centred on SWINE

PRAIRIE SWINE CENTRE

Spring 2026 Volume 34, Number 2

Successful floor feeding: how to do it right

Barn Insights Series – Practical Solutions to Group Sow Housing (Part 2)

Sows during feed dropping time

Jen-Yun Chou, Ph.D.
Research Scientist, Ethology
Prairi Swine Centre

When it comes to group housing for gestation sows, there are usually two major categories of housing based on the feeding system – protected and non-protected (or also conventionally known as non-competitive vs. competitive) systems. Protected feeding systems include individual free access stalls and most electronic sow feeders (ESF). In these systems, sows move into a protected space and can feed individually, relatively undisturbed. Non-protected feeding systems include floor feeding, long trough feeding or shoulder stall feeding. Contrary to the protected systems, sows feed together socially with little or no barrier between them. As adult sows have social hierarchy and pregnant sows are usually restrictedly fed to maintain a healthy body condition during gestation, feeding is a time that can create aggression due to competition, stress and physical injuries. The selection of a suitable feeding system is therefore a critical consideration for producers who are transitioning to group housing of sows.

(Successful floor feeding ... cont'd on page 3)

Inside This Edition

Program funding provided by

SaskPork ManitobaPork Alberta Pork Saskatchewan Ministry of Agriculture

Publication # 40010021

Novel strategies to control mycotoxins

Alvin Alvarado, M.Sc.,
Research Officer,
Engineering
Prairie Swine Centre

Alvin Alvarado is a Ph.D. student supervised by Dr. Bernardo Predicala. Alvin has worked at PSC since --- as a research assistant, and has now transitioned into a doctoral program studying the use of nanotechnology to mitigate mycotoxin contamination.

Introduction

Mycotoxin contamination, specifically contamination with deoxynivalenol (DON), is a common issue in animal husbandry; in North America, up to 85% of grain samples and 90% of livestock feed samples are contaminated with DON. The CFIA has set a regulatory guidance limit of 1 part per million (ppm) of DON in swine diets, but current detoxification strategies are limited by binding efficiency, biosafety, and cost effectiveness.

Ingestion of contaminated feed can result in health issues and associated economic losses. DON can result in reduced feed intake, impaired growth performance, and if the concentration is high enough, it can interrupt intestinal barrier integrity, immune function, and the composition of the normal gut microbiome. The initial exposure to mycotoxins is of the greatest concern as it has the most pronounced effect. Over time, pigs will adapt to the presence of mycotoxins in feed, though they do not produce as well as they would if they were never exposed.

Our group has previously identified magnetic graphene (MGO) as a method of reducing DON contamination in feed, with MGO application reducing DON concentrations by up to 34% with no impact on animal health or growth performance. This study investigated the application of magnetic graphene oxide (MGO)-based nanocomposites for the photocatalytic degradation of DON in wheat grains. Photocatalysis is a type of chemical reaction that involves the absorption of light by one or more reactive species. It was hypothesized that the integration of photocatalytic degradation would accelerate reaction rates and enhance DON degradation efficiency.

Figure 1. DON detoxification strategies. From Zhang et al., 2024. Deoxynivalenol: Occurrence, toxicity, and degradation. Food Control https://doi.org/10.1016/j.foodcont.2023.110027

Our Objectives

To assess and optimize the impact of magnetic graphene (MGO) nanocomposites on DON contamination, several objectives were formulated. First, we set out to synthesize MGO-based nanocomposites ourselves, then confirmed their ability to degrade the toxin. Second, we worked to characterize the surface morphology and composition of the synthesized

(Novel strategies to control mycotoxins... cont'd on page 4)

(Successful floor feeding ... from page 1)

Solid flooring allows more lying comfort. Solid floor area is kept clean for lying and feeding, and dunging happens in slatted area, which creates good functional areas. (Photo credit: Dave DeVries)

Protected systems offer sows a more isolated feeding environment, however, the footprint and capital investment can be higher, which may not be suitable for all scales of production. For medium-sized barns, floor feeding offers a more affordable renovation option. However, floor feeding is considered to increase feeding competition, aggression, variation in body condition and hygiene management issues. Are there ways to manage this system so that it can work for the producers and animals? This is the question we had in mind when we visited Dave DeVries' farm in Drayton, Ontario.

"I just like being able to walk through the pens, and the sows are up and moving, and you can interact." -- Dave DeVries

A formula for successful floor feeding

Dave runs a 350-sow, farrow-to-finish operation with a 2-week batch farrowing. He started this group housing in 2018. Back then, before deciding on which systems to go for, he talked to other producers extensively, did lots of research and went to other barns to see them with his own eyes. He chose the floor feeding system due to its simplicity. "Nothing really can go wrong," said Dave, "we saw another barn with the same setup…how calm and quiet it was, and the sows were just very consistent…very little fighting." In Dave's barn, sow aggression is minimal. We visited during one of the feed-dropping times, and what we saw was that most sows just quietly ate with no fighting and vocalisation. Some did not even bother getting up for that drop and stayed lying. Some went for a drink before the feed drop was finished. Dave only has 48 stalls in the barn for mating. Four days after the sows are bred, they are moved to the group pens, which consist of around 25 to 30 sows per pen. He has 8 group pens in total, and each pen is equipped with 8 drop feeders. Feed drops are on a timer, and they drop feed 6 times per day. The pens are two-thirds solid and one-third slatted at the back where the nipple drinkers are. When the mated sows first move in, the highest amount of aggression is expected, so he pre-drops lots of feed on the floor so that competition for feed is not triggering the sows to fight. He moves the sows in later in the day so that sows are not hungry as they have already eaten that day. In this way, even on the day of mixing, he does not observe excessive aggression. The feed is also a key: Dave feeds the sows a high-fibre diet, with 30% of wheat shorts in it that he mills on farm.

Genetics matters

Genetics is also an important factor. He chooses maternal lines with good leg health which he thinks is critical for successful group housing. He breeds his own gilts now to reduce biosecurity risk.

