

# Better pork



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**LETTERS FROM A FAMILY FARM**

**BUILDING UP THE  
COURAGE TO TALK**

As an industry, we've become pretty good at sharing our concerns about the growing season and the trade challenges we face.

We explain the effects of weather and market conditions to consumers as we share our stories of producing safe and wholesome food.

Our farm organizations convey our key messages to government officials in hopes they will reform business risk management programs and intensify trade negotiations.

What many of us are not good at talking about, however, is the effects of these broader factors on our mental health.

Rather, we tend to pride ourselves on our stoicism and eternal optimism. Many of us have a rote response when friends, family or colleagues ask how we're doing.

"My feet are still above ground," we'll say with a chuckle.

To survive in an industry like ours,

where so many factors are beyond our control, we need a fair dose of optimism. We need the hope that "Next year will be better" so we can motivate ourselves.

But we all inevitably feel varying degrees of stress, anxiety or depression over the course of our lives. We might worry we can't make our next mortgage payment because we were hit with some hefty quality discounts on our grain. We may get overwhelmed trying to deal with a disease outbreak in our herds.

Often, these worrisome thoughts remain internal monologues, rather than leading to frank talks with individuals we trust.

This winter, I encourage you to open up to someone about your personal concerns. Getting troubles off your chest can help you break that negative internal monologue. And, if you're more open about your challenges, people around you in need of a helping hand may just gain the courage to share their struggles.

*Andrea*



Martin Waldner photo

**Martin Waldner and his team at the Hartland Hutterite Colony near Bashaw, Alta. wean an average of 30 piglets per sow per year and achieve weaning weights of about 8.5 kilograms (18.7 pounds) at 25 days old. See the story on page 24.**



Martin Schwalbe photo



## SENECA VALLEY VIRUS REARS ITS UGLY HEAD

If Seneca Valley virus (SVV) was a book, it would be a mystery, and one that you'd rather put down.

SVV is a relative newcomer to North America, showing itself recently in the United States as well as at assembly yards in Ontario and Manitoba. Though the virus recently moved into two Ontario sow barns, the industry lacks knowledge on the disease.

Although it is non-reportable, SVV includes clinical signs that are undistinguishable from reportable vesicular foreign animal diseases such as foot-and-mouth disease (FMD), vesicular stomatitis and swine vesicular disease.

The most common of these signs are blisters or erosions on the snout, mouth or feet.

So, in cases of suspected SVV, "federal authorities (must) go through the testing process, potentially shutting down a plant for one to three days and causing market disruption," said **Dr. Egan Brockhoff**, managing partner of **Prairie Swine Health Services** in Red Deer, Alta.

Thankfully, to date, incidents of production losses due to SVV in North America have been extremely rare. Still, the confusion over what is SVV and what is something more serious like FMD presents a challenge for the swine industry.

"We don't yet know if SVV will be a lion or a kitten, but we know it's annoying," Brockhoff added. **BP**

## U.S. UPDATES SLAUGHTER INSPECTIONS

After more than five decades, America's **Food and Safety Inspection Service** (FSIS) is modernizing its swine slaughter inspection process, effective Dec. 2, 2019.

"FSIS will constantly verify plants are maintaining food safety process control and plants in the **New Swine Slaughter Inspection System** (NSIS) will only run at speeds that maintain food safety, worker safety, animal welfare, and quality," **Sarah Little**, vice-president of communications for the **North American Meat Institute**, said in an email statement to *Better Pork*.

However, participation in NSIS is voluntary. Market hog establishments can choose if they will adopt NSIS or continue using traditional methods.

The new rule that led to inspection updates requires that all participating swine slaughterhouses conduct microbial testing to ensure pathogen control throughout the system, a September **USDA** release said. These plants will also need to create written sanitary dressing plans to help prevent food-borne illness.

"In the NSIS, plant workers can perform the initial sort before the carcass is sent to the FSIS inspector. There will continue to be 100 per cent inspection of the carcass and the animal by a FSIS inspector," Little said. **BP**



dusanpetkovic/istock/Getty Images Plus photo

## A NEW APPROACH TO VACCINATION

Canadian swine researchers are trying a new strategy for vaccinating sows and gilts.

Scientists with the **Vaccine and Infectious Disease Organization – International Vaccine Centre** (VIDO-InterVac) at the **University of Saskatchewan** (USask) are

studying the viability of administering a vaccine directly into a pig's uterus during artificial insemination.

"During breeding, sows and gilts undergo a lordosis response, which means that they kind of freeze up, making it a safe time to vaccinate," **Dr. Heather Wilson**, a research scientist with VIDO-InterVac, told *Better Pork*. The timing of the vaccine helps "protect the moms."

One reason for studying the uterine vaccination technique is to help the pigs develop mucosal immune responses to such diseases as porcine reproductive and respiratory syndrome virus.

This type of "immune response will have a good blood response, but



it will also prevent colonization," she said. "If we can prevent colonization, then we can also prevent transmission to the rest of the herd."

The USask team has had one litter of piglets born

from a sow using the uterine vaccination method.

The piglets from that litter look good but more research is needed to make any definitive determinations about how the animals respond, Wilson said. **BP**

Martin Schwalbe photo



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# PORK PRODUCE THE



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Canadian hog farmers are global leaders in environmental stewardship and sustainability. This month, we celebrate the industry's accomplishments and highlight new opportunities.

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# PRODUCERS PROTECT THE ENVIRONMENT

by KATE AYERS

Canadian swine producers strive to take optimal care of their livestock and the environment, protecting them for the next generations.

For example, officials estimate that the amount of natural resources that pigs use has decreased over the last 50 years by about 50 per cent per kilogram (2.2 pounds) of pork, Manitoba Pork's website says. In addition, for every kilogram of pork that farmers produce, they use about 40 per cent less water, 33 per cent less feed and up to 59 per cent less land than hog producers five decades ago. Today's farms also emit 35 per cent less greenhouse gases.

And producers want to drive these numbers down even further.

"Farmers are innovators. (Producers) have and will continue to implement improvements as they come along, as long as they prove to be economically viable," says Sheldon Stott, a Manitoba pork producer and senior director of

corporate sustainability at HyLife Ltd.

"I think environmental stewardship is about staying diligent, being cognizant of our impacts and holding ourselves and our peers accountable for the activities we're doing on our landscapes," he adds.

HyLife Ltd., headquartered in La Broquerie, Man., is Canada's largest pork producer and global exporter of high-quality pork products, the company's website says.

This month, *Better Pork* speaks with farmers, producer group representatives, researchers and environmental specialists to highlight the new approaches that farmers have adopted in recent years to ensure that Canada's pork sector remains one of the most efficient in the world.

We also learn about the best management practices that producers can use in their operations to reduce their environmental footprints.



**Environmental regulations**

Canadian farmers are proud of their operations and follow strict rules and regulations to protect the environment.

For example, Ontario’s Environmental Protection Act, 1990, concerns the protection and conservation of the natural environment. This act has requirements for the containment, clean up and disposal of any agriculture-related discharge that is not in accordance with the province’s nutrient management protocols, says Sam Bradshaw, Ontario Pork’s environmental specialist.

In Ontario, farmers must also abide by the Clean Water Act, 2006, which concerns the mitigation of risks associated with any land-use activity that is designated as a significant drinking water threat in accordance with local source protection policy plan requirements, Bradshaw says.

And Ontario producers must also be aware of the Planning Act, 1990. This provincial act “concerns ground rules for land-use planning, including official plans that guide future development in an area and zoning bylaws that direct how farmland may be used and where buildings may be placed,” he adds.



**Grant Melnychuk**

In Manitoba, “hog farmers must file an annual manure management plan with the provincial government,”

Grant Melnychuk, Manitoba

Pork’s manager of sustainable development says in an email statement.

This document outlines “what fields they will apply manure to, how much manure they will apply and what crops they will grow.”

In addition, “there are strict limits as to how close to waterways and wells manure can be applied. Manure cannot be applied on frozen ground to prevent spring melt runoff, and manure cannot leave a property once applied,” he adds.

Other provinces also protect the environment through legislation. While adhering to all relevant regula-



National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

**For every kilogram of pork that farmers produce, they use about 40 per cent less water, 33 per cent less feed and up to 59 per cent less land than hog producers five decades ago.**

tions, Canadian farmers often go above and beyond to ensure they do what is best for the environment, says Stott.

**Nutrient management**

In many livestock operations, farmers harvest crops for feed and apply the resulting manure on their fields. Livestock are part of the natural carbon cycle.

However, these animals produce a lot of manure that farmers must handle properly to ensure nutrients do not leach into environmentally sensitive areas or waterways.

“Most pork producers test their soil and manure to make sure they are fertilizing to crop needs,” says Bradshaw.

Dr. Brett Kaysen, assistant vice-president of sustainability for the National Pork Board in Iowa, agrees.

When the time comes to apply manure on fields in the spring and fall, farmers can reduce the environmental effects by “measuring and managing,” he says in an interview with *Better Pork*.

“When you are trying to balance nitrogen (N) and phosphorus, you start with measuring what nutrients you have in your soils and knowing what nutrients the crop requires. There are platforms and software programs that can help farmers with N

balance so we don’t have excessive N in the soil that could harm waterways.”

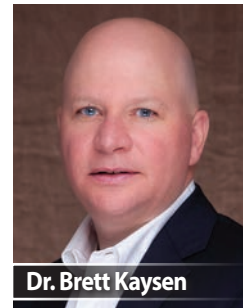
When applying manure to their fields, many farmers also adhere to the 4R principles: the right source, the right rate, the right time and the right place.

“We require all our manure applicators to install GPS and GIS technology in their equipment, which tracks the exact placement of the products on the fields as well as the rates,” says Stott.

When Stott and his team analyze this data alongside soil and manure samples, the producers ensure that they abide by the 4Rs, he says.

Stott’s approach is not unique: many Canadian pork producers use “guidance systems, yield mapping and variable rate technology to precisely monitor all inputs used on the farm,” says Mike Mitchell, Ontario Pork’s Middlesex County director.

Some farmers also use manure injection, which benefits crops and the environment.



**Dr. Brett Kaysen**

*Continued on page 12*



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## FUNDING ENVIRONMENTALLY FRIENDLY ON-FARM CHANGES

Pork producers are always looking for ways to improve their farms' efficiencies and reduce their environmental footprints. Across Canada, producers can find funding programs to help cover some of the associated costs.

The Ontario Soil and Crop Improvement Association (OSCIA), for example, offers several funding and educational programs to help farmers in the province achieve these goals.

Karen Jacobs, a program coordinator with OSCIA, provides descriptions of available programs.

**Environmental Farm Plan (educational)** – Helps identify risks by completing a self assessment for 23 areas of the farm.

Farmers must have a verified complete 4th Edition Environmental Farm Plan to be eligible for funding through any of the OSCIA-delivered programs.

Details can be found at [ontario-soilcrop.org/oscia-programs/workshops-webinars/environmental-farm-plan/](http://ontario-soilcrop.org/oscia-programs/workshops-webinars/environmental-farm-plan/).

**Farmland Health Check-Up (educational)** – One-on-one discussions between farmers and participating certified crop advisers or professional



National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

**“I think environmental stewardship is about staying diligent, being cognizant of our impacts and holding ourselves and our peers accountable for the activities we’re doing on our landscapes,” says Sheldon Stott.**

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**“Most pork producers test their soil and manure to make sure they are fertilizing to crop needs,” says Sam Bradshaw.**

agrologists assess soil health on specific areas of the farm.

Producers require a Farmland Health Check-Up to be eligible for funding through the Lake Erie Agriculture Demonstrating Sustainability (LEADS) program.

Details can be found at [ontariosoilcrop.org/canadian-agricultural-partnership/farm-health-check-up](http://ontariosoilcrop.org/canadian-agricultural-partnership/farm-health-check-up).

**Canadian Agricultural Partnership (funding)** – The environmental stewardship stream of the *Partnership* offers financial support to farmers implementing environmental projects.

Funding is also available in the protection and assurances stream and the economic development stream of the *Partnership*.

More information is available at [ontariosoilcrop.org/canadian-agricultural-partnership](http://ontariosoilcrop.org/canadian-agricultural-partnership) and [ontarioprogramguides.net/en](http://ontarioprogramguides.net/en).

**LEADS (funding)** – Eligible projects must be located in the Lake Erie and Lake St. Clair watersheds, and aim to improve soil health and water quality and to reduce agriculturally sourced phosphorus in Lake Erie.

More information about the program is available at [ontariosoilcrop.org/canadian-agricultural-partnership/lake-erie-agriculture-demonstrating-sustainability-leads](http://ontariosoilcrop.org/canadian-agricultural-partnership/lake-erie-agriculture-demonstrating-sustainability-leads) and [ontarioprogramguides.net/en](http://ontarioprogramguides.net/en).

**Species at Risk Partnerships on Agricultural Lands (funding)** –

This program is available to all Ontario producers who are interested in implementing best management practices that also create, enhance and protect habitat to support species at risk on agricultural lands. Details are available at [ontariosoilcrop.org/oscia-programs/sarpal](http://ontariosoilcrop.org/oscia-programs/sarpal).

Resources for similar programs exist in other provinces too.

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Continued from page 8

This approach places the manure near the root zone of plants, greatly reduces the risk of runoff and decreases greenhouse gas emissions, Melnychuk says.

