: Dr Baysinger submitted her message for publication on February 23, 2024 prior to her passing on Friday, March 8, 2024.

EXECUTIVE DIRECTOR'S MESSAGE

Angela Baysinger

AASV President Dr Angela Baysinger passed away on March 8, 2024 after a lengthy battle with cancer. Her loss will of course be felt most acutely by her family and those friends closest to her. But the swine veterinary profession and the pork industry have also lost an invaluable colleague and supporter, and the pigs she always put first have lost a staunch advocate.

Three of Angela's colleagues spoke during her funeral service. I thought each did a fabulous job capturing the different aspects of her character. Dr John Waddell focused on the force-of-nature approach she brought to the veterinary career she loved so much. Dr Lisa Tokach captured what it meant to be friends with Angela and the smile she brought to every encounter. Dr Wesley Lyons spoke to her love of people, mentorship, and her easy, supportive nature. For all who knew her, it was no surprise to hear how she was capable of positively impacting everyone she met in a different and meaningful way.

I first met Angela shortly after she graduated from veterinary school but did not really get to know her until we spent a couple of weeks together in 2000. She and I, along with Drs Paul Armbricht,

Christa Goodell, and David Pyburn, participated in a swine-focused Foreign Animal Disease Diagnostician training program at Plum Island that year. I then went on to serve with Angela on the AASV Board of Directors. We became good friends over the years, and I always enjoyed my interactions with her.

Professionally, she cherished her role as a swine veterinarian and was steadfast in her support of putting the needs of the pig first. She was adamant that swine veterinarians speak for the best interests of the pig. Promoting swine welfare and encouraging continued research into better understanding and improving swine welfare was not only the direction of her career but also her passion. She was always a proponent of a science-based approach to pig welfare but never lost sight of the importance of recognizing the emotional concerns of the people working with the pigs and the pork consumer.

Personally, Angela was never shy about meeting new people or welcoming a new graduate or student into whatever activity was going on. More than once, I had the opportunity to watch her introduce herself to a table full of strangers with a quick smile and genuine interest in their life stories. Her varied interests meant she could pretty much engage anyone on just about any topic and if it happened to be something she did not know anything about, all the better! She was truly a life-long learner.

The AASV played an important role in her life. She was proud of her profession and always eager to serve AASV and represent our members. Shortly after her election as AASV vice president in 2022, Angela told me how proud she was to have the opportunity to lead the association. She informed the AASV staff of her cancer diagnosis later that year but emphasized how important it was to her to contribute to the association, plan the 2024 Annual Meeting, and serve as the AASV president. Even as the disease weakened her body, it could not stifle her spirit and enthusiasm. She rallied her strength and led the 2024 Annual



Meeting with great pride and her usual effervescence. Many attendees have commented to me that they did not even realize she was sick given her performance during the meeting. But that was Angela. When she set her mind to doing something, whether it was riding motorcycles, showing muscle cars, flying airplanes, preparing for a Tough Mudder competition, advocating for pigs, loving and cherishing her family, or planning and chairing an AASV Annual Meeting, she did it with dedication and gusto.



Angela's husband, Jerry, told me that getting through the Annual Meeting and becoming AASV president were the goals she focused on during the last few weeks of her life. I am so glad she was able to accomplish those goals and I am so glad I had the opportunity to know her. We have all lost a friend, colleague, mother, wife, and daughter. I am sorry we will not have the benefit of her enthusiasm, dedication, and drive during what would have been her year as AASV president.

Godspeed to my favorite high-flying, hog-riding, Tough Mudder.

Harry Snelson, DVM
Executive Director



in Memoriam

Dr Angela K. Baysinger



Angela Kathryn (Wright) Baysinger, DVM of rural Bruning, NE, passed away peacefully on March 8, 2024, at her home with her two sons and beloved husband at her side. Angela was born February 14, 1967, at Chanute Air Force Base, Rantoul, IL to Jerry and Kathryn (Gough) Wright. She was united in marriage to Jerry Baysinger August 8, 1993, in Martinsburg, MO.

After living on several Air Force Bases across the country where her father was stationed, Angela grew up on a rural farm near Martinsburg, MO. It was there at a young age that she gained a true love of farm animals, especially pigs. She graduated from Community R-VI High School in Laddonia, MO in 1985 and then attended the University of Missouri - Columbia where she earned a Doctor of Veterinary Medicine degree in 1992. After graduation, she moved to Sutton, NE where she practiced at Sutton Veterinary Clinic. Angela left practice in 1995 to pursue a master's degree in epidemiology at the University of Nebraska/USDA Meat Animal Research Center - Clay Center, NE. While there she served as the Interim Extension Swine Specialist. After almost 20 years of various positions with animal health companies as a technical swine veterinarian and with Farmland Foods as Vice President of On-farm Food Safety, Angela accepted a position with Merck Animal Health. There, she first was a Technical Service Veterinarian and then later was the North America Animal Well-being Lead until the time of her death. Animal well-being was her passion, and she has championed many educational conferences to help bridge livestock producers with end-users/consumers. This position led her to

obtain a master's degree in Animal Welfare, Ethics, and Law from the University of Edinburgh in 2021.

Angela's professional memberships included the American Veterinary Medical Association, American Association of Swine Veterinarians, Professional Animal Auditor Certification Organization, International Poultry Welfare Alliance, Global Roundtable for Sustainable Beef, National Pork Board, North American Meat Institute, and numerous other organizations. She was recently installed as president of the American Association of Swine Veterinarians on February 27th, an association that she was involved with for many years and truly loved. She also contributed to science with peer-reviewed scientific journal articles and many abstracts over the years.

Angela lived life with great enthusiasm, adventure, and like "someone left the gate open." She loved to ride her Harley Davidson motorcycle which included trips to Sturgis with Jerry, riding on poker runs, or just getting much needed wind therapy. She developed a love for muscle cars and attended car shows with Jerry and loved to cruise in her 1970 Panther Pink Super Bee. She also loved to fly planes and always had that desire to have air beneath her wings. But her greatest love was her family. She was the in-house travel agent that planned family getaways to great places. She was always involved with her boys in their activities with 4-H, FFA, Boy Scouts, sports, band, speech, and any activity that they so desired. She was so very proud of them and will watch them go through life from the heavens above.

She is survived by her husband of 30 years, Jerry of Bruning, NE; her sons: Isaac of Minneapolis, MN, and Samuel of Bruning, NE; her parents, Jerry and Kathy Wright of Martinsburg, MO; sister, Betsy (Lyle) Kreisel of Warrensburg, MO; and brother, Clark (Stacy) Wright of Martinsburg, MO. She was preceded in death by her grandparents.

A funeral service for Angela was held on Thursday, March 14, 2024 in Ohioa, NE with Pastor Jeff Friesen and Pastor Preston Carter Fields presiding. Memorials are to be directed to the family to be designated at a future date in Angela's honor.

Watch Dr Baysinger's AASV Member Recollection video (aasv.org/members/only/video/Baysinger) to learn more about her personal history, her professional contributions to swine health and welfare, and her lasting impact on colleagues, mentees, and friends. A few of her recent professional accomplishments and awards include:

- Feather in Her Cap Award - 2021
- AASV Meritorious Service Award - 2021
- PAACO Service Award - 2022
- AASV Howard Dunne Memorial Lecture - 2022
- AVMA Animal Welfare Committee - 2013-2024
- PAACO Board of Directors - 2004-2007 and 2011-2024



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Case reports

I am writing this message on the heels of the AASV Annual Meeting in Nashville. It was a great meeting of learning, collaborating, and connecting with friends and colleagues. I also managed to keep my step count up (I cleared 21,000 steps on Saturday) by walking around the massive Gaylord Opryland Resort. I participated in the Sunday pre-conference session titled Case Reports, Case Studies, Field Trials, Oh My! It was a great session with lots of gems shared. I wanted to highlight this session as I know not everyone can attend all the sessions, it is not always easy to read the entire proceedings, and I selfishly want to get my message out to the broader membership.

In my proceedings paper and presentation, I discussed the important role that case reports play in veterinary medicine¹:

...case reports and case studies play a role in disseminating information about unique or rare cases, unusual disease presentations, management success stories (or limitations), or unexpected outcomes. Case reports are

often referenced as foundation reports of emerging diseases or new clinical presentations of a known disease.²

They provide a valuable platform for sharing personal experience(s) and allow others to learn from your observations and expertise.

Who is best suited to have access to case material? Practitioners! And yet, who has the least amount of time to devote to writing up case reports? Practitioners! I get it! When I was in practice, I rarely found time or motivation to write up cases. I was happy getting through my day, solving the problems as they presented. So, I feel a bit hypocritical encouraging practitioners to find the time to write up cases. But I will say this, do not be like me. As I mentioned in a previous message, “As practitioners you are our “first responders” to seeing novel diseases, novel presentations of common problems, an unexpected complication, or perhaps just something interesting that you feel should be communicated in a formal way to your colleagues.”³

Case reports are at the bottom of the pyramid of evidence for evidence-based decision making.⁴ However, case reports can deliver valuable insights into hypothesis generation and research, as well as for solving problems in practice. Case reports also contribute to learning as an educational resource for new veterinarians. Additionally, getting formalized research into the peer-reviewed literature is always a bit time delayed.

And at the risk of repeating myself, “The journal strives to publish information that is useful for the busy practitioner.

“However, case reports can deliver valuable insights into hypothesis generation and research, as well as for solving problems in practice.”

How can a busy practitioner become involved in contributing to the peer-reviewed literature? Consider contributing a case report or case study to the journal.”³

There are detailed author guidelines and genre templates that you can find online that outline the format for case report and case study articles. As always, the journal staff are here to help you. Please feel free to contact the journal office if you need any general guidance on how to proceed.

Terri O’Sullivan, DVM, PhD
Executive Editor

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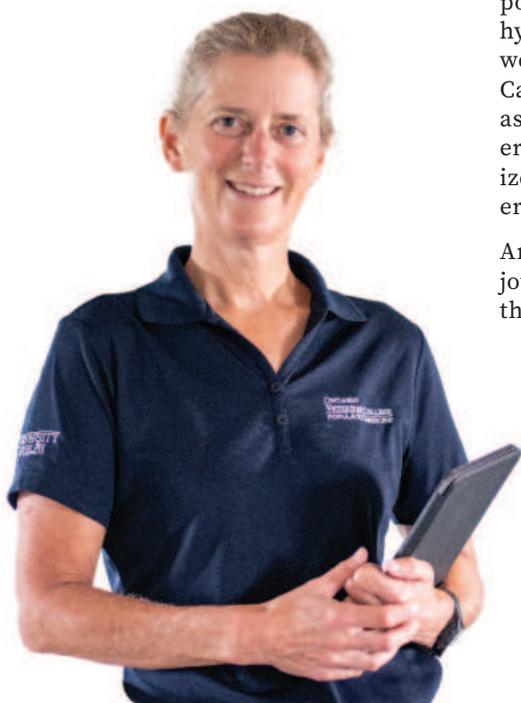
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Transition from one commercial porcine reproductive and respiratory syndrome modified-live virus vaccine to another in a breeding herd and impact on productivity

Jessica Risser, DVM; Matthew Ackerman, DVM; Dylan Lape, DVM; Jon Jordon, BS; Christopher L. Puls, PhD

Summary

Porcine reproductive and respiratory syndrome (PRRS) continues to represent a significant cost to the swine industry and efforts are focused on prevention and mitigation of losses across production phases. Herein describes a PRRS modified-live virus (MLV) vaccinated breeding herd that changed commercial MLV vaccines to improve post-weaning performance. Two whole-herd vaccinations with a new PRRS MLV vaccine, administered 4 weeks apart, occurred without breeding herd production disruptions and with limited changes in diagnostic results. Replacement gilts tested PRRS virus negative 10 weeks post vaccination with the new MLV vaccine. Diagnostics were intermittently positive in the breeding herd and early nursery.

Keywords: swine, breeding herd, modified-live virus vaccine, porcine reproductive and respiratory syndrome virus, prevention

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Resumen - Transición de una vacuna comercial de virus vivo modificado contra el síndrome reproductivo y respiratorio porcino a otra en una piara y su impacto en la productividad

El síndrome reproductivo y respiratorio porcino (PRRS) continúa representando un costo significativo para la industria porcina, hoy los esfuerzos se centran en la prevención y mitigación de las pérdidas en todas las fases de producción. En este artículo se describe un hato reproductor que vacunaba con un virus vivo modificado (MLV) de PRRS, y que cambió de vacuna comercial MLV para mejorar el rendimiento post-destete. Se hicieron dos vacunaciones en todo el hato de hembras con la nueva vacuna MLV contra el PRRS, éstas se aplicaron con 4 semanas de diferencia, sin problemas en la producción del hato, y con cambios limitados en los resultados de diagnóstico. Las primerizas de reemplazo fueron negativas al virus del PRRS 10 semanas después de la vacunación con la nueva vacuna MLV. Hubo resultados de diagnóstico intermitentemente positivos en el hato reproductor y en las primeras etapas de producción.

Résumé - Transition d'un vaccins vivant modifié contre le virus du syndrome reproducteur et respiratoire porcin vers un autre dans un troupeau reproducteur et impact sur la productivité

Le syndrome reproducteur et respiratoire porcin (SRRP) continue de représenter un coût important pour l'industrie porcine et les efforts sont orientés vers la prévention et une réduction des pertes tout au long des phases de production. Nous décrivons ici le cas d'un troupeau reproducteur utilisant un vaccin vivant modifié (VVM) contre le SRRP qui changea de vaccin commercial afin d'améliorer les performances post-sevrage. Deux rondes de vaccination de tout le troupeau avec un nouveau VVM contre le SRRP, administrés à 4 semaines d'intervalle, ont eu lieu sans interruption de la production du troupeau reproducteur et avec des changements limités dans les résultats diagnostiques. Les cochettes de remplacement se sont avérées négatives pour la détection du virus SRRP 10 semaines post-vaccination avec le nouveau VVM. Les diagnostics étaient positifs de manière intermittente dans le troupeau reproducteur et tôt en pouponnière.

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Risser J, Ackerman M, Lape D, Jordon J, Puls CL. Transition from one commercial porcine reproductive and respiratory syndrome modified-live virus vaccine to another in a breeding herd and impact on productivity. *J Swine Health Prod.* 2024;32(3):98-104. <https://doi.org/10.54846/jshap/1375>

Porcine reproductive and respiratory syndrome virus (PRRSV) is a significant pathogen in swine and continues to contribute significant cost to the global swine industry each year.¹⁻³ Even with coordinated efforts by the industry to focus on prevention strategies and methods to mitigate production losses, wild-type PRRSV (WT-PRRSV) outbreaks continue across all production phases. One mitigation effort to decrease the clinical impact of WT-PRRSV is use of porcine reproductive respiratory syndrome (PRRS) modified-live virus (MLV) vaccines.

