Better pork

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The Business of Canadian Pork Production

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DEAR READER: LETTERS FROM A FAMILY FARM

PLANNING FOR SUCCESS

Early in the year, I like to reflect on the previous season and how I can best set myself up for the time ahead.

This winter, for example, I pushed myself to act on a long-standing goal: increasing my understanding of farm financial statements. I'm taking the **Agri-food Management Institute's** Advanced Farm Management program to improve my skills in this area and I have enjoyed connecting with, and learning from, other producers in the course.

I'm hopeful this training will enable me to have more in-depth conversations with my family's accountant and banker as we finalize our year end and set our plans for the upcoming season.

As an industry, too, we can think back on 2018 as we shift onwards and upwards. (After all, as farmers, I think we're eternal optimists. How often do you hear the refrain "Next year will be better"?)

Last year, one of the big news headlines was the outbreak of African swine fever in China. Many other countries were hit with the disease, too.

More recently, Alberta reported its first case of porcine epidemic diarrhea virus.

Amid these disease challenges, North American industry reps continue to stress the importance of solid biosecurity practices to keep our herds safe.

This month, **Swine Health Ontario** provides a timely update on how industry stakeholders are preparing to deal with diseases that may strike in the future. And, in her Beyond the Barn article, staff writer **Lauren Arva** reminds us of the importance of clear biosecurity policies.

In 2018, we also experienced volatility in the markets because of NAFTA renegotiations and the U.S. trade wars with China and Mexico. This month, department writers **Moe Agostino** and **Abhinesh Gopal** review last year's American pork exports and outline the opportunities heading into 2019.

Finally, Dec. 1 brought changes in regulations on the use of medically important antimicrobials. In his short article on page 4, writer **Geoff Geddes** recaps the renewed importance of vet-client-patient-relationships. In her feature beginning on page 6, staff writer **Kate Ayers** delves into the best practices we can follow to ensure good piglet gut health as we adjust to these rules.

I hope this edition of *Better Pork* provides you with helpful insights as you pivot into planning for the new season.

Best wishes for a healthy, happy and prosperous 2019. I know it will be a good one! **BP**

Andrea

VIR2AL photo

New technology helps to improve the health and survivability of piglets. See "Smart technology may leave you dumbstruck" on page 24.

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PROPERLY STORING DRUGS PAYS OFF

Farmers who store their veterinary medications carefully can save both time and money.

"Vaccines … need to be kept at a refrigerated temperature," **Dr. Mark Jacobson**, a swine veterinarian with **Warman Veterinary Services** in Saskatoon, Sask., told *Better Pork*.

These drugs have both an adjuvant and an antigen. An adjuvant enhances the body's immune response to an antigen, which is a foreign substance that induces an immune response.

Freezing destroys vaccines – particularly the circovirus vaccines – by causing separation of the two components, Jacobson said.

So, farmers "need to follow the storage directions on the bottle."

Producers should also closely maintain and monitor their storage fridges. Accurate thermometers in these appliances will help farmers ensure optimal conditions.

As overstocking can limit air circulation and cause freezing, producers should avoid having too many items in their fridges. Some veterinarians recommend only stocking fridges to 50 per cent capacity, a November *Farmscape* article said.

Producers should also avoid placing drugs near the condenser or cooling units, Jacobson added.

Overall, "hog producers use good management practices but sometimes an outside observer like a vet is able to communicate potential risks to a producer which can make a difference," he said. **BP**

FINDING A PRESCRIPTION FOR SUCCESS

Producers have long known the value of a close link with their veterinarians. These days, though, that value is greater than ever before.

As of Dec. 1, 2018, the federal government moved all medically important antimicrobials previously available over the counter for veterinary use to prescription status.

"Vet-client-patient-relationships (VCPRs) are the foundation of veterinary medicine and have always been a critical part of managing the health of animals," said **Dr. Kurt Preugschas** of **Innovative Veterinary Services** in Red Deer, Alta.

"For producers who have some relationship with their veterinarians and valid VCPRs, but had been making some antibiotic decisions without their vets and have been purchasing these over-the-counter antibiotics in the past, there will be moderate impacts," Preugschas said.

Now, farmers must purchase all medically important antimicrobials – including injectable, water-soluble, and medicated feed additives – from veterinarians or pharmacies.

So if you've let that link with your vet slide recently, you might resolve to strengthen it in 2019. **BP**

RichLegg/iStock/Getty Images Plus photo

TIPS FOR KEEPING DISEASE AT BAY

Pork producers can help maintain biosecurity by establishing clear policies, an October article by **Alberta Pork** said.

Notably, between Alberta Pork's 2011-12 and 2017 biosecurity assessments, the number of barns with both downtime and decontamination policies in place dropped from roughly 80 per cent to under 60 per cent.

As a result, ensuring producers understand the importance of biosecurity measures is crucial, **Javier Bahamon**, quality assurance and production manager at Alberta Pork, told *Better Pork*.

"What we are trying to (show) them is an awareness and a policy they should have in their barn(s) in order to cover anything that can happen, or any viruses or bacteria that can come to their barns," he said.

Producers fared better in terms of improvements to clothing policies over time, however.

In 2011-12, almost 58 per cent of barns had policies for staff clothing and almost 70 per cent had policies for visitor clothing. In 2017, in contrast, over 70 per cent of premises had policies for both staff and visitor clothing.

Having a Danish entry is an effective way to ensure both staff and visitors wear appropriate clothing prior to entering the restricted-access zone. **BP**

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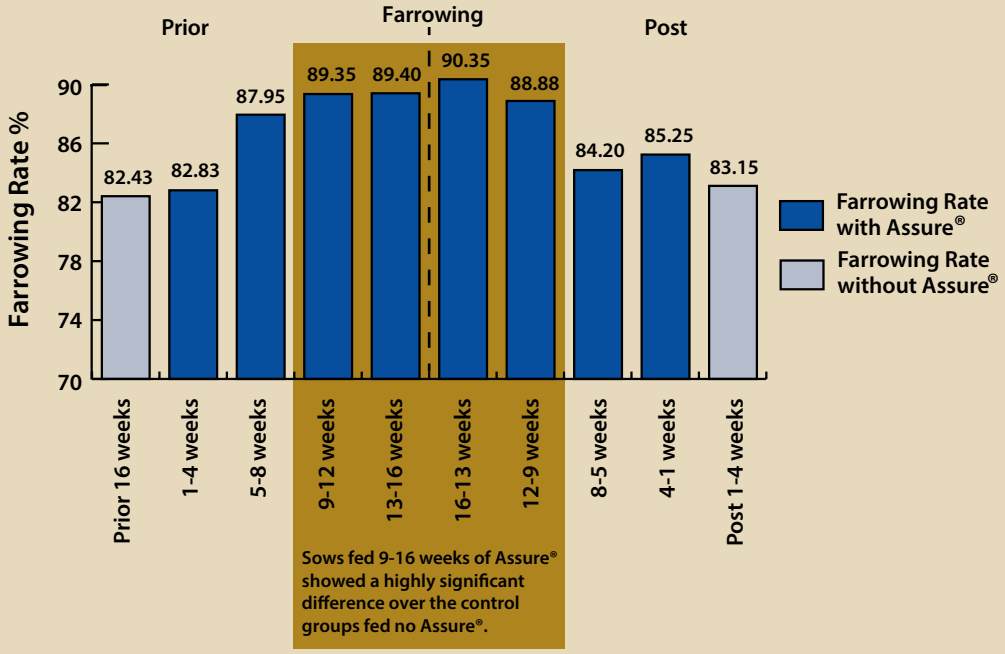

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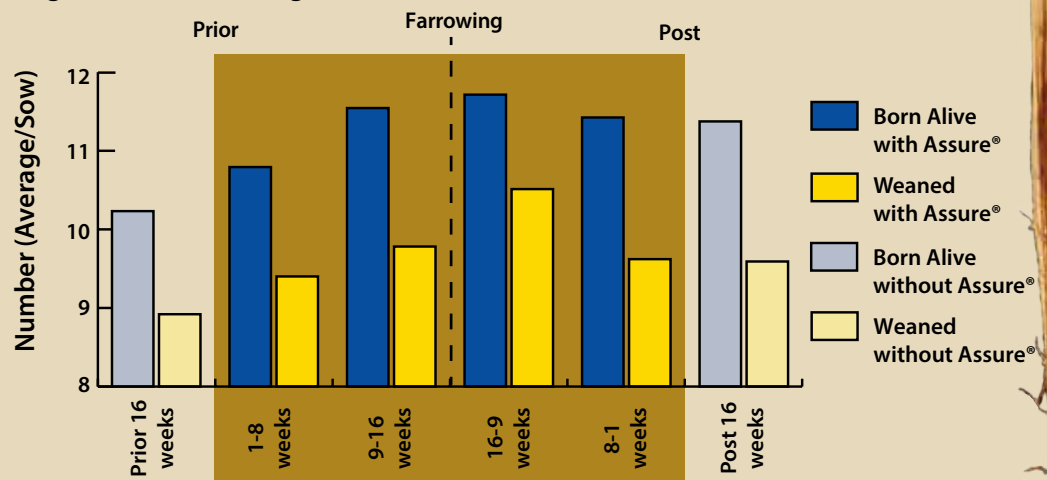

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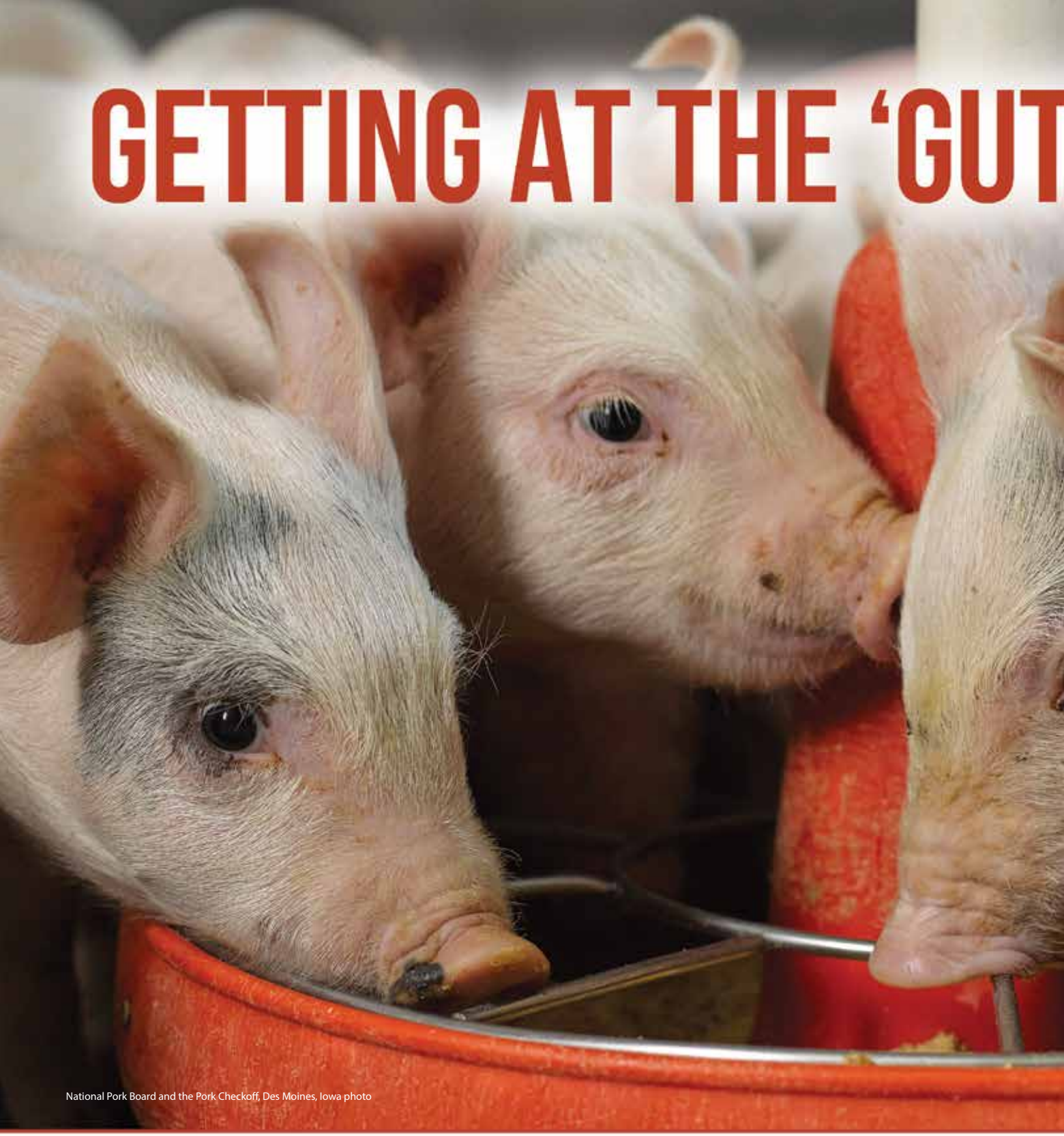

National Pork Board and the Pork Checkoff, Des Moines, Iowa photo

A strong swine herd begins with good piglet gut health, says Dr. Ben Willing, an associate professor in the agricultural, life and environmental sciences department at the University of Alberta.

