

Proceedings of the



ONTARIO SWINE CONFERENCE

March 24-25, 2026

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of the

ONTARIO SWINE
CONFERENCE

Edited by

J.H. Smith and M. Henry

March 24-25, 2026

Niagara Falls, Ontario

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Chair's Message

On behalf of the conference founding members, it is my pleasure to welcome you to the 2026 Ontario Swine Conference, here in Niagara Falls.

We are pleased to bring together producers, veterinarians, researchers, nutritionists, and industry partners from across the province, all united by our shared commitment to an innovative and resilient swine sector. Over the next two days, we look forward to sharing knowledge, building connections, and advancing the conversations that will shape the future of our industry.

It is wonderful to see so many familiar faces, and some new ones too, gathered here in Niagara Falls. Your presence here is a testament to the strength, dedication, and passion of Ontario's swine sector, and we are thrilled to have you with us.

This conference exists because the pork industry refuses to stand still. The conversations you will have in this room, in the hallways, and over meals have the power to move the pork sector forward. That is why we are here.

We have built a program this year that is both timely and inspiring, and I want to give you a taste of what is ahead. Our speakers and sessions span the full spectrum of what matters most to this industry right now: from the mindset and resilience it takes to lead through uncertainty, to the economic and trade realities shaping our market, to the cutting-edge research that is pushing the pork sector forward in genetics, nutrition, and animal care.

I am proud to highlight our Emerging Scholar Competition, which features four exceptional finalists this year. These are the next generation of people who will invest their talent into our industry - please make a point of engaging with them and showing your support.

I also encourage you to take time to visit our poster presentations. Students have brought their research to share with you. These posters represent the curiosity and ambition of the up-and-coming minds of the swine sector.

A conference of this scale does not happen without an enormous amount of work behind the scenes.

I want to sincerely thank our three volunteer committees, the Speaker Selection Committee (chaired by Tara Terpstra), the Sponsorship Committee (chaired by Emma Payne), and the Emerging Scholar Committee (chaired by Maggie Henry) for their dedication in bringing this program to life. Their work is what makes this conference excellent every year.

I also want to extend our deepest gratitude to our 43 sponsors. Forty-three organizations who believe in this industry, believe in this event, and make it possible for all of us to be here.

Lee-Anne Huber
Chair, 2026 Ontario Swine Conference

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Program Development

We greatly appreciate the ideas and input from the industry participants who attended the program development meetings.

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Deleting DNA: Positive Effects

Trish Berger

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Spontaneous changes (mutations) in the genetics of pigs and their ancestors have occurred over epochs, establishing the pool of genes (genetics) present in pigs at the beginning of domestication. During the approximate 10,000 years of domestication, the pigs more compatible with domestication reproduced. Hence, domestication and spontaneous genetic changes have altered representation of genes in the porcine gene pool. Representation of genes in the pig population has continued to change over the past 100 years as preferences in body conformation change and spontaneous mutations, approximately one per newborn pig, have also added to the changes. Not all expressed genes (segments of DNA coding for proteins) are relevant. (For example, presence or absence of the human gene influencing mid-phalangeal hair is totally irrelevant.) Pseudogenes are regions of DNA that resemble real genes but do not code for proteins. Spontaneous mutations eliminating expression (synthesis of a protein) are one cause for pseudogenes. The estimated number of pseudogenes is approximately the same as the number of expressed genes. Spontaneous changes in the DNA are natural, relatively frequent, and may have a positive effect but frequently have no effect, while pigs that have spontaneous mutations that are negative do not typically survive and/or reproduce. If one makes a change to the DNA using molecular tools, this is considered gene editing by the U.S. FDA. Gene editing can be classified by the molecular tool used with CRISPR/Cas9 and Base editing being currently used tools and Prime editing being a developing tool. Gene editing can also be classified by the amount of DNA removed or in a few cases the amount of DNA added and the source of DNA. Historically, a relatively large amount of DNA from bacteria has been introduced to several agronomic crops (the Roundup Ready crops) to install herbicide resistance using older tools. The CRISPR/Cas9 tool can be used to delete small and large amounts of DNA and is the typical process currently being used. A very small deletion can eliminate expression of the gene. Guide RNA and Cas9 protein are introduced into the 1 cell embryo and the Cas9 protein cuts the DNA at the site “programmed” by the guide RNA. The cut DNA may rejoin using cellular DNA repair machinery or this machinery may remove a few bases from either cut end before the DNA rejoins. Elimination of these bases will eliminate some or all of the protein coded by the targeted gene. The Cas9 protein and guide RNA are only active for a few hours but during this time will recut the designated site if the target site has been rejoined intact. PIC’s PRRS resistant pig is an example of how this technology can be used effectively. Missouri researchers identified the CD163 protein as the receptor for the PRRS virus. Positive functions don’t exist for this protein. By eliminating the expression of the protein, the virus cannot bind and infect the cell and the pig is resistant to PRRS. In order for this approach to work with other viral diseases, the pig cell molecule that the virus has hijacked to use for cell entry has to be identified and the pig cell molecule cannot have positive functions or the cell molecule needs to retain its positive functions after deletion of the part of the molecule required for viral entry. Hence, intentional gene alteration (editing) can be an effective tool to induce disease resistance and improve animal welfare in very specific cases.

Ethical Challenges Towards Good Stockmanship

Peter Kunzmann,
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University of Veterinary Medicine Hannover (TiHo)

Five freedoms and basic pathocentric concept

Introduced in the 1960s, the so-called “five freedoms” have become kind of a mantra to name the essentials of animal welfare and thus defining the rules of good stockmanship.

The basic list reads like this:

1. Freedom from hunger and thirst
2. Freedom from discomfort
3. Freedom from pain, injury or disease
4. Freedom to express normal behaviour
5. Freedom from fear and distress

The five freedoms remain correct, of course, when it comes to keeping animals free from suffering. Some of them directly address the kind of suffering, such as pain and distress, others name basic needs of animals that will lead to suffering if not sufficiently cared for; hunger, thirst and malnutrition may be called “evil” for animals, both when it comes to their bodily functions and possible sources and to forms of suffering that can be subjectively experienced.

So, the first note on five freedoms is that they describe good stockmanship starting from a *negative* perspective.

The corresponding ethical position, called pathocentrism, focuses on the avoidance of suffering. The yardstick for improvements in animal husbandry, in turn, is the degree of burden that the respective conditions impose on the animals. This is where especially sceptical considerations lead us: As humans, we can hardly ‘empathise’ with animals and imagine their ‘happiness’, but we can make an interpretative estimate of when animals are not feeling well. The least that humans owe animals is the avoidance of (unnecessary) suffering or pain. We don't know what goes on “inside” happy animals. But with effort and attention, we can recognise the ways in which we disturb their well-being.

That sounds much more relaxed than it can be justified philosophically and ethically and presented scientifically. The question of our ability to grasp animal well-being or animal suffering in its various facets, is still hotly debated even after decades. Even for a biologically rather fundamental entity such as pain, there are very different interpretations of what this concept actually denotes in animals. For example, for pigs, this is developed, for example, in the paper by Ison et al (Ison et al. 2016).