**Feed efficiencies**

Feed production accounts for 52 per cent of the carbon footprint resulting from the production of one kilogram (2.2 pounds) of Canadian pork, says a

2018 report on the life cycle assessment of pork production. Manure management – storage and treatment – accounts for 26 per cent of the carbon that farms produce. Other contributors – including meat processing and on-farm energy use – account for 22 per cent, the report says.

“As swine producers improve the feed conversion ratio, that is reducing the amount of feed needed to produce a pound of pork, the land base for

crop production and associated effects will decrease,” says Dr. Greg Thoma, a professor in the Ralph E. Martin department of chemical engineering at the University of Arkansas.

“This increased animal efficiency will lead to lower amounts of manure to be managed, also reducing impacts.”

In 2015, Thoma and a team of researchers completed a life cycle assessment and costing economic analysis for American swine operations.

Jean-Michel Couture, a partner and senior consultant in corporate responsibility at Groupe Agéco in Montreal, Que., agrees that less is more. Groupe Agéco is a consulting firm that specializes in economic studies and sustainability in the agri-food sector, and its team conducts environmental life cycle analyses.

Optimizing feed rations is beneficial from animal health, economic and environmental perspectives, Couture says. Farmers should look at their inputs – such as feed, gas and electricity – and compare their values to the farms’ outcomes, including product yield, water footprint and greenhouse gas emissions.

“The more you can produce with fewer inputs,” the lower your footprint will be, he adds. “Yield is a significant factor for productivity and for reducing the environmental footprint of production.”

Since the composition of animals’ diets and quantities of feed intake affect the sector’s environmental footprint, industry stakeholders and researchers strive to improve this aspect of production.

“Most farmers are constantly improving feed rations for better efficiency,” says Bradshaw.

Phytase, for example, helps reduce pigs’ environmental impact. This feed ingredient increases the digestibility of phosphorus found in cereal grains, allowing the pigs to better use the feed, which reduces the amount of the nutrient that can leach into groundwater, he adds.

Nutrition specialists play a key role in these efforts, Stott adds.

“One of the biggest advancements that we have implemented is having nutritionists looking at the pigs’ nu-

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tritional requirements,” he says. “Then we formulate our feed to meet” the animals’ needs.

**Continuous improvements**

As environmental stewards, Canadian producers are diligent about manure storage, energy and water use, and land conservation.

“Pig farmers are committed to continuous improvement,” Kaysen says. They recognize the industry’s progress in environmental stewardship over the years but ask “How can we do even better?”

Many farms in Ontario, for example, have environmental farm plans. Creating a plan increases producers’ environmental awareness of 23 areas on their farms, the Ontario Ministry of Agriculture, Food and Rural Affairs website says.

Farmers identify environmental strengths and weaknesses in their operations, and participation in local workshops helps producers develop action plans to deal with vulnerable areas on their farms.



National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

**In Manitoba, “hog farmers must file an annual manure management plan with the provincial government,” says Grant Melnychuk.**

In the field, “a lot of producers are using no till, minimum tillage and strip tillage,” Bradshaw says.

“Other farmers are planting cover crops to reduce erosion, use excess nitrogen and control weeds.”

Farmers are also investing in drainage and water protection infrastructure in their fields.

“Many farmers are building berms to slow down water runoff that could carry sediment and phosphorus” into

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PROTECTING THE ENVIRONMENT

nearby steams or water bodies, Bradshaw says.

“A number of producers are planting trees as buffers to reduce odours” and the risk of water contamination.

In manure storage pits, some farmers “use additives to ease agitation, save fuel and reduce greenhouse gas emissions,” Mitchell says.

In the barn, producers monitor their water and energy use to make sure resources are not wasted.

To reduce water use, farmers must first acknowledge “how much they are using,” says Stott.

“We track water usage daily on our farms. We submit those numbers to our compliance specialists monthly, and then we analyze our use to understand if it is in line with what the norms are across the province. If levels exceed the norm, then we investigate why.”

On many hog farms, leaky water

pipes are the top cause of excessive water use. So, producers need to be diligent in repairing leaks and conducting regular maintenance, Stott adds.

“In terms of energy usage, our modern barns are fantastic facilities. Farmers look at different factors like insulation, air flow and lighting in the barn to reduce energy use and use it most efficiently,” says Kaysen.

Farmers are installing energy efficient LED lights, programming “feed-mixing systems to run during off-peak times and converting electrical heaters to propane or natural gas,” Bradshaw says.

**Consumers want to know**

Canadians are becoming increasingly concerned about the origins of their food and how it gets from farms to their tables. As a result, pork producers need to effectively tell their stories and highlight the good work they do.

“On social media, consumers are constantly talking about environmental stewardship, sustainability, climate change and greenhouse gas emissions,” says Kaysen.

“We as pig farmers need to talk to consumers and say, ‘Hey, we want to connect with you and demonstrate our values, principles and practices on our farms.’”

Mitchell agrees.

“It is important for consumers to know that pork producers are always looking for efficiency improvements in both feed and energy use in pork production,” he says.

This information can help consumers “appreciate the sustainability we strive for in the production of the pork that they consume.”

Canadians want to know that pork industry stakeholders are committed to improving their practices and doing the right thing, Couture says. So, farmers need to communicate their efforts clearly.

Environmental sustainability “has become an important piece of marketing our products,” Stott says. We must show consumers “the environmental stewardship that we perform not only on our pig farms but also in our processing facilities.” **BP**

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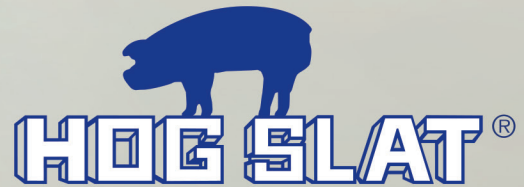
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# SUPPORT FOR MENTAL HEALTH ON THE FARM

by GEOFF GEDDES

The ongoing stressors in the pork sector, we must support mental health and assist producers.

Ups and downs are facts of life for pork producers, but what happens when you've fallen psychologically and you can't get up?

How do you cope when depression, stress or anxiety appear uninvited and refuse to leave?

Though farmers pride themselves on toughing it out and never complaining, they can sometimes be their own worst enemies. Keeping a stiff upper lip during a mental health crisis could hurt your relationships, business and well-being.

"Research at the University of Guelph by Dr. Andria Jones-Bitton and Briana Hagen has consistently shown that producers have greater mental health stress compared to the general public," says Andrea De Groot, managing director of the Ontario Pork Industry Council.

"Our industry has experienced so many changes in recent years. As farms get larger and more complex, there is more on the line."



Silvia Galbraith photo



**“For many farmers, the line between home and business is blurry, and the farm is a part of their identity,” says Andrea De Groot.**

At the same time, the pork industry is extremely volatile on several fronts, including pork and feed prices, disease threats, trade issues and consumer demands.

“The sheer number of issues, and the speed with which they arise, separates the pork industry from other commodities in terms of stress and

burnout,” says De Groot.

While producers share common challenges, the effect on their mental health can vary widely.

“This is not a one-size-fits-all situation,” says De Groot. “Each person is impacted in his or her own way. Some producers may have difficulties with their farming operation but not

have it affect their family. With others, mental health issues may touch all facets of their life.

“For many farmers, the line between home and business is blurry, and the farm is a part of their identity.”

While the agricultural community has made great progress in recognizing the importance of mental health, many observers still feel we have a long way to go.

**Growing awareness**

“Many in agriculture struggle to define mental health and to recognize differences among various mental health challenges such as depression, anxiety, high stress and suicide,” says De Groot. “As our communities increase the awareness of mental health, the self-recognition amongst farmers will also increase.”

Though awareness of – and attitudes toward – mental health issues may be improving in Canadian society more generally, pork producers don’t always reap the benefits.

“There is more open dialogue today on a national level around mental health, yet those campaigns have less of a reach in rural areas,” says David Grauwiler, executive director of the Alberta division of the Canadian Mental Health Association (CMHA).

“While there has been some reduction in stigma in urban settings, especially in younger demographics, that stigma is more prevalent as you get farther out. As well, whether you



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## MENTAL HEALTH

need your gallbladder removed or are dealing with depression, (you have) less access to treatment and other resources away from the major centres.”

### E-mental health

With the Internet, mental health treatment is just a mouse click away – or is it?

“Online access to support services can be complicated,” says Grauwiler. “We think in terms of e-mental health, but Egypt has better cell coverage and more access to Wi-Fi than Alberta, so there are significant gaps. In fact, the whole area of e-mental health, which could be a solution for access to counsellors in rural areas, is completely underdeveloped in this province.

“Unfortunately, we haven’t kept pace with technology to create virtual access where physical access is problematic,” he adds.

In response to the various challenges in rural communities, the CMHA’s Alberta division is hosting the Rural Mental Health Community



tommaso79/istock/Getty Images Plus photo

**“We think in terms of e-mental health, but Egypt has better cell coverage and more access to Wi-Fi than Alberta, so there are significant gaps,” David Grauwiler says.**

Development Project.

Alberta Health has provided \$1.6 million over three and a half years to develop an Alberta Rural Mental Health Network and support 150 ru-

ral Alberta communities to create community mental health roadmaps and action plans, the CMHA website says.

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**“Our message to those struggling with mental health issues is that, even if you feel alone, you’re not alone,” says Mara Grunau.**

aggravating factor for mental health stressors.

“In the past, when agriculture was struggling, people could find a job in the oil industry, and vice versa,” says

Grauwiler to *Better Pork*.

“Now, with both sectors under tremendous pressure, we are hearing dire reports of farm families in distress. That pressure is amplified by

farmers feeling they must keep pace with their neighbours and not lose ground or seem weak or out of control,” he adds.

“Against that backdrop, (farmers)



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are not likely to move easily into health-seeking behaviours when they have a problem.”

Increasingly, what Grauwiler calls an “irrational sense of self-reliance” is causing an inordinate number of rural men to pay the ultimate price.

“About 600 Albertans die each year from suicide, and men in their 40s, 50s and 60s are overrepresented. Many of these men come from rural areas,” he says.

### Isolated incidents

Some of the factors that trigger stress and anxiety for pork producers can also raise their risk of suicide.

“Farming is demanding, physical work where you often face problems outside your control, such as China shutting off your canola and pork sales,” says Mara Grunau, executive director of the Centre for Suicide Prevention in Calgary, Alta.

“Farming also involves a lot of iso-

lation, so there’s unlikely to be a co-worker nearby who will notice a problem arising.”

Isolation makes the role of friends and family in suicide prevention all the more critical.

“Our message to those struggling with mental health issues is that, even if you feel alone, you’re not alone,” says Grunau. “If you have symptoms of depression, you need to know that they are not normal feelings and they are treatable. Help is available.

“If someone close to you is struggling, realize that they often just can’t reach out for help, so you need to reach out to them. Ask them the question directly: ‘Are you thinking of suicide?’” she says.

“If they are, they will probably tell you. This is your chance to reassure them that you are there for support, and together you can call the crisis line and get the help they need.”

In all provinces except Manitoba and New Brunswick, people who need help can dial 211 and ask for guidance. Using the associated databases, they can identify local resources and help navigate the greater system.

Using 211.ca is another option. This online resource is accessible in all provinces except P.E.I. and Newfoundland and Labrador.

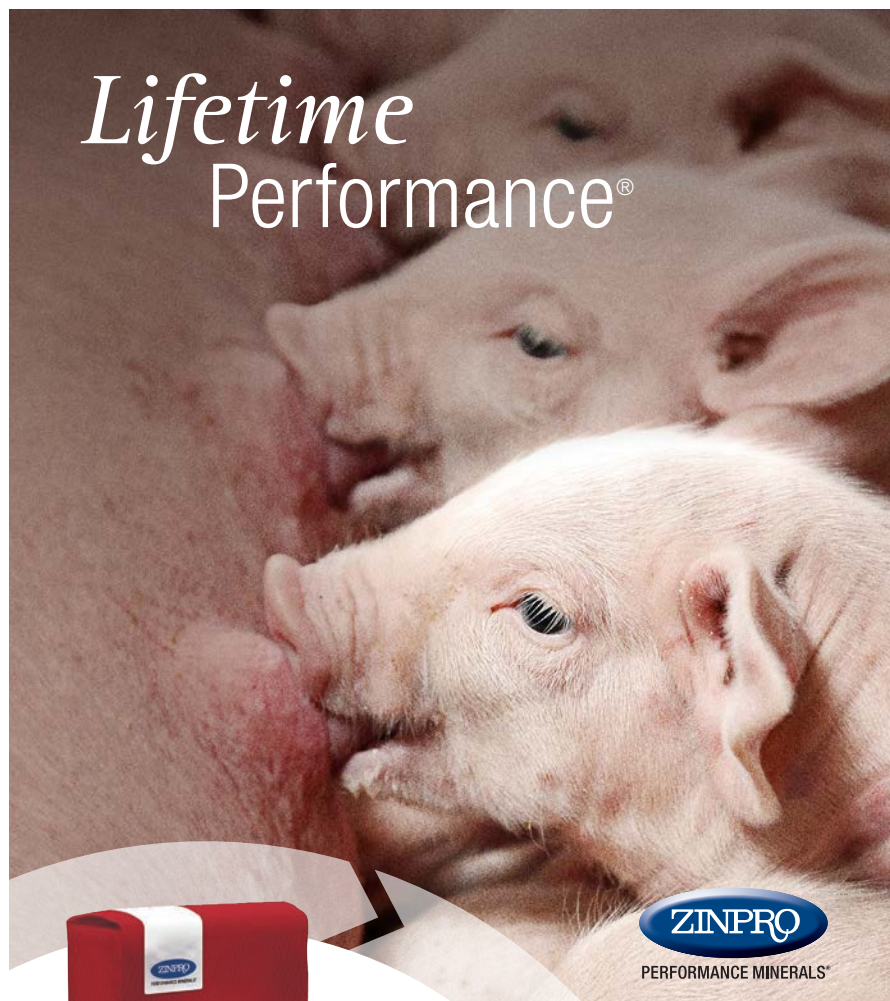
People who aren’t in a crisis and don’t need immediate help can call their local CMHA offices.