Several publications have reported on breeding herd and growing pig vaccination programs to mitigate losses incurred from a WT-PRRSV introduction.⁴⁻⁶ Both breeding herd and post-weaning WT-PRRSV risk and production performance results influence herd health programs. Because of this, veterinarians may suggest changes to MLV vaccines in advance of potential WT-PRRSV exposure. However, producers and veterinarians may be hesitant to change commercial PRRS MLV vaccines. In utero PRRSV transmission demonstrates the need for a PRRS MLV vaccine change in both the breeding herd and their offspring.^{7,8} The hesitation may also come from reports in the literature demonstrating the risk of recombination between vaccine-like and WT-PRRSV strains or between two vaccine-like strains.⁹⁻¹¹ Herein describes the process and supporting diagnostics from a vaccinated breeding herd that changed to a new commercial lineage 1 MLV PRRS (LN1MLV) vaccine (Prevacent PRRS; Elanco Animal Health) without production disruptions.

Animal care and use

Diagnostic samples were collected and vaccines administered per the disease prevention and health monitoring program for the herd. Hence, the procedures conducted on farm were considered within normal animal health monitoring and husbandry practices conducted under the advisement of the herd veterinarian.

Herd description

The herd was a 6000 head, MLV-vaccinated breeding herd with off-site nursery and gilt development unit (GDU) located in Indiana. Every 4 weeks, 9-week-old replacement gilts entered into 2 off-site, 1000-head GDU barns. Gilts were transported to the breeding herd every 4

weeks when they were approximately 23 weeks of age. Each GDU barn was emptied prior to entry of the next group of replacement gilts. Nursery sites were all in-all-out with unidirectional flow from a single breeding herd. Three nursery sites were single-barn sites with 4 rooms in each barn; two of which had a total capacity of 8800 pigs, and one with a capacity of 7200 pigs. The fourth site had 2 barns, each with a capacity of 2200 pigs.

For approximately 2 years prior to this herd observation, previous MLV (PMLV) vaccine (PRRS Ingelvac MLV; Boehringer Ingelheim) was administered to the breeding herd quarterly, to replacement gilts at entry to the GDU and 4 weeks later, and to suckling pigs ready to wean at approximately 21 days of age. The last WT-PRRSV infection in the breeding herd was approximately 2 years prior to the change from PMLV to LN1MLV vaccine. Circulating WT-PRRSV strains from the breeding herd and growing pigs were classified by a veterinary diagnostic laboratory. Two lineage 1 clusters, a lineage 1C and a lineage 1B cluster, were detected on open reading frame (ORF) 5 sequence with 85% similarity to PMLV vaccine (Figure 1). The lineage 1C labels circled in Figure 1 indicate WT-PRRSV detected in growing pigs.

Replacement gilts awaiting transport to the breeding herd historically had PRRSV-positive oral fluid (OF) samples when measured by quantitative reverse transcriptase-polymerase chain reaction (RT-qPCR). Positive results caused delays in transport due to the additional molecular diagnostics required to differentiate a PRRSV-positive RT-qPCR result as wild-type versus vaccine-like.¹² These delays often impacted farm breeding targets. The owner and veterinarian aimed to confirm vaccinated gilts negative for PRRSV using RT-qPCR before moving them into the breeding herd.

The owners also reported dissatisfaction with piglet growth and performance post weaning with WT-PRRSV diagnosed in repeated groups of pigs. During October 2020, the owner decided to change from PMLV to LN1MLV vaccine. The decision was based on the higher sequence similarity of LN1MLV to circulating wild-type strains. Existing information indicating LN1MLV reduced viral shedding, spread, and viremia also was taken into consideration.¹³⁻¹⁹

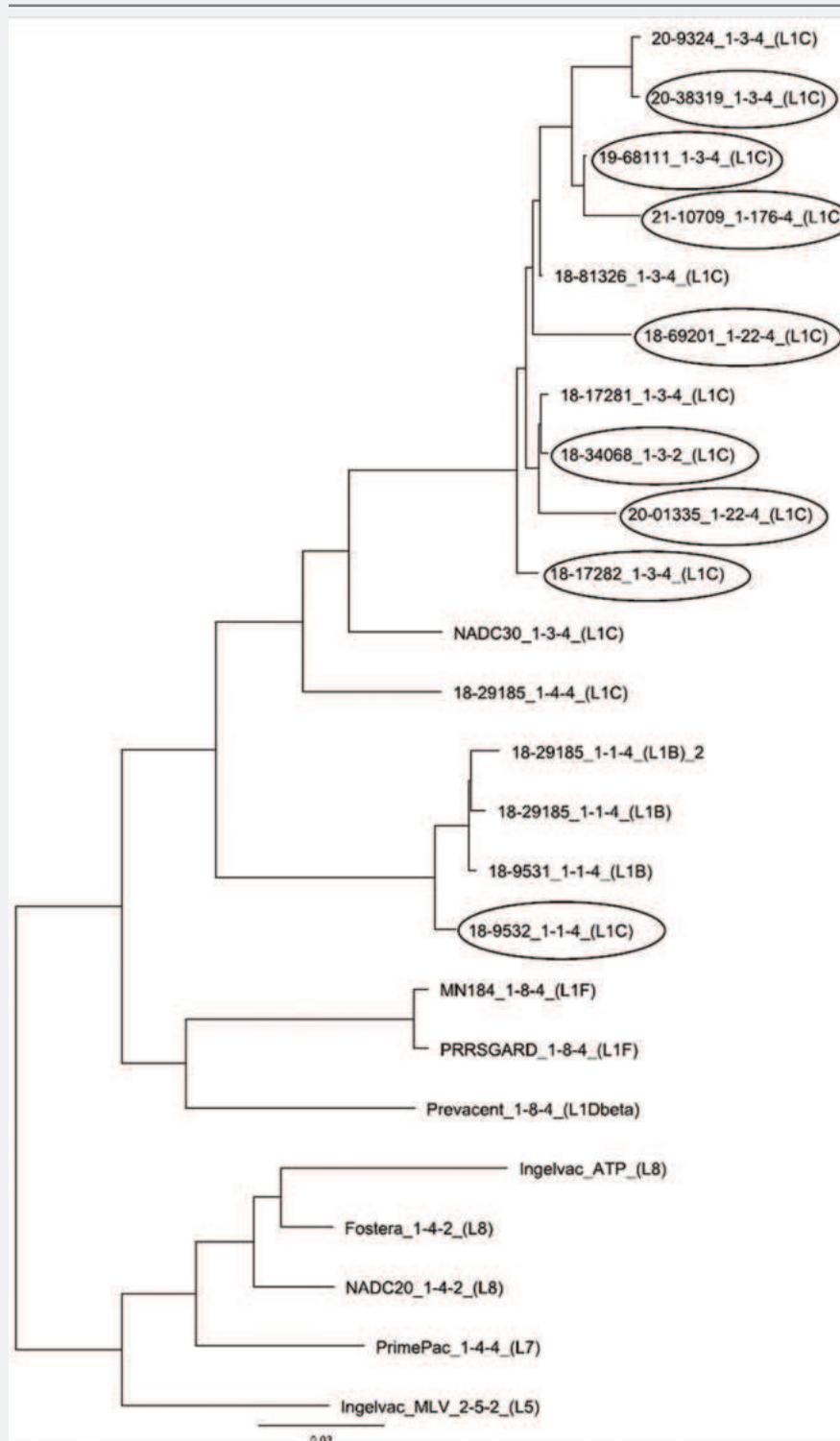
The change in MLV vaccine used occurred when the breeding herd was scheduled for a quarterly vaccination. A dose (1 mL)

of LN1MLV vaccine was administered to all sows, replacement gilts in the breeding herd, and replacement gilts at the off-site GDU. Suckling piglets received 1 mL LN1MLV vaccine 1 to 3 days prior to weaning (at approximately 21 days of age) beginning within a week of breeding herd vaccination. All administration of PMLV was discontinued in the breeding herd, replacement gilts, and suckling piglets. Four weeks later, a second whole-herd vaccination with LN1MLV vaccine was administered to all sows, replacement gilts in the breeding herd, and replacement gilts at the off-site GDU.

A sampling protocol was put in place by the herd veterinarian 6 weeks prior to the first LN1MLV whole-herd vaccination to assess PRRSV circulation through the change of MLV vaccines (Table 1). Externally sourced selected gilts were tested every 4 weeks prior to transport from the continuous-flow, off-site GDU to the breeding herd. Five OF samples were collected from pens (approximately 60 gilts/pen) and pooled into 1 sample/pen at each collection timepoint. Processing fluid (PF) samples from all the gilt (approximately 55) and sow (approximately 220) litters were collected separately and pooled by week.^{20,21} Family oral fluid (FOF) samples were collected 3 days prior to weaning from 5 gilt and 5 sow litters and pooled by week.²² Gilt litter samples for PF and FOF were kept separate from sow litter samples to monitor diagnostic differences as sows would have received multiple doses of PMLV vaccine prior to the change in commercial MLV vaccines. Five OF samples, one per pen, were collected at the beginning (week 1 of placement) and at the end (weeks 5-6 of placement) of the nursery period. Sample collection was distributed across the air space at the front, middle, and back of the room. These 4 sampling timepoints were aligned by birth week for longitudinal analysis of PRRSV status. All samples were submitted to the Iowa State University Veterinary Diagnostic Laboratory. Samples were analyzed by RT-qPCR and both the mean cycle threshold (Ct) value and the frequency to achieve a Ct value > 37 were evaluated.

Reproductive performance, livability, and growth metrics obtained from production databases for the breeding herd and weekly nursery groups were collected and retrospectively analyzed. Three periods of performance data were compared in the breeding herd: PMLV (6 weeks prior to the first whole-herd vaccination with the LN1MLV vaccine),

Figure 1: Phylogenetic tree of porcine reproductive and respiratory syndrome commercial modified-live virus (MLV) vaccines, reference strains, and those wild-type strains detected in the breeding herd and growing pigs 2 years prior to transitioning to Prevacent (new lineage 1 MLV PRRS [LN1MLV]) and through the change of MLV vaccines. Each are labeled with either the vaccine brand name, reference strain name, or an abbreviated case number. The label also includes restriction fragment length polymorphism cut pattern, lineage, and sublineage for lineage 1 strains. Depicted are 2 lineage 1 clusters, a lineage 1C and a lineage 1B cluster. The circled labels indicate wild-type viruses detected in growing pigs.



transition (4-week period between the first and second whole-herd vaccinations), and LN1MLV (6 weeks after the second whole-herd vaccination). The timeframe evaluated for the breeding herd occurred from October 2020 through February 2021 (16 weeks) as directed by the quarterly vaccination schedule. The data analysis focused on these 16 weeks due to other changes in the herd health program that confounded the results. Breeding herd production metrics were recorded weekly and included conception rate, farrowing rate, incidence of stillborn and mummified piglets, preweaning mortality, and pigs weaned per sow farrowed. Growth performance data from barn closeouts were compared for different nursery groups administered the respective vaccines, PMLV or LN1MLV. The nursery performance data evaluated included nursery exit weight, average daily gain (ADG), average daily feed intake, feed conversion rate (FCR), and mortality.

Results

Following each whole-herd vaccination of the breeding herd with LN1MLV vaccine, owners did not report adverse clinical signs such as sows off-feed, fever, or elevated rate of abortions. Breeding herd production parameters remained within expected and historical farm ranges throughout evaluation. The PMLV, transition, and LN1MLV periods had numerically similar variation, as shown by standard deviation, in mean conception rate, farrowing rate, incidence of stillborn and mummified piglets, preweaning mortality, and pigs weaned per sow farrowed (Table 2). Nursery pig productivity did not decrease with the LN1MLV vaccine compared to the PMLV vaccine (Table 2). Nursery exit weight was 1.5 kg greater while nursery ADG increased 0.03 kg/day and FCR improved by 0.02 for LN1MLV vaccinated pigs compared to the prior vaccine program. However, nursery mortality was 1.5% higher after the transition to LN1MLV vaccine (Table 2).

Replacement gilts sampled after 2 vaccinations with the LN1MLV vaccine tested negative at the time of transport to the breeding herd, approximately 10 weeks after the second LN1MLV vaccination. Aligned by birth week, piglet diagnostics from PMLV, transition, and LN1MLV periods are presented in Table 3. Processing fluids from gilt litters were intermittently PRRSV positive within 2 weeks of the whole-herd vaccination (Table 3). Piglet processing fluids from sow litters

Table 1: A sampling protocol for PRRSV detection using RT-qPCR at various timepoints through a PRRSV vaccine transition*

Sampled pigs	Sample type	Sample frequency	No. pooled samples collected
Replacement gilts	OF	Monthly	5 pens
Piglets			
3-5 d of age	PF	Weekly	~55 gilt litters ~220 sow litters
~18 d of age	FOF	Weekly	~5 gilt litters ~5 sow litters
Early nursery (~4 wk of age)	OF	Weekly	5 pens
Late nursery (~9 wk of age)	OF	Weekly	5 pens

* Replacement gilt samples were collected prior to transport from an off-site gilt development unit to the breeding herd. Piglet sample collection points were aligned by birth week for 16 groups of pigs (1 group/wk).

PRRSV = porcine reproductive and respiratory syndrome virus; RT-qPCR = quantitative reverse transcriptase-polymerase chain reaction; OF = oral fluids; PF = processing fluids; FOF = family oral fluids.

Table 2: Production metrics during the transition of a vaccinated PRRSV-vaccinated breeding herd to an LN1MLV vaccine

Production metrics*			
Breeding herd	PMLV	Transition	LN1MLV
No. production weeks	6	4	6
Conception rate, %, mean (SD)	92.9 (1.1)	92.0 (0.8)	91.7 (1.1)
Farrowing rate, %, mean (SD)	89.0 (1.9)	89.7 (1.8)	88.4 (2.2)
Stillborn and mummified piglets, %, mean (SD)	6.4 (0.6)	6.7 (0.7)	6.7 (0.5)
Preweaning mortality, %, mean (SD)	15.0 (2.1)	15.2 (1.1)	13.1 (1.1)
Pigs weaned/sow farrowed, No., mean (SD)	10.8 (2.09)	10.4 (0.75)	10.9 (0.99)
Nursery, mean	PMLV	LN1MLV	Difference
Nursery entry weight, kg	6.3	6.2	- 0.1
Nursery exit weight, kg	23.0	24.5	+ 1.5
Overall ADG, kg/d	0.37	0.40	+ 0.03
Overall FCR	1.50	1.48	- 0.02
Days on feed	46.1	46.4	+ 0.3
Mortality, %	3.2	4.7	1.5

* Production metrics were calculated as follows: conception rate = the percent of sows pregnant of those serviced 35 days prior; farrowing rate = percent of sows farrowed of those serviced 114 days prior; stillborn and mummified piglets = percent pigs stillborn and mummified of total pigs born in period; Pigs weaned/sow farrowed = total pigs weaned in period/total sows farrowed in period; ADG = pounds body weight gained/day in period; FCR = pounds of feed consumed/pound body weight gained in period.

PRRSV = porcine reproductive and respiratory syndrome virus; LN1MLV = new lineage 1 modified-live virus PRRS vaccine; PMLV = previous modified-live virus PRRS vaccine; ADG = average daily gain; FCR = feed conversion rate.