Even if it is not that easy to say what it is actually about, especially from a scientific and methodological point of view, it is the moral minimum consensus in our society and at the same time shapes animal protection legislation. The German animal protection law takes such an approach *ex negativo*, not requiring the facilitation or realisation of well-being, but instead prohibiting the infliction of pain, suffering or harm (unless justified by a reasonable

cause). In his much-cited footnote in his "Introduction to the Principles of Morals and Legislation" (1789), Jeremy Bentham has elevated the principle of pathocentrism to the key principle of all moral relationships with animals: "Is it the faculty of reason, or perhaps, the faculty for discourse?...the question is not, Can they reason? nor, Can they talk? but, Can they suffer?"

The thrust of Bentham's argument is obviously egalitarian: it does not matter *who* is suffering. The capacity to suffer is the only criterion. However, there is most likely to be a significant difference in the perception of pain and suffering between humans and animals.

In classical pathocentrism, 'suffering' is treated as a common, interchangeable coin that can be easily converted between humans and animals, but also between albatrosses and sea urchins. In the treatment of animals, however, the differences in sentience are morally relevant. A jellyfish presumably 'suffers' differently and under different conditions than a dog. Taking this into account allows for a more differentiated consideration of the morally decisive factor, namely whether animals are harmed at all by the treatment by humans.

Possible animal suffering is not only the ethical criterion for evaluating our actions towards animals – it is what makes an ethical relationship necessary in the first place. It is the capacity for suffering or, more generally, the sentience of animals that brings them into the spotlight of ethical considerations in the first place. Because we can cause animals to suffer and suffering, as an evil, is to be avoided, the well-being of animals cannot leave us indifferent.

In the assertion of the sentience of animals, two things become ethically significant: the reason for our responsibility towards animals and, at the same time, the extent of that responsibility. The reason, because the sentience of animals compels us to take special care of them; and the extent, because the avoidance of animal suffering represents an unavoidable task of ethically legitimate action.

In precisely this setting, the five freedoms have had an enormous impact and retained their relevance to this day.

It is likely to be extremely difficult to enforce positive duties, especially if they are linked to penal provisions. This raises the question of when we have fulfilled our duty to make animals 'happy'. If we assume a normal state free of suffering (in the broadest sense), we have set an achievable goal.

As long as the standards of good animal husbandry in morals and legislation are based on this form of pathocentrism, there is no need for major steps beyond the five freedoms. Whereby the (fourth) freedom, which, formulated positively, is a freedom to live out natural behavioural patterns, implicitly points beyond it: "Freedom to express (most) normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind".

However, in several perspectives, we go further.

Flourishing and permanent holidays

In ethics, a modern view of animals attributes positive emotions to animals. Accordingly, the question arises as to how we can grant this to animals in husbandry; this is a real challenge, especially with cognitively rich animals such as pigs. Such features are difficult to implement in the reality of husbandry, difficult to scientifically establish and difficult to monitor legally. Today, the numerous ethical approaches demand what could be called “flourishing”: the animal should be able to realize all its capabilities according to its nature. In contrast to the pathocentric view, however, it is extremely difficult to draw a line here.

In this context, F.A. Brom spread the question of whether an animal protection law could have the task of guaranteeing animals in human keeping a ‘permanent holiday’: “In a discussion on the practical implications of the [Dutch] Animal Health and Welfare Act (AHWA) ... someone claimed that the goal of the AHWA could not be to give animals a permanent holiday.” (Brom 1997). Or whether it should be geared more to damage prevention, to prevent suffering (pool welfare), not to promote happiness. From this point of view, the animal’s welfare is injured if it drops below a certain level. “The choice between a point of departure in the life with happiness or in a life without suffering is important” (Brom 1997).

In the context of this article the basic divide is based on the question whether the avoidance of suffering should suffice in the context of the five freedoms, or whether we have to fulfil quite different requirements for animals, in this case more precisely for pigs.

There is an almost bewildering variety of approaches, which go far beyond the claim that we owe animals the avoidance of (avoidable) suffering. To pick out just one very prominent one: Martha Nussbaum speaks of the fact that in our dealings with animals, we must ensure that they realise their respective, specific, species-inherent “capabilities”. Nussbaum has elaborated this approach mainly in her book “Frontiers of justice” (2006). Momand sums it up precisely: “Within each creature rests innate capability wishing to thrive. And, importantly, the Aristotelian argument insists that ‘there are waste and tragedy when a living creature with the innate or ‘basic’ capability for some functions that are evaluated as important and good never gets the opportunity to perform those functions’ ... Thus, the approach holds that ‘an ethical concern that the functions of life not be impeded, that the dignity of living organisms not be violated’. This is exactly what Nussbaum’s capabilities approach is intended to accomplish. ‘It wants to see each thing flourish as the sort of thing it is’” (Momand 2016, 222).

The concept of flourishing just recently found a strong reception in the discussion of animal welfare via a “consensus paper” (Rault et al. 2025), signed by a large group of experts working on animal welfare and especially interested in positive animal welfare. It reads: “Animal welfare science has been primarily concerned with minimizing suffering, but there is growing interest in also promoting positive experiences, grouped under the term positive animal welfare (PAW). However, there are discrepancies in the use of the term PAW. An interdisciplinary group arrived at a consensus that “PAW can be defined as the animal flourishing through the experience of predominantly positive mental states and the development of competence and resilience” (Rault et al. 2025). The link between animal

husbandry, animal welfare science and ethics is established by using the concept of flourishing.

To evaluate the approach, justification and scope of this concept even just in Nussbaum's theory would be beyond the scope of this paper. And it is only one of many approaches that, for various reasons, go far beyond pathocentricity. I will just point out that the very different moral claims very much lead to highly divergent perspectives in ethics and in the public consciousness of what we use to measure good animal husbandry.

Better animal husbandry

Most of our interested contemporaries in modern societies demand “better animal husbandry”, which is more closely oriented towards the complete satisfaction of all the animals’ needs. This differs from the logic of the five freedoms in that it also takes into account that “needs” do not immediately turn into suffering when frustrated. For the discourse, it is crucial that we can no longer realistically set a definable goal here: For pathocentrism, a goal is achieved when animals live free from suffering. Other approaches demand much more; above all, however, it is impossible to say when we will have fulfilled the claim of giving animals a good life.

Three different perspectives are conceivable here (Kunzmann 2019) although they can usually get mixed up in the discussion about farm animals:

1. All people want the animals *not* to live a bad life. Therein lies the moral consensus. This is also a ‘pathocentric’ basic law of animal protection: avoiding suffering. However, parts of agriculture still undercut these minimum standards again and again, with the consequence for the reputation and credibility of all animal owners.
2. People want animals to have a better life. What exactly this means, of course, ranges as widely as the space between the ideal fulfilment of all capabilities on the one hand and the frustration of all needs on the other. In Germany, the SocialLab consortium has evaluated corresponding surveys: “Ideas about ideal animal husbandry are characterised by terms such as ‘free-range’, ‘species-appropriate husbandry’, ‘hygiene compliance in the stable’, ‘no antibiotics’, ‘more controls’ or ‘feed without genetic engineering’. Overall, the participants would like to see the most species-appropriate husbandry possible for farm animals, characterised by, for example, ‘sufficient space’, ‘daylight’, healthy and not too rapid growth, and species-appropriate feeding. In pig farming, keeping the animals on straw and providing them with the opportunity to wallow are of great importance in the ideal images. (SocialLab 2019, 4).
3. Finally, there are those who want animals to be simply *super*. This involves a mixture of utopian images of animal husbandry, which real agriculture fails to meet. Not the only, but perhaps the most important motive here is the farm idyll, known in English literature as ‘Old MacDonald's Farm’.