Another national source of help is the Do More Agriculture Foundation, a non-profit organization that addresses mental health in Canada’s ag industry.

“We were founded on the three pillars of awareness, community and research,” says Adelle Stewart, executive director of the foundation. “We provide a safe place for people to have the conversation around mental health, and the response has been overwhelming.

“People are standing up after presentations to tell their stories, and local organizations are rallying to partner with us.”

The Do More Agriculture Foundation is running a pilot project. Its representatives travel across Canada con-



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ducting mental health workshops in partnership with Farm Credit Canada. The non-profit also provides important resources online.

“Our website links producers to appropriate resources,” says Stewart. “We act as a conduit to simplify all the options and help (farmers) find support.”

**You’ve got a friend**

Ultimately, whether you deal with depression, stress or other mental health challenges, support is essential to your recovery and, in some cases, survival.

“We have a person (who was) promoted to a higher and more stressful position. (He) was a manager who used to be in the hog barn and was then elected field boss,” says Martin Waldner, a hog boss with Hartland Hutterite Colony near Bashaw, Alta., and a director with Alberta Pork. “You never know how much stress people can take until you put them in a position like that. He wound up having a nervous breakdown.

“As a colony, we try to always have support for people in that circumstance and never leave them alone. Even so, we have seen it where we thought things were under control and missed the signs that depression was still a problem. It cost someone a life.”

Though colonies can offer internal support – and can even offer the option of having the person never work again but still have security – other producers may have fewer resources.

“It’s a lot tougher for an independent farm family. They may not have anyone to pick up the slack; they are already struggling to keep the farm going,” says Waldner. “In that case, there are still support groups out there and places people can call to talk, so they shouldn’t try to fight through it alone.”

Mental health illnesses are complex. A range of causes and possible solutions exist, but helping people feel less alone is a good place to start.

“As pork producers, we sometimes get so buried in our work that we don’t take enough time for each other and notice if someone else is struggling,” says Waldner. “We need to always keep our eyes open and look for signs of distress. We must ensure that if someone wants to talk, we take the time to listen.” **BP**

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by  
KATE  
AYERS

# HARTLAND HUTTERITE COLONY LEADS BY EXAMPLE

This Alberta hog barn manager values the opportunities that pig farming provides for his family.

Martin Waldner photo



The families of Hartland Hutterite Colony finished building their hog barn in 2008. This aerial photo was taken two years later. They also farm 7,000 acres of crops.

Martin Waldner, along with his colony, stays on the leading edge of technological advancements within the swine sector and the ag industry more generally.

For example, Hartland Hutterite Colony's most recent addition is a co-generation, or combined heat and power unit that generates electricity and heat simultaneously, a September Alberta Pork article says. The system is part of the colony's carbon-neutralizing system, which helps them farm sustainably.

While Waldner has worked with pigs since the late 1990s, he welcomed the opportunity to help develop a new operation in 2007. That year, Waldner and his family moved about 43.6 kilometres (27.1 miles) northeast from Pleasant Valley Hutterite Colony near Clive, Alta. to Hartland Hutterite Colony near Bashaw, Alta.

The hog barn was one of the first buildings the colony established and they finished it by 2008. The colony

completed the rest of their infrastructure three years later.

Originally, the hog operation was a commercial 750-sow farrow-to-finish facility but, in 2016, Waldner and his barn staff retrofitted the original gestation section of the barn to accommodate loose sow housing when they became a multiplier operation for Fast Genetics.

They also built an addition onto the finisher section of the barn to facilitate development and training of the gilts they sell for Fast Genetics, Waldner says.

Now, he manages a 600-sow farrow-to-finish operation. The barn has eight nursery rooms, each with two pens of 200 pigs. Waldner also uses electronic sow feeding systems. Over the years, he and his crew have achieved impressive production numbers including weaning an average of 30 piglets per sow per year and weaning weights of about 8.5 kilograms (18.7 pounds) when the

pigs are 25 days old.

"Since the transition to group housing, we have experienced bigger piglets at birth, calmer sows and lower noise levels," Waldner says.

In addition to the hogs, the Hartland Hutterite Colony cultivates 7,000 acres of cash crops including barley, wheat, canola and peas. They also have a canola crushing facility on the farm. Once workers have processed the canola, they sell the meal and use the remaining oil in the pig feed. The colony produces all the feed grains for the pigs except for soybeans, which they purchase.

Waldner looks forward to learning more about improvements that other swine industry stakeholders are making to create a more efficient and profitable sector. He is passionate about animal husbandry and loves every aspect of his job.

"I want to learn all that I can about the pork industry and help it through the challenges that it faces," he says.



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## UP CLOSE

### What are your roles on your farm?

In the colony, there is a total of 104 people and 19 families.

They all work on the farm, including grain farming and fabricating in the shop.

### What are your roles on your farm?

I manage the hog barn.

We also sell breeding stock to around 25 accounts. So, I look after that aspect as well.

### Hours you work per week?

I work over 12 hours per day.

Except on Sundays, when we just do the necessary chores.

### Hours in the office per day?

I would say about four or five hours per day, but it varies.

### What are three items that are on top of your desk?

Right now, there are a stack of invoices, paperwork for gilt and pig transportation, and Alberta Pork documents that I'm working on.

### Email or text?

If you need to get a hold of me quickly, texting is best.

But I use email a lot, too.

### What role does social media play in your daily life?

We rely on social media for messaging on the Alberta Pork side of things.

We use it quite a bit to communicate between producers and consumers, and to communicate within the industry.

### What do you like best about farming?

The fact that you can work side by side with your family.

It is the only lifestyle where you can grow food and watch your family grow up, too.

### What does your family think of farming?

Everybody loves it.

We live in the country and we work where we live.



Martin Waldner photo

**“Since the transition to group sow housing, we have experienced bigger piglets at birth, calmer sows and lower noise levels,”** Martin Waldner says.

### What's your top tip about farm transition planning?

If you're working with the next generation, let them get the experience when they are younger.

On our farm, we move the kids around the farm so they can find out what they're best at, whether it be grain farming, welding or carpentry.

They can try all these enterprises, so they know at a young age what they are good at and what they're interested in.

### What's the most important lesson you've learned?

Patience.

It's important and is probably the key ingredient for any job, no matter what you do.

### What's your guiding management principle?

Before we start our workday, we have a daily meeting in the office.

Over a cup of coffee, we discuss

who is doing what that day. We do our planning for the day and sometimes the whole week. I find that the most important thing for any meeting is communication.

### What's your top goal?

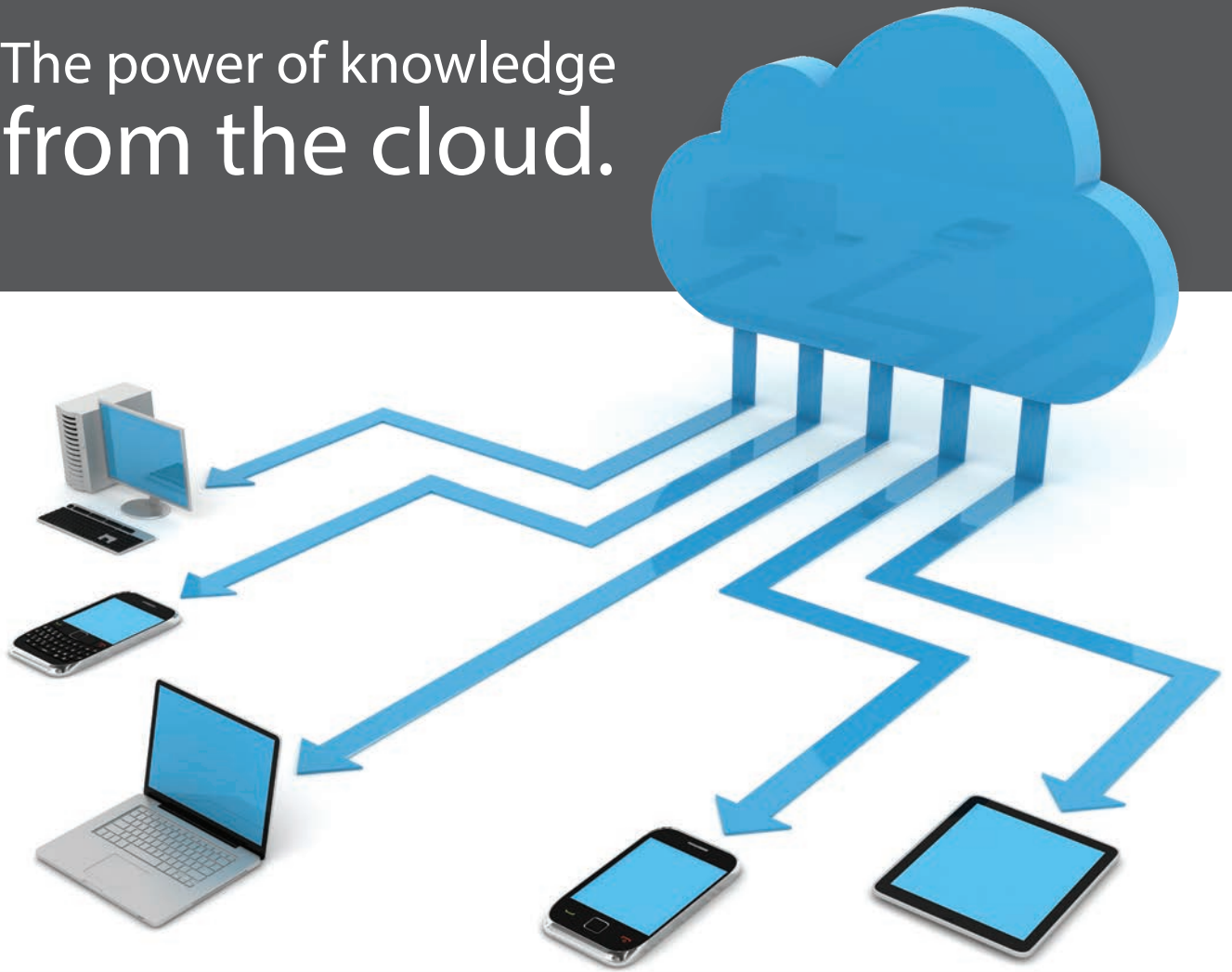
My top goal, no matter where I am in life or what I am doing, is never to hesitate to listen to people's opinions and never to hesitate to praise other people for something they've done well.

And to get rid of the negatives and focus on the positives in life. There is a lot of negativity in the world that can drag you down, but there are enough positive things happening day to day that we can get rid of a lot of negativity.

### How do you define success?

If I see that everybody is getting along and people have no problem bringing issues to light, I feel as though I've achieved success.

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**What are the biggest challenges you face in the agricultural industry and how have you addressed them?**

I think the biggest challenge in the livestock industry is the big gap between the farming community and the general public.

The upcoming generations who live in cities don't know a lot – if anything – about farming and that is where a lot of problems arise with activists.

Social media has its pros and cons. It is a quick way for stories to get out, whether they are true or false. A lot of false information can be spread through social media and bad stories travel faster than good stories.

**Are you involved in any committees, associations or volunteer efforts?**

I'm a director for Alberta Pork.

I am also on the AgSafe Alberta committee.

**If you could send a message to non-farmers, what would you say about the industry?**

My message to the public would be focused on the next generation of consumers. My message to them would be that farmers rely on the income they make from growing crops and raising animals.

So, farmers take good care of their land and livestock, and they take

great pride in what they do.

Things don't always turn out the way they're supposed to but, overall, farmers do their best. It is not the easiest lifestyle or the easiest way to make a living, but the rewards make it worth it.

**If you weren't a farmer, what do you think you'd be doing for a living?**

I've been a farmer all my life and I don't know what else I would do for a living.

I really enjoy working with the animals and I think farmers are a special breed of people.

**How do you support your mental health during the busy times of the year?**

That can be a challenging part of farming.

Your mental health is one of the most important things to protect and, sometimes, it's taken for granted.

To support your mental health during busy times of the year, you must realize that you can't do everything yourself and you can't do everything in one day.

We must remember that tomorrow is a new day and there are only certain things in life that humans have control over.

So, there is no use in getting too worked up about the things that we have no control over.

We need to be more thankful for what we have. There is rain but there is sunshine, too.

**What was the last book you read?**

The manure management guidelines.

**How often do you travel?**

As a director for Alberta Pork, I travel quite a bit.

**Where do you usually travel to?**

I travel all over Alberta and sometimes we have meetings in Montreal, Ottawa or Toronto.

**Is your farm vehicle messy or neat?**

Nothing is messy on the farm.

It's probably as clean as it was when we bought it.

**What's the best time of day?**

I would say that the best time of day is 5:30 p.m. when we are done working in the barn and we have a break for church service and supper.