Choose a system that works for you

For Dave, a good housing system should be easy to manage. He does not like the idea of training sows to use a feeding system as it makes the system high maintenance and may require more labour input. He also likes the solid flooring as it is good for sow leg health and provides better comfort for sows. The lying bays also provide some hiding and separation areas for sows that do not get along. However, once the sows are settled in, they establish their social hierarchy and fighting isn't usually an issue. Currently Dave is very happy with the investment he made to build this system and would never go back to stall housing. He maintains an 85% farrowing rate, just under 12 weaned per litter, which he expects to see an increase as he changes to a new genetic line. For Dave, the three factors of success to group sow housing are being open-minded, watching the animals while walking the pens and good genetics. Dave has demonstrated to us that floor feeding can work, when it is done right.

Dave DeVries and his son Garret.

(Novel strategies to control mycotoxins ... cont'd from page 2)

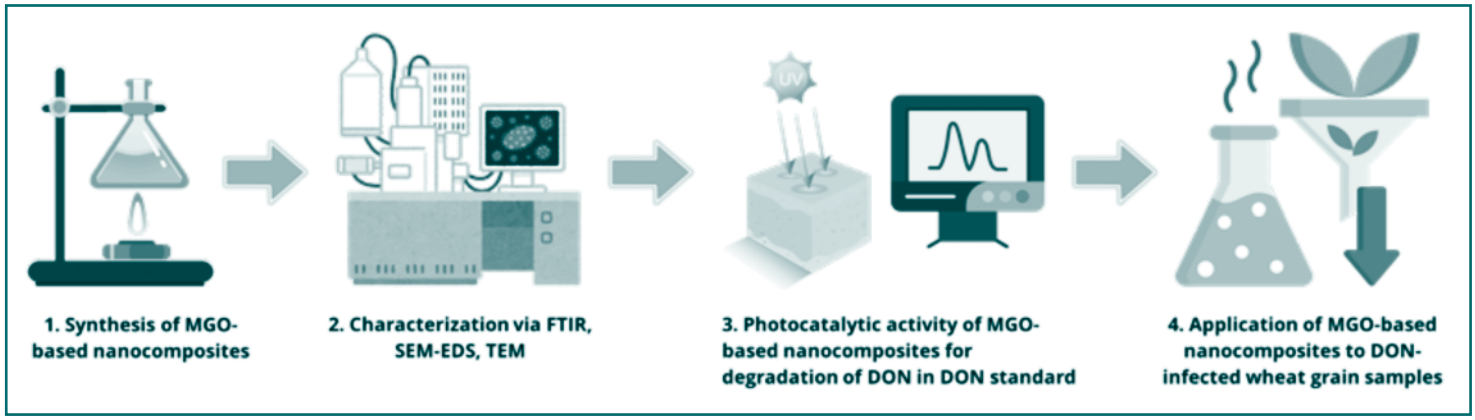


Figure 2. Workflow diagram to address project objectives.

nanocomposites using microscopy and spectroscopy techniques, furthering our understanding of the compounds. Our third objective was to evaluate the photocatalytic activity of the nanocomposites on standard and DON-contaminated samples in a controlled experiment, furthering our understanding of optimal exposure conditions. Fourth and finally, we are working to determine the resulting intermediate products of the degradation of DON and then assessing the impact of the photocatalytic reaction on wheat quality.

OR

To assess and optimize the impact of magnetic graphene (MGO) nanocomposites on DON contaminated grains, several objectives were developed;

1. Synthesize MGO-based nanocomposites for the degradation of DON
2. Characterize the surface morphology and composition of these nanocomposites using microscopy and spectroscopy
3. Evaluate the photocatalytic activity of the nanocomposites on standard and DON-contaminated feed samples
4. Determine the intermediate products of DON degradation and assess the impact of nanocomposite photocatalysis on wheat quality

What we did

Zinc oxide (ZnO) and titanium dioxide (TiO2) were selected as photocatalysts and integrated with MGO nanomaterials using a modified hydrothermal synthesis method. This may sound like a complicated procedure, but it actually utilizes a microwave to heat the solution! The liquid solution was then filtered and rinsed to collect the resulting residue, which was then dried in an oven to be used for further investigation.

Addressing our second objective, the resulting MGO-based nanocomposites were characterized using scanning electron microscopy, energy dispersive x-ray spectroscopy and Fourier transform infrared radiation. These methods allowed us to understand the characteristics of the compounds and visualize how they were bonded (Figure 3).

Following synthesis and characterization, photocatalytic experiments were conducted under visible light to determine the most promising nanocomposite and optimize key application

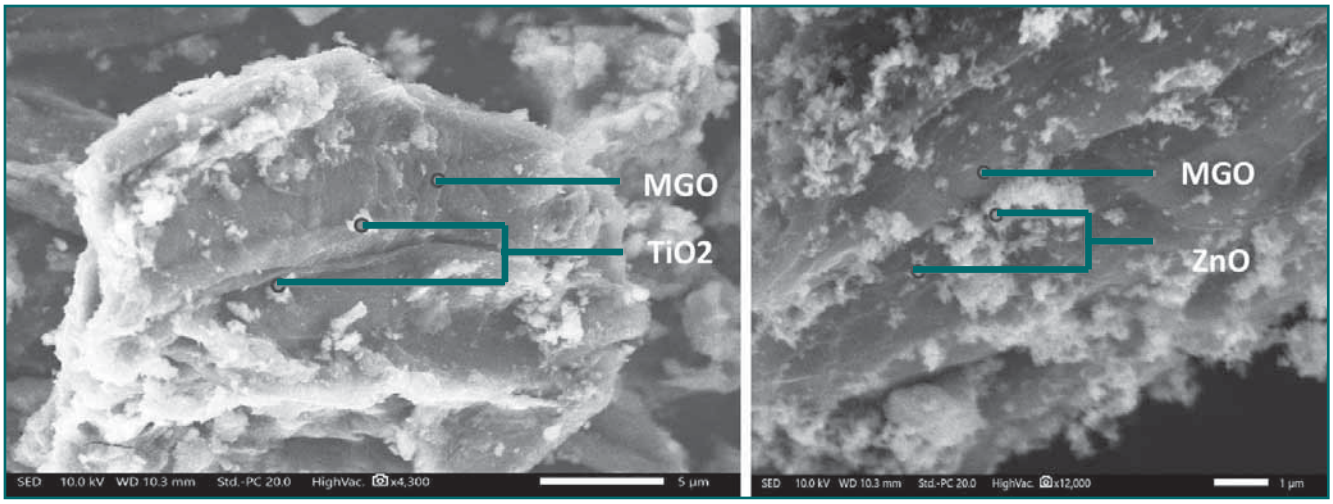
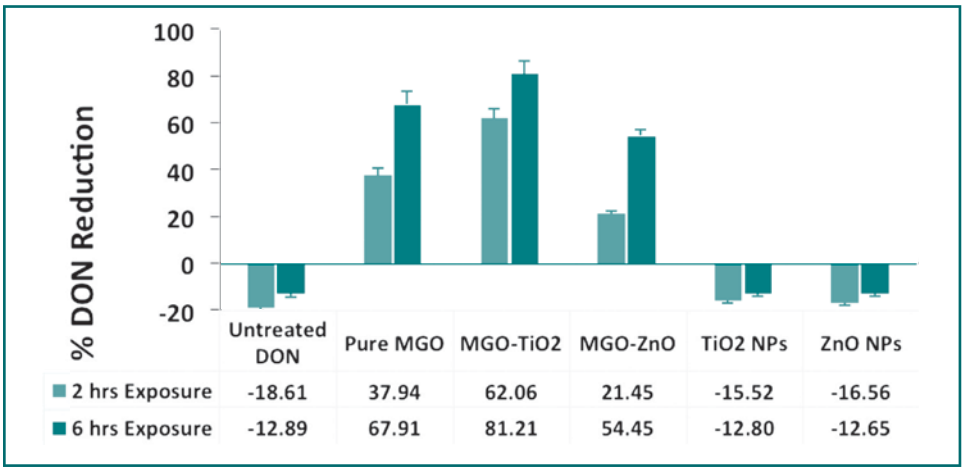