Without going through all the variants now: the demand for consistent compliance with animal welfare represents a minimum level that cannot, of course, be undercut. What goes beyond that, the demand for better conditions for the animals, has been driving the discussion for decades.

Theoretically and practically, it is difficult to take such interests of animals seriously without turning the ideals of good animal husbandry into utopian ideals. The five freedoms, to prevent animals from suffering, are, from an internal point of view, however, also far too little to be able to justify the demands on the keeping of animals as sentient beings.

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Immunonutrition in the Nursery Pig

The CFM DE LANGE Lecture in Pig Nutrition

Meeka Capozzalo

Molesworth Farm Supply Ltd.

This memorial lecture honours the scientific legacy of Kees de Lange. The presentation challenges traditional feed formulation approaches that rely on static nutrient requirements derived from healthy animals, arguing that these assumptions break down during the weaning period when pigs commonly experience immune activation and sub-clinical inflammation. Under immune challenge, nutrients are re-partitioned away from growth toward maintenance, immune responses, oxidative stress control, and gut repair, increasing metabolic cost and reducing feed efficiency even when growth rate appears unchanged. Using both experimental and commercial data, the lecture introduces resilience as a formulation objective—designing diets that minimize performance losses under stress rather than optimizing only for ideal conditions. Particular emphasis is placed on amino acids as conditionally limiting nutrients. Tryptophan and sulphur amino acids are highlighted as key examples whose requirements increase under immune stress due to their roles in appetite regulation, acute phase protein synthesis, immune modulation, glutathione production, and oxidative balance. Across multiple studies, increasing dietary tryptophan and sulphur amino acids improved feed conversion and protein deposition in immune-challenged pigs, often at relatively low cost compared with the financial losses associated with impaired health. Efficiency is not feeding less, it's understanding the biology deeply enough to feed appropriately under challenging conditions.

Emerging Animal Health Challenges Impacting Ontario Swine Producers

Murray Gillies
Animal Health Canada

Infectious disease remains one of the greatest challenges facing dairy producers and human health in general. Globally, many of these diseases continue to adapt, spread and gain traction, increasing their risk of eventually affecting the Canadian animal ag sector. The emergence of Highly Pathogenic Avian Influenza (Bird Flu) in US dairy cattle as well as the ever-present threat of Foot and Mouth disease and African Swine Fever means that surveillance and best management practices are paramount to protecting the health and productivity of our food animals.

Canadian producers can contribute to our national surveillance strategy through participating in the Canadian Animal Health Surveillance System (CAHSS). CAHSS is a network of networks that uses data-driven information to demonstrate animal health, minimize impacts of disease, and guide planning on national animal health priorities. CAHSS consists of subject matter experts across all animal species groups within Canada that represent industry, federal/provincial/territorial governments, academia, private veterinarians, diagnostic laboratories and many others who come together regularly to discuss animal health. CAHSS just recently reached 1000 members across Canada and continues to grow.

On March 25, 2024, the United States Department of Agriculture (USDA) confirmed an infection of bird flu in a dairy herd in Texas. This new disease caught the US dairy sector off guard as cows were traditionally believed to be resistant to flu viruses. No one anticipated bird flu crossing into and spreading among ruminants. From Texas, the virus spread very quickly, ultimately affecting over 1000 herds in 20 states. California was hit the hardest and the virus came as far north as Minnesota and Idaho, both on the Canadian border. This disease affected cattle in a new way, causing them to become very sick with thickened colostrum-like milk and drastic reductions in productivity. It was estimated that each case cost a producer around \$1000 USD. Farm workers were also susceptible to this virus, reporting cases of pink eye and mild respiratory signs. Canada, through collaborative efforts across industry, government agencies and veterinary epidemiologists, increased import restrictions and quickly implemented a national surveillance program which is still running today and has shown that the virus has not found its way into our dairy herd. We have been successful so far in keeping this nasty virus out of our dairy animals and our dairy producers and subsequently protecting our colleagues in the poultry sector and the swine sectors.

Insects also continue their northward spread, with one posing a direct threat to Canada and one posing a serious threat to the US. The New World Screwworm spread rapidly from Panama all the way up through Mexico right to the American border. This flesh-eating larva is devastating to animals and very difficult to treat. Although it is unlikely that New World Screwworm will come to Canada, it could cause trade disruptions between Canada and the US, and it could find its way here on travelling people and pets and bother our animals over the Summer and Fall. Additionally, a new type of tick, the Asian Longhorned Tick, is also spreading north and has been detected in Maine, Michigan and Iowa. This tick will almost certainly establish itself in Canada and brings with it a new disease that we are not very

familiar with: Theileriosis. Producers are also being asked to participate in tick surveillance by taking a quick picture of any ticks they find on their animals and submitting them to the ETick platform either via the app or their website (<https://www.etic.ca/>).

Foot and Mouth disease (FMD) and African Swine Fever remain present globally and continue to spread, making more frequent incursions into Europe. FMD would be devastating to the Canadian cattle and swine sectors and ASF would be devastating to the swine industry. Consequently, much of the work that we do ensuring we maintain our best management practices is aimed at preventing FMD and controlling it quickly should it ever find its way into our livestock. Seneca Valley Virus (A) has also emerged as a minor disease of swine but one that causes blister-like lesions that are suspicious of FMD and trigger a disease event response, so this disease has become significant to the swine sector.

Producers can use their best management practices to help prevent FMD and all the other diseases discussed above. These best management practices include on-farm biosecurity, global biosecurity, exceptional animal health practices as well as rapid detection, reporting of, and response to clinical signs. When travelling, especially when travelling with pets, it is important to follow further control measures, especially if going to a country with known infections (such as Mexico for screwworm). Pigs must be kept at a high level of health to mitigate the impacts of disease. This includes maintaining animals in good body condition with good nutrition and mineral supplementation, controlling lameness, keeping your animals well vaccinated following recommendations from your herd veterinarian, and keeping your barns well-ventilated and cool in the summer.

If producers detect anything off with their animals, especially anything that may indicate an issue with any of these emerging diseases like the presence of screwworms, a suspicion of bird flu, tick infestations or signs of FMD like blisters, they must report it to their veterinarian immediately. It is then imperative that producers work with their vet and regulatory officials to identify and control diseases as we all do our part to protect the health of our pigs and the productivity and sustainability of our industry.

Funding for CAHSS activities has been provided through the Agri Assurance Program under the Sustainable Canadian Agricultural Partnership, a federal-provincial-territorial initiative.

Managing Farm Data with AI Tools

Shalimar Martin, South West Vets, Stratford Ontario

Charlie Illick, Gilt-Edged Farms

Artificial Intelligence (AI) Moves into the Barn: Data Tools Begin Transforming Pork Production

Artificial intelligence is beginning to take hold in the pork industry as producers are challenged with managing increasingly large and complex datasets generated through breeding records, health treatments, and performance monitoring. While modern production systems capture extensive information, time constraints and analytical complexity have historically limited its use in day-to-day decision-making.