It is family time after that.

**What was your most memorable production year? Why?**

I would say it was 2014.

There was a PED outbreak in the United States. On the pork production side, we saw prices that we didn't think existed. But the peak was short lived. **BP**

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by  
DR. HOLLYN  
MALONEY

# UNDERSTANDING SOW LACTATION PROBLEMS

Producers must address postpartum dysgalactia syndrome to ensure the growth and survival of piglets.

Dr. Kelsey Gray photo



This sow has severe udder edema. Notice that the swelling is uniform and that all glands are affected.

To ensure that your piglets receive enough colostrum and meet their nutritional needs, your sows must be milking properly.

Postpartum dysgalactia syndrome (PDS) is the inadequate production of colostrum and milk in the first few

days post-farrowing. This syndrome causes piglet starvation and increased pre-weaning mortality. PDS can result from an infectious process, such as mastitis, or a feed or management issue that causes udder edema or hormonal imbalances.

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## Causes

Mastitis, which is inflammation of the mammary glands, is a common cause of PDS. A higher risk of mastitis exists in glands that are injured, often by piglets' teeth while nursing, or that are not milked out properly, often because the teat is inaccessible to piglets due to abnormal positioning.

Most commonly, coliform bacteria, such as *E. coli*, that are found in feces cause mastitis. These bacteria can enter the mammary gland through a cut in the skin if the udder is contaminated with manure.

Other bacteria that can be involved in causing mastitis are *Streptococcus* and *Staphylococcus*, although these bacteria are less common.

Mastitis in a single gland can also release bacterial toxins and cause a reduction in milk from all glands.

Infection of the uterus or bladder can cause PDS, too. These infections can release toxins produced by bacteria into the blood, which can reduce mammary development and disrupt hormones needed for milk production.

Bacterial toxins can also be released if a sow is constipated. This condition causes an imbalance in gut bacteria and damages the gut wall, allowing toxins to enter the blood. As well, constipation prior to farrowing can obstruct the birth canal by pressing down on it. This situation can result in the sow needing more assistance during farrowing, which can increase the risk of a uterine infection.

Bacterial toxins can also cause udder edema, which is the accumulation of fluid within the udder. Toxins in the blood cause fluid accumulation by interfering with the sow's circulation.

While edema may be caused by bacterial toxins, it is not an infection of the mammary gland, unlike mastitis.

Mammary edema can be associated with non-infectious processes. Excessive body condition or high feed intake, particularly of high-energy feed, pre-farrowing can result in over-development of the mammary tissue prior to farrowing.

This situation can cause over-production of milk and the newborn piglets cannot drink enough to reduce the pressure in the udder. This condition results in congestion of the glands and development of edema.

Eventually, the mammary glands will dry off due to the increased pressure. Tissue damage caused by udder edema can eventually lead to mastitis because it makes the glands more susceptible to infection.

So, it is important to monitor for changes that indicate an infection has developed, even though edema was the initial cause of PDS.

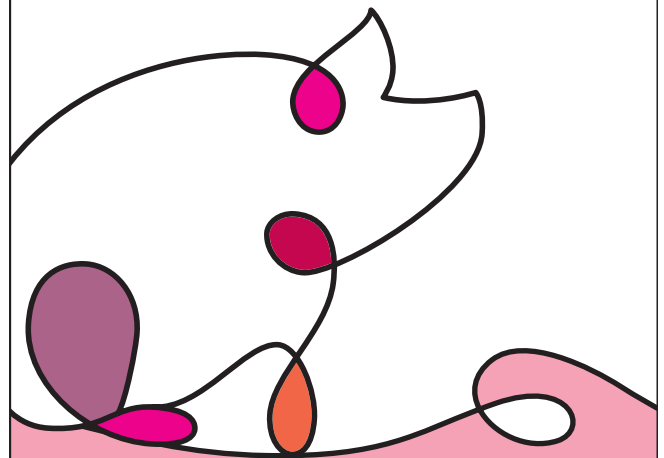
Other management issues can also cause PDS. Hormones released when an animal is stressed can interfere with milk production. So, poor environmental management, such as improper temperature control or improper handling prior to farrowing, can affect lactation. As well, good staff hygiene is essential if sows need assistance during farrowing to decrease the risk of PDS due to a uterine infection.

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Dr. Jessica Law photo



This sow has injured teats from piglets chewing on them. Bacteria can easily enter the gland through the damaged skin and cause mastitis.

**Symptoms**

Due to the wide range of potential causes, many symptoms may be observed with PDS.

Infections can make the sow visibly ill and show symptoms such as fever, reduced feed intake, decreased activity, signs of discomfort, or vaginal discharge.

One or more mammary glands may appear red or swollen and may feel hot when touched. Sows may also show signs of pain when the affected area is touched. Chronic cases of mastitis may cause hard nodules in the udder. If the infection remains localized, then milk production may only be reduced from the affected

glands, while the other glands continue to produce well.

Piglets nursing from the affected glands will starve, causing inconsistent growth within the litter.

Unlike mastitis, udder edema will not cause the sow to show generalized signs of illness. As well, edema will affect the entire udder, whereas mastitis



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will only affect up to a couple of glands.

With edema, the udder will appear uniformly firm and swollen. This swelling may extend up between the legs towards the vulva, which may also be affected. When the udder is touched, the sow may appear uncomfortable but not in as much pain as with mastitis. As well, in cases of edema, a depression in the skin may remain after you press on the udder since the skin may not immediately rebound.

The sow may show few symptoms with other causes of PDS. Insufficient milk production may only become apparent when the piglets fail to grow, or increased pre-weaning mortality, increased scours, or decreased weaning weights occur.

### Treatment and prevention

To treat PDS, you should consult with your veterinarian to determine whether an infection is involved and work with him or her to develop a treatment protocol which may involve some combination of the following options.

If your veterinarian determines that the cause is infectious because the sow appears ill, has mastitis, or vaginal discharge, then, following your vet's orders, you should give the animal an antibiotic.

In all cases of PDS, you should give the sow a non-steroidal anti-inflammatory, such as meloxicam, to decrease swelling and reduce bacterial toxins that may be circulating in the animal's body. Finally, you should give the sow oxytocin to promote milk let down.

Prevention of PDS in sows involves good feed management, environmental management, and close-to-farrowing management.

Feed management is essential to prevent udder edema. Ensuring that sows are not over-conditioned when they enter farrowing will help reduce the over-development of mammary tissue. This outcome can be achieved by controlling feed intake and the energy content of the diet. You should gradually increase the sow's feed intake in the week post-partum.

Preventing constipation around farrowing is also important. Sows must have enough fibre in their diets and sufficient access to water. Check flow rates and get sows up to drink to ensure adequate hydration.

Environmental sanitation is essential to prevent mastitis. You must regularly scrape manure from behind the sow to prevent accumulation and contamination of the udder. Fully slated floors also help to prevent accumulation of manure.

Farrowing rooms should be cleaned and disinfected between groups. Wounds on the udder can be sprayed with iodine to prevent bacteria from entering the gland.

Since it can be difficult to recover normal milk production for that lactation once PDS has occurred and mastitis can lead to permanent damage, it is essential to implement preventative measures. **BP**

*Dr. Hollyn Maloney is a veterinarian with Prairie Swine Health Services in Red Deer, Alta.*



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by  
**LILIAN  
SCHAER**

# ONT. SWINE INCIDENT COMMAND CENTRE 101

Learn what to do in a disease emergency in Ontario – whether on your farm or in the industry.



Jodie Aldred photo

If producers suspect something unusual in their barns, they should first contact their veterinarians.

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As African swine fever (ASF) spreads globally, the disease threat to Canada's pork industry is ever present. Everyone must continue to be vigilant – not only for ASF but also for other diseases, such as foot-and-mouth disease, that could affect the industry.

To help with better disease preparedness, Swine Health Ontario (SHO), Ontario Pork, the Ontario Pork Industry Council (OPIC) and other partners set up an Ontario Swine Incident Command Centre (ICC), which is a structure of people who can jump into action in an organized and efficient way to respond to a disease entering the province.

The Canadian Food Inspection Agency (CFIA) and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) each have incident command centres to manage their responses to animal disease emergencies. Now, the pork industry has such a centre as well, which will streamline response and ensure everyone involved knows their roles and responsibilities ahead of time.

## What should I do if I suspect a disease outbreak on my farm?

If producers suspect something unusual in their barns, they should first contact their veterinarians.

The vet can provide information, take samples, and contact the relevant authorities, like CFIA or OMAFRA, depending on the disease in question.

What is equally important is that either the veterinarian or the producer contact Dr. Bethany Davidson-Eng of SHO. She is the new manager of SHO and also the emergency management coordinator. Dr. Davidson-Eng is working within the ICC on disease emergency preparedness and response.

"In the event of a suspected disease, CFIA is unable to release producer information to industry due to confidentiality issues," Dr. Davidson-Eng said. "Without being informed by the producer or veterinarian, the ICC will not be able to activate and provide support, or begin coordinating the industry response."

The coordinator's role is to gather initial information and communicate with the incident commander to get a response underway once a disease is suspected or confirmed in Ontario.

### What can the ICC do for me?

During a disease emergency, a key role of the ICC is providing information and support to producers, particularly during the first 48 to 72 hours after a disease is suspected.

The ICC can provide support to producers during the testing process and after the confirmation of a disease. Potentially, the ICC could also provide technical support during the elimination process or producer support during CFIA on-farm visits.

"If CFIA orders destruction of your animals, it often falls to the producer to complete the process. However, the ICC has been developing humane depopulation and disposal protocols which would be made available to the affected producers," Dr. Davidson-Eng said.

The Ontario Swine Incident Command Centre will also centralize all communications to the industry to make sure everyone receives current and consistent information.

SHO, Ontario Pork and OPIC will distribute the necessary information to the industry, and all three organizational websites are designed to host up-to-date information as soon as a disease emergency is confirmed.

### How can I prepare my farm for a disease emergency?

**Prepare:** Educate yourself and your staff about possible disease threats and what you should do if you suspect a problem in your herd. Make sure you have a disease emergency contact list that includes your veterinarian, SHO, farm staff and service providers.



**Make sure you have biosecurity protocols in place and that everyone who visits your farm follows them.**

**Identify:** Learn to identify the signs of possible diseases so you know what to look for. The symptoms of some diseases can be similar, so it is important to call your veterinarian if you have something out of the ordinary in your herd.

**Guard:** Make sure you have biosecurity protocols in place and that everyone who visits your farm follows them. Review protocols periodically with staff, transporters and service providers to make sure everyone knows what is required and why.

**Stay informed:** SHO, OPIC and Ontario Pork provide regular updates on diseases of interest, preparedness activities and other news related to swine health. Visit their websites, sign up for their newsletters or follow them on social media to get the latest information.

### Who do I contact?

For more information on emergency preparedness and disease response, please contact SHO by phone at 519-767-4600 ext. 1401 or email [info@swinehealthontario.ca](mailto:info@swinehealthontario.ca).

For a suspected disease emergency, contact your veterinarian, as well as Dr. Davidson-Eng at 519-767-4600 ext. 1401 or 226-808-6055.

The ICC project was funded in part through the *Canadian Agricultural Partnership* (the *Partnership*), a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of the *Partnership* in Canada. **BP**

*Swine Health Ontario is a leadership team focused on improving and coordinating the industry's ability to prevent, prepare for and respond to serious swine health threats in Ontario.*

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## Key contact

Emergency management coordinator – Dr. Bethany Davidson-Eng,  
 Swine Health Ontario  
 519-767-4600 ext. 1401 or 226-808-6055  
[bethany.davidsoneng@swinehealthontario.ca](mailto:bethany.davidsoneng@swinehealthontario.ca)



# METHODS TO MANAGE CASTRATION PAIN

Since producers still lack clear guidelines for pain control, researchers studied some practical options.

Jodie Aldred photo



The Code of Practice has requirements for pain control at castration, but does not provide specific information regarding the appropriate analgesics or protocols for their administration.

Castration is a common procedure performed on male piglets at an early age to prevent the development of boar taint, an unpleasant smell and odour in pork from intact males.

Additional reasons for castration include reduction of aggression and mounting behaviour, and improved animal handling.

Piglets experience significant pain and stress during the procedure, and pain may last for up to five days (Taylor and Weary, 2000, Marchant-Forde et al., 2014). To address this problem, the Canadian Code of Practice for the Care and Handling of Pigs requires that castration be done with analgesics to help control post-procedural pain (NFACC 2014).

Furthermore, if piglets are castrated over 10 days of age, the code requires that both an analgesic to control pain following castration (e.g., meloxicam) and an anesthetic to reduce local sensation during the procedure (e.g., lidocaine) be provided.

While scientists have conducted considerable research on pain management in pigs following castration (Hay et al., 2003; Sutherland et al.,

2012; O'Connell et al., 2014), few clear recommendations are available.

The Code of Practice has requirements for pain control at castration, but does not provide specific information regarding the appropriate analgesics or protocols for their administration. While the Canadian Veterinary Medical Association and Canadian Pork Council have provided some guidance on appropriate drugs and dosages, several questions remain.

Metacam, a non-steroidal anti-inflammatory drug (NSAID), has received regulatory approval for treating pain at castration but other options, such as ketoprofen and acetaminophen, may also be effective.

Castration is normally performed on piglets at three to five days of age. Castration may be less stressful in older pigs, some studies have suggested, but the industry lacks clear evidence.