Figure 3. Resulting images from scanning electron microscopy on MGO-TiO2 (A) and MGO-ZnO (B) nanocomposite samples.

conditions such as dosage and irradiation time, for DON degradation in wheat grains. Six treatments were evaluated for two different time periods (2h or 6h); 1. MGO-TiO2, 2. MGO-ZnO, 3. Pure MGO, 4. Pure TiO2, 5. Pure ZnO, and 6. No treatment (Control). In glass vials, treatment materials were combined with a DON solution and ground wheat, then kept in a dark space for one hour. Samples were then placed under LED lamps for 2 hours or 6 hours. DON levels were then analyzed using high performance liquid chromatography (HPLC) and percent DON reduction was calculated.



	Untreated DON	Pure MGO	MGO-TiO2	MGO-ZnO	TiO2 NPs	ZnO NPs
2 hrs Exposure	-18.61	37.94	62.06	21.45	-15.52	-16.56
6 hrs Exposure	-12.89	67.91	81.21	54.45	-12.80	-12.65

Figure 4. Resulting DON degradation (%) following 2 and 6h of exposure to six experimental treatments.

What we found

Results of the photocatalytic experiments revealed that MGO-TiO2 nanocomposite (30 mg/ml) reduced DON by 81% after 6 hours of exposure to visible light, while MGO-ZnO demonstrated a 54% reduction (Figure 4). With 2 hours of light exposure, MGO-TiO2 caused a 62% reduction of DON concentration, while MGO-ZnO caused a 21.45% reduction. The use of MGO alone reduced DON concentration by 37.94% at 2 hours of exposure and 67.91% at 6 hours of exposure. Treatment with TiO2 and ZnO alone did not reduce DON contamination, and no reduction was seen in the untreated control group.

> "This study may provide opportunities to further utilize low-value grains."

MGO-TiO2 nanocomposites exhibited enhanced photocatalytic degradation of DON among all tested nanomaterials. Both dosage and irradiation time significantly influenced degradation performance. Further photocatalytic experiments using wheat grains will be conducted to determine the optimum operating conditions for subsequent practical applications and assess the impact of the technology on wheat quality.

Next steps

This project is ongoing – we are currently working on our fourth objective, understanding the by-products of DON catalysis and how wheat quality is impacted by the addition of our nanocomposite. We are also working on further optimization of the reaction, experimenting with the type of light used, dosage, and confirming which nanocomposite is the most effective. Once this stage is complete, we will move forward with scaling our methods, working with greater amounts of wheat and different exposure periods. Ultimately, these experiments and trials will allow us to develop further projects to move forward with feed testing and possible commercial applications.

Implications

The findings of this study may provide opportunities for the industry to remediate their low-value grains and utilize them more widely for feed or any other use, as well as mitigate the adverse impact of feeding contaminated grains to livestock. Further research on this topic must include the optimization of operational requirements, as large-scale exposure to visible light may be challenging in a commercial feed mill or grain processing plant. Economic feasibility of this process must also be assessed, as the synthesis of this nanoparticle is not currently commercialized.

Over all, this study has discovered an approach to mycotoxin decontamination with great potential. Reduction of a high concentration of DON by an average of 62% after only 2 hours of light exposure is undeniably promising, and the simplicity of the commercial approach is compelling. If mixing a powder into grain and then exposing it to light could reduce DON concentration by more than 50%, the way mycotoxin contamination is approached could be changed for good.

Comparing groups and stalls. What does the data say?

Shuang Luo, B.Sc.
Graduate Student,
Ethology
Prairie Swine Centre

Shuang Luo is a M.Sc. student, supervised by Dr. Jen-Yun Chou. After earing a B.Sc. in Animal Science from the University of Alberta, he spent time working at a commercial swine farm and gained a solid understanding of swine management practices. Currently, Shuang is studying retrospective data from sow barns to assess approaches to the upcoming deadline to switch to group sow housing.

Introduction

Following updates made to the Code of Practice for the Care and Handling of Pigs, Canadian producers will need to make the transition to group sow housing by July 1st, 2029. With the shocking cost associated with the barn renovations that will be needed for this change, there is great concern about the productivity challenges that sows in group housing may face. Reports of abortions and early pregnancy losses are rightfully worrisome, as well as concerns about learning and implementing practices for actually managing group housed animals over multiple parities.

To ease this transition, it is important that the industry begins to assess data that we have from farms that have already implemented group housing and developed their own management strategies. With management programs and computer based record keeping, the data exists, it just needs to be processed and analyzed.