AI-based tools aim to bridge this gap by continuously analyzing numerical data, text, and images to identify biological and management-related patterns. Rather than replacing producer expertise, these systems function as an added layer of insight, highlighting trends or anomalies that may warrant closer attention. This capability is particularly valuable in swine production, where early identification of subtle performance shifts can improve outcomes.

This presentation described the emerging role of artificial intelligence (AI) tools in commercial swine production, drawing on practical experience from a farrow-to-finish operation in Ontario. AI was presented as decision-support technology designed to identify patterns and trends in large datasets rather than replace human decision-making. By integrating production, health, and management data, AI tools can help producers identify performance trends that may otherwise go unnoticed and support earlier detection of potential health or management issues.

Several AI applications currently available to the swine industry were outlined, including cough and lameness detection, pig counting, and virtual farm assistants, noting that adoption is increasing but performance varies among tools. A user-friendly virtual farm assistant was highlighted, demonstrating how producers can initiate data analyses, review summarized areas of concern, and explore detailed reports for specific metrics such as pre-wean mortality. Virtual farm assistant platforms represent a newer category, offering producers the ability to initiate data analyses and receive summarized reports within minutes. Suggested actions linked to veterinarian-approved standard operating procedures emphasized the importance of combining AI insights with human judgment and professional expertise.

Additional functionality, such as logging management and environmental changes, improves analytical accuracy by providing context for performance variation over time. As digital record-keeping becomes more comprehensive, these tools may support a shift from reactive to more proactive, evidence-based herd management.

While current applications are already delivering value, the future potential of AI in swine production is significant. Continued integration of sensors, monitoring systems, and farm data is expected to enable more interactive platforms capable of addressing complex operational questions and supporting more efficient, informed decision-making.

Smart Barns: Real-World Tech You Can Use

John Otten
Floradale Feed Mill

A.I. Ideas for Pork Production – Some New Tools to Work With

Advances in artificial intelligence (AI) are accelerating a shift in pork production from management based on averages toward data-driven, responsive decision-making at the individual animal or group level. Building on developments in automated sensors, computer vision, and data analytics, these technologies collect and interpret thousands of data points daily to support earlier detection of health issues, improved feed efficiency, and enhanced labour utilization. Importantly, these tools are designed to complement, not replace, producer experience by providing additional insight into variation within barns and herds.

This presentation highlighted how data-driven applications are already being integrated into commercial swine operations. Examples included acoustic monitoring systems capable of detecting respiratory disease days before clinical signs appear, computer vision systems that estimate body weight and monitor gait or posture and feeding systems that adjust diets in real time based on growth performance. Feed bin monitoring and logistics platforms were also discussed as practical tools that improve worker safety, reduce feed outages, and strengthen coordination between farms, feed mills, and transport.

A central theme of understanding and managing variation was highlighted. Applications with pre-set parameters can identify subtle changes in feed intake, growth, or behaviour linked to health status, environmental conditions, or management events, allowing for more timely and targeted intervention. By automating routine monitoring and generating actionable daily reports, these technologies help staff focus attention where it is most needed, support more judicious use of antibiotics, and inform marketing decisions such as optimal shipping time.

While well-managed operations can continue to perform successfully with conventional equipment, new technology offers an additional layer of information that enhances confidence and precision in decision-making. As adoption increases, these tools are expected to play an expanding role in improving efficiency, resilience, and animal welfare in modern pork production.

Editors' Note: *References to artificial intelligence (AI) in these papers refer to applied machine-learning algorithms, rule-based automation, and sensor-driven analytics commonly used in Precision Livestock Farming. These systems perform specific tasks such as monitoring, prediction, and optimization to analyze data patterns and support human decision-making and should not be interpreted as autonomous or sentient intelligence.*

Pig Flow Tools for Modern Barns

Corey Bosko

The Progressive Group of Companies

PigFlow in our Farms

As a system managing approximately 45,000 sows—and continuing to grow—we are constantly seeking innovative ways to maintain lean and efficient labour while ensuring our animals receive the highest level of care, which is essential for strong production outcomes.

Over the years, we have tested several mobile data entry systems; however, many proved to be slow, inefficient, and prone to errors. When we discovered PigFlow, it quickly became clear that it met our needs. The platform offers a simple and effective user experience, while also incorporating feedback and improvement suggestions from farm-level staff—the individuals who rely on the system daily.

Several years ago, we conducted a trial of PigFlow at one of our most labour efficient facilities, operating with a ratio of one employee per 425 sows. Our goal was to improve operational efficiency, provide real-time data access for farm staff, and reduce the time spent on paperwork and manual data entry.

Since then, we have gradually expanded PigFlow across additional sites, with significant adoption occurring in recent years. This expansion has been driven by the need for improved efficiency, enhanced communication, and access to real-time information.

Key Benefits to Our Farms

- **Real-Time Information:** Immediate access to critical data such as mortality rates, stillborn counts, breeding activity, piglet numbers, and weaning information.
- **CPE Compliance:** Built-in documentation aligns with CPE requirements, eliminating paper records, reducing errors (such as withdrawal time mistakes), and improving traceability.
- **Proposition 12 Compliance:** Lock-up times are recorded digitally with the touch of a button. Data is easily retrievable, and alerts are generated if compliance risks arise—removing the need for extensive manual paperwork.
- **Staff Prompts and Guidance:** Automated prompts support staff with daily tasks, including farrowing activities (attending sows, processing, fostering) and breeding operations (pregnancy checks, breeding, and sow movement).

Overall, PigFlow has streamlined data entry, improved time and task management for farm managers as well as upper management levels and enhanced the efficiency of daily operations and production across our system.

Research Poster Session Abstracts



Ontario Swine Conference March 25-26, 2025

Mitigation of Heat Stress-Induced Impairments in Boars by Nutritional Supplementation

Abstract 2026-001

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Rising global temperatures are increasing the risk of heat stress (HS), with breeding boars being particularly vulnerable due to the high sensitivity of testicular function to elevated temperatures and oxidative stress. This study evaluated whether a complex liposomal preparation containing vitamins A, D₃, E, and C, zinc gluconate, and betaine could mitigate HS-induced impairments in boar endocrine function and semen quality.

Nine clinically healthy boars (Landrace, Piétrain, and Maxter; n=3 each; 2-4 years old) were studied across three consecutive stages: euthermic conditions (17-23°C), experimentally induced HS (25-30°C; 75-85% relative humidity), and HS with dietary supplementation (20 ml/day of liposomal emulsion). At the end of each stage, cortisol and thyroxine (plasma), testosterone (circulating and seminal), sperm kinematics, and antioxidant enzyme activity in ejaculates were evaluated.