Industry stakeholders have also questioned the timing of drug administration; providing pain control 30 minutes prior to castration may be more effective. However, producers

would then need to handle pigs twice and coordinate injection and castration times at processing. So, producers would prefer to provide analgesia at the time of castration.

The overall objective of this project was to determine optimal procedures for controlling post-procedural pain in piglets at castration. Three specific objectives were

1. to compare the effectiveness of different analgesics
2. to study the effect of piglet age at castration on pain responses
3. to study the timing of drug administration

## What did we do?

Researchers performed three studies. The first study compared the effectiveness of three NSAIDs on the treatment of post-castration pain. The second study examined the effect of age at castration (three versus 10 days) on piglets' responses to the procedure when provided pain control or not. The final study compared the effectiveness of providing pain control one hour before the procedure to providing pain control immediately

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before castration, which would facilitate implementation of the procedure on-farm.

Technicians measured behavioural and physiological responses in each study. Of the behaviour measures studied, only tail wagging behaviour in the third study showed a tendency for interaction between treatment and time point. At 20 minutes after the procedure, piglets that were castrated did more tail wagging than those animals that were sham handled only.

Behaviour measures using a specially designed handling chute were not reliable. Cortisol (a stress hormone) results in blood were more informative.

The first study showed higher cortisol concentrations at 45 minutes after treatment in castrated piglets compared with those animals that were sham castrated, with piglets given pain control being intermediate. The second and third studies also showed an increase in cortisol concentrations following the procedure

with higher levels in castrates compared to sham castrates.

Comparing cortisol responses in pigs castrated at three and 10 days of age, older piglets showed lower cortisol levels overall and a greater effect of analgesia on reducing cortisol levels. In the third study, providing analgesia one hour before castration resulted in significantly lower cortisol levels compared to pigs that did not receive analgesia. Providing analgesia immediately before castration was also significantly better than providing no analgesia, but was not as effective as provision one hour prior to castration.

We conclude that the analgesic ketoprofen has a positive effect on reducing pain following castration when given 30 minutes to one hour before the procedure. Drug provision immediately before castration appears to be better than providing no pain control.

Older piglets showed a clearer response when given pain control

than young piglets, and could be used as a model for evaluating pain control options.

### Conclusions

We can draw many conclusions and recommendations from this project. First, we can conclude that, based on this work and previous studies, both meloxicam and ketoprofen can reduce cortisol levels following castration. In addition:

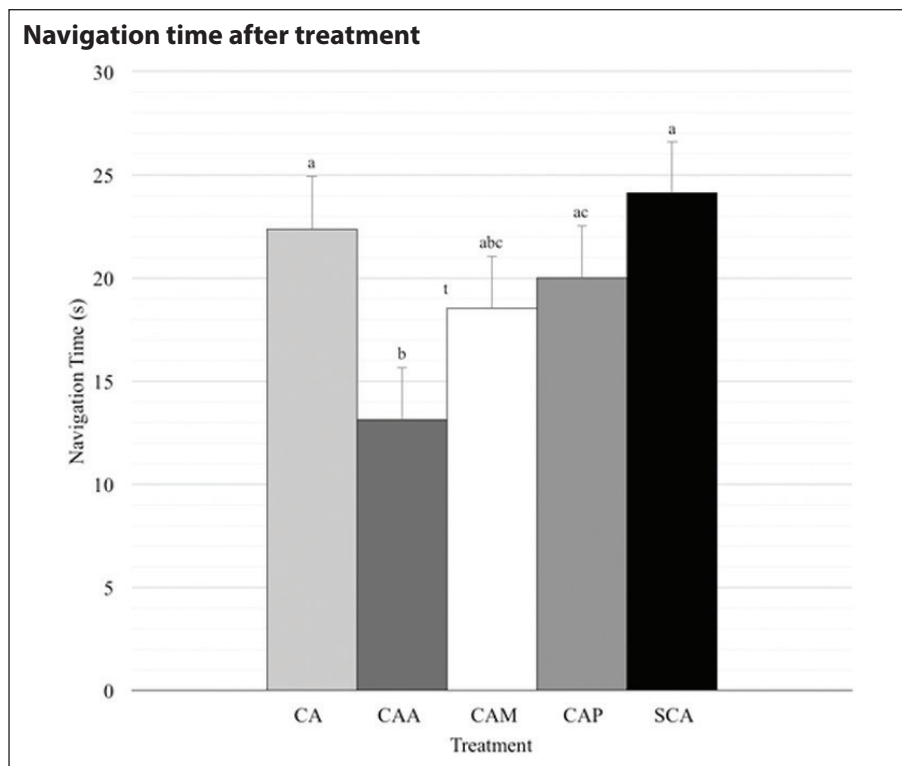
1. Providing ketoprofen one hour before castration is more effective than administering the drug immediately before the procedure.
2. Pigs castrated at 10 days of age show lower cortisol levels in response to castration than pigs castrated at three days of age.
3. Providing ketoprofen to pigs castrated at 10 days of age had a greater effect on reducing pain than providing ketoprofen to pigs castrated at three days of age.
4. The handling chute used as a behavioural measure in these studies is of limited value.

### Acknowledgements

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*Dr. Joe Stookey is a professor emeritus at USask's Western College of Veterinary Medicine. Dr. Terri O'Sullivan is an assistant professor at the University of Guelph's Ontario Veterinary College. Erin Davis is a graduate student at USask's Western College of Veterinary Medicine.*



**Figure 1:** Study 1. Average of chute runs at 15, 40, 60 and 120 minutes post-treatment (LS means ± SEM in sec) for pigs given one of five treatments.

The treatments were: castration control (CA), castration with ketoprofen (CAA), castration with meloxicam (CAM), castration with paracetamol (CAP), and sham castration (SCA).

Bars with different superscripts are significantly different,  $P \leq 0.05$ .

# HELPING HOGS TO THE FINISH(ING) LINE

by  
GEOFF  
GEDDES



**If you don't get your hog to market and sell it for the maximum profit, nothing else matters.**

It should be no surprise that the care and feeding of growing-finishing pigs is a prime concern of producers and, by extension, of researchers. From low-energy diets to high-precision feeding, science is seeking innovative approaches for growing your pigs without expanding your expenses.

## Low-energy feeds

To succeed in pork production, you must consider a range of factors and how they interact.

Dealing with low-energy feed is a perfect example. Previous research has found that low, constant net energy (NE) diets for grow-finish pigs provide a better return than higher NE diets. Sure, pigs must make up for that lower NE density by eating more, but how hard can that be? In theory, raising consumption is easy; however, this study on low-energy feeds considered the practical challenges that could affect feed intake, such as crowded pens and less feeder access.

After providing low- or high-NE diets to pigs in 96 pens of 18 or 22 pigs per pen, researchers found that less crowding resulted in more feed consumption and greater growth rates. Though adding an extra feeder also boosted consumption, it did little for average daily gain, most likely due to increased spillage.

Perhaps most interestingly, this project which set out to examine the relationship among stocking density, feeders and diet, concluded that there really wasn't one, and that's a good thing. This result means that, even when producers overcrowd a pen or fail to provide an extra feeder, pigs will still do well with a low-NE diet.

Not that anyone advocates overcrowding, but it should be of comfort to producers to know they can use these diets, save money and, for once, not have to balance multiple factors to succeed. Anytime research can bring some simplicity to a complicated business, it is worth the effort.

## Precision feeding

Like walking a tightrope, devising a pig diet is a delicate balancing act. In both cases, there is little margin for error, as improper feeding can send your profits plunging. Whether it's improving phosphorus efficiency or employing low-protein diets to reduce feed costs, research has looked extensively at how to get the biggest bang for your feed buck. As it turns out, the answer may be one that leads to more questions.

Just as humans have a range of appetites, growth rates and nutrition needs, so do pigs. Precision feed researchers addressed this situation by blending nutrients differently for each pig in their study. They used mathematical models to estimate pig requirements and experimental feeders



National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

**Less crowding resulted in more feed consumption and greater growth rates.**

to dole out the right blend to the right pig.

Though more work must be done to apply the approach in a commercial environment, this study spotlighted exciting advancements in technology that can have a major effect on farm. The computerized feeders offer real-time data on how each pig is performing, and producers can control the feeders from their office, thereby reducing labour needs.

If it's true that knowledge is power, technology and the precision feeding it allows could be a powerful ally for producers in the years ahead.

Speaking of allies, these two studies reinforced the value of research working in lockstep with industry. The need for greater feed efficiency and cost-reduction options for growing-finishing pigs is a constant theme for producers, and such cutting-edge research means that science is getting the message loud and clear. **BP**

*Swine Innovation Porc is a non-profit corporation committed to facilitating research in the Canadian swine sector.*

*Publication of this article was made possible by Swine Innovation Porc within the Swine Cluster 2: Driving Results Through Innovation research program. Funding is provided by Agriculture and Agri-Food Canada's AgriInnovation Program and by provincial producer organizations.*





# HEALTH STUDIES PROCEED AT FEVER PITCH

For humans, an apple a day may keep the doctor away, but keeping your pigs disease-free is more involved.

The research community is working feverishly to address swine health issues. While each project has a unique focus, they're all aimed at keeping pigs in the pink of health and your business squarely in the black.

## Genomics

With genetic advances coming at a dizzying pace these days, our “brave new world” has struck fear in some corners. Individuals in the know, however, understand the potential benefits of genomics for a wide range of applications.

For pork producers, the most notable of these may be improving disease resilience in pigs.

This is a field where knowledge truly is power, so grasping the possibilities begins with defining some key terms.

- **Genomics:** An interdisciplinary field of science focusing on the structure, function, evolution, mapping, and editing of genomes.
- **Genome:** An organism's complete set of DNA, including all of its genes.
- **Resilience:** The ability of an animal to respond to any disease challenge in a way that minimizes its impact.

The importance of resilience cannot be overstated. Disease will forever be a reality, so there will always be sick pigs. Through enhanced resilience, pigs can more easily cope with a disease challenge and recover faster.

We all know someone who barely misses work with the flu, while their co-worker is out for weeks with the same condition. Science has already established that genetics plays a role in disease resilience or susceptibility. The focus now is on what separates the animal that recovers quickly from the one that takes the animal equivalent of numerous sick days.

Genetically speaking, what makes the resilient pig so resilient?

The sooner researchers answer that



National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

Scientists may be able to use genomics to improve disease resilience in pigs.

question, the sooner they'll help sick pigs bounce back and keep production losses, and producer stress, to a minimum.

## Serologic testing

Like genomics, serologic testing involves complex terminology, but its importance is easy to define: you can't address what you're not aware of.

Serology is the scientific study of blood serum, especially with regard to the response of the immune system to pathogens. Serologic testing identifies the antibodies produced by animals that are present in blood, oral fluids or milk, and are used to fight infection.

At present, labs must use a separate assay or test for each disease-carrying virus or bacteria. Unfortunately, this wastes a lot of time and money – the two things producers have in limited quantities. It's a dilemma that sparked the basic question underlying much of research: what if it didn't have to be that way?

The answer may be found in a single test that detects several key swine pathogens simultaneously, including porcine reproductive and respiratory

syndrome virus type 1 and 2, porcine circovirus type 2 and swine influenza virus. Early results suggest this approach is as accurate as the standard serologic test, but could achieve in one procedure what used to take four. You don't need to crunch any numbers to see the benefit of that.

From grain prices to consumer preferences, much is out of producers' control. As a result, it's vital that they influence what they can, as much as they can. By finding ways to test more effectively for disease and help pigs fend it off or minimize its impact, research is empowering producers and giving them the last word on the health of their animals and their industry. **BP**

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## The Bugs Have It: The Standardized Ileal Digestibility of Amino Acids in Black Soldier Fly Larvae meal

By Michelina Crosbie – Michelina is a MSc. Candidate in Swine Nutrition at the University of Guelph studying under Dr. Lee-Anne Huber

As the world population increases,

greater stress is being placed on livestock producers to keep up with the demand for animal products and prevent global food insecurity<sup>1</sup>. Presently, many swine diets rely on soybean meal (**SBM**) as a plant-based protein source. Eighty five percent of the world's soybean supply is processed into SBM (and oil) and nearly 97% of the SBM is used to feed livestock, including swine<sup>1</sup>.

The use of soybeans for livestock diets can increase the competition between animals and humans for plant-based protein sources, which can also contribute to global food insecurity.

Black soldier fly larvae (**BSFL**) are an alternative to plant-based proteins in livestock diets. The BSFL require less water, land, and resources versus other conventional plant-based feed ingredients, thus BSFL could reduce the competition between humans and animals for preferable food sources<sup>2</sup>. Further, BSFL can efficiently consume a variety of substrates such as food waste, kitchen waste, and distillers' grains, among others, while maintaining an optimal amino acid (AA) profile; the AA profile of BSFL is comparable to SBM, making it an ideal substitute<sup>3</sup>. The meal made from BSFL is also enriched with functional compounds including chitin and medium chain fatty acids. Chitin can act as a prebiotic to support a balanced and diverse population of gut microbes, while medium chain fatty acids exhibit anti-inflammatory and antimicrobial properties, which make it a promising alternative to in-feed antimicrobials<sup>4,5</sup>.