Table 3: Changes in breeding herd and nursery PRRSV diagnostics measured by RT-qPCR before, during, and after changing from a PMLV vaccine to an LN1MLV vaccine

Breeding herd sample period	Ct values by sample type*				Nursery sample period	Ct values by sample type*	
	PF		FOF			Nursery OF	
	Gilt litters	Sow litters	Gilt litters	Sow litters		Early	Late
PMLV	> 37	> 37	> 37	> 37	PMLV	> 37	28.7
	> 37	> 37	> 37	> 37		> 37	27.7
	> 37	> 37	> 37	> 37		> 37	28.3
	> 37	> 37	> 37	> 37		36.2	30.2
	33.4	> 37	> 37	> 37		33.3	28.6
	> 37	> 37	> 37	> 37		> 37	31.2
Transition	> 37	> 37	> 37	> 37	LN1MLV	31.7	28.9
	35.7	> 37	> 37	32.4		34.7	31.1
	> 37	> 37	35.1	34.9		31.8	36.5
	> 37	> 37	> 37	34.0		33.8	32.5
LN1MLV	> 37	> 37	> 37	> 37	LN1MLV	34.3	30.0
	> 37	> 37	> 37	36.6		> 37	32.4
	31.6	> 37	> 37	> 37		> 37	> 37
	> 37	> 37	> 37	> 37		> 37	29.8
	> 37	> 37	> 37	35.6		> 37	35.6
	> 37	> 37	> 37	> 37		> 37	30.2

* Samples were considered PRRSV negative (gray shading) when Ct ≥ 37. Samples were considered PRRSV positive when Ct < 37.

PRRSV = porcine reproductive and respiratory syndrome virus; RT-qPCR = quantitative reverse transcriptase-polymerase chain reaction; PMLV = previous modified-live virus PRRS vaccine; LN1MLV = new lineage 1 modified-live virus PRRS vaccine; Ct = cycle threshold.

remained PRRSV negative throughout the PMLV, transition, and LN1MLV periods. The FOF from gilt and sow litters were intermittently PRRSV positive following the change to LN1MLV vaccine. Neither PF nor FOF samples were sequenced during the PMLV, transition, or LN1MLV periods due to the high Ct values. Early-nursery OF samples were PRRSV positive but tested PRRSV negative after sows received the second whole-herd vaccination with the LN1MLV vaccine. Positive early-nursery OF samples were not sequenced during the PMLV or LN1MLV periods due to the high Ct values. In late-nursery OF samples, PRRSV was detected in all but one group throughout the PMLV, transition, and LN1MLV periods (Table 3). The herd veterinarian reported that the late-nursery PMLV OF were positive for WT-PRRSV. The late-nursery LN1MLV OF with a Ct of 29.8 was Sanger sequenced as WT-PRRSV and is labeled “21-10709_1-176-4_(LIC)” on the phylogenetic tree (Figure 1).

Discussion

The breeding herd described here changed commercial MLV vaccines to 2 whole-herd vaccinations with an LN1MLV vaccine administered 4 weeks apart without production disruptions and limited changes to diagnostic results. To the authors’ knowledge, this is the first report to describe a vaccinated breeding herd and its suckling piglets changing to a new commercial PRRS MLV vaccine. Others have reported a breeding herd vaccination program that alternated quarterly between 2 commercial PRRS MLV vaccines with no negative impact on reproductive performance as measured by conception rate.²³

Prior to commercial availability of the LN1MLV vaccine in the United States, a retrospective epidemiological study enrolled 8 breeding herds that routinely administered commercial MLV vaccines to assess the productivity impact of vaccination.⁴ For each breeding herd, a 6-week period prior to whole-herd vaccination

was established as the baseline. This was compared to a 6-week period following whole-herd vaccination. There was no significant impact on breeding herd productivity from the aggregated data analysis.⁴ This is mentioned here to provide the reader with an indication of the impact of other commercial PRRS MLV vaccines on breeding herd productivity.

This breeding herd is only one vaccinated herd observed for a short duration prior to and following the change of commercial MLV vaccines. These observations did not determine if the process is specific to the commercial MLV vaccine administered, or the long-term impact of the change from one MLV vaccine to the other. A future study may consider enrollment of multiple breeding herds using different production management practices and vaccination programs with other commercial PRRS MLV vaccines. Those studies may want to consider a longer duration of monitoring within the breeding herd to encompass the persistent phase of PRRSV,

detect instability of viral swarm, recurrence and persistence of vaccine-like viremia, and recombination events.^{8,24} Monitoring pigs through the finishing phase would allow observation for changes in production results (eg, ADG, FCR, and mortality) through the time of marketing.

In the herd described here, we observed a shift of PRRSV shedding in the replacement gilts after the change in PRRS MLV vaccines. Historically, this herd's replacement gilts awaiting transport to the breeding herd had PRRSV-positive OF samples as measured by RT-qPCR. Although the virus detected was often vaccine-like, positive results caused entry delays and impacted farm breeding targets. Following the 2 vaccinations, gilt movements and production targets were more predictable. Existing information about the LN1MLV vaccine indicates reduced viral shedding, spread, and viremia,¹³⁻¹⁹ which may explain the consistent PRRSV-negative gilts observed with this herd. The same results may be achievable with other management practices, such as a decrease in the frequency in which gilts enter and exit the off-site GDU.

Processing fluids, FOF, and early-nursery OF tended to show more negative results following the second whole-herd vaccination. This suggests a second whole-herd vaccination with the new MLV vaccine is warranted to aid in the reduction of clinical PRRSV. In late-nursery OF samples, PRRSV was detected in all but one group throughout the herd observation. However, all the FOF samples collected 3 days prior to weaning and OF samples collected in the early and late nursery were pen-based pooled samples. The PF, FOF, and early-nursery OF PRRSV RT-qPCR Ct values were all > 30. Pooling of samples was a limitation in this study. Baker et al²⁵ reported that herds with a low viral load should avoid pooling pen-based oral fluid samples. Future herds may want to consider a larger sample size or fewer number of pen-based OF samples pooled for PRRSV RT-qPCR.

With PRRSV whole-genome sequencing, Trevisan et al¹¹ reported that administration of 2 commercial PRRS MLV vaccines in the same flow (breeding herd and respective growing pigs) can lead to recombination events. This supports the need for a deliberate process to change commercial MLV vaccines in both the breeding herd and their offspring. This vaccinated breeding herd

and its suckling piglets changed commercial PRRS MLV vaccines. Two whole-herd vaccinations with LN1MLV vaccine administered 4 weeks apart occurred without breeding herd production disruptions. In addition, the change in PRRS MLV vaccine allowed replacement gilts to be available for transport to the breeding herd from the off-site GDU in a timely manner post vaccination.

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Conflicts of Interest

Risser and Jordon are employed by Elanco Animal Health, which manufactures and markets Prevacent PRRS vaccine. Puls was employed by Elanco Animal Health at the time of herd observation and manuscript submission. Ackerman and Lape declare no conflict of interest.

Disclaimer

Dr Arruda, a member of this journal's editorial board, was not involved in the editorial review of or decision to publish this article.

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The evolving US swine industry

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Summary

The US swine industry has evolved toward large, integrated production systems and increased efficiency and sustainability, which also impacted disease ecology. A survey assessed the diversity of US barn sizes and pen designs. This report describes the results and discusses factors that may promote disease persistence in these changing conditions.

Keywords: swine, survey, United States swine industry, pen size, barn design

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Resumen - La evolución de la industria porcina estadounidense

La industria porcina estadounidense ha evolucionado hacia grandes sistemas de producción integrados, con una mayor eficiencia y sostenibilidad, lo que también impactó la ecología de las enfermedades. Una encuesta evaluó la diversidad del tamaño de los edificios, y los diseños de los corrales en las granjas de los Estados Unidos. Este reporte describe los resultados, y analiza los factores que pueden promover la persistencia de las enfermedades en estas condiciones cambiantes.

Résumé - Évolution de l'industrie porcine américaine

L'industrie porcine américaine a évolué vers des gros systèmes intégrés de production, avec une augmentation de l'efficacité et de la durabilité, mais ayant également un impact sur l'écologie des maladies. Un sondage a évalué la diversité de la taille des fermes américaines et du design des enclos. Ce rapport décrit les résultats et discute des facteurs qui peuvent favoriser la persistance de maladies dans ces conditions changeantes.

Pigs (*Sus scrofa*), domesticated perhaps as early as 10,000 BC, were common to early agrarian societies throughout the Middle East and Europe.^{1,2} Because they are largely self-sufficient, pigs were allowed to range freely on pastures and in woodlands; a fact particularly well-documented in art and literature from the Middle Ages.³ Pigs were not native to North America and were introduced by Christopher Columbus and other early explorers and settlers.⁴ They quickly adapted to the New World and by 1847 the US pig population reached approximately 35 million (as opposed to the human population estimated to be 20 million).⁵ Beginning in the 19th century, producers began to provide small shelters (2.4 m × 2.4 m or smaller) called “cots” or “colony houses” in pastures to protect animals from adverse weather conditions.⁶ Constructed by the farmers themselves, or available

in local lumberyards, cots were cheap, lightweight, and easily moved as animals were rotated between pastures.⁶

Experiments in the early 1900's led Danish producers to conclude that indoor housing (“intensive” production) provided more efficient use of land, protected animals from weather, eliminated fighting, and improved feed conversion.⁷ In 1919, Spencer⁸ commented on a 2-story barn he observed near Aarhus, Denmark, in which the pigs were fed downstairs and slept in an upstairs area they reached by walking up a ramp.

In the northern regions of the United States, the adoption of indoor housing was driven by the fact that newborn piglets could only survive if farrowed in the summer months. Because farrowing was seasonal, this periodically resulted in an excess supply of market-weight “summer pigs” and, consequently, low prices. To break this seasonal cycle, producers

began to implement indoor production as a way to improve newborn piglet survivability in the colder months and create the opportunity to market pigs throughout the year.

For most of the 20th century, pig barns in the northern regions of the United States were similar in design, ranging in size from 2.4 m × 4.2 m to 7.3 m × 14.6 m, with pen sizes typically 1.8 m × 2.4 m or 2.4 m × 2.4 m, and breeding barns up to 8.5 m × 24.4 m.^{6,9} Although extensive (outdoor) production remained in wide use, O. Burr Ross' writing in 1960 was prescient:

While the practicality of confinement systems of swine production has been demonstrated over and over again by research institutions, universal acceptance by swine producers has been slow. I believe most of the hogs of tomorrow will be raised under some sort of confinement program.⁶

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These words were prophetic and confinement production became the norm in the United States and elsewhere. Concurrent with the transition from outdoor to indoor production, the swine industry changed from predominantly small, individual farrow-to-finish herds to large, specialized production operations.

The progression toward larger farms necessitated changes in housing and management systems and led to the emergence of 2- and 3-site production systems.¹⁰ The first multi-site farm in the United States was constructed in 1988, but by 1995, 60% of production systems with more than 10,000 pigs in inventory were designed as multi-site systems.¹⁰ This evolution process continues with the new generation of confinement facilities. We will learn much about the current US industry, ie, type, size, number, and location of US swine farms, as the data collected through the 2022 US Department of Agriculture (USDA) Census of Agriculture are released. The objective of this research was to supplement the census with a snapshot of current barn designs, in terms of the number of pigs per pen and per barn, in the US swine industry.

Materials and methods

Survey design

The objective of the survey was to collect information on the mean number of pigs per pen and total barn capacities on production sites in the United States. The Iowa State University Office of Research Ethics determined that Institutional Review Board approval was not required because the survey collected no information about people. Participation in the survey was voluntary and efforts were made to include individual pig producers, integrated production companies, and swine veterinarians, ie, no restrictions were placed on participants in terms of production. Two questionnaires, one for swine producers and one for swine veterinarians, were published online using Microsoft 365 Forms and made available from February 2, 2022 to April 14, 2022. Using email listservs and conference announcements, the questionnaire for producers was distributed under the auspices of the National Pork Board and the questionnaire for veterinarians was distributed through the American Association of Swine Veterinarians. Participation was also solicited in a widely distributed electronic article published

by the *National Hog Farmer* on March 1, 2022, with a link provided to the online survey. Finally, the Iowa State University Veterinary Diagnostic Laboratory solicited participation from all clients who had ever submitted one or more swine-related cases.

Data analysis

Survey responses from veterinarians and producers were analyzed separately. For exact numeric responses, eg, the number of “Farm sites represented”, percentiles were calculated using Microsoft Excel. Means and percentiles for the mean, maximum, and minimum respondent-summarized values were also calculated using Microsoft Excel for survey questions such as the “Average number of sows per pen”, “Maximum number of grower-finisher pigs per barn”, or “Minimum number of pens in a grower-finisher barn”. The mean number of growing pigs per pen was calculated by dividing the “average number of grower-finisher pigs per barn” by the “average number of pens in a grower-finisher barn” for each individual response. The means (95% CI) and percentiles for these estimates were calculated using R Studio¹¹ (version 42023.12.1+402).

Results

A total of 147 swine producers provided responses to the survey (Table 1). Among 134 respondents providing location information, 77 were from the US North Central region (Illinois, Indiana, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin), but all areas of the United States were represented. The survey represented a wide range in the number of production sites managed by a respondent, eg, the median value was 2 production sites, but respondents at the 90th percentile reported 60 farm sites. The majority of producers (n = 99; 67.3%) had breeding herd(s) on their farm(s). Among this group, 65 (65.7%) reported using pen gestation. The mean number of sows per pen was 30, but respondents at the 10th percentile reported 4 sows/pen versus 65 sows/pen at the 90th percentile. Likewise, most producers (n = 130; 88.4%) raised grower-finisher pigs, with means of 26 pens/barn and 1333 pigs/barn, respectively. The mean number of pigs per pen was calculated as 75 (95%CI, 57-93). The individual calculated values ranged from 11 (10th percentile) to 146 (90th percentile).

A total of 73 swine veterinarians provided responses to the survey (Table 2). The median number of production sites personally overseen by veterinary respondents was 55; the median number of production sites serviced by the respondents' clinics was 150. The majority of veterinarians (n = 54; 74.0%) worked with breeding herds that utilized pen gestation. Among these herds, the mean number of sows per pen was 37, with 10 sows/pen at the 10th percentile and 88 sows at the 90th percentile. The mean number of pigs per pen in nurseries, wean-to-finish, and grow-to-finish pig sites was 107, 94, and 82 pigs/pen, respectively. All survey participants (n = 73) used oral fluid sampling for disease surveillance.