This project aims to gather knowledge and develop methods to assist producers in making the transition to group housing, while also improving sow welfare and maintaining productivity. This study focuses on utilizing retrospective and longitudinal data, comparing sow and gilt productivity in group and stall-housed herds under the same management practices. By identifying production benefits and risks associated with each housing system, we can better understand how to approach the transition to group housing. Our findings will help develop communication materials to assist producers and their staff with the changes made.

What we did

Using data from 12 farms run by a pork producer in Saskatchewan, we started our assessment. Within the group of 12 farms, 6 use group housing and 6 use stall housing, with all farms using the same genetics, feed, and general management strategies. This producer shared their electronic management data (Metafarms) with us, and we began to assess what was there.

> "There is no "best" housing system. Management is the key to success of any system."

To begin, we visualized the data using box plots based on the categories provided to us. Initially, we were working off of 68 initial metrics tracked by the management program, some of which are included in Table 1. From these 68 initial metrics, we identified 27 key performance indicators. Since many of these indicators overlapped or were closely related, we ended up developing 8 principal components to be considered as performance themes (Table 1.).

What we found

Regarding farrowing mortality (PC1), significant differences were found related to parity ($P<0.001$), housing style ($P=0.042$), and the interaction between parity and housing style ($P=0.003$, Figure 1). Sows and gilts in group housing had lower farrowing

mortality scores, indicating that they had more piglets born alive than their stall-housed counterparts.

Regarding sow fertility (PC2), mixed results were seen (Figure 2). Housing style alone did not have a significant impact on sow fertility aspects (P=0.497). Parity had a significant impact on PC2 score (P<0.001); as sows aged, the average PC2 score increased. There was a significant interaction between housing style and parity (P<0.001). Gilts in group housing seemed to struggle with aspects related to fertility, though sows parity 3 and beyond displayed a higher PC score than their stall-housed counterparts. The higher PC score indicates that any issues with fertility seen in group housed gilts are overcome by older sows.

Table 1. Eight principal components to be considered as performance themes

Principal component	Included metrics
Farrowing mortality (PC1)	Average born dead, birth loss rate, stillborn rate
Sow fertility (PC2)	Wean to first service, conception rate, number of repeat services,
Mummification (PC3)	Average number of mummified fetuses per litter
Sow herd turnover (PC4)	Number of females remaining at the end of a period, total number of females removed, unplanned sow deaths
Litter size potential (PC5)	Average number of live-born piglets, average total litter size
Late gestation success (PC6)	The percentage of sows confirmed pregnant at 72 days, the percentage of sows that remain pregnant at 105 days
Mid gestation success (PC7)	The percentage of sows confirmed pregnant at 35 days post-service
Problem litter management (PC8)	The net number of piglets cross-fostered, piglet death rate, total number of piglets that died before weaning

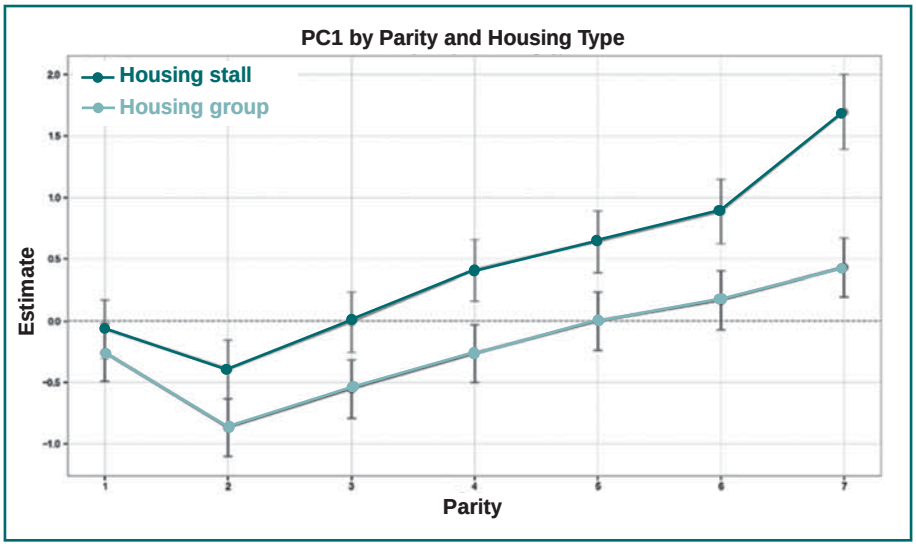


Figure 1. Average principal component (PC) score (estimate) for farrowing mortality (PC1).

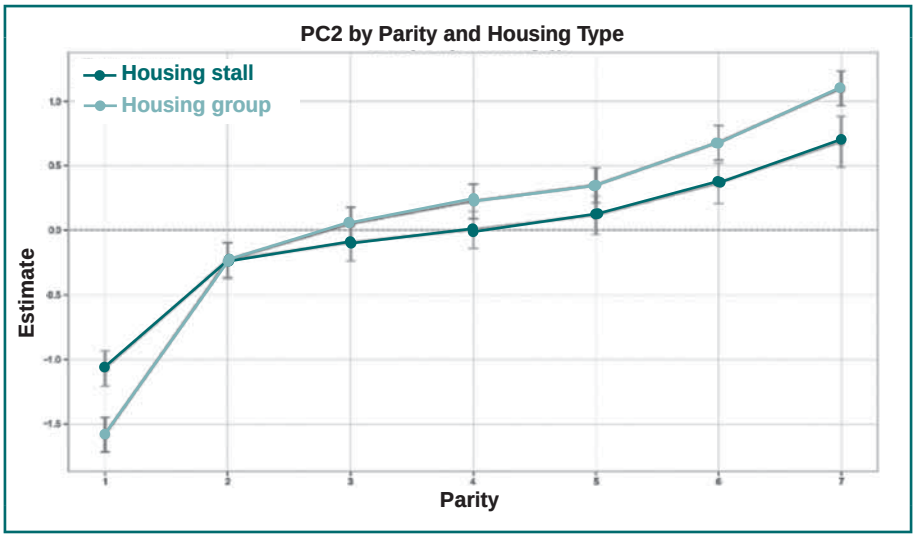


Figure 2. Average principal component (PC) score (estimate) for sow fertility (PC2).