Determining the standardized ileal digestibility (SID) of AA in BSFL meal is the first crucial step to including BSFL meal as a protein source in swine diets. This is because the SID values are the best practical estimate of the amount (%) of each AA that can be used by the pig for growth (and maintenance). This helps us to formulate diets for swine that precisely meet nutrient requirements, in order to improve feed efficiency and reduce nutrient losses to the environment.

**Table 1:** Crude protein concentration and standardized ileal digestibility (%) of AA in full fat BSFL meal and defatted BSFL meal fed to growing pigs.

Item	Black soldier fly larvae meal		SEM <sup>1</sup>	P-value <sup>2</sup>	SBM <sup>3</sup>
	Full fat	Defatted			
Crude protein, %	43	41	-	-	48
<b>Indispensable AA</b>					
Arginine	93	96	1	0.034	94
Histidine	81	84	2	0.185	90
Isoleucine	87	90	2	0.253	89
Leucine	87	91	2	0.130	88
Lysine	87	89	2	0.250	89
Methionine	90	79	5	0.074	90
Phenylalanine	95	98	2	0.297	88
Threonine	87	87	3	0.829	85
Valine	83	88	3	0.090	87
<b>Dispensable AA</b>					
Alanine	86	90	2	0.053	85
Aspartate	88	87	2	0.625	87
Cysteine	86	83	3	0.418	84
Glutamate	88	84	3	0.247	89
Glycine	81	85	3	0.258	84
Proline	100	105	2	0.065	113
Serine	86	88	2	0.289	89

<sup>1</sup>Standard error of the mean. <sup>2</sup>P-value indicates whether the SID of each AA was significantly different between full fat and defatted BSFL meal; P<0.05 indicates the difference is significant.

<sup>3</sup>SBM crude protein and SID AA (%) from NRC (2012) for reference.



We determined the SID AA contents of two different BSFL meal sources (full fat and defatted) (**Table 1**). The crude protein concentration of the BSFL meal sources were approximately 15% lower than that of SBM (48%; NRC, 2012).

The SID AA for the full fat BSFL meal were typically not different from the defatted BSFL meal, which were also comparable to those of SBM. An exception was for Methionine, whose SID was approximately 14% less for the defatted BSFL meal than for full fat BSFL meal or SBM. In addition, the SID of Phenylalanine, for both the full fat and defatted BSFL meals, was approximately 10% greater than that of SBM.

Compared to SBM, BSFL meals provided 15% less crude protein but the



Black Soldier Fly Larvae Meal (top: defatted; bottom: full fat).

AA supplied by BSFL meal generally have similar SID as those supplied by SBM. Therefore, both full fat and defatted BSFL meals are possible substitutes for SBM, but provide less digestible AA overall. Due to the high price point of BSFL meals, and the relatively lower CP concentration versus SBM, it may be appropriate to explore other functional benefits of BSFL meals versus using them as a complete replacement for SBM in swine diets.

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## Helping High Risk Piglets in the Farrowing Room

This is the second installment in a series on this topic. Look for the first in the October issue of PNV.

### Cross Fostering

Some sows have large litters that exceed their number of teats. These sows may not be able to feed their entire litter properly, and some piglets will be at risk of starvation. Other sows produce small litters and would be able to care for more piglets than just their own. Cross fostering is the act of moving piglets from their birth dam onto an adoptive sow in order to ensure all piglets are fed (Cecchinato et al., 2008; Baxter et al., 2013). Do not cross foster for the purpose of making each litter the same size. It should be done to ensure that piglets without a teat on their own mother have full access on another sow. Cross fostering needs to be done within the first 24 hours of life. By 48 hours, piglets within a litter have established a firm teat order (Hemsworth et al., 1975). After this teat order is established piglets will suckle on the same teat at each feeding for as long as they are with the sow.

There are a few rules to remember when cross-fostering piglets;

- Move the largest piglets in the litter to foster sows. The smaller piglets are more likely to thrive when left with their own sow.
- Try not to move piglets between rooms. Moving piglets between rooms aides in the spread of disease through the barn.
- Move as few piglets as possible. Piglets will do better when left with their own sow, therefore only cross-foster piglets when the sow will not be able to support all her piglets.
- Never add more piglets than there are teats available.
- Only foster piglets out once. Continuously moving litters

around increases stress on both piglets and sows.

- If there is a large number of poor doers, foster them onto one sow so there is less competition.
- If smaller piglets must be moved, provide them with a dose of an energy product prior to moving.

### Split Suckle

Split suckling is generally used when cross fostering is not an option. Split suckling ensures that smaller piglets get equal access to milk as the larger piglets, producing a more uniform litter. The first step in the split suckle process is to divide the litter into two groups; large piglets and small piglets or strong piglets and weak piglets (Baxter et al., 2013). Mark one group with a livestock marker. Using a board or a box, move the larger piglets into the creep area, taking care that they do not become overheated. Allow the smaller group of piglets to remain with the sow and suckle. Leave the piglets separated for about an hour, after you have seen the piglets suckle (Baxter et al., 2013). Switch the groups around and allow the larger piglets to suckle for an hour as well. Remix the piglets once both groups have had a chance to suckle. Repeat throughout the day for as long as necessary.

### Raised Decks

There are several commercially available raised decks on the market which act as a home for high risk piglets (Baxter et al., 2013). The decks are made of fully slatted material and are heated, have lighting, and a supply of artificial milk, water, and as the piglets' age, creep feed (Baxter et al., 2013). They are mounted above farrowing crates, and provide shelter for smaller (less competitive) piglets from their bigger litter mates, and provide them with a non-competitive access to food and water, in order to give them a better start. Piglets from

different litters can be combined to make a group for the deck. Depending on the manufacturer and size of the deck, they can typically hold between 10-15 piglets.

Piglets are typically moved to decks starting on day 3, after colostrum intake, and kept there until weaning (Baxter et al., 2013). By day 3 or 4, usually staff will have had lots of opportunity to determine which piglets are becoming disadvantaged and falling behind. Additionally, many producers prefer to move piglets when the litter is processed, to avoid handling a second time. The use of raised decks for piglets has been shown to reduce PWM by an average of 2-3%.

### Milk Replacers

Supplementing milk in litters where sows are unable to adequately feed all of their piglets can help save some of the higher-risk piglets (Wolter et al., 2002). There are several commercially available milk replacer products and delivery systems on the market. These systems can be expensive and labour intensive, but they may be worth the investment if you are able to wean larger, more uniform litters. Milk replacers can also be added into standard creep feeders, or milk feeders can be constructed for a relatively low cost (Figure 3). Milk replacers should be used when cross-fostering is not an option. Regardless of the type of feeder being used, keep the milk fresh and the feeders clean to encourage intake. Piglets will quickly be turned off of the milk product if it becomes dirty or spoiled.

### Gruel

Gruel is a liquid food composed of a mixture of warm milk replacer, or water, and feed. Gruel feeding aids in reducing starvation and dehydration in piglets and often uses high quality creep/starter feed. Gruel

feeding is very effective at increasing nutrient intake and keeping piglet's healthy. However, like feeding milk replacers, it is very labour intensive to ensure the gruel is kept fresh and feeders kept clean. Automated transition feeder systems are available to help reduce the labour requirement, but a standard round creep feeder can work just as well. Gruel feeding can also be carried over into the nursery post-weaning, especially for the lower weight pens of piglets.

### Electrolytes

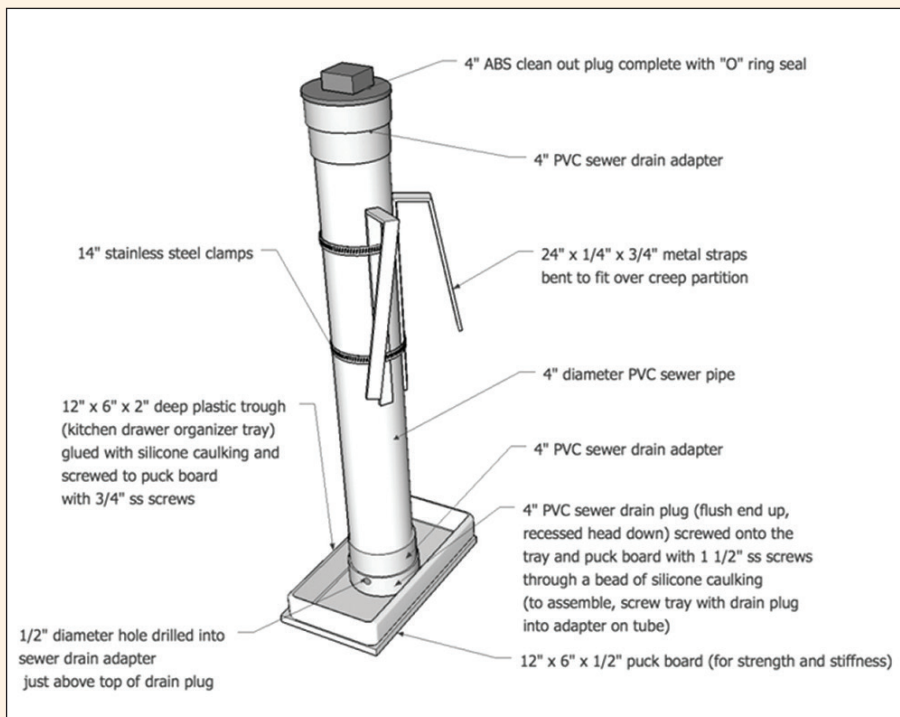
Young animals have a higher body weight percentage of water compared to mature animals (Lewis and Wamnes, 2006). The fluid balance of an animal is regulated through electrolytes, including sodium, chloride, potassium, hydrogen ions, bicarbonate, protein, calcium and magnesium. Fluid balance must be maintained in order to prevent dehydration and other health issues. If a piglet loses 15% of its water weight, mortality rates rapidly rise (Lewis and Wamnes, 2006). You can treat the symptoms of dehydration by providing commercially available electrolytes as a nutrient source in water (particularly in the nursery phase of production). This can be easily achieved by filling a round floor feeder with an electrolyte solution mixed per the manufacturer's instructions.

### Creep Feeding

Creep feeding, offering high quality, highly digestible feed to piglets prior to weaning, is another way to help piglets get off to a good start. Providing creep feed starting one week post-farrowing will help increase weaning weights and piglet survival. Refer to OMAFRA fact sheet 18-003 "Creep Feeding to Improve Piglet Performance" for information.

### Summary





**Figure 3:** Design plans for a homemade milk feeder developed by Dr. Tim Blackwell, OMAFRA

As litter sizes continue to increase, so will the production of small, less competitive piglets. Often these are the smaller birth weight piglets, but with the right care immediately after birth, they can become full value pigs. Remember that piglets have very few energy reserves when born. They need to get dry and suckle shortly after birth in order to thrive. Keep in mind that if a piglet doesn't suckle right away, and appears cold, it needs to be given an energy boost before being put under a heat lamp or on a heat pad. A good dose of colostrum is also very important for each and every piglet, as this is how they receive immunity from their mother. Cross fostering, split suckling, raised decks and nutritional management strategies can all be used as tools to increase the performance of these piglets. Strong neonatal management in the farrowing room can significantly decrease PWM rates, improving animal welfare and increasing the number of full value pigs going to market.

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- Laura Eastwood  
OMAFRA Swine Specialist  
laura.eastwood@ontario.ca  
226-921-5819



## Heating and Ventilation System Monitoring & Maintenance Checklist

Name of person responsible: _____				Winter (before Nov 15)	Summer (before June 1)	Action required (if any)	Date required action completed	Completed by:
Name of barn: _____								
Heating	Heater furnace	Cleaned:		Yes / No	Yes / No			
		Main shut-off valve:	Opened	Yes / No				
			Shut off		Yes / No			
		Variable output valve: (if equipped)	Set to Low	Yes / No				
			Set to High	Yes / No				
		Pilot light:	Lighted	Yes / No				
	Shut off			Yes / No				
	Controller	Checked:	Temperature set-points	Yes / No	Yes / No			
			Settings of fan stages	Yes / No	Yes / No			
			Variable-speed fan bandwidth (not less than 1 °C)	Yes / No	Yes / No			
			Heater offset (1-1.5 °C below room setpoint)	Yes / No				
	Sensors (temperature, humidity if equipped)	Cleaned:		Yes / No	Yes / No			
		Calibrated:	(against standard)	Yes / No	Yes / No			
	Fans	Cleaned:	Blades	Yes / No	Yes / No			
			Shutters	Yes / No	Yes / No			
Discharge cones			Yes / No	Yes / No				
Ventilation		Checked:	Fan rotation (direction of air flow)	Yes / No	Yes / No			
			Belt tension	Yes / No	Yes / No			
			Motors, housing, blades (i.e., damages)	Yes / No	Yes / No			
			Electrical wires, plugs/sockets	Yes / No	Yes / No			
	Inlets	Cleaned:	Not blocked with dirt or frozen shut	Yes / No	Yes / No			
			Checked:	Uniform opening/closing of all inlets	Yes / No	Yes / No		
				Opening size range at least 4 inches	Yes / No	Yes / No		
			Actuators functioning properly	Yes / No	Yes / No			
	Air intake (soffits/eaves screen/sidewall)	Cleaned:	Not blocked with dirt or ice build-up	Yes / No	Yes / No			
		Checked:	Proper slot opening size	Yes / No	Yes / No			
	Air leaks	Checked and sealed (if any):	Doors and external openings	Yes / No				
			Fan housing	Yes / No				
			Feeder/auger lines	Yes / No				
		Fan covers:	Installed	Yes / No				
	Removed			Yes / No				
	Insulation	Checked:	Attic	Yes / No	Yes / No			
			Hot water tank/pipes	Yes / No	Yes / No			
			Walls	Yes / No	Yes / No			
Emergency and alarm system	Checked:	Back-up power operation	Yes / No	Yes / No				
		Emergency thermostat settings	Yes / No	Yes / No				
		Alarm functions	Yes / No	Yes / No				



## Realising Production Potential

One aim of farm management is efficient production. One way to define efficiency is making the best use of inputs in the process of production. In practice, production often relies on a protocol where inputs are set up in advance, such as a ration prepared for a particular growth stage of an animal. Success depends upon past experience with the ration and similar animals, and also the environment they are housed in, in order to obtain a desired output, such as growth rate or carcass composition, coupled with “keeping an eye on things”, and making modifications based on observations of the animals.