Discussion

Swine producers achieved major gains in efficiency and sustainability over the course of the 20th century while, simultaneously, the industry underwent a major demographic shift. For example, in 1987, 8% of US pigs were on production sites housing ≥ 5000 head vs $> 72\%$ in 2017 (Table 3).¹²⁻¹⁵ The most remarkable period of change occurred between 1992 and 2009 when, as a result of the growth of multi-site production and improvements in productivity, there was a $> 850\%$ increase in the number of hogs sold or removed from production sites.¹⁶

The shift toward larger swine operations justified investment in technology and technological innovations. These advancements, in turn, reduced the cost of production and labor. For example, between 1992 and 2015, production costs were estimated to have decreased by 59% to achieve 100 pounds of weight gain.¹⁶ In the same period, labor declined by 83% to produce 100 pounds of weight gain.¹⁶ Over a slightly longer time frame (1960 to 2015), the US swine industry achieved major improvements in efficiency and sustainability: feed conversion went from 4.5 to 2.8 pounds of feed per pound of gain, weaned pigs per litter increased from 7 to 10, land use (99% of which is used for feed production) was reduced by 75.9%, water use decreased by 25.1%, global warming potential decreased by 7.7%, and energy use decreased by 7%.¹⁷

The remarkable improvements that were achieved in productivity and sustainability were largely made possible by the technification and efficiencies made possible by economies of scale. Large, specialized hog operations increased production efficiency and sustainability, but

Table 1: Summary of swine producer responses to pen size survey

Survey questions	Responses	Percentiles					Mean
		10 th	25 th	50 th	75 th	90 th	
1. Are you a pig producer?	147	NA	NA	NA	NA	NA	NA
2. How many farms are represented in your responses?	147	1	1	2	10	60	96
3. Do you have breeding herd(s)? If yes, answer 4.	Yes (99)	NA	NA	NA	NA	NA	NA
4. Do you house sows in pen gestation? If yes, answer 5-7.	Yes (65)	NA	NA	NA	NA	NA	NA
5. Average No. of sows/pen	64	4	8	12	43	65	30
6. Maximum No. of sows housed in each pen	64	6	10	20	50	170	51
7. Minimum No. of sows housed in each pen	64	1	2	6	10	48	17
8. Do you raise grower-finisher pigs? If yes, answer 9-14.	Yes (130)	NA	NA	NA	NA	NA	NA
9. Average No. of grower-finisher pigs/barn	129	30	500	1200	2000	2500	1333
10. Maximum No. of grower-finisher pigs/barn	128	39	225	1200	2400	4000	1605
11. Minimum No. of grower-finisher pigs/barn	123	14	30	550	1000	2120	748
12. Average No. of pens in a grower-finisher barn	125	4	10	20	40	48	26
13. Maximum No. of pens in grower-finisher barns	125	4	13	31	49	79	37
14. Minimum No. of pens in grower-finisher barns	126	2	5	10	20	40	16
Grower-finisher pigs/pen*	124	11	25	43	94	146	75
		≥ 2 areas	NC[†]	NE[‡]	SC[§]	SE[¶]	W^{**}
15. In what area of the country do you have production? No. responses.	7		77	19	10	6	15

* Grower-finisher pigs per pen was calculated by dividing the individual responses of question 9 by question 12.

† North Central (NC) included IL, IN, IA, MN, NE, ND, SD, and WI.

‡ Northeast (NE) included CT, DE, MD, MA, MI, NH, NJ, NY, OH, PA, RI, VT, and WV.

§ South Central (SC) included AR, KS, LA, MO, OK, and TX.

¶ Southeast (SE) included AL, FL, GA, KY, MS, NC, SC, TN, and VA.

** West (W) included AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, and WY.

NA = not applicable.

Table 2: Summary of swine veterinarian responses to pen size survey

Survey questions	Responses	Percentiles					Mean
		10 th	25 th	50 th	75 th	90 th	
1. Are you a veterinarian currently in practice?	Yes (73)	NA	NA	NA	NA	NA	NA
2. No. of production sites serviced by your vet clinic?	73	10	43	150	320	960	326
3. How many of these sites do you personally oversee?	54	5	20	55	150	275	109
4. Do your sow herds use pen gestation? If yes, answer 5-8.	Yes (54)	NA	NA	NA	NA	NA	NA
5. Percent of sow herds that use pen gestation	53	10	23	40	75	100	49
6. Average No. of sows/pen	54	10	15	25	40	88	37
7. Maximum No. of sows/pen	54	20	32	60	100	240	86
8. Minimum No. of sows/pen	54	4	5	10	15	39	16
9. Percent of sow herds that wean into nursery?	72	8	10	50	89	100	48
10. Average No. of weaned pigs/pen in the nursery	72	20	25	30	50	100	107
11. Percent of sow herds that use W-F	64	10	40	70	90	95	62
12. Average No. of weaned pigs/pen in the W-F	64	27	50	75	120	215	94
13. Average No. of pigs/barn in grow-to-finish	72	360	1000	1200	2150	2400	1418
14. Average No. of pens/barn in grow-to-finish	72	11	20	26	40	48	29
Grower-finisher pigs/pen*	72	21	26	50	85	125	82
15. Do you use oral fluid sampling for disease detection?	Yes (73)	NA	NA	NA	NA	NA	NA

* Grower-finisher pigs/pen was calculated by dividing the individual responses of question 13 by question 14.
W-F = wean-to-finish; NA = not applicable.

the shift in infrastructure also impacted disease. Some infections essentially disappeared as a direct consequence of housing pigs in confinement, eg, *Toxoplasma gondii* and *Ascaris suum* infections.¹⁸ However, other infectious agents have thrived in confined swine populations, eg, the agents of the porcine respiratory disease complex.¹⁹ Recognizing that the evolution from outdoor to indoor production had caused a fundamental shift in disease ecology, Schwabe²⁰ promoted systematic on-farm data collection and analysis as the best approach for understanding the processes impacting livestock health and production. This data-driven approach for understanding causality and evaluating the effects of management decisions on swine health is the basis of today's population medicine.

An important part of population medicine is to understand how production practices affect productivity and health. For example, influenza A virus infections in the small herds of times past were seasonal, with herd immunity rapidly acquired and the infection eliminated. In today's large herds, influenza A virus circulates throughout the year.²¹ Similarly, Rotolo et al²² showed that porcine reproductive and respiratory syndrome virus moves non-uniformly within and between wean-to-finish barns on the same site. Thus, infrastructure impacts disease and disease spread, but there is essentially no information on housing designs currently used by US producers. This study showed that the swine industry, in fact, is still diverse in terms of total inventory and housing

design. Interestingly, producers may house from a few to several hundred pigs per pen. Future research should address the impacts of pen and barn inventory on disease ecology and disease surveillance.

Implications

Under the conditions of this study:

- The industry is moving to group housing for gestating sows and larger pens for growing pigs.
- Disease surveillance must fit contemporary production systems.
- All veterinary respondents reported using oral fluids for surveillance.

Table 3: Number and proportion of US swine farms within inventory classification based on US Department of Agriculture Census of Agriculture data

Farm inventory	No, (%) of farms and pigs by year ¹²⁻¹⁵							
	2017		2007		1997		1987	
	Farms	Pigs	Farms	Pigs	Farms	Pigs	Farms	Pigs
1-24	46,475 (70.0)	278,691 (0.4)	45,047 (59.7)	260,154 (0.4)	56,092 (44.9)	381,729 (0.6)	86,621 (35.6)	743,251 (1.4)
25-49	3759 (5.7)	122,915 (0.2)	4292 (5.7)	146,672 (0.2)	9411 (7.5)	325,329 (0.5)	26,895 (11.0)	939,637 (1.8)
50-99	1889 (2.8)	122,090 (0.2)	3182 (4.2)	215,206 (0.3)	9334 (7.5)	639,493 (1.1)	29,881 (12.3)	2,058,524 (3.9)
100-199	1220 (1.8)	160,882 (0.2)	2590 (3.4)	354,203 (0.5)	10,364 (8.3)	1,417,039 (2.3)	32,293 (13.3)	4,426,492 (8.5)
200-499	1451 (2.2)	454,960 (0.6)	4524 (6.0)	1,467,383 (2.2)	16,539 (13.2)	5,194,768 (8.5)	40,156 (16.5)	12,334,432 (23.6)
500-999	1305 (2.0)	905,123 (1.3)	3588 (4.8)	2,488,234 (3.7)	10,378 (8.3)	7,104,689 (11.6)	17,878 (7.3)	11,924,290 (22.8)
1000-1999	2016 (3.0)	2,741,382 (3.8)	4013 (5.3)	5,527,798 (8.2)	6597 (5.3)	8,794,666 (14.4)	6865 (2.8)	8,870,231 (17.0)
2000-4999	4724 (7.1)	14,893,679 (20.6)	5356 (7.1)	16,532,918 (24.4)	4323 (3.5)	12,752,495 (20.8)	2403 (1.0)	6,733,228 (12.9)
≥ 5000	3600 (5.4)	52,701,285 (72.8)	2850 (3.8)	40,793,750 (60.2)	1851 (1.5)	24,577,941 (40.2)	406 (0.2)	4,241,035 (8.1)
TOTAL	66,439	72,381,007	75,442	67,786,318	124,889	61,188,149	243,398	52,271,120

Acknowledgments

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Conflict of interest

None reported.

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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

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$$

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
Grower	66	30
	99	45
	110	50
Finisher	132	60
	198	90
	220	100
Mature sow or boar	231	105
	242	110
	253	115
	300	136
Mature sow or boar	661	300
	794	360
	800	363

1 tonne = 1000 kg

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

1 ppm = 1 mg/L

Get to know the Swine Health and Production team at National Pork Board

The National Pork Board (NPB) has recently filled multiple positions on the Swine Health and Production team and wanted to use this opportunity to introduce them. Please feel free to contact them with any questions about the work we are prioritizing at NPB in the swine health and production areas.



Dusty Oedekoven, DVM, DACVPM
Chief Veterinarian
doedekoven@pork.org

Dr Dustin “Dusty” Oedekoven has been the chief veterinarian for the National Pork Board since February 2022. In this role, he leads a team of veterinarians and swine production experts in checkoff-funded work. Notably, the team collaborates with state and federal animal health officials, the National Pork Producers Council, the Swine Health Information Center, universities, and other national organizations to identify and execute strategic action and research to prepare and protect the US swine herd from African swine fever and other costly threats.

Dr Oedekoven most recently served as State Veterinarian and Executive Secretary for the South Dakota Animal Industry Board, where he provided strategic leadership and direction for the state’s

animal health agency – a seven-member, governor-appointed board of livestock producers with responsibility for all animal health programs and disease control efforts in the state.

He received his BS from South Dakota State University and DVM from Iowa State University. Dr Oedekoven is a diplomate of the American College of Veterinary Preventive Medicine.



Patrick Webb, DVM
Assistant Chief Veterinarian
pwebb@pork.org

Dr Patrick Webb is the assistant chief veterinarian at the National Pork Board, where he joined in 2005. He is responsible for the Pork Checkoff efforts for foreign animal disease (FAD) prevention and preparedness. Throughout his career, Dr Webb has worked extensively on emergency preparedness and planning at the local, state, and federal levels. He has developed and delivered numerous educational programs directed at training producers, veterinarians, county emergency managers, and first responders on how to respond to FAD disasters.

Dr Webb received his BS and DVM from Iowa State University.



Meredith Behr Petersen, DVM, MPH
Director of Swine Health
mpetersen@pork.org

Dr Meredith Petersen joined the National Pork Board in 2024 as Director of Swine Health. In this role, she collaborates with others on the Swine Health and Production Team on projects related to foreign and endemic disease programs. Before joining the National Pork Board, Dr Petersen was a post-doctoral research associate at the Swine Medicine Education Center (SMEC), a role focused on applied swine research, teaching, and clinical swine medicine. Her research with SMEC investigated the capabilities and limitations of telemedicine in swine practice.

Dr Petersen received her BS and DVM from Iowa State University and her MPH from the University of Iowa.



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Marisa Rotolo, DVM, PhD

Director of Swine Health
mrotolo@pork.org

Dr Marisa Rotolo joined the National Pork Board as Director of Swine Health in November 2023. In this role, she manages the Swine Disease Research Task Force and works to support the National Pork Board's efforts for FAD preparedness and response.

Dr Rotolo was previously a health assurance veterinarian with PIC, where she managed health and biosecurity programs for owned, elite, and multiplication herds. She also worked with the global dissemination team to execute successful live animal and liquid genetics exports to global customers. In this role, she supported efforts to implement FAD preparedness such as the development of Secure Pork Supply plans and keeping producers up to date on industry, federal, and state efforts. Before her time at PIC, Dr Rotolo worked as a veterinary epidemiologist cooperater at the US Department of Agriculture's Center for Epidemiology and Animal Health and Iowa State University to help develop the swine hemorrhagic fevers surveillance plan and preparedness and response documents for the African Swine Fever Red Book. She continues to manage this cooperative agreement.

She received her PhD and DVM from Iowa State University.



Brent Pepin, DVM, MS

Director of Swine Health
bpepin@pork.org

Dr Brent Pepin joined the National Pork Board as Director of Swine Health in March 2024. In this role, he will collaborate on work with US Swine Health Improvement Plan and projects related to foreign and endemic diseases. Before his current position, Dr Pepin was the director of veterinary medicine for a biomedical research company. In this role, he oversaw critical aspects of swine bio-surveillance, facility biosecurity, herd health management, and all surgical and medical interventions and served as the Institutional Animal Care and Use Committee Attending Veterinarian. Before his time in the biomedical field, he was an associate veterinarian with Pipestone Veterinary Services. In this role, he provided veterinary services to system farms and independent producers in conjunction with supporting the development and implementation of FAD preparedness, including Secure Pork Supply plans, and assisted in the execution of various research efforts. Before his time at Pipestone, he was an associate veterinarian for Postville Veterinary Clinic serving as a swine, dairy, and beef veterinarian.

He received his DVM and MS from Iowa State University.



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¹Boyd, R. D., et al. 239 Increasing Dietary Soybean Meal Level Improves Growth and Feed Conversion Efficiency in Healthy Pigs and Reduces GHG Emissions. *Journal of Animal Science*, Volume 100, Issue Supplement_3, October 2022, Page 122, <https://doi.org/10.1093/jas/skac247.233>.
²Large scale commercial trials: data on file

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AASV installs 2024 officers

Dr Angela Baysinger was installed as president of the American Association of Swine Veterinarians on February 27, 2024, during the association’s 55th Annual Meeting in Nashville, Tennessee. She succeeds Dr William Hollis, who is now immediate past president. Dr Locke Karkiker has ascended to president-elect. The newly elected vice president is Dr Rebecca Robbins.

AASV President Dr Angela Baysinger (Missouri ‘92) currently serves as the North American animal welfare lead for all species for Merck Animal Health. Dr Baysinger completed her undergraduate studies in animal science and her DVM at the University of Missouri. She received an MS in epidemiology from the University of Nebraska. Additionally, she received an MS in international animal welfare, ethics, and law in December 2021 from the University of Edinburgh, partially funded by the AASV Alex Hogg Memorial Scholarship. Dr Baysinger was honored with the AASV Meritorious Service Award in 2021 and delivered the prestigious Howard Dunne lecture in 2022. She has served on multiple AASV committees as a member and chair and on the AASV Board of Directors representing District 8.

When asked to comment on her thoughts about the future of AASV and her tenure as president, Dr Baysinger said, “It is an honor to serve AASV as your president. The AASV membership is comprised of veterinarians and scientists that eagerly take leadership roles within the swine industry. Therefore, with you as a leader, the swine industry will continue to evolve and AASV will support your leadership and the industry into the future.”

Dr Baysinger lives near Bruning, Nebraska with her family.