Implications

Based on these preliminary findings, we can see that there is no "best" housing system. The reality of working with animals is that we will face challenges no matter what we do, so we need to assess and adjust our practices as time goes on. The results presented here show that group housing is undoubtedly beneficial for higher parity sows, reducing farrowing mortality and increasing fertility. However, the major management challenge that the industry will face in transitioning to group housing is illustrated – gilt fertility suffers in group housing. Hopefully, through further investigation, we will be able to identify factors contributing to this struggle and develop different approaches to mitigate this issue.

Next steps

This project is currently ongoing. We are working on the analysis for principal components 3-8, which will provide further insight into gestation success, litter characteristics, and herd turnover. Following completion of our analyses, we will work on developing realistic approaches to mitigate challenges associated with group sow housing. Identifying factors which reduce reproductive performance or sow welfare will allow us to further investigate critical point where careful management is necessary, especially for gilts entering the breeding herd. Participation in knowledge transfer activities and further publication in communication materials such as this will also be pursued, to ensure that producers and industry members are being updated on our progress as much as possible.

PEDv Rapid test

Bernardo Predicala, Ph.D.
Research Scientist,
Engineering
Prairie Swine Centre

Introduction

Outbreaks of Porcine Epidemic Diarrhea virus (PEDv) cause significant economic losses, as well as negatively impacting animal welfare and productivity. Since the first outbreak in Canada in 2014, more than 200 cases of PED have been confirmed across numerous provinces. The virus causes diarrhea and vomiting in young pigs, and can be fatal. While PEDv is not known to pose any risk to human health or food safety, it is still a major concern for the industry. The virus is highly contagious and survives well in the environment, so strict biosecurity practices are key to stopping the spread of this pathogen. One important aspect of biosecurity is accurate and rapid disease detection – current standard PEDv detection depends on transportation of samples to diagnostic laboratories. The current test of choice is real-time reverse transcription PCR (rRT-PCR), which can be costly and time consuming as a result of the equipment, reagents, and expertise needed to run the testing.

> "The development of a rapid PEDv test kit will help producers identify potential risk on a more timely basis."

A reliable, cost-effective, and fast PEDv field diagnostic test kit is not currently available in Canada. Development and distribution of such a test kit will be valuable in reinforcing biosecurity measures and reducing the chance of this virus spreading. Loop-mediated isothermal amplification (LAMP) testing is an alternative nucleic acid amplification technique that does not require prohibitively expensive equipment or careful and extensive laboratory protocols. A rapid test for PEDv using reverse transcriptase LAMP (RT-LAMP) has been developed in the Phillipines. The Andali kit is a closed-tube system that contains target oligonucleotides (primers), a control DNA plasmid, and a premixed LAMP reagent. The kit also includes all necessary components for a simple nucleic extraction. The most expensive piece of equipment needed is a heating block to encourage the amplification reaction, which costs about $600 and is easily decontaminated. Total kit materials for a single test run add up to around $10, and the test can generate results in under an hour, with a colourimetric reaction indicating the presence of the virus. Though the Andali test kit has been validated in the Philipines, additional testing is needed to ensure that the primers used in the kit are viable for use to detect PEDv strains found in North America. Additionally, optimization of the kit was needed to ensure clear results, reducing ambiguity that may result during the interpretation of the colourimetric results.

What we did

Phase 1: To begin, we used an online database (BLAST – Global alignment) to ensure that PEDv spike protein sequence of several North American strains matched the primer sequence used in the Andali test (GenBank ID KM406181; 4126 base pairs). Luckily, the comparison suggested compatibility. To ensure that the test kit would generate the expected results, previously collected samples confirmed positive for PEDv using rRT-PCR were tested again using the kit. Some ambiguity was encountered as a result of the dyes used, so alternative dyes were selected for testing. Previously extracted viral RNA was used in the testing of these new components.

Phase 2: To evaluate the overall accuracy of the test kit following the modifications, actual field samples were collected from PEDv-positive barns. The collected samples were split and sent for testing at either a commercial laboratory or for testing at with the Andali kit. A total of 35 tests were conducted for comparison.
Phase 3: Following the testing in Phase 2, we set out to develop a new, user-friendly, step-by-step procedure for the modified kit. The instructions are being developed using plain language while also considering the requirements of diagnostic testing and surveillance programs to ensure that the results from the test kits are consistent and compatible. Alongside this guide, a short video is being produced to exhibit proper use of the kit and display expected results. These materials will not only be useful for training and instruction purposes, but also for the promotion of this kit to the target audience.

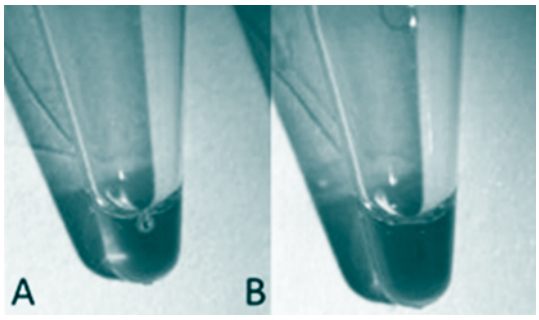


Figure 1. Positive 'blue' (A) and negative 'purple' (B) RT-LAMP results from the Andali test kit.

What we found

Phase 1: Through comparison of the sequences of the PEDv spike protein found in North American strains and the sequence of the primer in the Andali test kit, it was found that there was a minimum 96.8% similarity, with most strains sharing >99% similarity with the primer. Testing with previous samples confirmed this finding, as the test gave expected results.

Phase 2: Analysis of the collected samples showed that the Andali test kit had a 100% positive predictive value (PPV) and had 90% total agreement with rRT-PCR analysis. The positive predictive value of a diagnostic test indicates the probability that a positive test is actually true – in this case, 100% PPV shows that no false positives were detected. The negative predictive value (NPV) of the Andali kit was 80%, which indicates that there is an 80% chance that a sample determined to be negative for the presence of PEDv came from a truly healthy pig. The results of this testing are considered adequate for the exploratory assessment of a potential PED outbreak. In some cases, observed ambiguities of the visual outcomes of the test kit made it difficult to differentiate between positive and negative tests, leading to false negatives (the sample was deemed positive by RT-PCR assessment but decided as negative in the field). As shown in Figure 1., the reference colour for positive is 'blue' and for negative is 'purple', though the test can range in resulting colours as seen in Figure 2. In this stage of testing, there was a 16.7% false negative rate.