A continuing trend in modern animal agriculture is towards the mechanisation of labour-intensive processes, such as feeding. This reduces labour requirements, which may increase the number of animals a stockperson is expected to be responsible for. An ongoing assessment of individual animal's requirements, which is required for the success of traditional management approaches, is becoming less and less feasible. As a result, it may be more difficult to accurately manage feeding, weighing, shipping schedules, etc., which has a cost in production efficiency and therefore profit. The following examples use carcass weight and carcass composition to illustrate the potential for increasing returns by optimal management of production. Both characteristics are influenced by management decisions based on estimates of nutritional requirements, growth rate, animal body weight, etc.

*The value of controlling variation in*

*carcass weight*

A recent analysis of shipping data showed that hogs shipped from a farm during 2018 that were below the lower target carcass weight were valued at \$21 less (on average) than hogs that produced carcasses within the target range. Research from the US has demonstrated that avoiding sort loss by investing in the time and labour to weigh pigs accurately at shipping has a very good return on investment.

*“Genetic Potential” and “Management Potential”*

The genetic potential of a growing animal to produce a carcass of maximum value can only be realised if all possible factors (nutrition, housing, handling, time of marketing etc.) are geared to provide for that potential. The preceding examples illustrate the potential for accurate management to produce results that impact the value obtained from an animal. Attaining a desired carcass weight depends on knowing the live weight at the time of shipping. Methods of automatically determining or predicting the weight of individual animals (auto-sorters, visual imaging, computer monitored weigh-scales, etc. attached to a computer) and recording and reporting that information would improve shipping and marketing success. Carcass composition can be influenced by ration – not just the amount but also the formulation – delivered by computer to the growing pigs based on remotely monitored growth rate compared to a model of pig growth and nutrient utilisation.

Mechanization has increased the number of animals a stockperson

can care for, perhaps at the cost of reduced attention for individual animals. New measurement and control technologies offer the potential to help reverse that tendency, resulting in improvements in resource use, production efficiency, and animal care. The current rapid innovation and uptake of in-barn technologies makes this a very interesting time for agriculture.

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## Resources Available from the London Swine Conference

The London Swine Conference has covered a lot of ground over the years. Did you know that all of the conference proceedings, beginning in 2001, are available at [www.londonswineconference.ca](http://www.londonswineconference.ca)? Besides a record of the ‘hot topics’ over the years, the proceedings are a great industry resource covering an impressive range of practical and technical topics.

There are also links to videos of selected presentations beginning with the 2018 and 2019 conferences, and we plan to continue that for 2020.

London Swine Conference hosted an auxiliary event in December last year - the Group Sow Housing and Management Seminar. Videos of presentations from that meeting are available, and links can be found at the LSC website in the GSHMS section. The videos include a number of producer profiles. There are also a number of other resources in that section that were prepared especially for the seminar (and are described in the previous articles in this newsletter).

## 40 Years Ago in PNV

Pork News and Views marked 45 years of bimonthly publication in 2019. It began as a periodic note from Andy Bunn, OMAF Swine Specialist to agriculture advisors across Ontario to update them on issues and management advice they might offer farmers in their region. It was developed into a newsletter for broader distribution in 1974. The contributions of swine special-

ists and others record a remarkable period of development in the swine industry. One example of a challenge agriculture struggled with 40 years ago is captured in the following excerpt from the **Nov-Dec 1979** issue:

### BUILDING AND EQUIPMENT COSTS

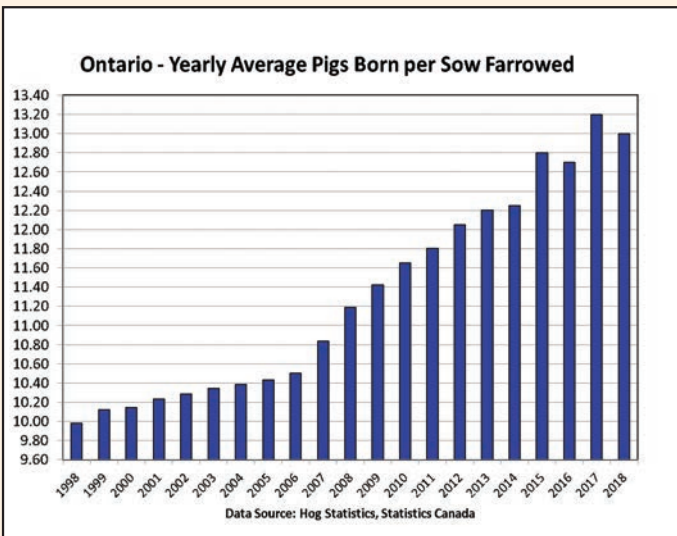
On October 1st we re-costed building and equipment costs. The interest rate we charged at that

time was prime + 1%, or 14% interest. As of November 1st, prime + 1% is 16%, so our present building and equipment costs do not reflect present interest rates. Hopefully our January 1st budget will reflect current interest rates. The way the interest rates have been increasing, it has been impossible to keep current.

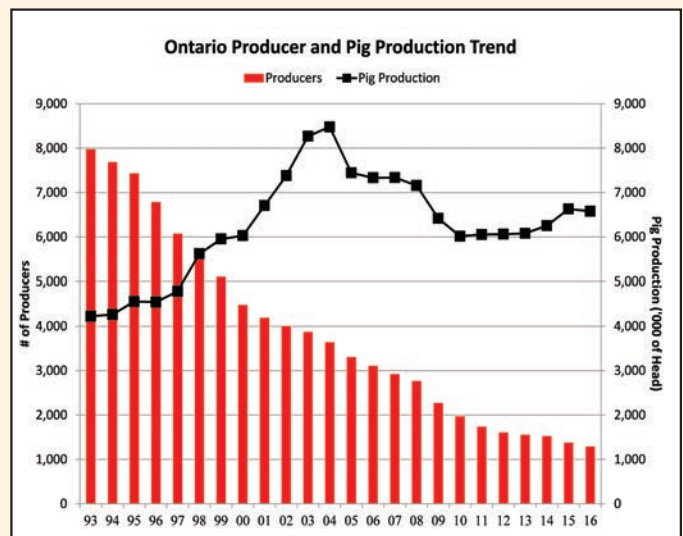
*Andy J. Bunn, Swine Specialist  
O.M.A.F., London, Ontario*

## Trends in Ontario Pork Production

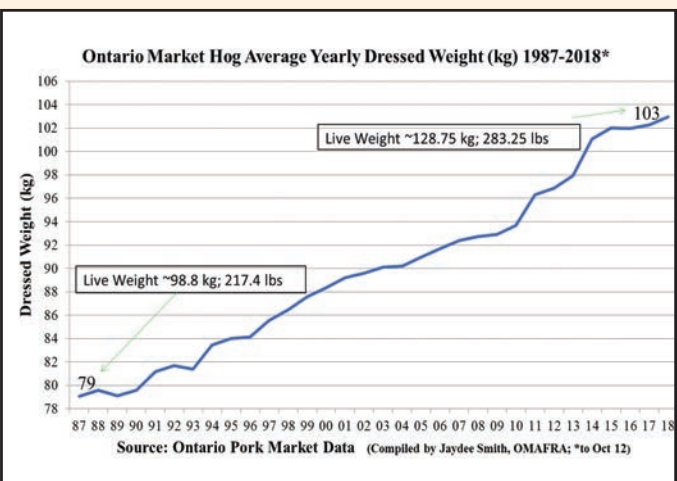
The following charts illustrate some interesting trends in production numbers and hog statistics. There have been many changes in the Ontario pork industry over the past decades, and some impressive improvements in basic production.



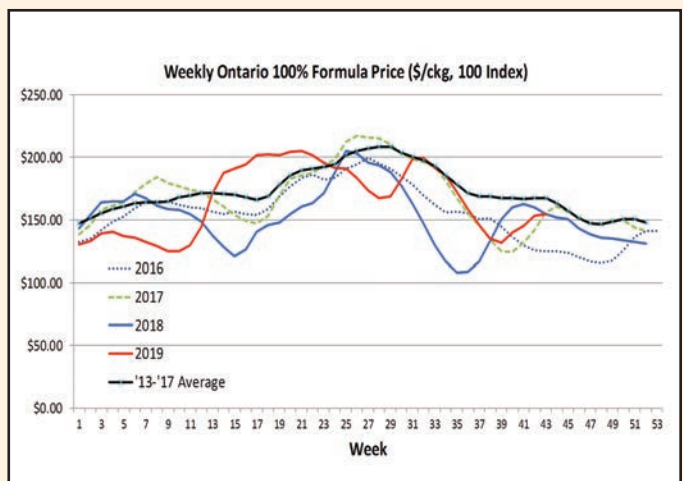
Ontario Sow Productivity (estimates calculated from Statistics Canada data)



Ontario Producer and Pig Production trends (source: Statistics Canada, Ontario Pork)



Ontario Market Hog Weight 1987-2018 (source: Ontario Pork)



Ontario Formula Price (source: Ontario Pork)



Income (\$/pig)	Farrow to Wean	Nursery	Grow-Finish	Farrow to Finish
Market Pig @ 101% of Base Price \$147.96/ckg, 110 index, 103.9 kg plus \$2 premium				\$172.79

Variable Costs (\$/pig)				
Breeding Herd Feed @ 1,100 kg/sow	\$13.85			\$15.20
Nursery Feed @ 33.5 kg/pig		\$17.65		\$18.60
Grower-Finisher Feed @ 283 kg/pig			\$95.14	\$95.14
Net Replacement Cost for Gilts	\$1.98			\$2.17
Health (Vet & Supplies)	\$2.16	\$2.10	\$0.45	\$5.03
Breeding (A.I. & Supplies)	\$1.80			\$1.98
Marketing, Grading, Trucking	\$0.95	\$1.60	\$6.01	\$8.74
Utilities (Hydro, Gas)	\$2.35	\$1.38	\$2.13	\$6.17
Miscellaneous	\$1.00	\$0.10	\$0.20	\$1.40
Repairs & Maintenance	\$1.26	\$0.61	\$2.15	\$4.19
Labour	\$6.27	\$1.85	\$4.15	\$12.98
Operating Loan Interest	\$0.32	\$0.40	\$1.42	\$2.20
<b>Total Variable Costs</b>	<b>\$31.96</b>	<b>\$25.69</b>	<b>\$111.65</b>	<b>\$173.78</b>

Fixed Costs (\$/pig)				
Depreciation	\$13.85	\$17.65	\$95.14	\$128.93
Interest	\$18.10	\$8.04	\$16.52	\$44.85
Taxes & Insurance	\$7.42	\$3.59	\$12.64	\$24.55
<b>Total Fixed Costs</b>	<b>\$39.38</b>	<b>\$29.28</b>	<b>\$124.29</b>	<b>\$198.33</b>

Summary of Costs (\$/pig)				
Feed	\$13.84	\$16.52	\$91.36	\$123.95
Other Variable	\$18.22	\$8.04	\$16.31	\$44.76
Fixed	\$7.42	\$3.59	\$12.64	\$24.55
<b>Total Variable &amp; Fixed Costs</b>	<b>\$39.48</b>	<b>\$28.15</b>	<b>\$120.30</b>	<b>\$193.27</b>

Summary	Farrow to Wean	Feeder Pig	Wean to Finish	Farrow to Finish
Total Cost (\$/pig)	\$39.38	\$70.27	\$155.14	\$198.33
Net Return Farrow to Finish (\$/pig)				-\$25.54
Farrow to Finish Breakeven Base Price (\$/ckg, 100 index) includes 101% Base Price & \$2 Premium				\$170.08
Farrow to Finish Breakeven Base Price (\$/ckg, 100 index) excludes 101% Base Price & \$2 Premium				\$173.54

This is the estimated accumulated cost for a market hog sold during the month of October 2019. The farrow to wean phase estimates the weaned pig cost for May 2019 and the nursery phase estimates the feeder pig cost for July 2019. For further details, refer to the "2019 Budget Notes" posted at <http://www.omafra.gov.on.ca/english/livestock/swine/finmark.html>.

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by  
RACHEL  
TONDA

# REDUCING THE RISK OF MYCOTOXINS IN FEED

**Producers should consider the use of aluminosilicate feed additives as part of their management strategies.**

Managing mycotoxin-contaminated feed ingredients is a constant challenge for livestock producers.

Mycotoxins are produced by both field and storage moulds, and – even when fed at low levels – can have a detrimental effect on livestock and poultry performance.<sup>1</sup>

To make matters worse, grains are frequently contaminated with multiple mycotoxins, and research suggests toxic synergies may exist with certain mycotoxin combinations.<sup>2</sup> Absorption of mycotoxins by the gastrointestinal (GI) tract may result in immunological dysfunction, malabsorption of nutrients and, ultimately, losses in weight and performance.