Indeed, "intestinal health is the foundation for systemic health in all animals," he says.

"The impact of an imbalanced intestinal microbial population or reduced intestinal barrier function can result in systemic inflammation, changes in whole body metabolism and overall poor growth and disease susceptibility," he explains to *Better Pork*.

Piglets are vulnerable during their early stages of development, as pathogens and stress can compromise their well-being. However, producers can create barn environments and feed protocols that minimize the challenges piglets face.

This news story reviews the functions that the gut plays in maintaining overall pig health. *Better Pork* spoke with industry experts to learn how hog producers can protect piglet gut health.

'S' OF PIGLET HEALTH

Producers can review biosecurity, nutrition and animal husbandry practices to get their pigs off to a good start.

by KATE AYERS

Gut function

The gastrointestinal (GI) tract is a series of organs that play important roles in the general health of animals. The main organs are the tongue, esophagus, gut, small intestine, cecum and large intestine.

Other associated organs that are critical for GI function are the gall bladder and pancreas. Indeed, the GI tract is "the largest surface area where the pig is exposed to the outside world," says Chad Stahl, the chair of animal and avian sciences at the University of Maryland.

The gut's role extends beyond simply digesting and absorbing nutrients from food.

The GI tract, including the gut, also serves as an immune system powerhouse, protecting animals from a wide array of pathogens. The tract supports a dynamic environment where fermentation, enzyme secretion and pH conditions are in constant flux.

The tract is home to the largest number of immune cells in the animal's body, Stahl says.

Dr. Greg Wideman, a veterinarian at South West

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

A piglet's physiology and environment can largely affect GI functionality.

Ontario Veterinary Services in Stratford, Ont., agrees that the gut is critical for proper immune function.

"Many of the bacteria, viruses and parasites that the pig will encounter in its life will" pass through the gut, he says. Gut microbes deter pathogenic bacteria, toxins and other compounds that could harm the animal.

A piglet's physiology and environment can largely affect GI functionality. Such factors include digestion and absorption, GI tract microbiota, GI tract mucosa, diet, welfare and immune status, says a December 2017 article by Pietro Celi and others in the journal *Animal Feed Science and Technology*.

Microbiota and mucosa in the GI tract are essential to keep piglets healthy. Gut microbiota, which are comprised of trillions of cells, are important for nutrition and immunity. An organism's body hosts these cells shortly after birth.

Intestinal mucosal cells create physical and chemical barriers between the potentially hostile environment in the lumen of the intestine and within the pig. These cells absorb nutrients, secrete waste and help trigger immune responses.

"Anything we can do to maintain the barrier function of that mucosa is going to improve piglet gut health and feed efficiency," says Stahl.

"Improving the integrity of the intestinal mucosa – not just by reducing pathogens and toxins, but also by feeding the mucosa appropriately and reducing stressors that we know can challenge the gut health of a piglet" – is important.

A properly functioning GI tract ensures that piglets can grow and fight off diseases. Gut health is particularly important for newly

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Producers who limit the number of health and environmental challenges that young pigs encounter are more likely to maintain a healthy herd.

weaned piglets, as the tract undergoes structural and functional changes during the post-weaning transition to a nursery barn.

Indeed, the stress of weaning can cause the intestinal villi to shorten, reducing the piglets' absorption capacity and feed efficiency, says a 2013 review paper by Joy Campbell and others in the *Journal of Animal Science and Biotechnology*. Villi are small finger-like projections that increase the surface area of the small intestine. They absorb nutrients.

External stressors

Producers who limit the number of health and environmental challenges that young pigs encounter are more likely to maintain a healthy herd.

Stress is the main external factor that can jeopardize piglet gut health, says Willing.

Weaning, for example, can compromise the piglet's intestinal environment. Because of emotional and dietary stresses, unhealthy microbiota can inhabit the gut.

The invasion of pathogenic bacteria and viruses can also pose problems for growing piglets.

"Some of the most common bacterial pathogens we see are the E. coli-caused diarrheas," Stahl says.

Salmonellas and clostridial strains can also create issues. "And there are many viruses that can also cause intestinal problems," he adds. The porcine reproductive and respiratory syndrome (PRRS) virus, for example, can compromise piglet gut health and development.

Contaminated feed, such as corn with mycotoxin, can lead to significant gut issues. Many producers in southwestern and western Ontario found high mycotoxin levels in their 2018-19 corn because of a wet and prolonged harvest season.

This toxin can "modulate the immunity of the animal and make the animal more susceptible to viral or

bacterial infections," says Martin Lessard, a research scientist with Agriculture and Agri-Food Canada at the Sherbrooke Research and Development Centre in Quebec.

In addition, hog producers who have nursery piglets at various weaning ages and weights may find health management tougher than the farmers who have piglets that are developing more uniformly.


Martin Lessard

In nurseries with scattered piglet weights, "it is more difficult to get the right temperature and feed in front of pigs," Wideman says.

Lessard agrees.

"Animals that have a low birth weight could be more susceptible to infection after weaning," he adds.

Optimum barn conditions

Although piglets are exposed to many stressors in the first few weeks of life, producers can follow a process in their barns to set the animals up for success.

Adhering to strict biosecurity practices can help pigs develop to their full potential, Stahl says.

Biosecurity is particularly important "around pig transport and entrance to the farm." It prevents the spread of deadly diseases, Wideman adds.

"If we fail there, then we could introduce a virus or bacteria so virulent that the pigs just cannot survive," he says.

Farrowing and nursery conditions are also vital.

As soon as a piglet is born, it "has to get dry, fast," Wideman says.

Ambient temperature, can also put gut health at risk. For example, "the chilling of piglets in a farrowing crate or nursery can prevent those piglets from developing properly," he says.

Keeping piglets warm is particularly critical in the winter.

Producers can also adjust their

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

"The colostrum and the milk contain several functional molecules including antimicrobial peptides, antibodies, and oligosaccharides, which contribute to a healthy digestive tract," Martin Lessard says.

production windows to accommodate a later weaning age, which could help piglets make healthier transitions to nursery barns.

"One of the easiest things that can be done, and has the biggest impact, is to shift to an older weaning age," Stahl says. Piglets should not be weaned prior to 21 days of age, he suggests.

"When piglets are weaned early, the stress that occurs around weaning is very damaging to the gut. … If you wean piglets at a younger age, the animal's GI tract is not yet fully developed. So, weaning animals early can cause much greater damage, and that damage lasts for a much longer time."

Piglets that are healthy post-weaning will perform better as adult pigs.

"One of the biggest determinants of how well a pig does ... is whether or not it had a healthy gut at the time of weaning," Wideman says.

The best conditions "enable a piglet to eat and digest solid food, which is important."

Nailing down nutrition

Piglets that receive the nutrients they require will be better prepared to fight off disease and infection.

And good nutrition begins within piglets' first few hours of life. The animals' timely consumption of colostrum plays an integral role in ensuring well-being and immunity development.

"Piglets develop their immune systems during the lactation period," says Lessard.

"The colostrum and the milk contain several functional molecules including antimicrobial peptides, antibodies, and oligosaccharides, which contribute to a healthy digestive tract. Both colostrum and milk also contain a lot of growth factors and nutrients that are important for the maturation and integrity of intestinal mucosa development," he explains.

Mothers transfer antibodies and several other immune factors to piglets through the colostrum and milk. This passive immunity contributes to the establishment of beneficial microbiota in piglets' guts, which will foster healthy GI tracts, he adds.

The combination of these functional molecules promotes the development of healthy intestines and contrib-

utes to robust immune systems.

Introducing creep feed during the sow's lactation period can help ensure that piglets remain healthy throughout and following weaning.

Farmers could try creep feeding piglets one week before and two weeks after weaning. Producers must provide "nutrients and feed supplements that will contribute to the development of the gut microbiota and immune system of the piglet" during this time frame, Lessard says.

"The maturation of the intestinal immunity takes at least six to seven weeks."

So, the nutrition program from birth to the time after weaning, around six weeks of age, is particularly important for the maintenance of piglet GI tract health.

If they desire, producers can use bovine colostrum as a feed supplement for piglets.

"It is a good source of protein, and the milk's molecules support the development of microbiota to maintain good bacteria and control the bad bacteria," Lessard adds.

The colostrum also provides "peptides and other nutrients that will be useful for maintaining the integrity of the mucosa," he says.

"Piglets fed colostrum may still get sick, but they can recover faster."

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

Some farmers are using nutraceuticals and functional foods as alternatives to antibiotics in their feed formulations for both piglets and sows.

New rules, same diligence

In December, Health Canada implemented new rules governing antimicrobials in livestock production. Canadian farmers require a prescription from a veterinarian to purchase items on the Prescription Drug List,

including acetaminophen and penicillin.

Some farmers are using nutraceuticals and functional foods as alternatives to antibiotics in their feed formulations for both piglets and sows.

"The sow's health is a critical component in supporting piglet health," says Willing.

"Feeding sows diets with fermentable fibre has been shown to improve the quality of milk, including the amount of antibodies they transfer to their piglets. This also allows sows to transfer healthier microbial populations to their piglets."

Wideman agrees that a healthy piglet starts with a healthy sow.

"In the whole world of nutraceuticals and natural products, the one that I feel most confident about is acidified water for sows that have suckling piglets," Wideman says.

"We'll learn more about nutraceuticals and natural products as we go along."

Farmers must choose wisely, as many products which are said to promote pig gut health have recently flooded the feed market.

"There has been a tremendous increase in a broad range of products that fall under the nutraceutical umbrella," says Stahl.

Dr. Ben Willing

"Some are direct nutrients that help feed the intestinal cells directly. Others are designed to help improve intestinal cell function … or work to select against bad bacteria and improve the number of good bacteria in the gut."

Farmers should speak with their veterinarians to choose products that will work best for their operations and herd health goals.

Producers can share production strategies as they become accustomed to these regulatory changes.

For example, farmers can participate in the Ontario Pork Industry Council's antimicrobial use benchmarking project, Wideman adds.

This project "puts farmers in the same room with one another" where they can discuss antibiotic use, he says. "They can learn from each other and review practices for disease control using fewer antibiotics."

Researchers also continue to study ways to promote a healthy microbiome without using antimicrobials.

"We are looking to figure out what beneficial and protective microbes are missing from our pig populations and finding ways to reintroduce them while keeping pathogens out," Willing says.

Indeed, maintaining piglet gut health requires a coordinated effort by a producer's advisory team.

"The vet and nutritionist need to work together because sickness is often a combination of infection, environment and overall management – especially nutrition management – and everyone needs to work together to figure it out," Wideman says.

Promoting healthy piglet gut development is vital to ensure overall hog herd health.

Although piglets sometimes face challenges that can make them more susceptible to disease, producers and industry professionals have strategies at their disposal to help piglets develop into resilient and productive hogs. **BP**

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

"In the whole world of nutraceuticals and natural products, the one that I feel (most) confident about is (acidified) water for sows that have suckling piglets," Dr. Greg Wideman says.

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IMPROVING SO

Industry experts recommend ways to maximize sow lifespans.

by LAUREN ARVA

OW LONGEVITY

As the industry moves toward group housing for sows, farmers and other industry reps continue their quest to improve sow productivity.

"In the late '80s, 35 pigs weaned per mated sow per year was like going to the moon in 1960. Mostly a dream," says Andrew Fenton, business development manager at DNA Genetics in Ontario. "As the industry moves closer to the (National Farm Animal Care Council's July 1, 2024) deadline of mandated group housing for gestating sows, it appears these new systems are also presenting challenges for sow longevity."


Andrew Fenton

Producers face challenges because of conflict between animals, floors that cause sow feet and leg injuries, and a lack of knowledge about the management of new systems, Fenton says.

"Health, genetics, nutrition, and management will have to continue to improve sow longevity, working together as they always have to meet what producers need but, more and more, what consumers expect," he adds.

Recognizing the benefits

Culling a sow early leads to one of two undesirable situations, says Dr. Robert Friendship, professor in the department of population medicine at the University of Guelph.

"You have an empty spot in the farrowing room where a sow should be farrowing, or you've got a sow that should have been culled a year ago who will wean five to six pigs at best, but she's still there," he says. "The young animal that should have replaced her didn't last.