(PEDv Rapid test... cont'd on page 11)

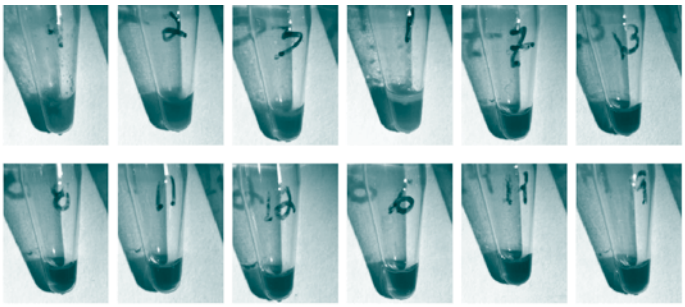


Figure 2. Colour range of results from the Andali RT-LAMP test kit.

Figure 3. Results of field testing the modified test kit with SYBR Green as indicator dye as observed under normal light (A) and under UV light (B).

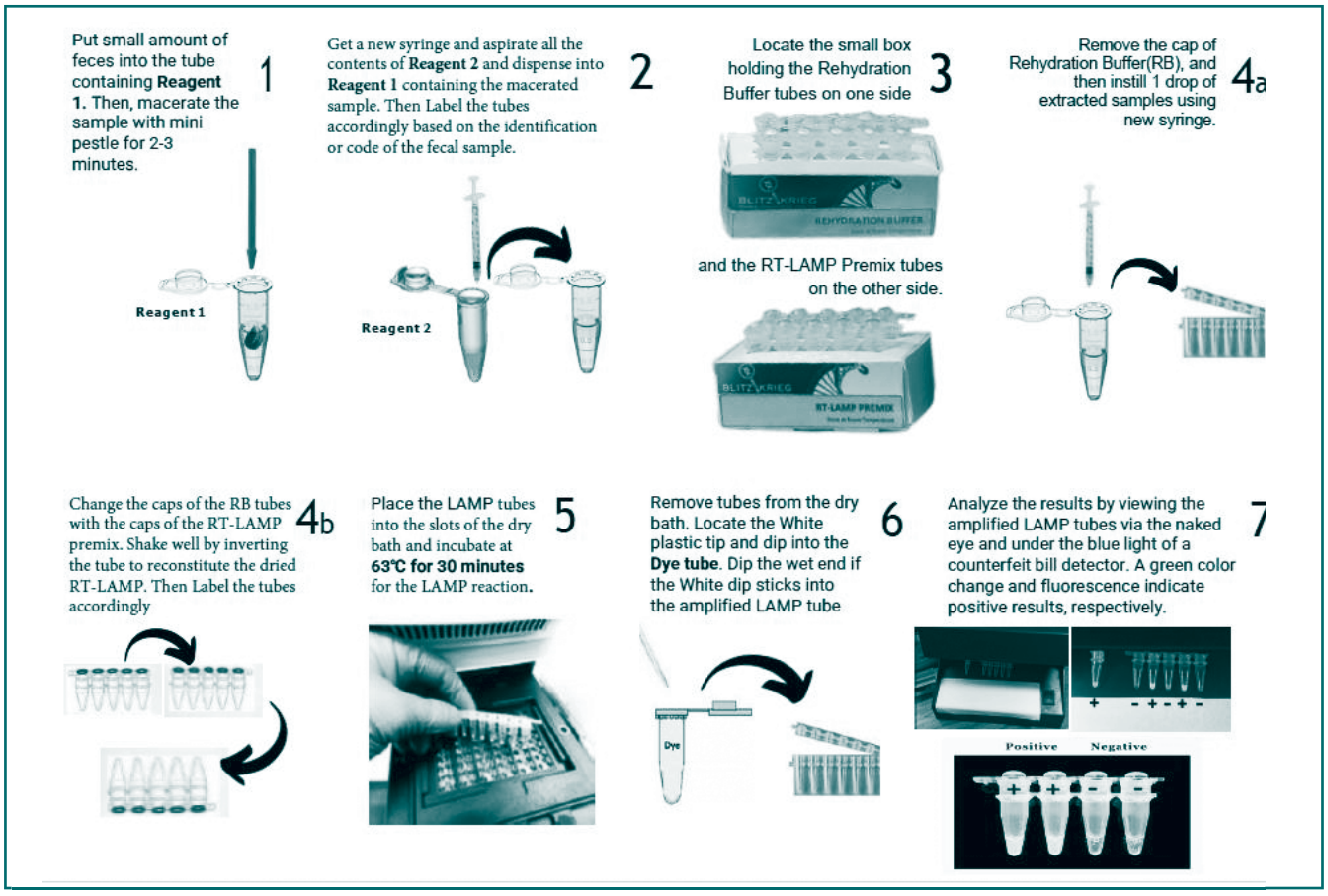


Figure 4. Schematic diagram of the revised Users' Guide for the use of modified test kit.

Low Crude Protein for post-weaning diarrhea

Michael Bosompem, M.Sc.,
Graduate Student,
Animal and Poultry Science,
University of Saskatchewan

Micheal is a Ph.D. student in supervised by Drs Michael Wellington and Andrew van Kessel. Michael returned to the University of Saskatchewan for his Ph.D. program in January 2025 following five years working in the Canadian swine industry as a nutritionist, which began after he earned his M.Sc. in Animal Science from the College of Agriculture and Bioresources.

Introduction

The rapidly growing weanling pig has a high requirement for total nitrogen (crude protein, CP) and amino acids (AA). These requirements are typically met using highly nutritious vegetable protein such as soy bean meal and canola meal. While these ingredients have a generally good essential amino acid profile (EAA), increased supplementation is inadequate to meet EAA requirements, making supplementation of crystalline EAA necessary.

Increased protein inclusion can lead to post-weaning diarrhea (PWD) as a result of the microbial fermentation of excess undigested or partially-digested proteins reaching the hindgut. Fermentation of this protein can lead to the production of harmful metabolites, upsetting the commensal microflora and intestinal epithelium, resulting in gastrointestinal upset and diarrhea. Significant losses related to morbidity and mortality may occur, and impacted animals may exhibit poor performance for an extended period of time. The use of low crude protein diets has been suggested as an approach to mitigate this issue, and has been proven to be an efficient method when adopted.