AASV President-elect Dr Locke Karkiker (Mississippi State ‘99) is director of the Swine Medicine Education Center and a Morrill Professor, holding the Dr Douglas and Ann Gustafson Professorship for Teaching Excellence in Veterinary Medicine in the Iowa State University Veterinary Diagnostic and Production Animal

Medicine Department. Dr Karkiker has served the association as District 6 Director, co-chair of the Collegiate Activities Committee, member of the Annual Meeting Program Planning Committee, member of the Pharmaceutical Issues Committee, member of the AASV-National Pork Board Task Force on Antimicrobial Resistance, and member of the Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria. He delivered the 2011 Howard Dunne Memorial Lecture and was honored with the AASV Howard Dunne Memorial Award in 2014.

AASV Vice President Dr Rebecca Robbins (North Carolina State ‘09) previously provided veterinary services for two of the world’s largest integrated pork production companies and is now a health assurance veterinarian for Pig Improvement Company (PIC). She received her BS, DVM, and PhD from North Carolina State University. Dr Robbins has served the association as a member of multiple AASV Annual Meeting Program Planning Committees,

chair of the Pharmaceutical Issues Committee, and as AASV’s alternate representative on the American Veterinary Medical Association’s Committee on Antimicrobials. She has served the broader swine industry as a member of several other committees and task forces led by the National Pork Board and Swine Health Information Center. She was honored with the Allen D. Leman Science in Practice award in 2018.

Commenting on her upcoming role as vice president, Dr Robbins said, “As swine veterinarians, we are integral to protecting health, well-being, and food safety in the pork supply chain. The AASV delivers many benefits to its members including dissemination of peer-reviewed science in its journal, providing continuing education, and funding scholarships for students and practitioners. I look forward to serving the organization, strengthening the member benefits, and, by extension, ensuring the prosperity of the swine industry.”



AASV officers (left to right) Dr Angela Baysinger (president), Dr Locke Karkiker (president-elect), Dr Rebecca Robbins (vice president), and Dr Bill Hollis (past president).

AASV news continued on page 117

BACKED BY DATA. PROVEN IN PIGS.

SAFE + EFFECTIVE

NO DRAG

LOW SHED

1.17lb
per day ADG

1.19lb
per day ADG

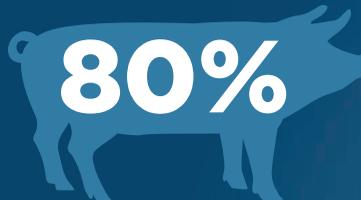
PRRSgard*

Control

No statistical difference in average daily gain between vaccinates and control pigs D0-42.*

0%
**DIFFERENCE
IN NURSERY
LIVABILITY**

No difference in livability between vaccinates and control pigs.



80%

of naïve pen-mates
tested PRRS
negative after
6 WEEKS

At 41 days post-vaccination, 80% of the control pigs (57/71) tested negative for PRRSGard RT-PCR compared to 20% (14/71) of the control pigs that tested positive.**



82%
less time viremic

1.10 weeks in vaccinates and 2.0 weeks in control group.*



75%
fewer viremic pigs

Mean TCID of 3.0 for placebo pigs compared to mean TCID of 0.75 for vaccinates at 14 days post-vaccination.*



zero VIRUS DETECTION IN AIR FOR 35 DAYS

There was no PRRSV detected in aerosol samples at any of the three test locations up to 35 days post-vaccination, when aerosol testing concluded.**

See for yourself at PRRSgard.com



Pharmgate
ANIMAL HEALTH

* Pharmgate Animal Health, Smithfield Hog Production-North Region, Iowa State University; Smith, C.; Chamba, F.; Pittman, J.; Rawal, G.; Zhang, J.; Francisco, C.; Evaluation of the response to PRRSGard* administration in weaned pigs. March 2020.

** Pharmgate Animal Health, Veterinary Resources Inc.; Chamba, F.; Sui, J.; Conarchy, B.; Zhang, X.; Kesi, L.; Ma, S.; Ruth, D.; Venegoni, A.; Experimental safety and efficacy of a unique MLV PRRSV vaccine: PRRSGard*; July 2019.

*** Swine Vet Center, Pharmgate Animal Health; Kettelkamp, E.; Betlach, A.; Yeske, P.; McCuiston, L.; Okones, J.; Evaluation of airborne shedding and production setback post-weaning from Pharmgate PRRSGard* vaccine in commercial conditions. March 2023.

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Dr Robbins lives in Amarillo, Texas with her husband, Andrew Brown, and their son, Grady. They are active members in their church, Saint Paul Methodist, and enjoy adventuring in the Panhandle.

AASV Past President Dr William Hollis (Illinois '96) is a partner and veterinarian of Carthage Veterinary Service and serves as the president of Professional Swine Management, the Carthage swine service management company. Dr Hollis

was named the AASV Swine Practitioner of the Year in 2019. He is a Pork Quality 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 Bill Hollis to serve as AASV acting president

Dr Angela Baysinger was installed as president of the AASV during the Business Meeting at the AASV Annual Meeting on February 27, 2024 in Nashville, Tennessee. Her recent passing results in a vacancy in the office of AASV president. In accordance with the association's bylaws, the immediate

past president presides in the absence of the president. As such, Dr Bill Hollis, AASV past president, has graciously agreed to serve as acting president for 2024. He will assume all duties and responsibilities of the president effective immediately. Elections will be held as normal in early 2025.

AASV proceedings and seminar papers online

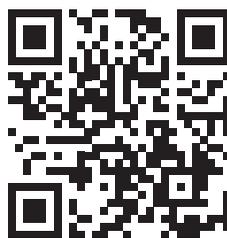
Were you unable to attend the AASV Annual Meeting? Or perhaps you could not attend all the presentations you were interested in? Good news: the conference proceedings are available online to all AASV members at aasv.org/library/proceedings (2024 membership dues-paid status required).

The proceedings papers are available in several formats:

- "Big book" of the papers for the regular meeting sessions in a single PDF file with a linked table of contents

- Seminar booklets - PDF file for each seminar
- Individual papers in the Swine Information Library (aasv.org/library/swineinfo)

Happy reading!



SAVE THE DATE

March 1-4, 2025
AASV Annual Meeting



San Francisco, California
San Francisco Marriott Marquis



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Protect pigs from porcine circovirus types 2a and 2d, *Mycoplasma hyopneumoniae* and *Lawsonia intracellularis* with CIRCUMVENT CML – the first and only vaccine that covers these three major causes of disease with just one injection.

- + FEWER INJECTIONS
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For a singularly better experience for your staff and your animals,

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ANNUAL MEETING REPORT

Attendees look to lead into the future during the AASV Annual Meeting

The American Association of Swine Veterinarians (AASV) held its 55th Annual Meeting in Nashville, Tennessee, February 24-27, 2024, at the Gaylord Opryland Resort. The theme this year, “Leading AASV into the Future,” emphasized the importance of acknowledging and embracing an AASV member’s role in the future of swine production and provision of food for the world. Program Chair and AASV President-elect Dr Angela Baysinger called on the 2024 program planning committee to compile a scientific program where attendees could learn from the past and lead into the future. She challenged attendees to follow Albert Einstein’s approach, “Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning.”

This year’s Annual Meeting drew 1040 total attendees, including 104 veterinary students from 23 universities in the United States, Canada, and Mexico. The total attendance also included 260 exhibit representatives from 98 companies and organizations and 4 media representatives. Including the United States, 22 countries were represented; 15% of attendees came from outside the United States.

Meeting participants enjoyed the opportunity to listen to 219 speakers and poster presenters by attending educational sessions including 10 preconference seminars, 2 general sessions, 3 concurrent sessions, 1 Research Topics session, 3 Industrial Partners sessions, the Student Seminar, and a poster session featuring posters from students, researchers, and industrial partners.

Preconference seminars included topics about diagnostic data, disease preparedness, swine business, pig livability, biosecurity, influenza, field research, and nutrition. Saturday’s Pig Livability: What Works, What Doesn’t preconference seminar drew the most preregistered attendees. As always, the Swine Medicine for Students preconference seminar was well attended by veterinary students. Sunday afternoon, veterinary students highlighted their research and experience to a large crowd during the Student Seminar.

The ever-popular Dr Max Rodibaugh Practice Tips preconference seminar was voluntarily judged by Drs Bryant Chapman, Kelly Greiner, and Lisa Tokach and chaired by Dr Melissa Billing. Dr Will Fombelle’s presentation titled, “Triaging emergencies: Be the calm after the storm,” received the top prize, followed by Dr Rachel Stika Jensen’s “Round up the pigs” and Dr Susan Detmer’s “Catching the flu: Best practices for successful sampling.”

Dr Joel Nerem, chief veterinary officer at Pipestone, opened the Monday general session with the Howard Dunne Memorial Lecture. During his presentation titled “Swine veterinarians: Who are we and where are we going?,” he encouraged veterinarians to focus on the pig, the farmer, and the consumer. He defined a “next generation swine veterinarian” as someone who eliminates diseases, welcomes next generation biosecurity, promotes foreign animal disease preparedness, develops traceability solutions, champions pig welfare, and embraces consumer preferences and delivers solutions to farmers.

Dr Chris Rademacher, clinical professor and swine extension veterinarian at Iowa State University, presented the Alex Hogg Memorial Lecture titled “Past, present, and future challenges for the swine veterinary profession.” After a tribute to Dr Hogg and the many mentors and experiences that shaped his life, Dr Rademacher acknowledged the challenges of swine veterinary education, recruitment and retention of the next generation of swine veterinarians, and an evolving profession. He recognized any solution will require a different way of thinking about swine veterinary practice. He said, “The key to relationships is understanding people. We raise pigs, but we are still in the people business.”

Speakers during the second half of the Monday general session described disease elimination and eradication challenges, including a zombie apocalypse approach to biosecurity, biocontainment, and disease control and elimination.



Dr Angela Baysinger, AASV president-elect and program chair welcomes attendees to the 55th Annual Meeting.

The Monday afternoon concurrent sessions challenged veterinarians to think critically about sustaining the farm in the face of evolution, moving disease elimination beyond theory and into success in the future, and what immunology tools are available today and those in a toolbox of the future. The Tuesday general session encouraged attendees to refocus on the end goal – producing safe, wholesome, and high-quality pork.

While continuing education is incredibly important to attending veterinarians, some of the most valuable takeaways from each Annual Meeting might be the personal and professional connections made outside of each session. In addition to the scientific sessions, avant-garde ideas and generous sponsorships allow the AASV to host professional and student social networking events, personal and professional development opportunities, self-care experiences, and receptions to celebrate and recognize student, college, and mentor accomplishments.

Fourteen AASV committees met during the Annual Meeting to discuss important issues in swine health, public health, pig welfare, and membership services. For the first time, several universities hosted receptions for their collegiate alumni. Students met and mingled with peers and veterinarians during multiple student social events. Luggage tags with the AASV logo and other prizes were awarded to those who participated in a member scavenger hunt to help attendees welcome new faces, get to know and appreciate their AASV colleagues, and promote well-being and inclusivity. Thanks to efforts by the AASV Human Health, Safety, and Well-being Committee, basic hearing tests were offered by the Vanderbilt Audiology Community Outreach Team at no charge to attendees. A yoga class was fun for early morning risers looking to exercise their mind, body, and spirit. Early morning risers also joined together for breakfast, music, and fellowship at the annual praise breakfast.

For the second year, the AASV Foundation cosponsored the Monday luncheon with the AASV. Recipients of AASV Foundation-funded programs, including veterinary student scholarships, Alex Hogg Memorial Scholarships, Zoetis Foundation and Dr Conrad and Judy Schmidt Family Student Debt Relief Scholarships, and research grants were announced. The Foundation also honored its newest Heritage fellows, Dr Hans and Darcy Koehnke. The AASV Student Podcast Award winner Kaci Way was announced, as were the Dr Max Rodibaugh Practice Tips seminar winners.

The AASV Awards Reception was held Monday night, followed by the AASV Foundation's annual fund-raising auction. Dr Jeff Harker, 2020 AASV president and 2024 AASV Awards Selection Committee chair, introduced the recipients of the Swine Practitioner of the Year Award, the Howard Dunne Memorial Award, the Meritorious Service Award, the Outstanding Swine Academic of the Year Award, the Technical Services/ Allied Industry Veterinarian of the Year Award, and the Young Swine Veterinarian of the Year Award.

Swine Practitioner of the Year

Dr Matt Allerson was named the 2024 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 Allerson earned a BS from the University of Wisconsin-River Falls. He received an MPH, DVM, and PhD from the University of Minnesota.

Dr Allerson is a veterinarian at Holden Farms, based out of Northfield, Minnesota, where he leads a team of veterinarians for one of the largest family-owned production systems in the country. He has presented many scientific abstracts at AASV Annual Meetings and other swine health meetings. Not only is Dr Allerson known nationally and internationally for his work in disease control, health, and production, he also stands out for his outstanding teaching, mentorship, natural team leadership, and approachability. "His ability to navigate and lead through challenging situations with a calm and positive outlook reflects his resilience and unwavering commitment to the well-being of the swine industry," said one of his nominators.

Asked to share his thoughts about receiving this award, Dr Allerson replied, "I am honored to receive this award from the AASV. I am very grateful for the team at Holden Farms that I have had the pleasure to work with over the past 13 years. Additionally, I appreciate all the mentorship I have received from members of the AASV and the University of Minnesota College of Veterinary Medicine. I am also thankful for my wonderful wife and family and all the support they have provided for me during my career."

As noted by colleagues and clients, Dr Allerson's passion for swine is second only to that of his family. He is very proud of his wife Jenna and three children, Owen, August, and Adeline. He considers it a joy to watch his family grow and spend time with them.



Dr Matt Allerson, recipient of the AASV Swine Practitioner of the Year Award.

Howard Dunne Memorial Award

Dr Paul Yeske received the 2024 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.

Dr Yeske is a 1985 graduate of Iowa State University College of Veterinary Medicine. He went on to earn an MS at the University of Minnesota (1998) and completed the Executive Veterinary Program



Dr Paul Yeske, recipient of the Howard Dunne Memorial Award.

in Swine Health Management at the University of Illinois (2009). He is a senior member of the veterinary team at the Swine Vet Center in St. Peter, Minnesota.

With more than 30 years of swine veterinary experience, Dr Yeske has been recognized by his peers for his important contributions to swine medicine in disease management and elimination as the AASV Swine Practitioner of the Year (1998), the recipient of the Allen D. Leman Science in Practice Award (2010), and the Iowa State University Swine Disease Conference Science in Practice Award (2013).

He has contributed to the greater knowledge of swine medicine for veterinarians as a speaker at multiple AASV Annual Meetings. In 1996, he delivered the Howard Dunne Memorial Lecture. He has served on the AASV Swine Health Committee, the PCV2 Task Force, and the Annual Meeting Program Planning Committee. He continues to serve the association as a member of the PRRS Committee and PED Elimination Task Force.

Upon acceptance of the award, Dr Yeske said, "I am humbled to be considered with the previous recipients." He offers his gratitude to his wife, Lori, and son, Adam, for their support.

Meritorious Service Award

Dr Nathan Winkelman was named the 2024 recipient of the Meritorious Service Award. The award recognizes individuals who have provided outstanding service to the AASV.



Dr Nathan Winkelman, recipient of the AASV Meritorious Service Award.