HS significantly increased circulating cortisol (+45.9%) and thyroxine (+15.5%) while reducing testosterone concentrations in blood (-21.7%) and seminal plasma (-52.2%). It also decreased total sperm number (-26.8%), progressive motility (-14.2%), and most kinematic parameters ($P<0.05$). Supplementation restored testosterone levels (+36.6% in blood, +117.5% in seminal plasma) and reduced cortisol and thyroxine (-24.6% and -12.7%, respectively). Ejaculate volume, sperm concentration, and total sperm count increased (+18.0%, +26.8%, and +53.4%), while motility and kinematic parameters improved significantly. Antioxidant defences also rebounded, with glutathione peroxidase and catalase activities increasing by 61.4% and 29.8%, respectively. Most parameters returned to baseline ranges, with several exceeding the values observed under euthermic conditions.

In conclusion, dietary supplementation with a liposomal complex of vitamins (A, D₃, E, and C), zinc gluconate, and betaine effectively reversed the adverse effects of HS on endocrine and reproductive function in boars, underscoring its potential as a nutritional strategy for maintaining fertility under thermal stress.

This study highlights the usefulness of highly absorbable complex liposomal supplements to improve reproductive performance under HS conditions in boars.



Ontario Swine Conference March 24-25, 2026

Azaperone Treatment at Weaning Alters Circulating Concentrations of Glucoregulatory Hormones in Sows

Abstract 2026-002

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At-weaning treatment of sows with azaperone, a sedative neuroleptic used to reduce stress, has been associated with improved piglet productivity. Glucose can impinge on fertility by modulating insulin and cortisol secretion and suppression of facultative and inducible insulin-dependent ovarian glucose transporters. We analyzed circulating concentrations of cortisol, insulin, and glucose during the 6-day post-weaning period in Polish Large White×Polish Landrace sows with (n=12) or without (n=12) a single i.m. injection of azaperone (2 mg/kg body weigh) at weaning on day 28 of lactation.

Blood samples were drawn every 10 min during the first hour post-treatment, hourly for the next 5 h, at 10 and 14 h, and once a day until day 6 after azaperone injection via indwelling jugular catheters inserted 5 days before weaning.

There was a significant decline in glucose and insulin concentrations that lasted from ~20 min to 2 h after azaperone administration, followed by a peak ($P<0.05$) 3 h post-treatment. Cortisol levels decreased at 10 and 30 min after azaperone injection but were greater ($P<0.05$) in azaperone-treated sows vs control animals 2 h, 4 h and 6 days post-treatment. Circulating cortisol (Cort) and glucose (Glu) concentrations at various time points post-weaning (p.w.) were significantly correlated with behavioral estrus timing (Cort at 4 h p.w. and Glu at 30 min p.w.), stillborn piglet numbers (Cort at 10 h p.w. and Glu at 4 h p.w.), ovulation rate (Cort at 20 min p.w.), and live piglet counts (Glu at 5 days p.w.).

Our results indicate that azaperone given at weaning influences hormonal and metabolic responses in sows, suppressing systemic glucose and insulin concentrations alongside cortisol secretion. Blood glucose and cortisol levels at specific time points post-weaning are significantly correlated with reproductive outcomes.

Temporary feeding restrictions or glucose and cortisol manipulations after weaning could improve fertility in pigs.



Ontario Swine Conference March 25-26, 2025

Evaluating Welfare Factors Related to Route of Iron Dextran Administration in Piglets

Abstract 2026-003

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Intramuscular treatments in swine are routinely administered by automatic-refillable needle-syringe (NS) devices. Needle-free injection devices (NFID) use compressed gas to deliver an injection, removing the use of a needle and offering a sustainable alternative for repeated injections. Knowledge of the current impact of NFID on the welfare of nursing piglets remains limited. This study aimed to evaluate the impact of NS and NFID use on piglet welfare during intramuscular iron supplementation, a necessary procedure in piglets 3-4 days old to prevent iron deficiency anemia.

This study compared behavioural pain response indicators in nursing piglets when administering intramuscular iron dextran using an NFID versus conventional NS. Litters (n=206) were randomly assigned to one of three groups for iron supplementation: 1) NFID, 2) NS with a new needle for each pig (NS1), or 3) NS with one needle for the litter (NS10). Vocalizations and retreat behaviours were recorded following injection. A frequency threshold of 1,000 Hz was used to indicate pain-associated vocalizations, and behaviour was scored by intensity and duration.

Piglets in the NFID group produced shorter calls (NFID=550ms, NS1=690ms, NS10=610ms; $p < 0.05$) and lower average vocalization intensity (NFID= 50dB, NS1=52dB, NS10=52dB; $p=0.08$) compared to NS. There were no significant differences in vocalization frequency between groups. At the time of injection, a greater proportion of piglets treated with NFID showed no reaction (NFID=26%) compared to NS groups (NS1=14%; NS10=10%; $p<0.05$). Results show that NFID use may reduce pain associated with injection procedures in nursing piglets compared to conventional NS.

Understanding the impact of NFID on current management practices will strengthen evidence-based decisions involving animal welfare and piglet husbandry.



Ontario Swine Conference March 24-25, 2026

The Effects of Providing Perforated Rubber Mats on Sow Welfare and Production

Abstract 2026-004

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Lameness and leg disorders are major welfare and production concerns for group-housed gestating animals. Rubber mats have been proposed to improve comfort and reduce leg injuries, yet results remain inconsistent due to issues such as drainage, durability, and slipperiness. The newly developed perforated, vulcanized rubber mat, manufactured from recycled tires in Canada, aims to combine slip resistance, drainage (slat-compatible), and durability through a patented locking mechanism. This study investigates the effects of providing perforated rubber mats for group-housed gestating animals on behaviour, leg health, and productivity.

Four replicates of 23-27 (24.8 ± 1.5) sows and gilts (99 in total) in group housing with individual access stalls were assigned to either: (1) control pens with fully concrete flooring or (2) pens equipped with perforated rubber mats covering the slatted walking alley and half of the solid social floor. Mats were not provided in feeding stalls to prevent slurry buildup. Lameness, hoof lesions, skin lesions, body condition, and cleanliness were scored at the gestation entry, mid-gestation and gestation exit. A subsample of animals was selected for infrared thermography of hind limbs to quantify inflammation. Behavioural data from video recordings quantify time spent in different pen areas (either matted or concrete). Pen cleanliness was assessed weekly. Data collection is currently ongoing, with full results expected in March 2026.

This research will provide scientific evaluation of this novel type of perforated rubber mats for gestating animals in commercial conditions. Expected outcomes include practical flooring solutions that improve sow comfort, reduce lameness and injury, and enhance sustainability by using recycled materials. Findings will inform flooring recommendations and help producers adopt durable, welfare-friendly alternatives to conventional concrete flooring.

Implication: Perforated rubber mats show potential to improve sow leg health, which can reduce lameness and injuries, enhancing sow longevity and productivity.



Ontario Swine Conference March 25-26, 2025

Evaluation of On-Farm Processed Full Fat Soybeans for Use in Swine Diets

Abstract 2026-005

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Full-fat soybeans (FFS) are used in commercial swine diets as a high-energy, high-protein alternative to soybean meal and added oils. Nutrient value, however, depends on proper thermal processing to inactivate anti-nutritional factors, and on-farm conditions often vary, creating challenges for consistent diet formulation. This study evaluated the chemical composition and nutritional value of on-farm processed FFS for growing pigs.