What we did

While the use of low CP diets has been seen to be effective in reducing the incidence of PWD, findings from published literature on the ideal concentration of CP in nursery diets are inconsistent. To determine how piglets performed when fed a low CP diet that met EAA requirements, we tested five diets, formulated at 14, 16, 18, 20, and 22% CP. The base diets included wheat, barley, and soy bean meal, and were EAA balanced. These diets were fed to 360 mixed-sex weanling piglets, with 72 pigs per treatment. Diets were fed in two phases, Phase 1 for days 0 – 21 of the trial, and Phase 2 for days 22 – 42. Piglet weight and feed intake were recorded over the course of the trial.

This project was completed in cooperation with Truow Nutrition, and was run through their Swine Research Centre in the Netherlands.

What we found

Piglets fed diets containing 18-22% CP displayed the highest final body weight (Figure 1), accompanied by the highest average daily gain (ADG). Average daily feed intake (ADFI) also increased as CP inclusion increased. Gain-to-feed ratio (G:F) displayed the same impact, with CP provision between 18-22% resulting in higher ratios.

To assess which diet contained the optimal CP level, a linear breakpoint model was used (Figure 1). It was determined that the provision of CP at 18% resulted in optimal performance when all EAA requirements were met. This finding was supported when PWD was assessed, as the incidence of diarrhea increased

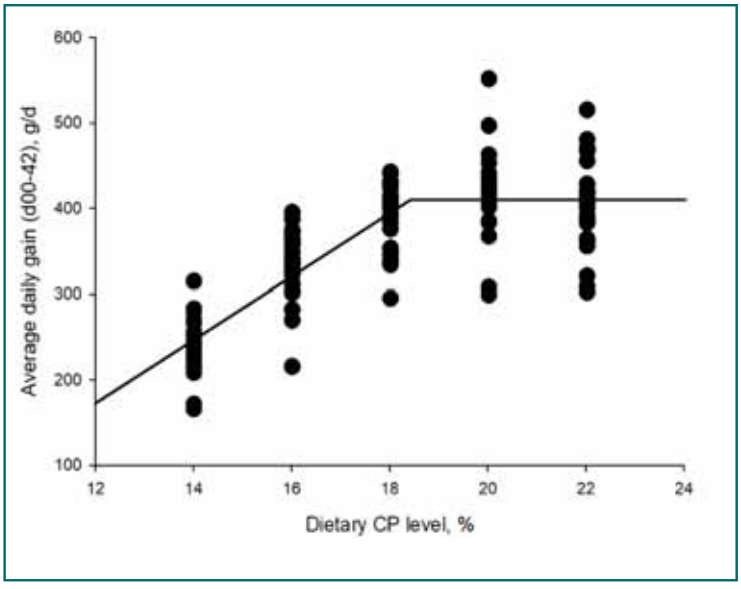


Figure 1. Linear breakpoint model used to determine the optimal CP inclusion concentration.

from 6% in piglets fed the 18% CP diet to 29% and 30% in the groups fed 20% and 22% CP respectively (Figure 2). At 18%, both the incidence of diarrhea and total feed cost could be reduced, making swine production more economically and environmentally sustainable

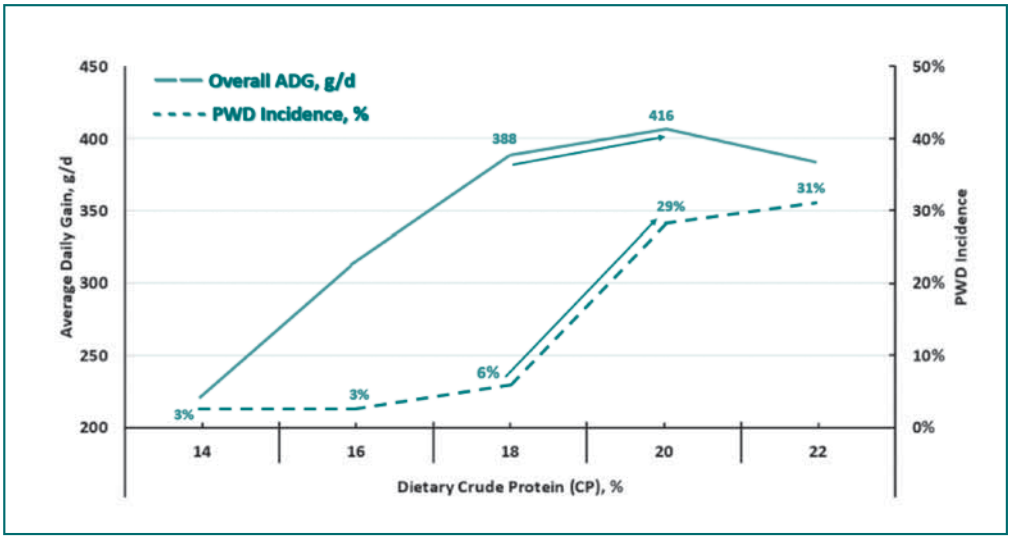


Figure 2. Comparison of overall ADG and PWD incidence at different levels of CP inclusion.

Next steps

Moving forward, studies related to EAA balance and CP inclusion are planned. Investigation into the essential-to-total nitrogen (N) ratio (E:T) is also planned, with intent to assess a number of diets representing a titration of NRC nitrogen requirements. Further, assessment of novel N sources has also been suggested, along with comparison of protein and non-protein N sources. Upon completion of dietary optimization trials, we hope to assess the impact of the diet in 'clean' and 'dirty' environments to determine if there is any protective value.

Implications

This study clearly exhibited the influence of CP inclusion on both growth performance and PWD. Though piglets fed diets containing 20% CP displayed better growth performance than those fed 18% CP, they also experienced diarrhea to a greater extent than piglets fed lower CP concentrations. Piglets fed the highest concentration diet (22% CP) also experienced PWD to a greater extent. Understanding how dietary composition can impact the incidence of disease is important to the sustainability of our industry, and will help reduce the use of antibiotics and other feed additives such as zinc oxide. Lowering CP inclusion may also reduce nitrogen excretion, supporting environmental sustainability. Optimizing dietary CP concentrations is also financially beneficial, as it can reduce feed costs and losses associated with PWD.