Dr Winkelman earned his BS and DVM from the University of Minnesota. He is the co-owner of Swine Services Unlimited Inc, a swine research and consulting practice he started in 1998.

As expected of a Meritorious Service Award recipient, Dr Winkelman has worked tirelessly for the AASV. He led the association as president in 2019 and chaired the AASV's 50th Anniversary Annual Meeting. He has served on the AASV Executive Committee, the AASV Board of Directors, and many other AASV committees, including Annual Meeting Program Planning Committees. He has moderated many seminars at AASV Annual Meetings. Dr Winkelman was an active participant in the National Pork Board Operation Mainstreet program giving presentations to raise awareness about modern pork production.

Dr Winkelman has also been a member of the AASV Foundation Board and chaired the AASV Foundation research grant committee. In 2016, he created the first AASV Foundation Legacy fund. The Legacy Fund represents the highest level of the foundation's endowed giving programs, with a minimum \$50,000 contribution required to establish a named endowment.

Dr Winkelman strongly believes the AASV has been integral in a long and successful career as a swine veterinarian and researcher. "My dedication to the AASV is exemplified in not missing an Annual Meeting since I was a vet student in 1982."

He is the lead author of more than 40 scientific articles and has been invited to speak at many local, national, and international meetings. He was the 2019 recipient of the Allen D. Leman Science in Practice Award.

Thankful for the association, Dr Winkelman stated, "I am grateful and humbled to receive the Meritorious Service Award. It's easy to give back time and effort to an organization I love. The AASV has given me 100 times what I try to give in return."

Outstanding Swine Academic of the Year Award

Dr Rodger Main was named the 2024 recipient of the Outstanding Swine Academic of the Year Award. The award is given annually to an AASV member employed in academia who has demonstrated excellence in teaching, research,

and service to the swine veterinary profession. Faculty members, graduate students, and researchers are eligible to receive this award.

Dr Main received his BS and DVM from Iowa State University and PhD from Kansas State University. He is a professor and director of the Iowa State University Veterinary Diagnostic Laboratory (ISU VDL). The ISU VDL's team of 180 faculty and staff play an active role on the frontlines of US animal agriculture processing approximately 120,000 diagnostic case submissions and conducting more than 1.5 million diagnostic assays each year. Peers credit Dr Main's commitment and innovation as key to transforming the ISU VDL into a global leader in food-animal diagnostic medicine.

More recently, Dr Main has also been serving as the principal investigator of the US Swine Health Improvement Plan endeavor that centers on bringing industry, state, and federal partners together to establish an officially recognized platform for safeguarding, certifying, and bettering the health of US swine and the longer-term competitiveness of the US pork industry.

Dr Main is a member of the AASV Committee on Transboundary and Emerging Diseases and has served on many others. He delivered the Alex Hogg Memorial Lecture at the 2019 AASV Annual Meeting. He has been recognized for his outstanding service to the swine industry with the Allen D. Leman Science in Practice Award (2008), the AASV Howard Dunne Memorial Award (2017), the Iowa State University Award for Outstanding



Dr Rodger Main, recipient of the Outstanding Swine Academic of the Year Award.

Achievement in Extension or Professional Practice (2020), and the American Association of Veterinary Laboratory Diagnosticians Distinguished Service Award (2022).

Appreciative of his career and colleagues, Dr Main stated, “I am most certainly humbled and honored to be recognized by my peers in this way. I feel extremely fortunate to have been given the opportunity to work with and for so many great people over the course of my career. I fully realize that any such recognition that comes my way is simply an acknowledgment and appreciation for the contributions being made by those I have the good fortune to work with and be supported in both the workplace and at home. For that, I am indeed most certainly grateful.”

Technical Services/Allied Industry Veterinarian of the Year

Dr Melissa Farber Billing received the Technical Services/Allied Industry Veterinarian of the Year Award. This 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.

Dr Billing graduated from Wilmington College of Ohio and received her DVM from The Ohio State University College of Veterinary Medicine. She completed the Executive Veterinary Program in



Dr Melissa Billing, recipient of the AASV Technical Services / Allied Industry Veterinarian of the Year Award.

Swine Health Management and received a Master of Veterinary Science degree from the University of Illinois.

As a senior key account veterinarian in the swine division at Boehringer Ingelheim Animal Health (BIAH) USA Inc, Dr Billing assists veterinarians and swine producers throughout the eastern United States on topics including BIAH swine vaccines, custom made vaccines, disease challenges, disease prevention, biosecurity, food safety, and swine production.

Dr Billing has been an AASV member since joining as a student in 2002. She has served on the AASV Board of Directors as the District 1 Director for the past 6 years. She has also assisted the organization as the chair of the Operation Main Street Committee and as a member of the Annual Meeting Program Planning Committee.

Upon acceptance of the award, Dr Billing commented, “I am extremely honored to have been selected as the recipient of the 2024 AASV Technical Service Veterinarian Award. I am grateful to my peers and mentors within the AASV for recognizing me. I really appreciate that my company has given me the opportunity to work in such a great industry. Last but not the least, I am thankful to have such a loving family that has always supported me as I strive to reach my goals.”

Outside of work, Dr Billing enjoys spending time with her husband, Steve, and their two daughters, Rose and Teagen.

Young Swine Veterinarian of the Year

The Young Swine Veterinarian of the Year Award was presented to Dr Dylan Lape. The award is given annually to an AASV member five or less years post veterinary graduation who has demonstrated the ideals of exemplary service and proficiency early in their career.

Dr Lape, son of Dana Lape and Rose Young, grew up in the small town of Lebanon, Pennsylvania raising exhibition poultry along with his brother and father. He received a BS from Pennsylvania State University in 2014. He received a DVM in 2018 from Purdue University.



Dr Dylan Lape, recipient of the AASV Young Swine Veterinarian of the Year Award.

After developing an interest in swine at the Penn State swine farm and pursuing those interests through veterinary school, Dr Lape joined Pork Veterinary Solutions in July of 2018. He works with independent swine producers, contract growers, and large integrators and oversees the production of approximately 1 million pigs a year.

Dr Lape has participated in multiple foreign animal disease planning and preparedness exercises and has completed the Swine Veterinarians Public Policy Advocacy Program through the National Pork Producers Council and AASV.

All of Dr Lape’s many nominations for this award describe his infectious positivity as an ideal of exemplary service. Even in challenging, difficult, or stressful situations, Dr Lape continuously chooses to be happy, making him a valuable team member and a joy for colleagues and clients.

Upon acceptance of the award, Dr Lape commented, “I am shocked and honored to be selected for this award! I 100% would not be the veterinarian I am today without the mentorship I have received from many members of AASV, but especially my boss Dr Matt Ackerman!”

Dr Lape still raises exhibition poultry locally and enjoys showing across the Midwest in his spare time.

AASV annual business meeting

During the annual business meeting on Tuesday, February 27, AASV President Dr Bill Hollis reported on the association's membership and activities. As of that date, total membership was 1536, including 210 students from 36 universities, 976 members residing in the United States, 39 members residing in Mexico, 125 members residing in Canada, and 186 international members residing in 35 additional countries.

The 2024 AASV officers, Drs Angela Baysinger, president; Locke Karriker, president-elect; Rebecca Robbins, vice president; and Bill Hollis, past president, were installed. The board congratulated re-elected district directors Drs Chris Rademacher (District 6) and Christine Mainquist-Whigham (District 8) and welcomed newly elected district directors Dr Andrew Bowman (District 1), Dennis Villani (District 4), and Joaquin Becerril (District 10). The board thanked outgoing district directors Drs Melissa Billing (District 1), Megan Inskip (District 4), and Enrique Corona (District 10).

Dr Hollis also welcomed Mallory Wilhelm (Iowa State University, 2026) as incoming alternate student delegate to the AASV Board of Directors and thanked outgoing Student Delegate Hunter Everett (North Carolina State University, 2024). Alexis Berte (Iowa State University, 2025) assumes the role of student delegate.

Honored guests at the business breakfast included Drs Sandra Faeh-Butler (American Veterinary Medical Association president-elect), Sam Miller (AVMA executive board representative), Germán Gómez Tenorio (La Asociación Mexicana de Veterinarios Especialistas en Cerdos president), Bill Even (National Pork Board CEO), and Megan Niederwerder (Swine Health Information Center executive director).



AASV officer installation during the 2024 annual business meeting.



Megan Niederwerder, Swine Health Information Center executive director.



Dr Sandra Faeh-Butler, AVMA president-elect, addresses attendees during the 2024 AASV annual business meeting.



Bill Even, National Pork Board CEO.

Encouraging students to pursue life-long careers as swine veterinarians at the Annual Meeting

The American Association of Swine Veterinarians encourages veterinary students to attend the AASV Annual Meeting and offers a variety of activities for student participation during the conference to help fulfill part of AASV's mission: "mentor students, encouraging life-long careers as swine veterinarians."

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 mentors.

Registration to the Annual Meeting is free for student members and includes access to all educational sessions and activities, including the preconference seminars on Saturday and Sunday. As usual, AASV's Student Engagement committee offered several conference activities designed specifically for veterinary students, including the Swine Medicine for Students preconference seminar, a vet hunt, speed networking, and the Swine Student Trivia event.

Swine Medicine for Students preconference seminar

An always popular preconference seminar was designed especially for new and soon-to-be veterinarians. Veterinary students and 2022 and 2023 veterinarian graduates received free seminar registration. Attendees learned about diagnostics, including sample selection, sample collection, test selection, cost, and result interpretation.

Vet Hunt

The Vet Hunt encouraged veterinary students to network with veterinarians. Students introduced themselves to and visited with at least ten veterinarians who voluntarily participated in the Vet Hunt for a chance to win swine swag or other prizes, sponsored by Merck Animal Health. Thank you to the 65 veterinarians that participated in the Vet Hunt and welcomed students to the Annual Meeting.

Speed Networking

Speed networking during the Annual Meeting provided a fun way to meet swine-savvy students and mentors, future interns, or even potential new employees or employers. Seventeen veterinary students met with twenty veterinarians, spending three 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.

Student Trivia

Merck Animal Health hosted and sponsored prizes for a pub-style trivia event. Fifty-five students from nine veterinary schools participated in the friendly competition. The AASV student delegates Alexis Berte and Mallory Wilhelm coordinated the sign-ups, Dr Megan Inskeep welcomed the students, reviewed the benefits of AASV student membership, and 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. Prizes were awarded for the

top three teams. The first-place team included Erin Larsen, Sarah Albers, Mallory Wilhelm, Elizabeth Oney, Madelyn Harrison, and Zachary Meyer. The second-place team included Chelsea Harris, Erin Russell, Elizabeth Porteus, Carly Bates, and Megan Thomas. The third-place team included Bailey Ward, Austin Janssen, Coral Njus, Emma Mannery, and Alek Goll.

Podcasts

AASV provided an opportunity for students to earn a \$200 stipend by conducting a recorded interview of an AASV speaker for podcasting. Twenty-seven students from ten universities participated. Students selected a speaker, prepared questions in advance, and interviewed speakers during the Annual Meeting. The end products are 5 to 15-minute MP3 audio recordings available to members in the AASV Podcast Library at aasv.org/podcast.

Student Reception

Always a favorite, the Student Reception, sponsored by Merck Animal Health, drew a large crowd on Sunday evening. Students, veterinarians, researchers, faculty members, and industry representatives spent the evening interacting with each other in an informal setting.



Students practiced their interview and networking skills at the Student Speed Networking event.

Students preparing for tomorrow



AASV Foundation announces Student Seminar awards and scholarships

The American Association of Swine Veterinarians Foundation awarded scholarships totaling \$25,000 to 15 veterinary students who participated in the AASV Student Seminar at the Annual Meeting.

Megan Neveau Thomas, Iowa State University, received the \$5000 scholarship for top student presentation. Her presentation was titled “Interstate swine transportation network as a predictor of pathogen spread across the US.” The Zoetis Foundation provided the funding for the Top Student Presenter Award.

Elanco Animal Health provided \$20,000 in additional funding, enabling the AASV Foundation to award scholarships for second through 15th place.

Four veterinary student presenters received \$2500 scholarships: Hope Dohleman, Iowa State University; Jenny (Yuan Rong) Lin, University of Guelph; Matilyn Wheeler, Iowa State University; and Mallory Wilhelm, Iowa State University.

Five veterinary student presenters received \$1500 scholarships: Julia Baker, University of Minnesota; Alexis Berte, Iowa State University; Francisco Gomez Cruz, University of Saskatchewan; Erin Larsen, Lincoln Memorial University; and Brianna McAleese, North Carolina State University.

The student presenters receiving \$500 scholarships were Morgan Almeida, Iowa State University; Cassidy Cordon, University of Minnesota; Sarah Lutz, Auburn University; Amber Vegter, Iowa State University; and Claire Vincent, Mississippi State University.

Additionally, a grant from the Zoetis Foundation supported \$750 awards for each student selected to participate in the oral session. Thirty-two veterinary students from 16 universities submitted abstracts for consideration by student abstract volunteer judges Drs Ben Blair, Doug King, Darin Madson, Brent Pepin, Marisa Rotolo, and Joel Sparks. From those submissions, 15 students were selected to present during the annual meeting. Drs Andrew Bowman and Justin Brown chaired the student seminar which was judged by those individuals who judged the abstracts.

\$5000 STUDENT SEMINAR WINNER



Dr Rick Swalla (right) presented the \$5000 scholarship for Top Student Presenter Award to Megan Neveau Thomas, Iowa State University. The award is funded by the Zoetis Foundation.

\$2500 STUDENT SEMINAR WINNERS



Dr Jessica Risser (right) presented scholarships sponsored by Elanco Animal Health. Recipients of the \$2500 AASV Foundation scholarships were (from left) Matilyn Wheeler, Mallory Wilhelm, and Hope Dohleman. Not pictured: Jenny (Yuan Rong) Lin.

\$1500 STUDENT SEMINAR WINNERS



Dr Jessica Risser (right) presented scholarships sponsored by Elanco Animal Health. Recipients of the \$1500 AASV Foundation scholarships were (from left) Francisco Gomez Cruz, Bri McAleese, Julia Baker, Alexis Berte, and Erin Larsen.

\$500 STUDENT SEMINAR WINNERS



Dr Jessica Risser (right) presented scholarships sponsored by Elanco Animal Health. Recipients of the \$500 AASV Foundation scholarships were (from left) Claire Vincent and Amber Vegter. Not pictured: Morgan Almeida, Cassidy Cordon, and Sara Lutz.

AASV announces Student Poster Competition awardees

The American Association of Swine Veterinarians 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. Additionally, a grant from the Zoetis Foundation supports \$500 awards for each student selected to participate in the poster session.

Dr Joel Spencer, United Animal Health, announced the following awards during the AASV Luncheon on February 26:

\$500 scholarship: Yi-Fan Shen, The Ohio State University – Top student poster titled “Assessing the impact of a negative air ionization system on particulate matter and gaseous pollutants in swine farm environment.”

\$400 scholarships: Carly Bates, Iowa State University, and Taylor Clark, Iowa State University.