Representative FFS samples that were extruded or roasted were collected from eight sources. Heating protocols ranged from 137 to 160°C, but gross chemical composition (energy and crude protein) was comparable among samples. Thus, extreme processing conditions were selected to assess standardized ileal digestibility (SID) of crude protein (CP) and amino acids and compared to soybean meal (SBM; 48% CP). Roasted FFS were processed at ~137°C using dry heat, whereas extruded FFS were processed at ~160°C under high temperature, pressure, and mechanical friction. Ten barrows fitted with distal ileal T-cannulas were used for ileal digestibility measurements, while fecal samples were collected from ten barrows in a second experiment to assess energy digestibility.

Extruded FFS provided 8% greater digestible energy versus SBM (4,318 vs 4,002 kcal/kg) whereas roasted FFS had the poorest digestible energy content (3,158 kcal/kg). The SID of CP was comparable between extruded FFS and SBM (80.2%) but roasted FFS had reduced SID of crude protein (68.6%). Likewise, the SID of lysine was comparable between extruded FFS and SBM (86.5%) but roasted FFS had reduced SID of lysine (74.0%).

These outcomes confirm that inadequate processing substantially reduces the nutritional value of on-farm FFS, while proper thermal treatment enhances protein and energy. Therefore, processing conditions should be considered when formulating diets with on-farm processed soybeans.

Overall, the findings reinforce the importance of standardized processing and quality control to ensure predictable nutrient contributions of full-fat soybeans in commercial swine production.



Ontario Swine Conference March 24-25, 2026

PRRS Prevalence, Production Outcomes, and Intervention Strategies in Ontario

Abstract 2026-006

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Monitoring disease dynamics and management approaches is important to understand Porcine reproductive and respiratory syndrome (PRRS) changes over time, and ultimately, optimal control strategies. A surveillance program was established at a swine-focused veterinary practice in Ontario to monitor and evaluate PRRS outbreaks and their intervention strategies.

Sow herds are enrolled upon exhibiting clinical signs of PRRS infection, with subsequent sequencing. Staff conduct surveys with veterinarians gathering insights on demographics, clinical severity, genetic sequencing, co-infections, outbreak history, biosecurity, farrowing schedule, infection route, and mitigation strategies. Timelines are created for veterinarians and producers, establishing dates and procedures to be implemented on-farm. Standardized performance and diagnostic data are databased, allowing for annual evaluation of intervention strategies across strains and years.

By using this surveillance model, 176 sow herd outbreaks have been monitored since 2022. A higher proportion of herds applied elimination interventions in 2024-2025 (55%) versus 2023-2024 (48%), due to increased severity and prolonged production impacts associated with PRRS infection. When comparing cumulative incidence of PRRS in sow sites, the 2024-2025 season saw approximately 50% reduction in sequences as compared to 2023-2024 (this could be due to a higher proportion of herds deciding to stabilize rather than eliminate in 2024-2025). Classification of PRRS virus has changed in recent years, with the development of lineage classification systems in the United States. Our surveillance program used this system to classify Ontario sequences, finding that the majority of sequences were Lineage 1H (59%).

This information can be used alongside existing RFLP data, to better classify PRRS sequences and their impact. Implementing a surveillance program facilitates continuous learning and understanding of endemic disease trends and identifying effective mitigation strategies within a clinical practice. This program demonstrates that veterinary practices can successfully implement surveillance systems, often providing detailed and specific data not possible to obtain through broader initiatives.



Ontario Swine Conference March 25-26, 2025

Late-Gestating Gilt Feeding Program Affects Fetal Piglet Body Composition

Abstract 2026-007

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Lysine is an essential amino acid that plays a key role in building protein in both the gestating gilt and her developing litter. The goal of this project was to determine the effect of dietary lysine supply on growth of gilt and fetal tissue during late gestation.

Twenty-nine pregnant gilts at the Ontario Swine Research Centre were assigned to one of two dietary treatments: lysine-deficient (11.3 g standardized ileal digestible lysine per day; n=15) or optimal lysine via the addition of soybean meal (26.6 g standardized ileal digestible lysine per day; n=14). Gilts were fed the treatment diets from days 90 to 110 of gestation and were sacrificed on day 110 to assess changes in chemical composition of maternal (carcass and viscera) and fetal tissues.

Gilts fed the optimal lysine diet had greater average daily gain during late gestation, while backfat depth was not influenced by dietary lysine supply. Maternal carcass composition on day 110 of gestation did not differ between dietary treatments but gilts that received the optimal lysine diet had 9% lower visceral fat content. Total number of fetuses and fetal body weight were not different between dietary treatments but fetal protein deposition between gestation days 90 and 110 was 12% greater when gilts were fed optimal lysine. Conversely, fetal fat content on gestation day 110 was less and fetal fat deposition between days 90 and 110 of gestation was 55% lower for gilts that received the optimal versus inadequate lysine. Thus, gilts fed the inadequate diet could not overcome deficiencies to maintain fetal protein deposition in late gestation, resulting in a greater proportion of energy partitioned toward fat versus protein.

Adequate lysine intake in late gestation is crucial to help gilts develop fetuses by supporting protein instead of fat deposition.



Ontario Swine Conference March 24-25, 2026

Predictive Modeling for Reproductive Potential of Gilts using Vaginal Microbiomes

Abstract 2026-008

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Reproductive potential is essential for animal production and economic success in swine production. In a breeding herd it is crucial for advancing breeding efficiency in the pork industry. However, the low heritability of fertility and litter-related traits is slowing the improvement of pig selection efficiency. The vaginal microbiome plays an important role in maintaining reproductive health, and recent research has begun to explore the potential relationship between vaginal microorganisms and fertility. Yet, it is currently unknown whether the vaginal microbiome can be used to create effective models to predict reproductive outcomes. This study aimed to evaluate whether the combination of vaginal microbiome composition in gilts with machine learning approaches could be used to predict reproductive outcomes.

Vaginal microbiome samples were collected from gilts at approximately 180 days of age, prior to their first breeding. Based on subsequent reproductive performance, animals were categorized as having **high reproductive potential** (HRP; n = 20) or being **infertile** (INF; n = 16). Bacterial DNA was sequenced using 16S RNA gene amplification and long-read PacBio sequencing, to determine genus-level relative abundances. Feature selection was conducted using Partial Least Squares Discriminant Analysis (PLS-DA) and Recursive Feature Elimination (RFE), and the selected genera were used to train and evaluate five machine learning classifiers. All models achieved satisfactory predictive performance during validation and testing, with the Decision Tree classifier achieving the best performance with a prediction rate of $89 \pm 6\%$ for HRP gilts and $82 \pm 6\%$ for the INF gilts.

These findings suggest that the vaginal microbiome represents a promising source of biomarkers for predicting reproductive performance in gilts and may contribute to the development of new methods for reproductive selection in swine breeding. Future studies will focus on expanding the dataset and further validating the prediction models to enhance their robustness and practical applicability.



Ontario Swine Conference March 25-26, 2025

Trends and Causes of Sow Mortality in Canadian Swine Farms

Abstract 2026-009

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Keeping sows healthy and productive within the herd is essential to commercial swine production, yet Ontario and other Canadian farms are increasingly affected by sow mortality and other unplanned early removals. These losses directly reduce herd productivity, cause financial instability, and raise welfare concerns, as a result we need to understand what is changing over time and why. Sow removals may occur due to expected reasons such as age or reproductive performance, but early losses often reflect acute health events or combined predisposing factors at the sow and herd level. Understanding the common reasons for sow mortality helps producers act early and use practical, on-farm solutions.