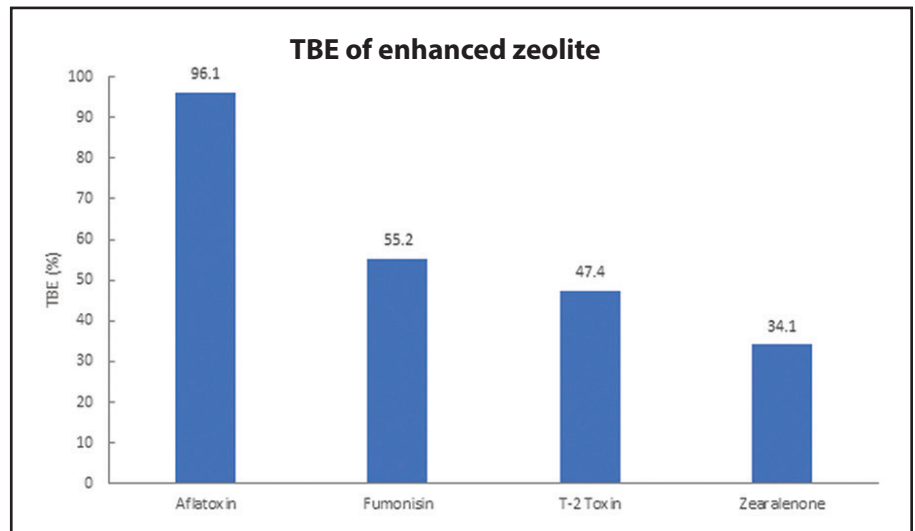
So, when considering mycotoxin management strategies, a key focus area should be on minimizing absorption of toxins by the intestine.

One management strategy used for many years is the idea of decontaminating the feed by sequestering the mycotoxin. Sequestration, or neutralization, can reduce the bioavailability of mycotoxins, thereby preventing the toxins from interacting and being absorbed by the intestine.<sup>3,4</sup> This practice of neutralization is often completed by incorporating adsorbent feed additives – like hydrated sodium calcium aluminosilicates (HSCAS) – into dietary rations.

## The basics of silicates, aluminosilicates and HSCAS

Characterized by diverse chemical and physical properties, silicates represent approximately 25 per cent of all known minerals.<sup>5</sup>

Silicates are further divided into seven major subclasses based on their structural configuration, two of which are phyllosilicates and tectosilicates. Phyllosilicates – like montmorillonite, bentonite, illite and sepiolite – have a layer cake, or sheet-like, structure. Tectosilicates – like zeolite – are characterized by hav-



**Figure 1. *In vitro* total binding efficiency (TBE) of enhanced zeolite applied at an equivalent of 2 lbs./ton towards aflatoxin, fumonisin, T-2 toxin and zearalenone. For all toxins, 100 per cent = 3 ppm.**

ing an infinite 3D crystal structure framework. Silicates from these two subclasses are often used as anticaking agents in livestock and poultry feed.

Aluminosilicates are silicate minerals where a proportion of the silicon ions are replaced by aluminum. HSCAS represent a structurally diverse group of aluminosilicate minerals. Researchers have studied many of these minerals for their ability to sequester mycotoxins.<sup>3,4,6</sup>

Although generally recognized as efficient binders of aflatoxins, aluminosilicates are typically not considered efficient binders of *Fusarium* spp. toxins.<sup>6</sup> However, not all aluminosilicates are created equal. Structural differences, absorptive capacity, mineral source and inclusion of additional ingredients can all affect the toxin-binding efficiency of an HSCAS mineral.

## Evaluating binding efficiency of aluminosilicates

While nothing beats *in vivo* evaluation, *in vitro* testing provides quick, reproducible results to evaluate the

binding efficiency of different aluminosilicates.

However, it's important to evaluate the binding efficiency under conditions that mimic the digestive process. Specifically, binding efficiency studies should evaluate both the ability of an adsorbent to grab toxins under acidic pH conditions and hold onto the toxins under neutral pH conditions.

Measuring only absorption does not provide adequate information to evaluate whether an aluminosilicate will successfully sequester a mycotoxin throughout the GI tract.

## Total binding efficiency of enhanced zeolite

Recently, researchers used a two-phase *in vitro* total binding efficiency (TBE) model to evaluate the binding efficiency of an enhanced zeolite mineral flow agent.

The scientists dosed enhanced zeolite at a rate equivalent to 2 pounds (0.9 kilograms) of product per ton of feed. Researchers tested Aflatoxin B1, fumonisin B1, T-2 toxin and zearalenone at a concentration of 3 ppm.

The scientists determined the TBE of enhanced zeolite for each toxin by comparing per cent toxin absorption under acidic buffer conditions (pH 4) with per cent toxin desorption under neutral buffer conditions (pH 6.5). Researchers conducted analyses in triplicate, using average adsorption and desorption results to calculate TBE.<sup>7</sup> (See Figure 1 on page 50.)

### TBE of enhanced zeolite

As expected, enhanced zeolite showed extremely efficient binding for aflatoxin. Enhanced zeolite TBE was 55.2 per cent for fumonisin, 47.4 per cent for T-2 toxin and 34.1 per cent of zearalenone.

Overall, *in vitro* TBE of enhanced zeolite was broad-spectrum, showing binding for aflatoxins as well as three of the four *Fusarium* toxins evaluated in the study. Additionally, the binding efficiency of enhanced zeolite was strong even at a low inclusion level.

### Conclusions

The use of aluminosilicate feed additives can help producers manage mycotoxin-contaminated grains to improve the health and performance of livestock and poultry.

However, not all aluminosilicates have equal efficacy. Addressing mycotoxins depends on providing an aluminosilicate that has the structural makeup that enables targeting of toxins, and the ability to effectively sequester and usher targeted toxins through the entire gastrointestinal system to be excreted. Producers should consult with their nutritionists and feed suppliers to determine the best options for managing the health of their herds. **BP**

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National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

**When considering mycotoxin management strategies, a key focus area should be on minimizing absorption of toxins by the intestine.**

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*Rachel Tonda is an associate product manager for antioxidants and feed quality products at Kemin Animal Nutrition and Health.*

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**Better pork**





by  
**MOE AGOSTINO  
& ABHINESH GOPAL**

# SHIFTS IN 2020 GLOBAL PORK PRODUCTION

**As the industry struggles with ASF, production is forecast to fall to the lowest level since 2007.**

Martin Schwalbe photo



**Global pork production in 2020 will fall by 10.3 per cent year over year (Y/Y), the USDA's October update forecast.**

Pork producers across the world are inundated with discussions of African swine fever (ASF) as the industry has worried about the disease since the latest epidemic began in August 2018 in China.

Since the start of the outbreak, ASF has reduced China's swine herd by half. The disease has also hit many of the major pork-producing nations in Eurasia.

Global pork production in 2020 will fall by 10.3 per cent year over year (Y/Y), dropping to 95.2 million metric tons, the USDA's October update forecast. This figure would equate to a drop of 15.7 per cent from 2018's production level and be the lowest since 2007.

The global decline of 17.715 million metric tons (MMT) of pork

from 2018's level is due to a drop of 19.29 MMT of production in China. That country's 2020 pork production will fall by 25 per cent Y/Y to 34.8 MMT, the USDA projected.

The effects of ASF are also evident in other countries; both Vietnam and the Philippines will also likely produce less pork in 2020.

In contrast, American farmers will produce a record amount of pork in 2020, the USDA predicted. The forecast American production of 13 MMT equates to approximately 67 per cent of the expected decline in China. Total U.S. pork exports will likely be up by 11 per cent Y/Y to 3.3 MMT.

The European Union (E.U.) will likely hold its position as the top global pork exporter, however, as

2020 E.U. pork exports will be up by 13 per cent Y/Y to 3.9 MMT, the USDA predicted.

Because of its lower domestic pork production, China will import more of this meat. The country is forecast to import 2.6 MMT of pork this year and 3.5 MMT next year.

Although U.S. pork faces tariffs of up to 72.5 per cent, the recent increase in Chinese pig prices to U.S. \$250/cwt equivalent means some American products are still competitive. The Chinese prices are approximately five times higher than American prices.

More importantly, current product shortages suggest that China may allow for the import of significant volumes of pork without the retaliatory tariffs. In September, the country's





**China's pork consumption will fall by over 20 per cent in 2020, the USDA predicted.**

total pork purchases jumped more than 70 per cent Y/Y.

Despite these positive signals for Chinese import demand, the country's large-scale hog farms that survived the ASF outbreak are expanding their herds, which should drive a recovery in sow numbers by as early as 2020. This restocking will shift Chinese hog production from small-scale backyard farming operations, which enabled the rapid spread of ASF, to larger-scale production.

Going forward, market analysts expect Chinese consumer demand for pork will also shift. The country's pork consumption will fall by over 20 per cent in 2020, the USDA predicted. The high retail pork prices have shocked consumers so much that demand for the meat may never be the same as it was before the ASF outbreak. Exorbitant prices caused Chinese restaurants to reduce their pork menus, causing domestic consumption to drop. Global pork prices are set to remain elevated in 2020.

Other meat and aqua-based protein suppliers also seem to have responded faster to the pork supply shortfall than the pork sector did. Major shifts are underway in Chinese consumers' demand as they turn to alternative protein sources like poultry, fish, eggs, lamb and beef.

Chinese farmers are also shifting from pork to chicken and duck production. The country's chicken production will increase to about 15.8 MMT in 2020, which would be higher by 14.5 per cent Y/Y, the USDA forecast. Chinese chicken consumption is also forecast to increase to 16.1 MMT in 2020, which is an increase of 15 per cent Y/Y because of changing consumption patterns.

Decreased global pork production because of ASF is expected to cause total global production of beef, pork and poultry to decline by 1.5 per cent Y/Y in 2019 and by another 2.4 per cent in 2020. As a result, global meat exports are expected to rise by 6.9 per cent in 2019 and by another 6.1 per cent in 2020. **BP**

*Maurizio "Moe" Agostino is chief commodity strategist with Farms.com Risk Management and Abhinesh Gopal is head of commodity research. Risk Management is a Farms.com company. Visit [RiskManagement.Farms.com](http://RiskManagement.Farms.com) for more information.*

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by  
**RICHARD  
SMELSKI**

# THE IMPORTANCE OF HAVING FUN AT WORK

**A positive attitude and a good dose of humour are beneficial for your well-being and your farm.**

If you are not having fun in the workplace, you are not working at the right place.

Numerous studies have shown the importance of having fun at work.

Take this true story. A well-respected manager was annoyed at an employee who was consistently late for work. So, one morning, the manager asked the staff member, “Do you know what time we start around here?”

“How am I supposed to know?” the employee asked. “Everyone is at work before I get here.”

Humour saved that day.

“Laughter relieves stress and boredom, (and) boosts engagement and well-being,” a 2014 Harvard Business Review article said. Humour also spurs creativity and collaboration, the article added.

“Humour is contagious and laughter is infectious. Both are good for your health,” said Dr. William F. Fry, a professor of psychology at Stanford University. Laughter and humour are also good for everyone and everything around you, I’d add.

Humour is an excellent way to break through tensions. It is the key component of creative thinking, helping to prevent you from falling into the one-answer way of thinking.

“Humour creates an upbeat atmosphere that encourages interaction, brainstorming ... and a feeling that there are few risks to thinking outside the box. All that leads to greater productivity,” a 2013 Forbes article said. “Humour boosts morale and retention while reducing turnover because employees look forward to coming to work.”

Why wouldn’t you want to work in an enjoyable workplace since you spend a big portion of your life there?

“If you can learn the humour of people and really control it, you are also in control of nearly everything else,” said Edward Hall, an American



**Since we spend so much of our days working, it’s important to have fun on the job.**

anthropologist.

For example, Lady Astor, the first female member of parliament in England, told Winston Churchill, “If you were my husband, I would put poison in your coffee.”

“Nancy, if I were your husband, I would drink it,” Churchill said. This quote is a classic example of controlling a situation through humour.

Laughter is a powerful medicine, several studies have shown.

Laughter not only bolsters the immune system, but it also leads people to take better care of themselves and other people around them. When you laugh, your body releases oxytocin, which helps with social bonding, and dopamine, which helps with information processing, a 2017 Stanford Business article said.

Laughter lowers the blood pressure. Laughter stimulates endorphins, which are your natural painkillers, and boosts your immune system.

The benefits extend beyond humans to help our livestock, too. Dr. Paul Hemsworth, a professor of animal welfare and behaviour at the

University of Melbourne, has shown that our attitude and well-being is passed onto the productivity of the livestock with which we work. So, if we lighten up, our animals should do better as well.

Poor attitudes also have far-reaching effects. Anger and stress, for example, elevate the hormones adrenaline and cortisol, which are known to suppress the immune system.

Hostile people who bang on elevator buttons, yell at cars that cut in front of them and count items in express lines are almost seven times more likely to die from disease than those individuals who aren’t hostile, a Duke University study showed.

So, find the humour in your workplace.

The best part is that fun at work doesn’t cost any money and it doesn’t need to be injected or added to the feed. **BP**

*Richard Smelski has over 35 years of agribusiness experience and farms in the Shakespear, Ont. area.*

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