"I think the biggest cost of not having good sow longevity is a smaller litter size. There are too many gilts, or there are too many old sows that haven't been replaced."

Producers can boost the overall efficiency of their operations if they ensure good sow longevity.

For every parity a producer keeps a sow, she can produce between US$100 (C$134.90) and US$150 (C$202.36) extra profit, says Dr. Kenneth J. Stalder, a professor of swine genetics at Iowa State University.

"Think of each sow as your own little farrowing machine. The more pigs you get out of that female, the more you can distribute her fixed cost over more pigs."

An increase in sow longevity also reduces the overall labour requirements in a farming operation, says Brady McNeil, a member of the technical and multiplication team at DNA Genetics, headquartered in Columbus, Neb.

"The most labour-intensive animals in the system are gilts," he explains. "They require the most vaccinations, take the longest to breed and can be the hardest when moving from one location to another."

Maximizing sow longevity helps producers enhance the quality of the pigs they ship. Sows pass on antibodies to their piglets and typically produce heavier litters than gilts, McNeil says.

"In turn, those offspring can perform at a higher level in finishing," he says.

Costs can fall, too. "Maximizing sow longevity reduces the farm's replacement rate," he says, so "the farm needs to produce or purchase fewer gilts."

Changes over time

Strategies for ensuring sow longevity have shifted over time and mostly for the better, industry experts say.

"I think there's probably a better awareness of how costly it is to replace sows," says Friendship. "I remember the days when people would pull gilts out of their finisher barns, so replacing a sow was relatively easy to do.

"If producers needed more sows, they would hold back some gilts from going to market and start bringing them in to the breeding herd. I think, in the farmer's view, that was not costing them a lot."

Friendship points to improvements in feed programs that extend longevity.

The ability for the sow to have free choice feed while she's lactating – and eating feed that is more suited to a highly producing sow – allows her to milk better and maintain body condition, come out of the farrowing room in good shape, be ready to breed again and fit right back in to the farrowing group, he says. "Credit goes to the nutritionists, the feed mills and the makers of feeders for farrowing rooms."

Producers also devote more attention now than in the past to sow lifetime productivity, says Stalder.

"More and more people are looking at how much

RGtimeline/ iStock/Getty Images Plus photo

Gilt development can greatly influence an animal's future reproductive success, says Brady McNeil.

they have invested in the gilt and development," he says. More producers are looking at their herds' lifetime productivity traits than at just the number of pigs per sow per year.

Over the last 30 years, producers have gained a better understanding of managing gilts before they enter the breeding herd, says Fenton.

Kenneth J. Stalder

The industry did not discuss "gilt development units and gilt development diets … in the late 1980s and '90s," he says. "Mature gilts were sold at 90 kilograms (198 pounds) and typically bred on first heat. Sows just didn't last in the herd under this kind of management."

What can producers do?

Gilt development can greatly influence an animal's future reproductive success, says McNeil.

The sows should be acclimatized before they enter the breeding herd, he says. This process includes a proper vaccination program which exposes the gilt to the key pathogens on the site.

So, as a first step, producers should ensure their gilt development unit facilities are properly sized to provide gilts with the necessary square footage to allow their reproductive development to occur properly, Stalder says.

Herd management is also important for sow longevity.

Producers should have robust gilts come into the herd and breed them when they're an appropriate size and age, Friendship says.

"I think producers make a common mistake. … They've got some young gilts that are just coming into heat for the first time. They're a little bit too young to breed, but producers breed these animals anyway because they fit into the group," he says.

"Starting with a good animal is probably the main thing producers can do. They should treat the sows very nicely when they farrow the first time."

Stalder agrees.

"Have some really good people work in the breeding barns for gilt development, and make sure you're getting good boar exposure on those gilts at the right time and the right weight," he says.

John de Bruyn

After farmers clear that hurdle, the primary driver of sow longevity is her reproductive success, McNeil says.

"Did she conceive a litter on the first or second mating? Did she give birth to and wean an average or better number of pigs?

"If she can do this consistently, she will be a profitable female in the herd," he says.

Martin Schwalbe photo

Producers should closely watch their animals' feet and leg soundness, Brady McNeil says.

In some cases, however, producers are willing to give a sow a second chance to meet her reproductive criteria.

"Sometimes, if a sow aborts, it's enough that she's lost her spot," says John de Bruyn, an Ontario Pork director and Oxford County pork producer. Instead of risking another sow abortion, the producer replaces her.

"On my farm, (however), we allow them to repeat once," he adds.

Even if sows have strong reproductive success, they may leave a herd because of another key health challenge: lameness, Friendship says.

To help avoid this problem, producers should closely watch their animals' feet and leg soundness, McNeil says.

"If the producer is creating his or her own replacement gilts, is he or she being critical enough of the purebred females? If there is a problem in the internal multiplication portion of a herd, it will be an issue in the entire population," he explains.

Farmers must identify and address lameness as soon as possible to extend a sow's lifetime, McNeil says.

"When I am walking farms, if sows favour a leg or are off feed, and I do not see any treatment records, I become concerned," he says.

"Stockmanship is critical … to maximize sow longevity."

Producers should also treat problems quickly and review culling criteria, McNeil adds.

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More producers are looking at their herds' lifetime productivity traits than at just the number of pigs per sow per year.

Looking ahead

Researchers are approaching improvements to sow longevity from many sides, says McNeil.

One of the most exciting research collaborations in the swine industry is between Iowa State University and producers who are looking for common denominators that affect specific production issues such as prolapses, he says.

And genetic companies are looking at measuring traits that will increase the likelihood that a sow will have long-term success in a herd.

DNA Genetics, for example, is working with a large commercial production system to gain a better understanding of the genetics of sow longevity, McNeil adds. The system will be stocked with pedigreed F1 females and the lifetime productivity will be analyzed on over 25,000 sows in the Midwestern United States.

In Canada, Friendship is working with Chantal Farmer from Agriculture and Agri-Food Canada to examine nutrition in gilt development units.

"The one worry with reducing nutrition in gilts is the period when their mammary development occurs, so we're starting a project looking at nutrition in the growing stages of gilts and how it affects their lactation performance when they farrow," Friendship says.

Researchers are examining the practice of limit feeding to try to slow gilts' growth. Some industry reps believe this technique can reduce osteochondrosis, which is the main cause of lameness in replacement gilts, Friendship explains.

"It's something nobody has looked at because it's not easy."

Sow longevity research is important for producers like de Bruyn.

"In the old days, we just picked a pig out of the finishing barn, and she became the gilt. Then we went to raising gilts on our own, but we probably didn't raise them big enough," he says.

Robert Friendship

"Research showed us that feeding gilts differently than market hogs and letting them mature a bit more before first breeding" improves longevity.

Producers look forward to finding new information to help them drive their operations ahead as they shift to group housing. **BP**

PRIORITIZING SOW LONGEVITY FROM THE START

Martin Schwalbe photo

"You (need) really good management during both the functional and developmental periods to maximize sow longevity," Dr. William L. Flowers says.

The factors shaping sow longevity begin when a future replacement gilt becomes a fetus in her mother's uterus, says Dr. William L. Flowers, the William Neal Reynolds distinguished professor in the department of animal science at North Carolina State University.

William L. Flowers

"Our data indicates that birth weight and pre-weaning growth have important positive relationships with sow longevity," he says.

Two phases shape longevity, he says to *Better Pork*.

"From both a physiological and management perspective, I like to think of sow longevity as having a developmental phase and a functional phase," he says.

The first phase involves the development of the significant components of the sow's reproductive system that she will use as an adult.

The phase "ends when she is bred for the first time as a gilt on a commercial farm."

The functional phase for sows begins when the animal initially mates and involves everything that the animal is exposed to while she remains in production, he explains.

"The term 'functional' is appropriate since, after she is bred and enters production, her reproductive physiology functions to produce piglets," Flowers says.

"The analogy that I like to use is that of a car. The developmental phase is similar to building the car: the engine, transmission, brakes etc. The functional phase is similar to the skill of the driver, the road conditions and the type of gasoline that is used.

"You can have a good car but, if you have a bad driver, bad gasoline and poor road conditions, then you can't get very far."

The opposite is true as well.

"You (need) really good management during both the functional and developmental periods to maximize sow longevity," Flowers says. **BP**

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LEAVE YOU DUMBSTRUCK

The swine industry continues to innovate and adopt new tech, which helps to streamline production, at an almost dizzying speed.

by GEOFF GEDDES

As night descends on the barn, a high-pitched squeal pierces the silence. Panic-stricken, a worker makes a frantic dash to the farrowing room. The noise is one he knows only too well: the sound of a life draining away from another crushed piglet. Barging through the door, the worker grits his teeth, sucks up his courage and peers into the pen to find the poor, defenceless animal … fast asleep.

In the time it took a staff member to hear that plaintive cry and respond, a sensor has detected the problem, sent a warning signal to the sow and saved a life. While the story might sound like science fiction, this technology is real and getting better. It's making history at every turn and helping the pork industry boldly go where no pig has gone before.

In the age of smartphones and smart homes, we are surrounded by computer wizardry. The pork industry stands out as an embodiment of this brave new world.

A rewarding experience

"Pork producers have always been early adopters of innovation, so it's only fitting that their industry is reaping the rewards of these (technological) advances," says Tom Stein, senior strategic adviser at Maximus Systems in Quebec.

As technology evolved, Stein has had a front row seat. In the 1980s, his team developed PigCHAMP software, a swine production management program. (PigCHAMP is now a Farms.com company, as is *Better Pork*.) In 2000, Stein co-founded MetaFarms Inc., which aimed to develop a web-based software platform for animal production that met the needs of all species.

"At the time of MetaFarms, people were concerned that producers wouldn't buy into the new technology, but that wasn't the case. For example, in the early days, we just had mechanical control for things like temperature and humidity," he says.

"That has since evolved to modular computerized control of ventilation, biosecurity and workflow. We can track standby generator fuel levels and load cells on feed bins and have real-time measurement of feed inventory and consumption."

With the advent of the iPhone and cloud technology, new avenues of mobile applications and communication have emerged, and pork producers continue to lead the way. The costs – like the costs of other technologies – are coming down, enabling smaller producers to adopt the same technology that their larger counterparts have.

The brains of the operation

"Now that we're carrying around these brains with the smartphone in our hand, the next big advancement is a brain in the barn. It pulls together all this information on environment, health, mortality, processing and feed. And the list goes on," Stein says.

Apart from the "cool" factor, smart technology also brings significant benefits to producers and their animals. As a consultant, Stein has advised inventors about a device that hangs on farrowing crates and detects the unique sound a piglet makes when it's being crushed by the sow. The device transmits vibrations to a patch on the sow, causing it to stand and spare its baby.

"Early installations in pork production systems show large reductions in crushing deaths and pre-wean mortality, in the neighborhood of 0.5 to 1.0 piglet saved per litter," he says.

SoundTalks NV, a Belgian company, is also making wise use of smart technology. The company's cough monitor, which will soon be introduced in North America, can detect an increase in coughing levels in a barn. Sometimes, the device can even identify the type of cough, giving pork producers a heads-up about disease, and a head start on treatment and prevention.

When looking at what is, or could be, affected by smart technology, we should also consider the

VIR2AL photo

Producers can monitor their operations from the farm office. In this set-up, the farmer has the Maximus barn view on the left screen and the dashboard on the right.

question of what is not affected. The answer appears to be simple: not much.

"Our company has controls that can optimize the operation of heat lamps and fans, saving money and reducing our carbon footprint," Stein says.

"Then there is the area of labour, one of the biggest bottlenecks in pork production. Industry is under great pressure to devise ways of using people more efficiently, and we can employ the new technology to increase the number of pigs one person can manage."

Smart tech fan club

As more producers are discovering, the benefits are not just theoretical. They are making noticeable differences in day-to-day operations. The Lakeside Colony near Lethbridge, Alta., installed the Maximus controller system last year, and staff already see it as a game changer for their hog business.

"The system uses humidity and pressure sensors to maximize fan efficiency," says Phillip Wipf, who works the pig barns with his brother Mark.

"When the animals go to sleep, they do it as a group, which brings the humidity down to zero. The problem is that we don't know when that will happen, but the sensor system detects the change and only moves air when it's required."

If fans or heaters malfunction, the technology recognizes that issue too. The system sends a text message to

VIR2AL photo

"We can employ the new technology to increase the number of pigs one person can manage," Tom Stein says.

Phillip or Mark so they can fix the problem immediately.

Of course, for smart technology to really be relevant, it must also address the biggest line item on any producer's budget: feed costs.

"One way to lower feed expenses is to improve nutrient efficiency, or the amount of protein you must feed pigs to give them 1 kilogram (2.2 pounds) of body protein," says Dr. Candido Pomar, a research scientist at Agriculture and Agri-Food Canada.