(PEDv Rapid test... cont'd from page 9)

In an effort to reduce ambiguity, different dyes were tested. Phenol red (PR) and SYBR green both had advantages and disadvantages. Use of PR ensured greater colour differentiation, but if an insufficient amount of sample was used or the extraction was not adequate, false negatives occurred. Use of SYBR green gave the added advantage of a fluorescent signal for positive tests, but the reagent requires careful environmental control and handling; using SYBR requires an additional piece of equipment, as UV light is needed to detect the fluorescent signal. Careful environmental handling is of the greatest concern for SYBR green, as exposure during transport can lead to false positives. To address this issue, changes to reagent formulation have been completed. Ultimately, it was determined that SYBR green gave the most accurate and unambiguous results, as the fluorescent reaction leaves little room for misinterpretation (Figure 3).

Phase 3: The existing Anadali user's guide has been updated based on North American conditions and requirements (Figure 4). Information on provincial surveillance program protocols has been incorporated into the guide and has also been used in the development of other instructional materials to ensure that adherence to sampling and testing requirements is maintained.

What's next?

Based on the results of this study, the possibility of using the Andali test kit in Canada is clear. Porcine epidemic diarrhea continues to be a major concern in the North American swine industry, and it is paramount that we work to keep the virus under control. Though the kit was developed to test samples collected directly from animals, it can also be used to test critical sites and surfaces to ensure effective clean-up and decontamination, further supporting disease eradication. To continue the development and commercialization of this kit for use in North America, suitable permits need to be obtained and more testing needs to be done.

Future work on this project will focus on involving producers and veterinarians to test the kit in the field and provide feedback on user experience and the identification of results. To evaluate the efficacy of the updated kit in commercial situations before moving forward to commercialization, participation of commercial farms as demonstration sites will be needed to meet CFIA requirements for kit commercialization.

Personal Profile

Serge Muhzi, M.Sc.

Serge Muhizi, originally from the eastern part of Rwanda, has started his Ph.D. under the guidance of Jennifer Brown, Jen-Yun Chou, and Deborah Adewole. He looks forward to furthering his research in animal science and contributing to the ongoing advancements in this field. Serge is excited about the journey ahead and eager to collaborate with fellow researchers and industry professionals to drive innovation and improve animal behavior, nutrition, and welfare. Serge began his master's journey at Dankook University in South Korea in 2020, where he was supervised by Dr. In Ho Kim and Jae Hong Park. His master's thesis focused on assessing the effects of organic acid-based feed additives on various aspects of pig production, including nutrient digestibility, fecal microbial communities, and fecal gas emissions in both weaning and growing pigs. This research provided critical insights into feed additives' impact on the health and growth of monogastric animals. In addition, he had a chance to participate in several trials evaluating the effect of feed additives such as enzymes, prebiotics, probiotics, and organic acids in different stages of swine and poultry production. Before pursuing his master's, he completed a bachelor's degree in veterinary medicine at the University of Rwanda, where he was supervised by Dr. Anselme Shyaka. His undergraduate thesis, titled "Assessing the Prevalence of Salmonella Contamination in Pig and Pork at Farms and Slaughterhouses in Northwest Rwanda," laid the groundwork for his focus on animal health and food safety. Apart from that, in his spare time, Serge enjoys meeting friends and hiking, which helps him maintain a balanced lifestyle.

Coming Events

Saskatchewan Livestock Expo
February 19
Swift Current, Saskatchewan

PSC Spring Producer Meetings

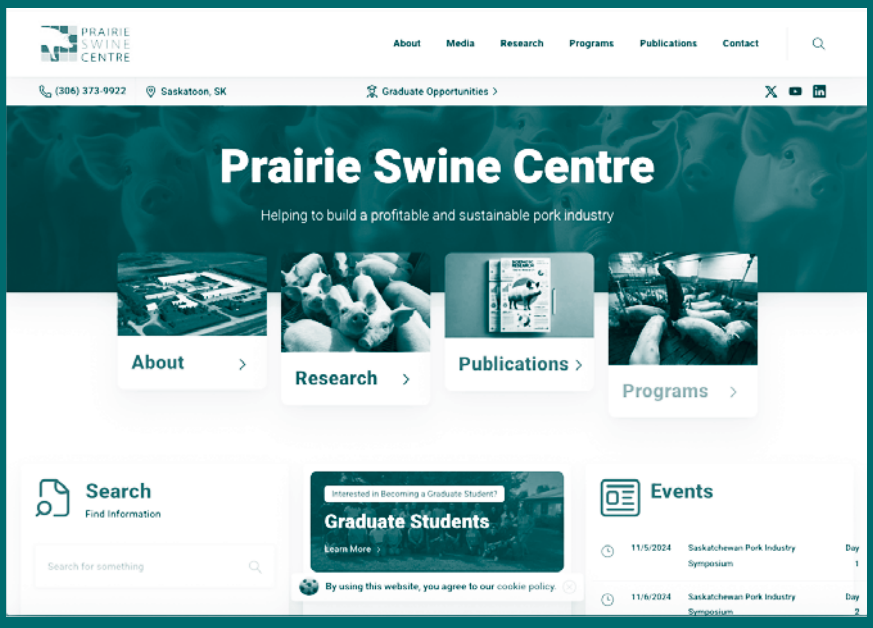
April 15
Saskatoon, Saskatchewan

April 17
Portage la Prairie, Manitoba

April 23
Lethbridge, Alberta

April 24
Red Deer, Alberta

Check out the new
Prairieswine.com
You will be glad you did.



PRAIRIE SWINE CENTRE

Centred on Swine is a semi-annual newsletter produced by Prairie Swine Centre Inc. (PSCI).

Prairie Swine Centre Inc.
P.O. Box 21057, 2105 - 8th St. E.
Saskatoon, SK S7H 5N9 Canada

Tel:(306) 373-9922
Fax:(306) 955-2510
www.prairieswine.com

Prairie Swine Centre is an affiliate of UNIVERSITY OF SASKATCHEWAN