\$300 scholarships: David Buckwalter, University of Pennsylvania; Ellen Gibbs, University of Missouri; and Madeline Hall, Kansas State University.

\$200 scholarships: Kristen Cleaver, Iowa State University; Victoria Diaz, University of Tennessee; Callie Ezell, Louisiana

State University; Lauren Harper, Cornell University; Molly Jones, North Carolina State University; Samantha Nixon, University of Saskatchewan; Sarah Roach, North Carolina State University; Erin Russell, Lincoln Memorial University; and Casondra Snow, University of Minnesota.

Thirty-two veterinary students from 16 universities submitted abstracts for consideration by student abstract volunteer judges Drs Ben Blair, Doug King, Darin Madson, Brent Pepin, Marisa Rotolo,

and Joel Sparks. 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. A panel of three AASV veterinarian volunteers, Drs Mike Eisenmenger, Brooke Kitting, and Whitney Lincoln, interviewed the competing students and scored their posters to determine the scholarship awards. Drs Andrew Bowman and Justin Brown chaired the competition.

\$400 POSTER WINNERS



Dr Joel Spencer (right) presented scholarships sponsored by United Animal Health. Recipients of the \$400 AASV Foundation scholarships were (from left) Taylor Clark and Carly Bates.

\$500 POSTER WINNER



Dr Joel Spencer (left) presented scholarships sponsored by United Animal Health. Recipient of the \$500 scholarship for Top Student Poster was Yi-Fan Shen, The Ohio State University.

\$300 POSTER WINNERS



Dr Joel Spencer (second from left) presented scholarships sponsored by United Animal Health. Recipients of the \$300 AASV Foundation scholarships were (from left) Madeline Hall, Ellen Gibbs, and David Buckwalter.

\$200 POSTER WINNERS



Dr Joel Spencer (second from left) presented scholarships sponsored by United Animal Health. Recipients of the \$200 AASV Foundation scholarships were (from left) Kristen Cleaver, Lauren Harper, Sara Roach, Molly Jones, and Erin Russell. Not pictured: Victoria Diaz, Callie Ezell, Samantha Nixon, and Casondra Snow.

Student Podcast Award recipient announced

Kaci Way, a fourth-year student at The Ohio State University, was awarded the Student Podcast Award for the most accessed podcast from the 2023 AASV Annual Meeting. Kaci interviewed Dr Corrine Fruge about her presentation, “Stranger than fiction: PRRS in a remote farm.” Kaci was announced as the winner of the \$500 award, sponsored by Huvepharma, during the 2024 AASV Annual Meeting.

Each year, up to 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.

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



Recipient of the Student Podcast Award: Kaci Way, The Ohio State University.



Thank You, Sponsors and Exhibitors!

There's no doubt about it - it can be expensive to attend the AASV Annual Meeting! But attendee registration fees cover only a portion of the cost of conducting the meeting. The cost to attendees would be even higher if it were not for the financial support provided by sponsors and exhibitors.

Please join AASV staff in expressing your personal appreciation to representatives of the following companies for their generous support of the 2024 AASV Annual Meeting:

SCHOLARSHIP AND EVENT SPONSORS

- **AASV Foundation:** Monday Luncheon, Praise Breakfast, Debt-Relief Scholarships, and Research Grants
- **dsm-firmenich:** Yoga Class
- **Elanco Animal Health:** AASV Foundation Veterinary Student Scholarships
- **Huvepharma:** Student Podcaster Award
- **Merck Animal Health:** AASV Awards Reception, Student Reception, Veterinary Student Trivia Event, and AASVF-Merck Veterinary Student Scholarships
- **Stuart Products:** Praise Breakfast
- **SwineTech:** Downtown Nashville Shuttle
- **United Animal Health:** Veterinary Student Poster Awards
- **Vaxxinova:** Veterinary Student Travel Stipends, Refreshment Break Cosponsor
- **Veterinary Pharmaceutical Solutions:** Refreshment Break Cosponsor
- **Zoetis:** Refreshment Break Cosponsor
- **Zoetis Foundation:** AASV Student Seminar and Poster Session, AASV Foundation Top Student Presenter Scholarship, and Debt-Relief Grants





TECHNICAL TABLE EXHIBITORS

ABVP	Farm Health Guardian	Pharmacosmos
AcuFast	Feedstuffs/National Hog Farmer	Pharmgate Animal Health
Addison Biological Laboratory	Feedworks USA	Phibro Animal Health Corporation
Adisseo	Genesis Instruments	PIC
AgriSafe	GlobalVetLink	PigCHAMP
Alltech	Henke-Sass, Wolf	PigKnows
Animal Health International	HIPRA	PigTek, Chore-Time
Animal Science Products	Huvepharma	PMI Additives
Anitox	Hypor	Prairie Systems
Anpario	IDEXX	Precision Health Technologies
Aptimmune Biologics	IHT Group	PrideVMC
ARKO Laboratories	IMV Technologies	ProtonDx
Arm & Hammer	Insight Wealth Group	Ralco
Atmosphere Global	Iowa State University Office of Innovation Commercialization	Reproduction Provisions
Aurora Pharmaceutical	IPVS & ESPHM 2024, Germany	RO-MAIN
Automated Production	Kemin Animal Nutrition & Health	SEPPIC
Bimeda	LANXESS Corporation	Stuart Products
Bock Industries	LifeStock International	Swine Health Information Center
Boehringer Ingelheim Animal Health	Longhorn Vaccines & Diagnostics	SwineTech
Cambridge Technologies	Magapor USA	TechMix
Cargill Animal Nutrition	MatMaCorp	Tetracore
Central Life Sciences	Mazen Animal Health	Thermo Fisher Scientific
Ceva Animal Health	Medgene	Topigs Norsvin USA
Chr Hansen	Merck Animal Health	United Animal Health
CID Lines, an Ecolab Company	Merck Animal Health Allflex/LeeO	US Customs and Border Protection
Clipper Distributing	Metafarms	USDA APHIS VS
Crystal Spring Hog Equipment	Minitube USA	US Soy
DNA Genetics	MSP[RS] Resistant Starch	Vaxxinova
DPI Global	MWI Animal Health	Veterinary Pharmaceutical Solutions
dsm-firmenich	National Pork Board	Wilson's Prairie View Farm
Eastman	National Pork Producers Council	Zinpro
Elanco	Neogen	Zoetis
Endovac Animal Health	Norbrook	



Photo courtesy of National Pork Board and the Pork Checkoff, Des Moines, Iowa USA.

How much is it costing you to not manage Mhp?

(*Mycoplasma hyopneumoniae*)

ADG
4.4%¹
↓

HCW
9.2 lbs¹
↓

Wean - to - finish cost / pig
\$2 - \$5¹
↑

\$50 - \$125 /sow¹
↓

Protect your pigs and profits with a comprehensive *Mycoplasma hyopneumoniae* (Mhp) management plan tailored to your operation. The Mhp Guardian four-step process helps you move positive herds into a negative or more stable status and keep them there.

Take the first step, visit www.zoetis.com/MhpGuardian



Establishing herd status
STEP 1

Assessing intervention options
STEP 2

Implementing intervention strategies
STEP 3

Monitoring intervention outcomes
STEP 4

These are general guidelines only. Producers should consult with their veterinarian.

¹Yeske, 2016. *Mycoplasma hyopneumoniae* elimination, 2016 AASV Annual Meeting Proceedings, pg. 376-380. https://www.aasv.org/library/swineinfo/item.php?AASV/2016/376_Yeske.pdf
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AASV Foundation awards more than \$100,000 for research

As part of its mission to fund research with direct application to the profession, the American Association of Swine Veterinarians Foundation awarded more than \$100,000 in funding for research. Dr Ross Kiehne, chair of the AASV Foundation, announced the selection of 4 research proposals for funding during the AASV and AASV Foundation cosponsored luncheon held on February 26 during the AASV Annual Meeting in Nashville, Tennessee. The foundation granted funds to support efforts by principal researchers from the University of Minnesota and Iowa State University.

University of Minnesota researcher Dr Cesar Corzo and coinvestigators, including graduate student Marcello Melini, were awarded \$29,827 to fund the proposal “Advancing biocontainment strategies through advanced viability qPCR for PRRSV environmental contamination assessment.” The project will focus on understanding whether environmentally detected PRRSV in pig barns remains viable. In addition, investigators plan to assess whether frequently touched surfaces by personnel contain viable virus particles which can represent a risk for dissemination to other farms.

The foundation granted \$22,442.50 to Dr Daniel Linhares and coinvestigators from Iowa State University to fund the proposal “Assessing the effect of pooling commonly used samples on the probability of influenza A virus sequencing and virus isolation.” The objective of the project is to compare the success of sequencing and virus isolation by using different cycle threshold levels from pooled sample types for influenza A virus in swine.

Dr Ana Paula Poeta Silva and coinvestigators from Iowa State University received \$30,000 to fund the proposal “Improving extraction and PCR protocols to enhance *Mycoplasma hyopneumoniae* (MHP) DNA detection in oral fluid samples in field conditions.” The goal of this study is to compare the diagnostic performance of six MHP detection protocols for MHP DNA detection in field oral fluid samples.

The foundation partially funded a proposal submitted by Dr Giovanni Trevisan and coinvestigators from Iowa State University titled “Further characterization of PRRSV diversity and other pathogens in live virus inoculation (LVI) material

used in breeding herd stabilization programs,” at \$18,000. The study aims to characterize the genetic diversity of PRRSV and the potential presence of other pathogens of interest in LVI samples used in swine production.

Investigators will share results at various swine meetings and in peer-reviewed publications.

Dr Brett O’Brien chaired the scientific subcommittee responsible for reviewing and scoring the 16 proposals received for consideration, and she joins the AASV Foundation in thanking Drs Eva Jablonski, Christine Mainquist-Whigham, Tom Petznick, Rebecca Robbins, and Todd Williams for their participation on this important subcommittee.

An overview of past and current projects funded by the AASV Foundation is available at aasv.org/foundation/research. The foundation will issue its next call for research proposals in fall 2024.

The AASV Foundation granted funds to support research efforts of:



Dr Cesar Corzo



Dr Daniel Linhares



Dr Ana Paula Poeta Silva



Dr Giovanni Trevisan

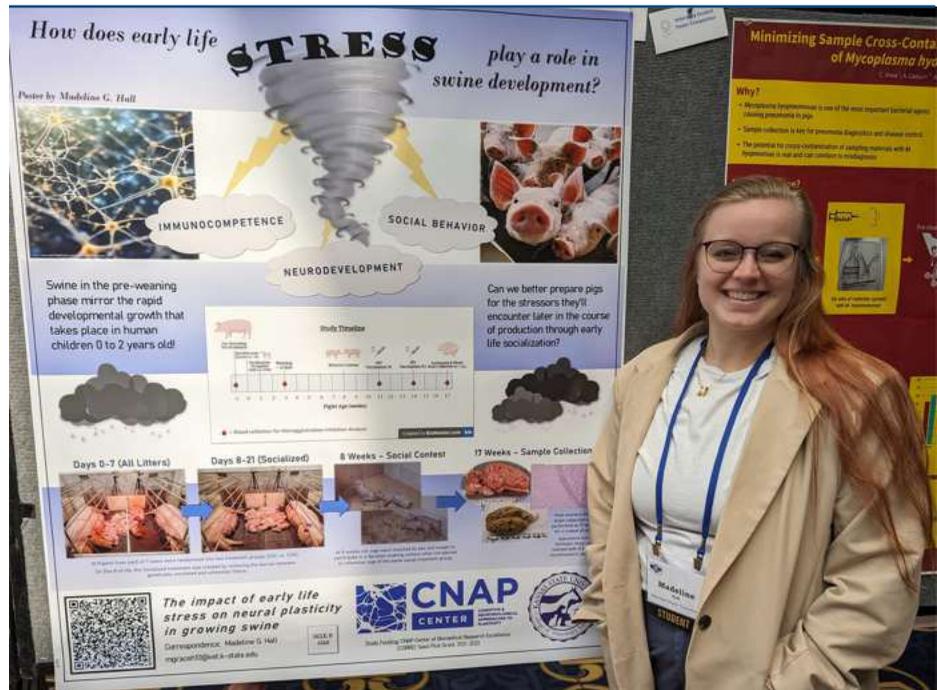
Kansas State University veterinary student receives David A. Schoneweis Scholarship

Madeline Hall, a fourth-year student at Kansas State University College of Veterinary Medicine, was awarded the David A. Schoneweis Scholarship during the American Association of Swine Veterinarians Annual Meeting held in Nashville, Tennessee.

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 AASV Annual Meeting, based upon a selection rubric prepared with the oversight and approval of the Schoneweis family.

Hall presented her research, “The impact of early life stress on neural plasticity in growing swine,” during the AASV Student Poster Session. She was one of 16 students presenting a poster.

Dr Schoneweis was born in Clay Center, Kansas and earned his DVM from Kansas State University in 1956. He served 2 years in the Army Veterinary Corps before teaching clinical sciences at Oklahoma State University for 6 years. After 2 years in private practice in Lawrence, Kansas, he joined the KSU College of Veterinary Medicine faculty in 1966,



Madeline Hall, a Kansas State University veterinary student, was the recipient of the David A. Schoneweis Scholarship.

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.

Twelve AASV members receive debt relief grants

Twelve \$7500 grants were awarded by the American Association of Swine Veterinarians Foundation on February 26 during the 55th AASV Annual Meeting in Nashville, Tennessee.

New in 2024, the AASVF-Zoetis Foundation Student Debt Relief Grants, funded by the Zoetis Foundation, are awarded to swine veterinarians who are 2 to 10 years post graduation. The Dr Conrad and Judy Schmidt Family Student Debt Relief Scholarships, funded through the Conrad Schmidt and Family Endowment within the AASV Foundation, are awarded annually to swine veterinarians who are 2 to 5 years post graduation and engaged in private veterinary practice. The intent of both awards is to offset a portion of student loan debt and relieve some of the burden associated with the significant financial cost of completing a veterinary medical education.

AASVF-Zoetis Foundation Student Debt Relief Grants

- Justin Brown, University of Georgia, 2016
- Emily Fry, The Ohio State University, 2015
- Kayla Henness, University of Illinois, 2019
- Megan Kelly, University of Illinois, 2020
- Erin Kettelkamp, University of Illinois, 2021
- Evan Koep, Iowa State University, 2019
- Miranda Medrano, Virginia-Maryland, 2020
- Kathleen O'Brien, University of Illinois, 2019
- Rachel Stika-Jensen, Iowa State University, 2021
- Katie Woodard, St. George's University, 2014

Dr Conrad and Judy Schmidt Family Student Debt Relief Scholarships

- Lauren Nagel, University of Illinois, 2021
- Andrea Patterson, Ontario Veterinary College, 2020

All 12 recipients have been continuous members of the AASV since joining as students.

The AASV Foundation thanks Drs Ross Kiehne, Mike Pierdon, and Cary Sexton for reviewing the 23 applications.



AASVF-Zoetis Foundation Student Debt Relief Grant awardees: (from left) Drs Emily Fry, Erin Kettelkamp, Megan Kelly, Miranda Medrano, Rachel Stika-Jensen, Katie Woodard, Justin Brown, Kayla Henness, Evan Koep, and Katie O'Brien.