"One of our projects is looking at formulating different feed rations for pigs with different nutrient requirements," he explains.

When a pig enters the feeder, a computer determines how much that animal has been eating and growing. Each day, the system calculates the optimal protein concentration for the animal to maintain its growth rate and dispenses the feed accordingly.

The feeder "works automatically, so a farmer just has to be sure it is stocked, and the computer does the rest," says Pomar.

Lakeside Colony photo

The Lakeside Colony near Lethbridge, Alta., installed the Maximus controller system last year, and staff already see it as a game changer for their hog business.

Incentive to succeed

Though smart systems offer ease of use, some producers may find the prices steep. Fortunately, programs are available to help mitigate the expense.

"We have a pair of programs geared toward industrial and commercial customers to help them optimize energy use," says Joel Cherry, spokesperson for SaskPower.

"For large-scale producers, the Industrial Energy Optimization Program provides customized technical assistance to identify and implement energy management and capital projects. It can also include incentives to reduce the investment payback period on projects."

Smaller Saskatchewan producers may qualify for the Commercial Energy Optimization Program. It helps them create plans to improve efficiencies and save money, and

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Chantal Farmer,
Agriculture and Agri-Food Canada

Billy Flowers,
North Carolina State University

Michelle Painchaud,
Painchaud Performance Group

Topics

Day 1 - Tuesday March 26 - When the headline is you; Sow longevity and neonatal management; Role of nutrition in promoting swine health; Thinking like a pig; Walking through the barn – wean to finish; What do your staff think of you? Maximizing performance of the sow; Building the best team; Sow feeding strategies; When biosecurity fails.

Day 2 - Wednesday March 27 - The forward factors: disruptive ideas that drive innovation; Digestibility of Ca and P by pigs; Troubleshooting reproductive problems using records and observations; Basic Health – when to call the vet; Breaking the carcass down; Best management practices across Canada; Cost of production – build it, use it; Where do all the pig parts go?; USMCA, CPTPP and the like: deciphering the alphabet soup of trade agreements.

Topics and speakers are current at time of print and are subject to change.

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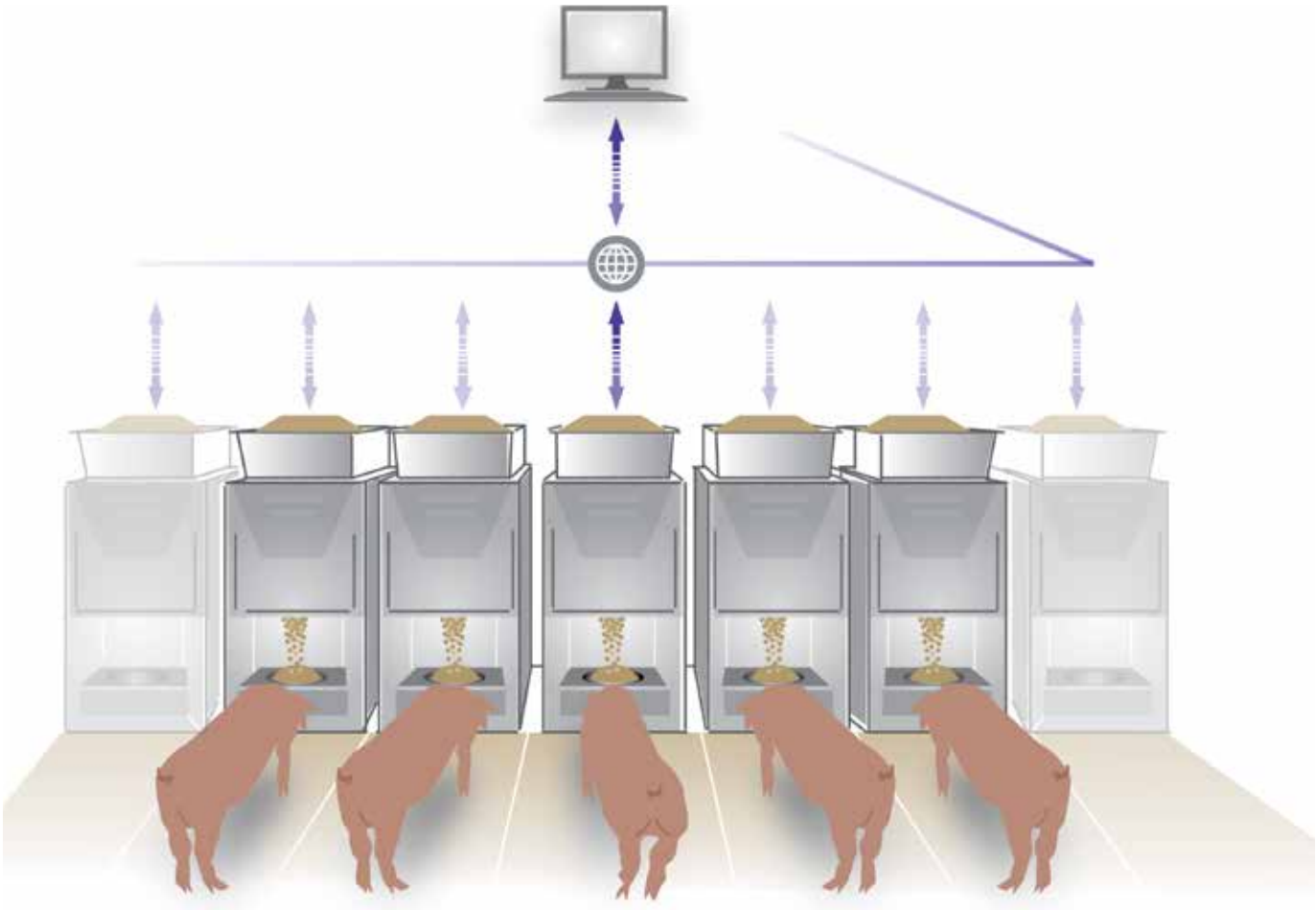

Dr. Candido Pomar and his team are "looking at formulating different feed rations for pigs with different nutrient requirements," he says.

offers incentive funds to help make the plans a reality.

In the case of the Wipf brothers, a little assistance went a long way.

"In Alberta, we have the Farm Energy and Agri-Processing Program that offers incentives for energy efficient technologies," says Charlotte Shipp, Alberta Pork's industry programs manager.

The program funds both new projects and renovations and is popular with producers like the Wipfs.

"We've seen some innovative proposals go through," Shipp says. "The best thing about the program is that it's run by a very creative group. If producers can make strong arguments about the benefits of technology that they are putting in place, (their proposals) will be considered."

As that innovation continues, one of the most exciting developments involves machine learning. This branch of artificial intelligence is based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.

Artificial intelligence could listen to pigs squeal or cough.

"There will be more and more of this behaviour and activity monitoring," says Stein. "Rather than just track the quantity (of feed and water) that pigs eat or drink, technology will track how many times they go to the feeder or water source.

"Systems will then use the information in different ways. (One is) early identification of animals that may be getting sick. One PhD thesis in Belgium found (systematic analysis of) this data was 24 to 36 hours faster than humans walking through the barn at identifying sick pigs."

The industry must address a few wrinkles in smart systems, though.

"One key consideration is the openness of the technology," says Stein. "Can you integrate it with other systems running on the farm?"

Since a lot of companies only offer single-purpose applications, producers need a data platform where everything comes together.

When you bet on technology, you need to ensure that you're betting on the right horse or horses, says Stein. You want to have a winning platform.

"A start-up company with one application which is a small piece of the bigger puzzle can be useful," Stein says. "However, you can't bet the farm (that the app) will grow into a massively useful platform that integrates a lot of information from other sources. Ultimately, producers should look at who has the vision and capability to (provide) a solid data platform for years to come."

If your head is spinning as you try to make sense of it all, don't worry. An app likely exists for that too. **BP**

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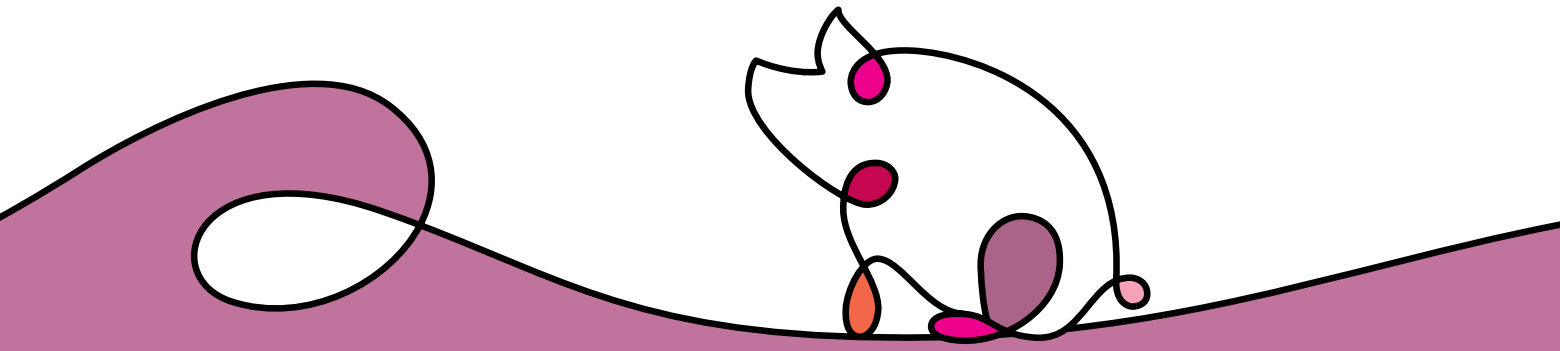

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by
KATE
AYERS

MAKING MOVES, OPTIMIZING OPPORTUNITIES

A Danish hog producer is growing his operation and planting family roots in Manitoba.

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

"I like being around the animals and I love what we are doing," says Henrik Thomsen.

Henrik Thomsen made an adventurous career move 13 years ago, emigrating from Denmark to Roblin, Man. to pursue his passion as a hog farmer.

Thomsen's love for ag stems from his upbringing on a hog and grain farm. In 1991, he attended Bygholm Agricultural College in Denmark where he obtained an ag degree. In that country, prospective farmers must obtain post-secondary education to qualify for financing.

After graduation, Thomsen worked on many hog farms, slowly working his way up to managerial positions. In 2006, he received a job offer for a commercial hog operation in Romania. However, Thomsen turned it down because he had his sights set on Canada.

Six months later, his patience was rewarded when a position became available at Canmark Family Farming Ltd. in Manitoba. The company hired Thomsen to manage its operations.

A group of 12 Danish farmers established Canmark in 2001. In fact, the name Canmark comes from the meshing of the names of Canada and Denmark. At the time, the company's decision-makers saw Manitoba as the most economical place in the world to raise hogs.

While Thomsen works in Canada, he continues to spend time in his native country, as part of his family still lives in Denmark.

Every three months or so, Henrik travels to Denmark to visit his children – Marco (14), Mads (16), and Janni (18). Henrik stays there for two weeks at a time and his kids come to Canada during the summer holidays as well.

Since moving to Canada, Henrik has planted roots in his new community. He met his partner Jeanine seven years ago. She has two girls – Charlie (13), and Georgia (16).

In 2015, Thomsen bought the Canmark operation. He raises 1,800 sows, farrow to finish.

However, this spring, he plans to expand one of his farrowing barns to house 3,900 sows.

Thomsen owns 900 acres but does not grow any crops. Rather, he rents the land out to area farmers and buys feed ingredients from local producers. He formulates his rations in the on-farm feed mill. The operation has five sites within a 180-kilometre (112-mile) radius.

This second-generation farmer is eager to continue growing his hog operation and happily embraces the agricultural lifestyle, 24 hours a day, 365 days a year.

What contributed to your decision to become a pork producer?

Just the way things worked out.

I wanted to be a policeman when I was young, but I had to reach 21 years old before I could apply. So, then I thought I would get an agricultural education and maybe have a hobby grain farm. When I went to college and started working more with the hogs, I really liked it.

I haven't looked back.

Describe your role on your farm.

My role is to oversee everything. I am in the barns, at the feed mill, in the office – doing all kinds of things.

The farm employs 20 people. So, I don't have routines in the barns, but I will help when needed.

Hours you spend in the barn per week?

Probably seven to eight hours.

But it all depends on the help we have.

Hours you spend in the office per week?

Nowadays with the Internet and email, it is kind of hard to put a time on it. Quite often, I send emails in the evening while I'm on the couch. But I'd say I spend 15 to 20 hours in the office per week.

Jeanine owns a hair salon, but she also works one day a week in the Canmark office. She's trying to be involved that way, and I really enjoy that she is getting an idea of what we do out there.