The objective of this study was to quantify temporal trends in sow mortality and culling rates and to describe the most frequent removal reasons using production data from Canadian swine farms. Retrospective data from 78 farms recorded between 2017 and 2024 were compiled and analyzed, representing over 300,000 individual sows and more than 10 million health and production events.

Across the study period, 209,689 sows (61%) were culled, 35,493 (10%) died, 10,530 (3%) were euthanized/destroyed, and 84,192 (26%) remained in the herds. Annual sow mortality averaged 8 deaths per 100 sow years and increased from 7 in 2017 to 11 in 2024, while culling rates stayed relatively stable (37-42%). The most recorded mortality reasons were sudden death (17%), lameness (16%), and prolapse (12%). "Not recorded" (29%) and "Unknown" (12%) categories remained substantial, highlighting opportunities to improve consistency in on farm recording.

This study shows clear mortality trends and leading removal reasons, and by identifying why sows are being removed, it helps farmers adjust their intervention strategies to prevent early removals.



Ontario Swine Conference March 24-25, 2026

Refining the Porcine Ear Necrosis Animal Challenge Model

Abstract 2026-010

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Porcine ear necrosis (PEN) results in loss of ear tissue in nursery and grower pigs. This disease has been associated with poor growth rates and injudicious antibiotic use. Our team recently identified the causative agent of ETN: *Fusobacterium necrophorum*. Our previous PEN model used a needle free, commercially available injector system in 4-week-old pigs. However, this device was labour intensive, time consuming and not user friendly. Additionally, PEN is observed in pigs 6-9-weeks of age. The objective of this study was to refine the animal challenge model in 4-week-old pigs with a new 9-pin intradermal device and replicate the disease in 9-week-old pigs, to reduce the use of animals for research.

Trial 1 contained 4-week-old pigs (n=4 pigs, n=4 ears) who intradermally received 1 mL of *F. necrophorum* injected dorsally and 1 mL ventrally on the right ear. Trial 2 had 9-week-old pigs (n=3 pigs, n=6 ears) which were inoculated in both left and right ears. A scoring system was developed to score lesions; notable scores were 0 (no lesions), 4 (subcutaneous hemorrhaging with or without ischemia), 6 (necrotic lesions), 7 (lesions slough off) and 8 (resolved lesions). Lesion incidence, mode time to necrotic tissue, time to lesion slough off, and time to healing are reported.

Immediately following inoculation, hyperemia and edema were observed in both age groups. After 24 hours, subcutaneous hemorrhage was present on the ear pinna in 4/4 ears for trial 1 and 5/6 ears for group 2. At 36 hours, ischemia is observed in 7/10 ears, noting clear lesion margins. In trial 1, mode time to necrosis, lesion sloughing off and lesion resolution was 6 (± 1.47), 10 (± 2.25) and 14.5 (± 4.39) days, respectively. In trial 2, mode time was 3.5 (± 1.32), 7.5 (± 0.55) and 9 (± 0.89) days for necrosis, lesion sloughing off and lesion resolution.

Inoculation of *F. necrophorum* produced lesions that are indistinguishable from on farm lesions. In both ages, similar lesion development was observed. Trial 1 proved the refinement of the model by testing our new device, while trial 2 reproduced the disease in the age of pigs we see on farm.

This model will support future ETN disease research to further understand managerial, environmental and possible non-antimicrobial treatment options.



Ontario Swine Conference March 25-26, 2025

Fermentable Carbohydrates as Dietary Treatment to Prevent Boar Taint

Abstract 2026-011

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Raising intact male pigs (boars) offers clear advantages to pork producers, including improved growth rate, feed efficiency, and lean yield. However, boar taint, caused by the accumulation of androstenone and skatole in fat, remains a major barrier to adopting intact male production. Feeding fermentable carbohydrates offers a targeted nutritional approach to controlling boar taint because they can alter gut fermentation and may influence the production or clearance of boar taint compounds. This study compared two fermentable carbohydrates, raw potato starch (RPS) and sugar beet pulp (SBP), to evaluate how each diet affects boar taint-related metabolism and the gut microbial environment.

Forty boars were fed a control diet for one week before receiving either 5% RPS or 5% SBP for four weeks, followed by a two-week recovery period back on the control diet. Weekly blood and fecal samples, and biweekly fat samples were collected throughout the trial. Skatole and androstenone concentrations were measured using high-performance liquid chromatography (HPLC) and enzyme-linked immunoassay (ELISA). Fecal samples were also used to assess fermentation products and changes in the gut microbiome.

The two diets produced distinct fermentation patterns. SBP-fed boars showed higher acetate concentrations in fecal samples, while propionate and butyrate fluctuated between diets. During the treatment phase, SBP boars had lower fecal skatole than RPS boars. These diet-specific differences suggest that fibre type influences the gut environment in ways that may affect skatole production or clearance. Ongoing analyses of fat androstenone, fecal microbiome, and gene expression will help determine how changes in gut fermentation and boar taint metabolism relate to boar taint outcomes.

Fermentable carbohydrates may be an effective dietary treatment for boar taint that could help eliminate the need for castration while maintaining pork quality.



Ontario Swine Conference March 24-25, 2026

Maternally Fed *Fusarium* mycotoxins Can Alter Offspring Intestinal Development and Microbiome Composition

Abstract 2026-012

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Mycotoxins contaminate cereal crops and have adverse effects on livestock health and productivity. Pigs are particularly sensitive to the negative consequences of mycotoxin exposure, including feed refusal, damage to the gastrointestinal barrier, and dysbiosis. Little is known about the vertical transmission of these effects from sows fed a mycotoxin contaminated diet to their offspring, and how mycotoxin mitigation products (MMPs) may alter these effects. This trial assessed the growth performance, jejunal histopathology, and colon microbiota of piglets, as well as the ability of two MMPs (TOXO-XL and TOXO-HP) to provide protection to the sow's offspring.

Pregnant sows were fed contaminated diets from gestation day 70 until weaning (**NC**: 0.32 ppm deoxynivalenol + 0.102 ppm zearalenone, **PC**: 2.88 ppm deoxynivalenol + 0.362 ppm zearalenone, **XL**: 2.86 ppm deoxynivalenol + 0.361 ppm zearalenone + TOXO-XL, **HP**: 2.88 ppm deoxynivalenol + 0.428 ppm zearalenone + TOXO-HP). Piglets were weighed at birth and weekly up until 56 days of age. On post-partum day 14, two piglets per sow were euthanized and tissue samples were collected. Jejunum sections were stained with hematoxylin and eosin then analyzed for villi height and crypt depth. DNA was extracted from colon samples and 16S rRNA amplicons sequenced for microbiome assessment.

There was no significant difference in piglet growth performance or feed intake among treatment groups. NC and HP piglets had a larger villi height to crypt depth ratio than PC piglets ($p = 0.0458$ and $p = 0.0415$, respectively). The microbiome of piglets from different treatment groups had altered alpha diversity and beta diversity ($p < 0.05$), which indicates that maternally fed mycotoxins can negatively impact piglet intestinal development and alter piglet colon microbiota composition with minimal impact on growth performance. These data support the use of TOXO-HP to mitigate the negative effects of mycotoxins on piglet intestinal development.