The Dr Conrad and Judy Schmidt Family Student Debt Relief Scholarship was awarded to Drs Lauren Nagel and Andrea Patterson (not pictured).

Merck Animal Health supports future swine practitioners through AASV Foundation partnership

Merck Animal Health 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 2024 recipients of the AASVF/Merck Animal Health Veterinary Student Scholarships.

Scholarships totaling \$50,000 were awarded to 10 veterinary students for 2024. The recipients were announced on February 26 during the AASV Annual Meeting in Nashville, Tennessee.

The following students were each awarded a \$5,000 scholarship:

- Kristen Cleaver, Iowa State University, Class of 2026
- Cassidy Cordon, University of Minnesota, Class of 2026
- Juan Hernández Cuevas, The Ohio State University, Class of 2025
- Megan Neveau Thomas, Iowa State University, Class of 2025
- Samantha Nixon, University of Saskatchewan, Class of 2026
- Elizabeth Ohl, The Ohio State University, Class of 2026
- Kendall Sattler, Purdue University, Class of 2026
- Adam Steffensmeier, Iowa State University, Class of 2025
- Matilyn Wheeler, Iowa State University, Class of 2026
- Mallory Wilhelm, Iowa State University, Class of 2026

“Merck Animal Health is committed to the veterinary profession and is proud to honor these students who represent the next generation of veterinary leaders for the swine industry,” said Dr Justin Welsh, executive director of livestock technical services, Merck Animal



Dr Jack Creel (second from left) presented the \$5000 AASVF-Merck Veterinary Student Scholarships to (from left) Megan Neveau Thomas, Matilyn Wheeler, Adam Steffensmeier, Kristen Cleaver, Mallory Wilhelm, Kendall Sattler, and Elizabeth Ohl. Not pictured: Cassidy Cordon, Juan Hernandez Cuevas, and Samantha Nixon.

Health. “Through our partnership with AASV, we are helping to build students’ knowledge of swine health and well-being as they prepare for a career in this important field.”

“The AASV and the AASV Foundation appreciate Merck Animal Health’s long-standing support for the AASVF-Merck Veterinary Student Scholarship Program. Their generous donation enables the AASV Foundation to assist future swine veterinarians with their educational expenses,” said Dr Harry Snelson, AASV executive director. “This support has become increasingly important as educational expenses for veterinary students continue to rise.”

The scholarship program assists the foundation’s mission to support the development and scholarship of students and veterinarians 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 Justin Brown, Josh Ellingson, Jeff Feder, and Ross Kiehne for judging this year’s applications. Learn more at aasv.org/foundation.

AASV Foundation announces recipients of Hogg Scholarship

Drs Ashley Johnson and Jana Morgan were named the 2024 recipients of the American Association of Swine Veterinarians Foundation Hogg Scholarship during the 55th AASV Annual Meeting in Nashville, Tennessee on February 26.

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 their education after years as a swine practitioner. Former Hogg Scholarship recipients Drs Kate Dion, Jessica Seate, and Amanda Sponheim reviewed the 2024 applications.

Dr Ashley Johnson received her DVM in 2013 from Virginia-Maryland and is now pursuing an MS in food safety at Michigan State University. She is the director of food policy at the National Pork Producers Council in Washington, D.C. Her work focuses on developing and implementing post-harvest food safety and human nutrition programs and addressing animal care issues in market channels. She underscores the value of furthering her education through this program to enhance her ability to defend science for food safety policies.



Drs Ashley Johnson (left) and Jana Morgan were recipients of the AASV Foundation Hogg Scholarship.

Dr Jana Morgan earned her DVM from Iowa State University in 2006 and is a current student in the Master of Veterinary Science program at the University of Illinois. She is a key account veterinarian - swine division at Boehringer Ingelheim Animal Health and provides technical and product support for her

customers in the Midwest. She also provides support through the Swine Veterinary Internship Program (SVIP) and DVM Swine Academy Programs. She expects this advanced degree to add value to her career, especially in health, research and development, production management, and field trials.

Ya'll came to bid! AASV Foundation auction raises \$101,000

The foundation's annual auction fundraiser was held March 26 in the beautiful Gaylord Opryland Resort during the 55th AASV Annual Meeting in Nashville, Tennessee. The event was coordinated by the 2024 Auction Committee, led by co-chairs Drs Chase Stahl, John Waddell, and Butch Baker.

Electronic bidding for silent auction items opened on ClickBid in February and continued during the meeting until the evening of Monday, February 26. A leaderboard kept attendees apprised of the current winning bidder for each item. In the end, the 48 silent auction items generated \$8570 in winning bids. As in previous years, donors ship the items directly to the winning bidders.

A new auctioneer, Kent Andersen, brought his enthusiasm and skills to the live auction, which offered fishing trips, vacation opportunities, customized cutting boards, sporting events, diagnostic lab training, a home security system, and even a commissioned pig sculpture. Mr. Andersen was assisted on the podium by Dr Chase Stahl, while ring men Drs Wesley Lyons, John Waddell, Justin Cagle, and Chris Deegan worked the crowd to capture and call out bids.

The auction bidding took off like a shot with the first item, a Benelli 20-gauge shotgun, which sold for \$3500. The top-selling item was the luxury glamping package, which brought \$4000.

The five tailgate paloozas were a hit again this year. The football tickets and tailgate parties hosted at schools across the country (North Carolina State University, University of Illinois, Iowa State University, Kansas State University, and University of Minnesota) generated \$11,000 in total proceeds.

When it was "all-in, all-done," the live auction items raised \$38,500! Added to the silent auction proceeds and an additional \$53,930 in monetary contributions, the event generated a grand total of \$101,000 to support scholarships, research grants, travel stipends, externship grants, student debt relief grants, and more.

For a complete recap of the auction, including the items, donors, winning bids, and bidders, see aasv.org/foundation/2024/auctionlist.php.



And the winners are...

**Thank you to ALL who made a contribution, donated an item, or placed a bid on items in the auction.
As a result of your generosity, the auction raised \$101,000 for the AASV Foundation!**

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

Matt Ackerman	Gabi Doughan	Kerry Keffaber	Doug Powers
Thomas Kent Adams	Thomas Fangman	Joel Kimpston-Burkgren	Paul Runnels
Matt Anderson	Attila Farkas	James Kober	Mike Senn
Paul Armbrecht	Dan Fedders	John Kolb	Harry Snelson
R.B. (Butch) Baker	Joe Fent	Stephanie Krohn	Amber Stricker
Angela Baysinger	Jerome Fiechtner	Rodger Main	Matthew Turner
Keith Bretey	Lauren Glowzenski	Michelle Michalak	Sherrie Webb
Steve Bretey	Dan Grooms	Jana Morgan	Warren Wilson
Corinne Bromfield	Douglas Groth	Chris Olsen	Nathan Winkelman
Thomas Burkgren	Dwain Guggenbiller	Steve Patterson	Teddi Wolff
Brandi Burton	Perry Harms	Thomas Petznick	
Abbey Canon	Peggy Anne Hawkins	Meghann Pierdon	
Susan Detmer	William Hollis	Mike Pierdon	
Todd Distad	Clayton Johnson	Chad Pilcher	

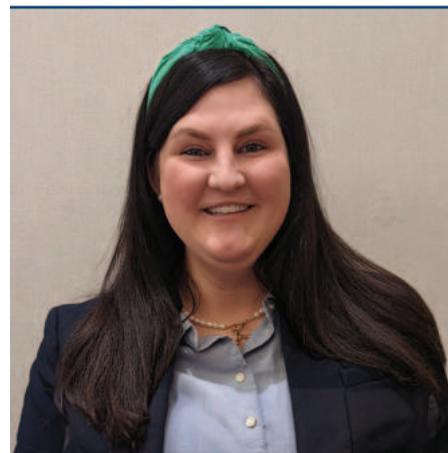
First AASV Foundation ABVP scholarship awarded

In 2023, the AASV Foundation Board of Directors established the Swine Health Management Scholarship Program to annually support one AASV member interested in pursuing certification through the American Board of Veterinary Practitioners (ABVP). As part of its mission to support the development and scholarship of students and veterinarians, the goal of this program is to relieve some of the financial burden associated with achieving board certification.

The first recipient of the scholarship, Dr Jessica Seate, was announced during the AASV and AASV Foundation Luncheon held February 26, 2024, at the 55th AASV Annual Meeting.

The scholarship provides reimbursement for Swine Health Management certification-related expenses incurred within the first 3 years following the scholarship award date. The maximum amount of reimbursement will be \$10,000. An additional incentive payment of \$10,000 will be paid upon successful and timely achievement of ABVP certification in Swine Health Management.

Learn more about the scholarship at aasv.org/foundation/abvp-scholarship.



Dr Jessica Seate received the AASV Foundation ABVP Scholarship.

AASV Foundation news continued on page 141



MORE Than Just a Vaccine

Studies have determined that ENDOVAC-Porci; a core antigen vaccine with an immunostimulant, provides pigs broad-spectrum protection against the enteric & respiratory effects of gram-negative bacterial diseases.

Lawsonia Intracellularis Challenge: ENDOVAC-Porci vs. Porcilis® Ileitis vs. Controls

- 29.0% (7.7 lb) higher weight gain over controls
- No statistical difference in weight gain compared to Porcilis Ileitis
- 40.9% better clinical scores than controls
- 8.2% better clinical scores than Porcilis Ileitis
- 37.6% better fecal scores to controls
- 18.2% better fecal scores than Porcilis Ileitis

Clinical & Fecal Scores			
Study days 58-70: Clinical Scores: 0 Normal, 1 Mild, 2 Moderate, 3 Severe Fecal Scores: 0 Normal, 1 Soft, 2 Loose, 3 Watery			
Scoring	Saline	ENDOVAC-Porci®	Porcilis® Ileitis
Clinical	24.7 ^a	14.6 ^b	15.9 ^{ab}
Fecal	27.4 ^a	17.1 ^b	20.9 ^{ab}
Treatment means with different superscripts differ from each other (P < 0.05)			

E. coli and Pasteurella Challenge: ENDOVAC-Porci vs. Controls

- 11.1% pre-wean survivability advantage
- 7.9% (1.05 lbs) higher average weaning weight
- 13.6% (3.3 lbs) higher final 42-day weight
- 61.9% less mortality over the entire study
- 75.6% better clinical scores
- 50.8% better fecal scores

Clinical & Fecal Scores			
Study days 22-35: Clinical Scores: 0 Normal, 1 Mild, 2 Moderate, 3 Severe Fecal Scores: 0 Normal, 1 Soft, 2 Loose, 3 Watery			
Treatment	Saline	ENDOVAC-Porci®	P-value
Clinical	1.19	0.29	.05
Fecal	1.95	0.96	.05
Effect of treatment (P < 0.01)			

To review the studies that back up the science, scan the QR Code.



AASV Foundation Heritage Fellows recognized

The American Association of Swine Veterinarians Foundation 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 and AASV Foundation Luncheon held February 26, 2024, at the 55th AASV Annual Meeting, AASV Foundation Chair Dr Ross Kiehne announced Dr Hans and Darci Koehnck as new Heritage fellows.

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 contribute \$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 3 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, foundation@aasv.org.

AASV Foundation Golf Outing

Save the date!

Tuesday, September 10th
Veenker Memorial Golf Course
Ames, Iowa

REGISTRATION OPENS IN JULY

IT ISN'T HOW MUCH A SECOND
DOSE OF UNIFERON[®] COSTS.

IT'S HOW MUCH IT RETURNS.

Research proves that investing in a second dose of Uniferon[®] for your baby pigs provides ROI that can't be denied.

6.56 LBS

IMPROVEMENT AT WEAN TO MARKET

4%

INCREASE IN AVERAGE DAILY GAIN

2.5%

IMPROVEMENT IN HOT AND COLD CARCASS WEIGHTS

1.5 LBS

ADDITIONAL TRIMMED LOIN

To learn more about what two doses of Uniferon[®] can do for your baby pigs and your operation, call 908-769-7045 or email us at uniferon.us@pharmacosmos.com.

UPCOMING MEETINGS

Animal Agriculture Alliance 2024 Stakeholders Summit

May 8 - 9, 2024 (Wed-Thu)
InterContinental at the Plaza
Kansas City, Missouri

For more information:
Email: akornegay@animalagalliance.org
Web: animalagalliance.org/initiatives/stakeholders-summit

27th International Pig Veterinary Society Congress & 15th European Symposium of Porcine Health Management

June 4 - 7, 2024 (Tue-Fri)
Congress Centre Leipzig
Leipzig, Germany

For more information:
Web: ipvs2024.com

World Pork Expo

June 5 - 6, 2024 (Wed-Thu)
Iowa State Fairgrounds
Des Moines, Iowa

For more information:
Web: worldpork.org

9th International Conference on Emerging Zoonoses

June 9 - 12, 2024 (Sun-Wed)
Grand Hotel Piazza Borsa
Palermo, Italy

For more information:
Email: zoo@target-conferences.com
Web: zoonoses-conferences.com

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

12th International Conference on Antimicrobial Agents in Veterinary Medicine

June 16 - 19, 2024 (Sun-Wed)
Athens, Greece

For more information:
Email: aavm@target-conferences.com
Web: aavmconference.com

AVMA Convention 2024

June 21 - 25, 2024 (Fri-Tue)
Austin, Texas

For more information:
Web: avma.org/events/avma-convention

ISU James D. McKean Swine Conference

July 23 - 24, 2024 (Tue-Wed)
Scheman Building
Iowa State University
Ames, Iowa

For more information:
Tel: 515-294-6222
Email: registrations@iastate.edu
Web: regcytes.extension.iastate.edu/swinedisease

International Conference on Boar Semen Preservation

August 19 - 22, 2024 (Mon-Thu)
Vic, Barcelona, Spain

For more information:
Email: info@boarsemen2024.com
Web: boarsemen2024.com

Carthage Veterinary Service 34th Annual Swine Conference

August 27, 2024 (Tue)
Oakley-Lindsay Center
Quincy, Illinois

For more information:
Web: hogvet.com

Allen D. Lemman Swine Conference

September 21 - 24, 2024 (Sat-Tue)
St Paul River Center
Saint Paul, Minnesota

For more information:
Web: lemanconference.umn.edu

US Animal Health Association 128th Annual Meeting

October 10 - 16, 2024 (Thu-Wed)
Gaylord Opryland Hotel
Nashville, Tennessee

For more information:
Web: usaha.org/meetings

13th Lemman China Swine Conference & World Swine Industry Expo

October 25 - 27, 2024 (Fri-Sun)
Western China International Expo City
Chengdu city, Sichuan province, China

For more information:
Tel: +86 010 60600195
Email: andyzhang@shixin-expo.com
Web: lemanchina.com

AVMA Diversity, Equity, Inclusion, and Wellbeing Summit

November 7 - 9, 2024 (Thu-Sat)
Atlanta, Georgia

For more information:
Web: avma.org/events

Pig Research Summit 2024

November 20 - 21, 2024 (Wed-Thu)
Crowne Plaza Copenhagen Towers
Copenhagen, Denmark

For more information:
Web: pigresearchsummit.com

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