It makes it easier to discuss things in the evening when she knows what's going on.

How many emails do you receive per day?

That is a good question.

Maybe 10 emails.

How many text messages do you receive per day?

I think that number is 10 as well.

Hours a day on a cellphone?

The cellphone service isn't always great where we are.

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

Henrik Thomsen's goal is "to have a good life and keep building Canmark together with my family."

yongkiet/iStock/Getty Images Plus photo

"We are very steady at a high level – constantly weaning 30 to 31 piglets per sow," says Henrik Thomsen.

Between my cellphone and my office phone, it's maybe an hour on the phone per day.

Email or text?
I like email the best.

Hours a day on the Internet?
Probably an hour but it depends on what is going on.

Where did you last travel to?
I went to Mexico last February.

What do you like best about farming?
There are a lot of things I like about farming and it's hard to point out one specific aspect.

But for me, it's all about the lifestyle.

I like being around the animals and I love what we are doing.

Farming is fun – I like watching things grow and I like the countryside.

What do you like least?
It would be nice if we could shut down, go home on Friday afternoons and not worry about working on weekends. And on Christmas and other holidays.

But it's not really a big deal and it's not something I put a lot of thought into.

What's the most important lesson you've learned?
I had a very good life growing up.

My family never supported me with money to get where I am today.

I used to say that if you want to be successful, be consistent. That is my motto in life.

Be on the ball all the time.

What's your guiding management principle?
I try to be fair, and I try to treat people the way I like to be treated.

It's very simple.

What's your top tip about farm transition planning?
I don't have any plans for farm transition yet.

In general, an exit strategy is something us farmers have to worry about, and I do think about it.

Right now, we're planning an expansion and applied for permits through the province.

But then, at the same time, we get up to a size and wonder who is going to take the operation over.

Are you involved in any committees, boards, associations or volunteer efforts?
I have been an adviser on the Manitoba Pork board for the last nine or ten years.

What are your hobbies or recreational activities?
I love fishing and camping in the bush.

I also drive dirt bikes and ATVs.

What does your family think of farming?
They show a lot of interest in it. I think they think it's fun, what we're doing with the farm.

I think my family back in Denmark thinks farming is really cool and they find it very interesting.

What's your top goal?
To have a good life and keep building Canmark together with my family.

Hopefully we have continued success with the operation.

Is your pickup messy or neat?
I'm sure people say it's neat. I take pride in my vehicles.

What are items that are always in your pickup?
I don't really have any specifics.

Right now, I have my phone charger, a pen and paper, and a water bottle.

What are items that are on top of your desk?
My computer, my notebook and pens, and my calculator.

What was the last piece of shop equipment you bought?
Some electric drills.

What's the best time of day?
I'm happy from when I get up until I go to bed.

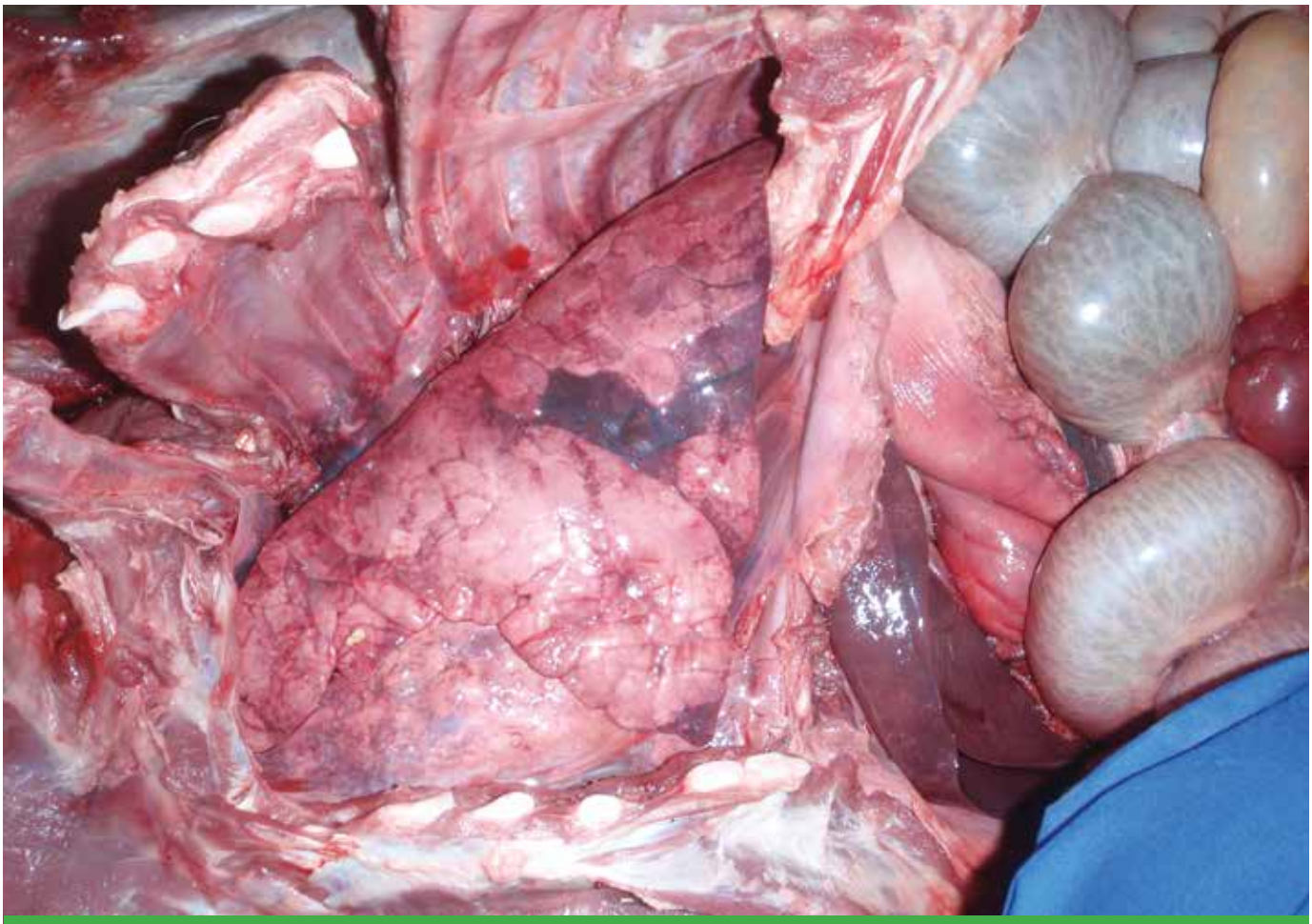
What was your most memorable production year?
Production wise, I can't really point to one specific year.

We are very steady at a high level – constantly weaning 30 to 31 piglets per sow. **BP**

UNDERSTANDING MYCOPLASMA SPP.

by
DR. JESSICA LAW

Four mycoplasma species can affect swine health, but the severity of the associated diseases varies.



This photo shows the uncomplicated pathology of *Mycoplasma hyopneumoniae (Mhyo)* in a finisher pig.

For North American pork producers, receiving a diagnosis of mycoplasma can be quite stressful. Mycoplasma is the overarching name for different bacteria that affect many species such as cattle, swine and even humans.

The good news, however, is that not all mycoplasma species have the same effect that *Mycoplasma hyopneumoniae (Mhyo)* does on health status and productivity.

Understanding the differences between species is important for your herd management techniques, as the presentation and treatment of the associated diseases varies between the species of bacteria.

Four mycoplasma species are relevant to swine health: *Mycoplasma hyopneumoniae*, *Mycoplasma hyosynoviae*, *Mycoplasma hyorhinis* and *Mycoplasma suis*. While a few other swine mycoplasmas exist, they have not been proven to cause disease. So, these pathogens are considered non-pathogenic.

Mycoplasma hyopneumoniae

Researchers first isolated this species in 1965 in the United States. *Mhyo* has significant consequences for pig production.

The key feature of this disease is a chronic bronchopneumonia that is caused by immune suppression of the respiratory tract.

Pigs with this pathogen often suffer from secondary infections such as *Pasteurella multocida*, *Streptococcus suis*, *Haemophilus parasuis* and/or *Actinobacillus pleuropneumoniae*. The combination of *Mhyo* as the primary pathogen and bacterial secondary pathogens is known as enzootic pneumonia.

Mhyo can also team up with other viral pathogens, resulting in the porcine respiratory disease complex (PRDC). The viruses include porcine reproductive and respiratory syndrome virus (PRRSV), swine influenza virus (SIV) and porcine circovirus type 2 (PCV2).

Mhyo facilitates the proliferation of normal pulmonary pathogens (such as the above-named bacteria) through its inflammatory effects and destruc-

tion of the respiratory cilia which line the upper respiratory tract. Healthy cilia's primary role is to clear debris and invading pathogens. *Mhyo* causes a prolonged inflammatory reaction resulting in the eventual loss of cilia.

Mhyo also has other immunosuppressive effects which eventually significantly suppress the respiratory immune system.

Mhyo is one of the main pathogens that producers should discuss and declare when selling and purchasing live animals. *Mhyo*-infected pigs can be significantly less efficient compared to *Mhyo*-negative pigs.

The cost difference of uncomplicated *Mhyo* is US$0.63 (C$0.83) per head. Since *Mhyo* effectively compromises the pig's immune system, however, secondary bacteria and other viruses can create an additive effect. When researchers Cara Haden and others (2012) calculated the effects of *Mhyo* and PRRSV or *Mhyo* and influenza on pigs, the cost per head rose to US$10.41 (C$13.77) per head.

The cost of *Mhyo* varies based on complication with secondary infections, vaccination, pig flow and presence of other viral pathogens. However, the disease will decrease feed efficiency, increase mortality and thus increase costs of production.

Producers can control *Mhyo* through vaccination, pig flow management and general herd health management. Farmers have also eliminated this disease from individual herds using strategies involving medication and herd closure.

Producers and their vets can evaluate pigs as they eat to identify *Mhs* lameness and swollen hocks.

Dr. Egan Brockhoff photo

This pig had bilateral swollen hocks, demonstrating the clinical disease caused by *Mycoplasma hyosynoviae*.

Mycoplasma hyorhinis

The next species of mycoplasma, *Mycoplasma hyorhinis (Mhr)*, is not nearly as well researched as *Mhyo* for a few reasons. While *Mhr* is ubiquitous within swine populations, it is often less clear what role it has on the disease processes.

Mhr is considered a commensal organism of the respiratory tract, meaning it can be found in pigs' respiratory tissues. This species, however, should not be present in the pericardium, pleura, peritoneum or joints of healthy pigs.

When *Mhr* causes disease, the conditions associated are

- arthritis (joint inflammation)
- polyserositis (inflammation of multiple serosal surfaces, like the surface of the lungs, pericardium or intestines)
- conjunctivitis (inflammation of the of the front of the eyes and insides of the eyelids)
- pneumonia

In these cases, positive results showing *Mhr* in tissues outside of the pig's respiratory tract could likely indicate *Mhr's* contribution to the disease process.

Mhr-associated disease seems to occur when the pathogen moves systemically from the respiratory tract. In the process, the species results in two main clinical diseases: polyarthritis and polyserositis. These diseases typically occur in pigs three to ten weeks of age. Pigs over three months old are often only affected with polyarthritis.

Swine veterinarians typically do not turn to *Mhr* as the first differential when these clinical conditions occur. When determining the cause of disease in pigs, it is more critical to rule out other pathogens, as well as anything that might be predisposing the animal to the systemic spread of *Mhr*.

Recent anecdotal cases exist of vets using autogenous vaccines to control this disease.

Mycoplasma hyosynoviae

Mycoplasma hyosynoviae (*Mhs*) is the next clinically relevant mycoplasma species in swine. This species is frequently implicated in swine lameness.

Mhs causes inflammation of the synovial tissues of the joints and often presents as swelling and edema in the hocks in growing pigs. Clinical disease caused by *Mhs* tends to present in three- to five-month-old pigs and acute signs can last anywhere from three to ten days.

This disease can compromise animal welfare as well as affect growth performance.

Producers and their veterinarians can limit the *Mhs* clinical signs and the decrease in growth performance using appropriate medication. These treatments must be timed prior to the onset of clinical signs.

Anti-inflammatory drugs and antibiotics have been shown to reduce the swelling and lameness associated with clinical disease, thus minimizing the effect on welfare.

Mhs is a disease with low mortality, so very few animals will die from the disease itself.

To achieve a definitive diagnosis, joint fluid or synovial membranes are tested by culture or polymerase chain reaction (PCR). In most cases, veterinary practitioners can recognize and tentatively diagnose the disease without the need of euthanizing an animal for diagnostics. However, when the veterinarian and client agree to send samples to the lab, it is often best to send an entire limb.