Industry Impact: *Fusarium* mycotoxins can induce multigenerational effects on intestinal morphology and gut microbial composition, which may be partially remediated with the use of mycotoxin mitigation products.

Abstract 2026-013



Ontario Swine Conference March 25-26, 2025

Comparing Piglet Reactions to Different Routes of Injection of Iron Dextran

Abstract 2026-013

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Providing supplemental iron to piglets is essential in commercial swine production with administration via needle-and-syringe (NS) being the common practice. While the use of needle-free injection devices (NFID) is approved in Canada, its benefits on animal welfare during piglet processing is not fully explored. This study aimed to compare behavior reaction and vocalizations in piglet administered iron dextran via NFID or NS.

In this study, 519 piglets (approx. 3 days of age) were randomly assigned to one of two treatment groups: 1) NFID group using the Pulse® 250 (Pulse NeedleFree Systems Inc., USA), and 2) NS group using a 20G × 1/2" needle and a 3 mL syringe to inject iron dextran intramuscularly (IM), with the needle changed after each animal. Piglets in both groups were administered 1 mL of 200g iron dextran (Dexafer-200, Vetoquinol N.-A. Inc., Canada) on the left side of the neck. The behaviour reaction was assessed individually by a validated ethogram, and the vocalization of each pig was audio recorded.

Preliminary results indicated piglets in the NS group were more likely to show a stronger behavior reaction than those in the NFID group (OR: 1.47; 95% CI: 1.04 - 2.04; $P = 0.028$). Additionally, there were more vocalizations (per 10 seconds) in NS group than in NFID group, $n=6.31$ and $n=5.32$, respectively ($P = 0.006$). Other associations and final models will be explored by generalized linear mixed models.

Research impact: This study demonstrated the potential to improve piglet welfare by using NFID technology to inject iron dextran.



Ontario Swine Conference March 24-25, 2026

Validation and Implementation of a Rapid Detection Test for Boar Taint in a Commercial Slaughter Plant

Abstract 2026-014

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Male pigs are castrated to prevent an off-odour or taste in their meat known as 'boar taint', caused by the accumulation of androstenone and skatole in fat. The condition also affects ridglings, males with undescended testes. Ridgling carcasses exceeding 110 kg are discarded at slaughter, despite unpublished preliminary data showing that up to 30% of ridglings are boar taint-free. Current lab-based detection methods, such as high-performance liquid chromatography (HPLC) and enzyme-linked immunosorbent assays (ELISA), are accurate but time-consuming, costly, and unsuitable for use at slaughter. The only practical alternative, the human nose test, is subjective and inconsistent.

In collaboration with the DeRosa Lab at Carleton University, we developed a prototype test for detecting boar taint compounds that is faster, simpler, and less expensive than existing methods. The test employs DNA aptamers, single-stranded oligonucleotides with antibody-like specificity, that bind androstenone and skatole, producing a visible colour change via gold nanoparticles. Similar to a COVID-19 test, our prototype is a lateral flow assay, displaying two red lines for a negative result and one for a positive result.

The objective of this project is to progress our prototype detection test to a commercially available product. To improve test speed and accuracy for commercial use, we will optimize protocols for fat sample collection and extraction of boar taint compounds, validating with lab assays. Preliminary testing at the Department of Animal Biosciences Meat Science Laboratory will train staff to use the test, developing initial training materials and validating results in a semi-commercial setting. We will evaluate the prototypes' performance and implementation in a commercial setting at Conestoga Meats and further refine training materials.

A rapid boar taint detection test will recover significant value from taint-free ridgling carcasses that are currently discarded at slaughter.



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Sow Preferences and Interaction Time with Enrichment Items

Abstract 2026-015

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Providing environmental enrichment for sows is an important part of improving pig welfare, especially in intensive production systems. Traditional housing methods, such as gestation stalls, limit the sows' ability to engage in natural behaviours, while group housing may also pose challenges through conspecific aggression and the stress of new social groups. Common pig enrichment items can include straw, chew toys, and scratchers, which encourage natural behaviours, such as rooting and exploration.

This observational study monitored 14-20 group-housed gestating sows using video recordings on Mondays and Fridays from 09:30-14:30 over five weeks. The goal was to measure how much time sows spent interacting with different enrichment items (straw feeder (with straw), EasyFix Astro 200 chew toy, diamond scratcher, and penning) and identify which items were preferred. Behaviours were recorded and analyzed using an ethogram and BORIS software. Straw was weighed before and after each observation session.

Results showed that the sows spent the majority of their time resting (82.9%), while approximately 7.0% of the observation period/day was spent exploring and interacting with enrichment. Interaction was similar across three items: penning (2.49%), EasyFix Astro 200 (2.33%) and straw feeder (2.12%). On average, each sow consumed 6.5 grams of straw/day. The diamond scratcher was used very little (0.05%), and aggressive behaviours were rare, representing only 0.13% of total activity.

These observations suggest that offering different types of enrichment encourages sows to explore and interact with their environment. While no single item was strongly preferred, both straw and chewable toys were used consistently.

These findings can help farms choose enrichment items that sows actually use, supporting both welfare and productivity with practical, evidence-based strategies.



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Anti H1N1 Potential of *Lactococcus lactis* A1-2 in Swine Cells

Abstract 2026-016

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Viral diseases such as influenza continue to challenge swine health, productivity and are a risk for zoonoses. High mutation rates can limit vaccine effectiveness, creating a need for complementary strategies that help reduce viral spread. Probiotics are known to support gut health, enhance epithelial function, and influence immune activity, and emerging work suggests some strains may also interfere directly with viral infections.

In this study, the antiviral properties of *Lactococcus lactis* A1-2, a fruit originated isolate, were evaluated using porcine intestinal epithelial (IPEC-J2) cells and avian erythrocytes as model systems. A series of time-of-addition assays showed that the A1-2 culture supernatant consistently reduced H1N1 infectivity. The reduction was strongest when the virus and supernatant were applied to host cells at the same time, suggesting that its antiviral activity is most effective during early infection. Hemagglutination assays further demonstrated that A1-2 supernatant sharply reduced HA titers, including after pH neutralization, indicating activity beyond acidity alone.

We also assessed how A1-2 affected epithelial responses during infection. The culture supernatant had little influence on gene expression, but live A1-2 increased CLDN1, a tight-junction protein important for maintaining epithelial barriers, and lowered IL-6, an inflammatory marker. Together, these shifts point toward improved epithelial stability during infection.

To investigate potential metabolite involvement, preliminary untargeted metabolomics analysis was performed on the supernatant, revealing a few metabolites previously reported to have antiviral activity. Further confirmation and qualification of these secreted compounds are underway.

Probiotic validation assays showed that A1-2 tolerates acidic environments but has reduced metabolic activity under bile exposure, indicating partial resilience through the gastrointestinal tract.

A1-2 demonstrates consistent antiviral activity, driven primarily by direct disruption of viral infectivity and supported by enhanced epithelial barrier function. Our study provides insights into A1-2 as a probiotic with antiviral potential for improving swine intestine health.