Dr. Maria Clavijo and her team from Iowa State University are researching the possibility of eliminating the pathogen through herd closure. When closing and medicating a herd for elimination of *Mhyo*, these researchers also investigated whether *Mhs* and *Mhr* could also be eliminated.

By 43 weeks post-herd closure, *Mhr* no longer remained. However, *Mhs* was still present, although shedding had decreased and was only present in sows. Further research is needed if the industry intends to move towards elimination of this pathogen.

Mycoplasma suis

The final mycoplasma species is *Mycoplasma suis* (*Ms*). This species can cause anemia in pigs. This pathogen is of significant concern in commercial pork production.

Ms is transmitted through blood either by direct exposure via licking of wounds or cannibalism, or by indirect exposure through needles or bloodsucking insects.

Clinical disease of *Ms* is impacted by the presence of other infectious diseases in the herd, nutritional status and environmental factors. Clinical signs are non-specific and can include fever, lethargy and poor growth. More specific clinical signs such as fever, icterus (yellowish pigmentation of the skin and eyes), and cyanosis (bluish discoloration of the skin and mucous membranes) occur with acute disease. The latter occurs during periods of stress such as farrowing.

The disease can be diagnosed through PCR assays from untreated animals. Treatment typically includes a combination of antibiotic medication and iron injections. While the treatment may not eliminate the organism, it can reduce the incidence of clinical disease.

No commercial vaccines are available for *Ms*. Producers and their veterinarians commonly use antibiotic treatment, supportive therapy, and minimize the transmission of the disease through needles, surgical instruments and insect vectors to manage *Ms*.

Conclusion

Though many different species of mycoplasma exist, not all are as threatening to swine health and production as *Mycoplasma hyopneumoniae*. Understanding the differences between the species can help producers with disease management as well as avoiding confusion when purchasing or selling animals. **BP**

Dr. Jessica Law is a veterinarian with Prairie Swine Health Services in Red Deer, Alta.

by LILIAN SCHAER

ASF'S BIGGEST EFFECTS WILL BE ECONOMIC

Ontario is better prepared for a swine disease outbreak response, thanks to new resources and systems.

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

ASF "is not a tough disease to control under most circumstances, especially in modern production," said Dr. John Deen.

Ontario's pork industry is on high alert for African swine fever (ASF). As it is an internationally reportable disease, trading partners would immediately close their borders to Canadian pigs and pork if the industry found ASF here.

And, as a country that exports 70 per cent of its production, that effect would be devastating, much more so than the effects of the actual disease itself.

ASF "is not a tough disease to control under most circumstances, especially in modern production," said Dr. John Deen of the University of Minnesota at the 2018 Big Bug Day. "If you get it, you'll get it under control."

It's the decline in pork demand that will be hardest for the industry to absorb and one of the most difficult outbreak consequences for which to prepare, Deen said.

Questions like how to sell market hogs when no demand exists, how to access financing to feed pigs that won't command a decent market price, and how to gain shackle space from processors who've lost their markets will all have to be addressed. At the same time, the industry will also be navigating issues related to eliminating the disease outbreak.

An ASF outbreak would cost the Canadian pork industry $40 billion, current estimates suggest.

A major challenge in dealing with a disease outbreak is local culture, particularly in countries like China where many customs run counter to modern disease management and biosecurity practices, Deen said.

Almost half of the reported ASF outbreaks in China are said to be caused by people or vehicles carrying and spreading the disease. A further 18 per cent of outbreaks are caused by the cross-regional transport (i.e. smuggling) of live pigs, and 7 per cent of causes are yet to be determined, but may include contaminated feed.

"The challenge of the risk is that exposure is so high (in China) – pigs are everywhere and fresh pork is sold in the streets," Deen said. "They're trying to create more discipline in their industry by trying to manage pig movement, but sometimes quarantine requirements are not fully followed."

Despite the serious nature of a potential ASF outbreak, Ontario is much better prepared now to respond to a disease problem than it has ever been.

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

Despite the serious nature of a potential ASF outbreak, Ontario is much better prepared now to respond to a disease problem than it has ever been.

Swine Health Ontario (SHO) and its founding partners – Ontario Pork and the Ontario Pork Industry Council – will lead the development of an Incident Command Centre. This group will help direct the industry response and coordinate with government officials during the next swine disease issue.

"This is way ahead of the curve from an industry perspective and we're excited to have this kind of structure in place," said Doug MacDougald of South West Ontario Veterinary Services and a member of the SHO Leadership Team.

And Ontario's new Swine Health Information System is integrating livestock movement, health status and other information into a single system. In an emergency, the industry could quickly track where animals came from and what barns, facilities and trucks they might have touched in the process.

"Ontario is very unique in this in Canada and across the U.S.," said Clare Schlegel, another member of the SHO Leadership Team. "If we have (ASF) and we can keep it from spreading, then other regions of Canada can maybe get back into the markets and this gives me some hope for our industry."

Maintaining strict biosecurity is the number one way to keep the disease from entering Canada, Deen said. Producers and other industry reps must remain vigilant, and continually review and improve biosecurity processes.

Since feed and feed containers are potential risk sources for ASF, the industry should also pay attention to where feed and feed ingredients come from. If possible, producers should seek out feed alternatives from more low-risk countries.

Illegally imported meat products, and visitors or workers from countries with ASF, also serve as potential risks. **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.

by GEOFF GEDDES

FED UP WITH FEED COSTS? CHEW ON THIS RESEARCH

Pigs can do well on low net energy diets if the ratio of amino acids to energy isn't substantially altered.

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

Producers view feed costs as most Canadians view winter: something to complain about that never goes away.

While we get a short break from winter each year, feed costs are a constant, which explains the abundance of research on how to reduce that expense. What makes a recent study unique is that it looked at feed in relation to other factors on the farm, with some surprising results.

"We have previously shown that feeding low, constant net energy (NE) diets to grow out hogs resulted in greater revenue than feeding higher NE levels," said Dr. Miranda Smit, technical writer and editor in the livestock and crop research extension section at Alberta Agriculture and Forestry.

Feed fights

The catch is that pigs must be able to increase feed intake to compensate for the lower dietary energy density. That condition can be easier said than done in a setting where they may face crowded pens and/or less feeder access that could affect feed intake.

Does a relationship exist among dietary NE level, stocking density, feeder space and sex? If so, what is it? Researchers conducted a study with 960 barrows and 960 gilts to find out.

"Pigs were housed in 96 pens by sex – 18 or 22 pigs per pen – and fed either a low NE (2.2 Mcal) diet based on wheat/barley or a high NE (2.35 Mcal) diet based on wheat and field peas with some canola oil. Half the pens had two feeder spaces and the other half had three. Pen body weight and feed disappearance were measured for each growth phase."

Eat more, grow the same?

"Once again, we found pigs on the low NE diet consumed more feed than those on the high NE regimen, without really changing growth rate. For stocking density, the 18 pigs per pen ate a bit more than those with 22 per pen and also had better growth rates, as overcrowding means pigs have fewer chances to eat and generally don't grow as well."

Adding an extra feeder in a pen did result in pigs eating more, yet the difference in average daily gain was negligible.

"My best guess is that the added feeder raised the chance of feed being spilled."

For Smit, the biggest surprise in their research findings was what didn't happen.

"I expected to see interactions for feed intake among three different things: stocking density, feeders and diet. In actuality, we saw no relationship between those parameters. … Regardless of whether you overcrowd your pigs or give them an extra feeder, you can use low NE diets and the pigs will do quite well with it.

"That was an interesting take away, as when we saw in previous trials that low NE diets worked and lowered feed costs, we assumed all the other factors had to be right for that to happen. But this study suggests otherwise."

Though this project is further confirmation that diets based on low net energy value can save on feed costs, it's important that the ratio of amino acids to energy isn't substantially altered or results will not meet producer expectations. For those farmers considering such a swine diet, Smit urges them to consult nutritionists. **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 Agri-Innovation Program and by provincial producer organizations.

Ontario

Pork News & Views

Prepared and Edited by the OMAFRA Swine Advisory Team

ONTARIO PORK

February 2019

Group Sow Housing – What System is Right for Me?

On December 4, OMAFRA, Ontario Pork, the Ontario Pork Industry Council and the Prairie Swine Centre held a 1 day seminar on group sow housing in Stratford. We heard speakers from all across Canada as well as a producer from Ohio. A lot of great information was presented, and we are planning to make the presentations available online in the near future - keep your eye on the London Swine Conference YouTube channel.

There are five main types of loose sow feeding systems that you can pick from. Floor feeding, shoulder stalls, free access stalls, electronic sow feeding or a combined free access-electronic system. Within each of these categories there are many different design options and possibilities.

During the meeting we heard many speakers say there are lots of options and there are pros and cons to each. What will work really depends on the farm, the barn, the management and the staff. The biggest question you need to ask if you are looking to switch to loose housing is "what will work for me and my farm?" People are the key to making loose housing work. If you don't think it will work, it won't. If you believe it will work, you will make it happen. There really is no 'right' or 'best' system. You need to match the system to the personnel, and be willing to learn how to make it work. Patience is key when working with staff and sows as they learn a new system. Keep an open mind and be willing to make adjustments as needed.

As you decide to make the move to loose housing it can be hard to know where to even start. The OMAFRA swine team worked with the Prairie Swine Centre to develop a group housing decision tree, and a pros & cons table for the different types of feeding systems. The decision tree walks you through a few key questions to get you started. First, "should I renovate my existing barn or build new?", then "should I choose a competitive or non-competitive feeding system?" This will help you narrow down what type of feeding system you will want in your barn, and help you get started with the planning process. These resources are available by visiting http://www.prairieswine.com/group-sow-housing-resources/ or you can contact me for a hard copy. They are also reprinted in this newsletter.

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Senecavirus A (SVA) On-Farm Surveillance Project Update

The OMAFRA funded SVA on-farm surveillance project has found no evidence of SVA infection on Ontario farms. There have been no SVA positive results at loading docks for over a year since the SVA monitoring program began. Consequently, the routine loading dock environmental monitoring program has been discontinued as of June 2018. It is important to note, however, that SVA can still be detected in Ontario assembly sites and therefore producers do need to maintain vigilance for clinical signs of SVA on farms. Attention to detail on biosecurity procedures continues to be very important as SVA is still a threat.

From the Ontario Animal Health Network Producer Report.
To view the producer reports visit www.oahn.ca

Forty Years Ago in PNV: PRODUCTION GOALS FOR 1978

At the start of a New Year, many of us make New Year's resolutions. The resolutions may vary from stopping smoking to losing 15 lbs. Probably the most important aspect of making resolutions is that we recognize that there are things we are doing that can be improved upon. In this edition, we have set forth some swine production goals for the various segments of pork production. We feel these goals are attainable. We hope you will assess these goals against your present swine operation. Are there areas that can be improved upon? If so, start working on areas that will return the most profit to your swine operation. It would appear pork prices will be somewhat lower in 1978. You can do virtually nothing about improving pork prices. You can however, improve the efficiency of your swine operation. Good luck, may 1978 be a profitable and rewarding year.

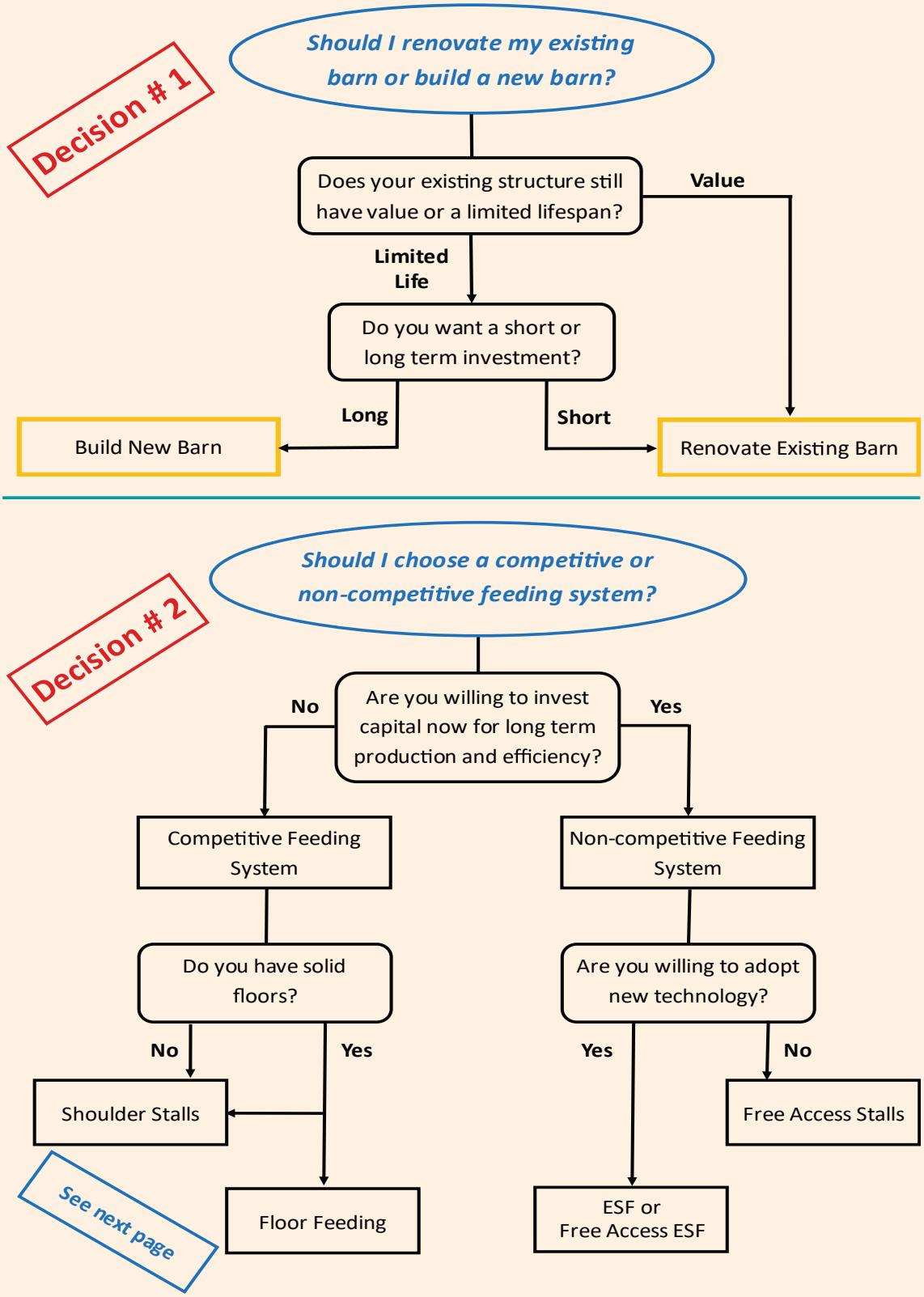
Andy J. Bunn, Swine Specialist, O.M.A.F.

Ministry of Agriculture, Food and Rural Affairs

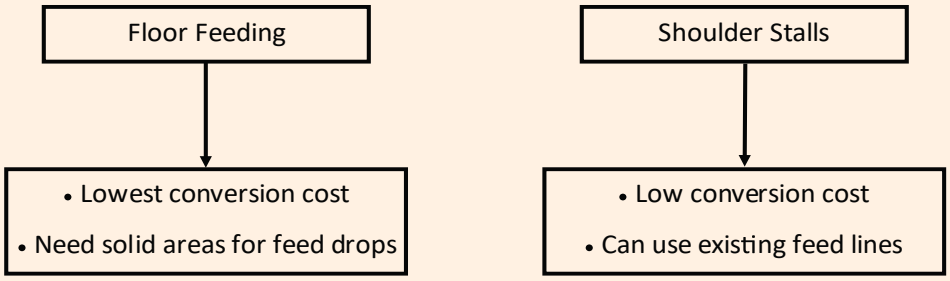
Ontario

Group Sow Housing Decision Tree

Determining which group housing system to use can be a daunting task. There are multiple systems to chose from, and no hard rules to follow. This decision tree provides a rough guide based on key questions you need to ask yourself.



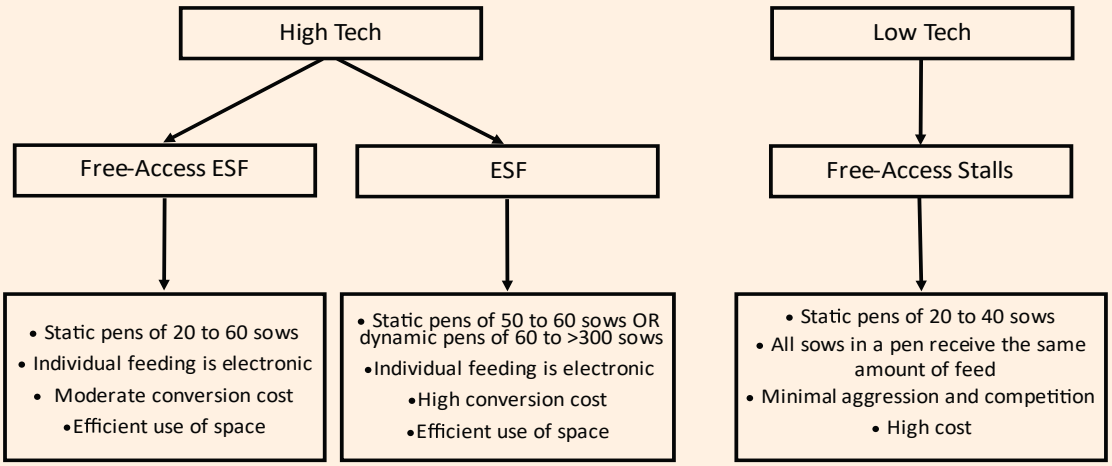
Competitive Feeding Systems



Competitive Feeding Systems:

- Suitable for small static groups of 10 to 20 sows
- Good stockmanship required: form small, uniform groups and monitor sows daily at feeding
- Expect variation in body condition, feed wastage and production challenges due to competition
- Small pens require more space per pig in pens and more alleyways for access
- Feeding aggression is reduced in shoulder stalls compared to floor feeding

Non-Competitive Feeding Systems



Non-Competitive Feeding Systems:

- Individual feeding allows for more uniform body condition
- Reduced feed costs due to less wastage and overfeeding
- Can still have competition at the feeder stall
- Potential for precision feeding as technology and data management improve

Developed by staff from Prairie Swine Centre and the Ontario Ministry of Agriculture, Food & Rural Affairs Swine Team.

For more information on group sow housing visit
www.groupsowhousing.com

Group Sow Housing Feeding Systems

Pros & Cons

Determining which group housing system to use can be a daunting task. There are multiple systems to choose from, and no hard reules to follow. This chart outline some of the pros and cons of each of the different systems. Combines witg tge Group Housing Decision Tree, this should help you decide which system fits your needs.

Category	Floor Feeding	Shoulder Stalls	ESF	Free-Access ESF	Free-Access Stalls
Space Allowance	Pro: Moderate space requirement	Pro: Moderate space requirement	Pro: Low space requirement	Pro: Low-moderate space requirement	Con: High space requirement
Cost	Pro: Low cost	Pro: Low cost	Con: Moderate to high cost	Con: Moderate cost	Con: High cost
Daily Management	Pro: Low tech Con: High management input to sort groups, find and manage dropouts	Pro: Low tech Con: High management input to sort groups, find and manage dropouts	Pro: Automated management Con: Technical expertise, ear tags	Pro: Automated management Con: Technical expertise, ear tags	Pro: Low management input Con: Low tech
Training	Pro: No sow training	Pro: No sow training	Con: Training required	Con: Some training required	Pro: No sow training
Social/Welfare	Con: High aggression and competition	Con: Aggression and competition	Pro: Individual feeding Con: Sows compete at feeder	Pro: Individual feeding Con: Sows compete at feeder	Pro: Individual feeding Con?: Many sows remain in stalls
Other	Con: Overfeeding used to reduce aggression	Con: Overfeeding used to reduce aggression	Pro: Automated sorting, heat checking, 'precision farming'	Pro: Automated data collection, 'precision farming'	Con: All sows in a group get same feed amount

The Human Side: Stress and Mental Well-Being on the Farm

(reprinted from the Proceedings of the London Swine Conference, March 27-28, 2018)

SUMMARY

A recent national survey of Canadian farmer mental health (Jones-Bitton et al., unpublished) has helped stimulate discussion of mental health in the agricultural sector. Indeed, farmers worldwide are reported to experience occupational stress, depression, anxiety, suicidal ideation, and suicide at levels higher than other occupational groups and population norms (Fraser et al., 2005; Hounsome et al., 2012).

This interactive workshop will build upon the presentation given at the London Swine Conference in 2017. First, the results of the national survey will be briefly reviewed in order to provide context for the subsequent workshop discussion. A panel of producers, a veterinarian, an industry representative, and a farmer mental health researcher will then engage in an interactive discussion, including questions and comments from the audience. Discussion topics will include: farm stress, how farmer mental wellness impacts farming, how to recognize signs that a farmer may be struggling with their mental health and what can be done to help, and farmer help-seeking for mental health. A brief overview of the concept of resilience will then be provided, using the Eight Dimensions of Wellness (Figure 1) and a breakout session used to brainstorm practical ways farmers can help increase their resilience in order to better protect themselves from the stresses inherent in farming. This session will be highly interactive in nature, and attendees will leave with an understanding of mental health in Canadian agriculture and tangible ideas for building their resilience skills.

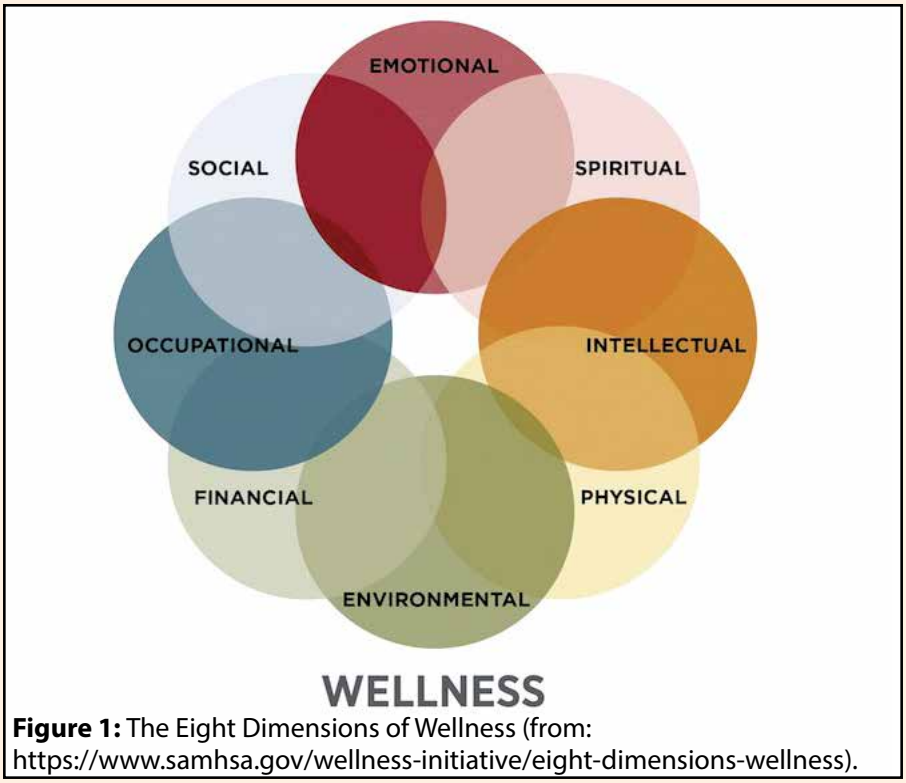


Figure 1: The Eight Dimensions of Wellness (from: https://www.samhsa.gov/wellness-initiative/eight-dimensions-wellness).

CONCLUSIONS

The stark realities that farmers face in terms of stress and mental well-being has led to farmer mental health programs in several countries that focus on building farmer health and resilience (e.g. National Centre for Farmer Health, 2017). Farmer mental wellness efforts in Canada are gaining momentum. The Eight Dimensions of Wellness can serve as a helpful model for farmers in building their resilience skills. This workshop involved an interactive discussion of farm stress, farmer mental health and its associated impacts on farming, mental health literacy training for people in the agricultural community, and practical strategies farmers can use to help build resilience so they can thrive in spite of the challenges inherent to farming.

ACKNOWLEDGEMENTS

We gratefully acknowledge the producers who participated in our national survey and research interviews, as well as the participants in the workshop panel, who have all shared their stories with us. We also acknowledge the research funding provided by the following organizations to the Jones-Bitton lab to support farmer mental health research: the Ontario Ministry of Agriculture Food and Rural Affairs – University of Guelph Partnership (Emergency Management program), Ontario Sheep Federation, Ontario Pork, Egg Farmers of Ontario, Ontario Federation of Agriculture, and the Canadian Animal Health Coalition.

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London Swine Conference proceedings are available at www.londonswineconference.ca

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57th Southwestern Ontario Pork Conference

This long running and popular event will be held at the University of Guelph Ridgetown Campus on Wednesday February 20th, 2019 (in the Rudy H. Brown Rural Development Centre and the Agronomy Ag Theatre, with optional visit to the campus swine teaching and demonstration unit from 12-2pm).

Save $15 by registering by February 13th!

Registration is at 2pm with a trade show including refreshments from 2-4pm. The program begins at 4pm and includes a producer panel and talks on export markets, a local health update, and after dinner our feature speaker Ron Ketchum of Swine Management Services in Nebraska will speak on "Focus On the Little Things". **New this year** is an evening reception in Willson Hall from 8:30-9:30pm, to provide an opportunity to network and catch up with your friends in the industry. Early registration (by Feb. 13th) is only $15.00, or $10 for students, thanks to generous industry sponsorship. Dinner is included. You can register online at http://www.ridgetownc.com/swopc. Or you can call 1-866-222-9682. Registration at the door is $40. If you would prefer a registration form to mail or fax in, contact me (below) or the number above.

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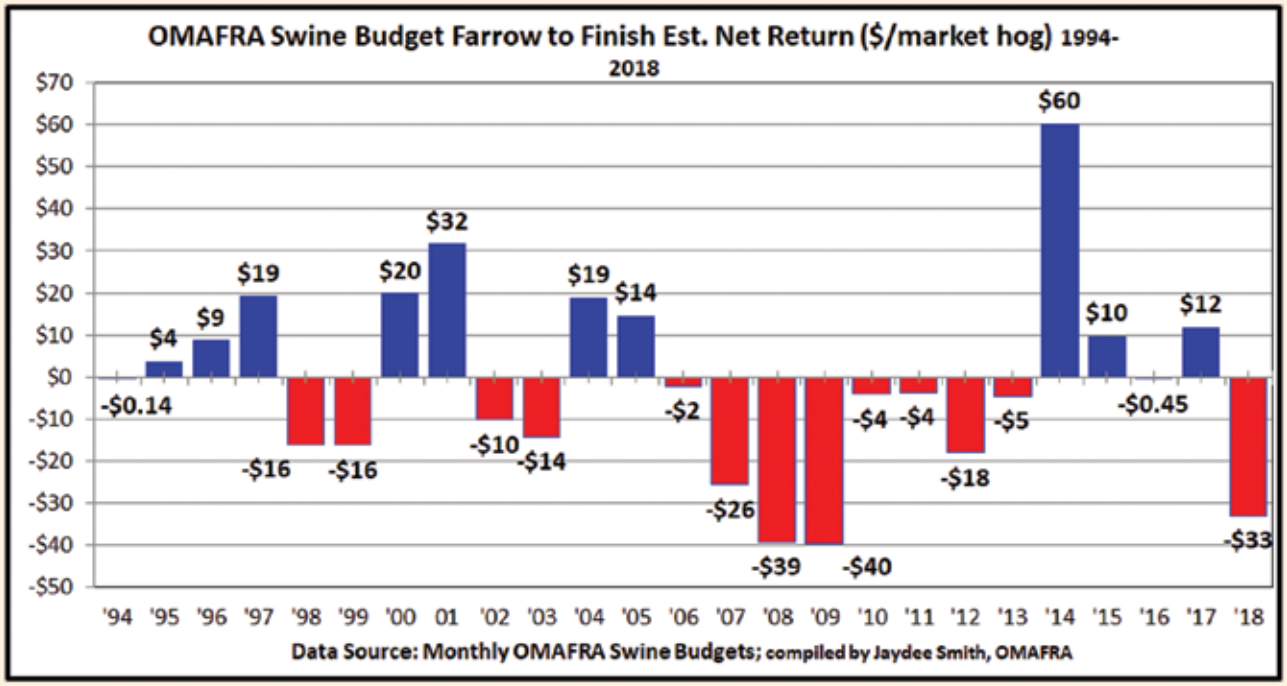

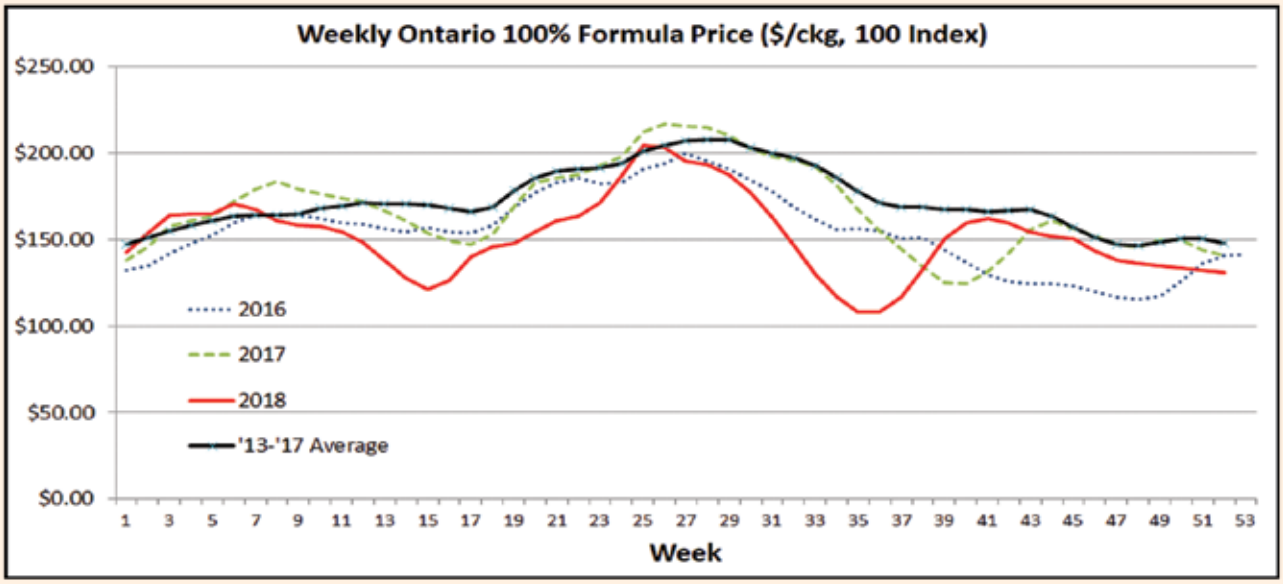

Ministry of Agriculture,
Food and Rural Affairs

Ontario

Swine Budget – Average 2018

Compiled by Jaydee Smith, OMAFRA *jaydee.smith@ontario.ca*

Income ($/pig)	**Farrow to Wean**	**Nursery**	**Grow-Finish**	**Farrow to Finish**
Market Pig @ 101% of Base Price $152.10/ckg, 110 index, 102.920 kg plus $2 premium				$175.92
Variable Costs ($/pig)				
Breeding Herd Feed @ 1,100 kg/sow	$13.38			$14.68
Nursery Feed @ 33.5 kg/pig		$16.68		$17.58
Grower-Finisher Feed @ 280 kg/pig			$85.34	$85.34
Net Replacement Cost for Gilts	$1.94			$2.13
Health (Vet & Supplies)	$2.16	$2.10	$0.45	$5.03
Breeding (A.I. & Supplies)	$1.80			$1.98
Marketing, Grading, Trucking	$0.90	$1.50	$5.76	$8.33
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	$4.00	$12.83
Operating Loan Interest	$0.27	$0.35	$1.20	$1.86
Total Variable Costs	**$31.34**	**$24.57**	**$101.23**	**$161.50**
Fixed Costs ($/pig)				
Depreciation	$4.22	$2.04	$7.18	$13.95
Interest	$2.36	$1.14	$4.02	$7.81
Taxes & Insurance	$0.84	$0.41	$1.44	$2.79
Total Fixed Costs	**$7.42**	**$3.59**	**$12.64**	**$24.55**
Summary of Costs ($/pig)				
Feed	$13.43	$16.68	$85.34	$117.60
Other Variable	$17.96	$7.89	$15.89	$43.90
Fixed	$7.42	$3.59	$12.64	$24.55
Total Variable & Fixed Costs	**$38.72**	**$28.16**	**$113.87**	**$186.06**

Summary	**Farrow to Wean**	**Feeder Pig**	**Wean to Finish**	**Farrow to Finish**
Total Cost ($/pig)	**$38.76**	**$68.50**	**$143.54**	**$186.06**
Net Return Farrow to Finish ($/pig)				**-$10.14**
Farrow to Finish Breakeven Base Price ($/ckg, 100 index) includes 101% Base Price & $2 Premium				**$160.96**
Farrow to Finish Breakeven Base Price ($/ckg, 100 index) excludes 101% Base Price & $2 Premium				**$164.34**

This is the estimated accumulated cost for a market hog sold during 2018. For further details, refer to the "2018 Budget Notes" posted at http://www.omafra.gov.on.ca/english/livestock/swine/finmark.html.

Ontario

Swine Budget – December 2018

Compiled by Jaydee Smith, Swine Specialist, OMAFRA *jaydee.smith@ontario.ca*

Income ($/pig)	**Farrow to Wean**	**Nursery**	**Grow-Finish**	**Farrow to Finish**
Market Pig @ 101% of Base Price $132.98/ckg, 110 index, 102.59 kg plus $2 premium				$153.57
Variable Costs ($/pig)				
Breeding Herd Feed @ 1,100 kg/sow	$14.30			$15.68
Nursery Feed @ 33.5 kg/pig		$16.62		$17.51
Grower-Finisher Feed @ 277 kg/pig			$84.55	$84.55
Net Replacement Cost for Gilts	$2.17			$2.38
Health (Vet & Supplies)	$2.16	$2.10	$0.45	$5.03
Breeding (A.I. & Supplies)	$1.80			$1.98
Marketing, Grading, Trucking	$0.90	$1.50	$5.76	$8.33
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	$4.00	$12.83
Operating Loan Interest	$0.30	$0.38	$1.28	$2.01
Total Variable Costs	**$32.52**	**$24.54**	**$100.52**	**$162.04**
Fixed Costs ($/pig)				
Depreciation	$4.22	$2.04	$7.18	$13.95
Interest	$2.36	$1.14	$4.02	$7.81
Taxes & Insurance	$0.84	$0.41	$1.44	$2.79
Total Fixed Costs	**$7.42**	**$3.59**	**$12.64**	**$24.55**
Summary of Costs ($/pig)				
Feed	$14.30	$16.92	$84.55	$117.74
Other Variable	$18.22	$7.92	$15.97	$44.30
Fixed	$7.42	$3.59	$12.64	$24.55
Total Variable & Fixed Costs	**$39.94**	**$28.13**	**$113.16**	**$186.60**

Summary	**Farrow to Wean**	**Feeder Pig**	**Wean to Finish**	**Farrow to Finish**
Total Cost ($/pig)	**$39.94**	**$69.69**	**$142.80**	**$186.60**
Net Return Farrow to Finish ($/pig)				**-$33.03**
Farrow to Finish Breakeven Base Price ($/ckg, 100 index) includes 101% Base Price & $2 Premium				**$161.96**
Farrow to Finish Breakeven Base Price ($/ckg, 100 index) excludes 101% Base Price & $2 Premium				**$165.35**

This is the estimated accumulated cost for a market hog sold during the month of December 2018. The farrow to wean phase estimates the weaned pig cost for July 2018 and the nursery phase estimates the feeder pig cost for September 2018. For further details, refer to the "2018 Budget Notes" posted at http://www.omafra.gov.on.ca/english/livestock/swine/finmark.html .

by OMAFRA

TOP 10 WAYS TO HELP PREVENT BARN FIRES

Producers can implement these strategies in their operations without significant financial costs.

Though barn fires are a year-round concern, most barn fires occur in the winter. The colder months are generally the time when feed and bedding storage is greatest, electricity use is high, and producers make equipment repairs and upgrades. It is an important time to be extra vigilant. When it comes to barn fires, prevention is key.

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), in collaboration with representatives from fire protection and response, insurance, university, farm and commodity organizations, recommends these top 10 safety practices to reduce the risk of fire. These practices can be implemented without having to make major changes to building structures or equipment.

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1. Focus on housekeeping

Maintaining a clean and organized barn is a simple and cost-effective way to reduce the likelihood of barn fires.

2. Limit the use of temporary electrical equipment

Extended use of temporary equipment can increase the chance of a fire occurring through degraded outlets and extension cords. Hardwire electrical equipment that is used regularly.

3. Regularly inspect and maintain permanent electrical systems

The humidity and corrosive gases generated by livestock and the storage of manure can degrade permanent electrical systems. The Electrical Safety Code has specific requirements for the installation of electrical equipment within livestock housing areas. For more information, see Section 22-204 and Bulletin 22-3-5 in the Ontario Electrical Safety Code and the OMAFRA factsheet Electrical Systems in Barns.

4. Perform hot work safely

When using such things as welders and blow torches, make sure to do the work in well-ventilated areas outside buildings. If the work needs to be done inside farm buildings, ensure the area is well ventilated, remove all combustible materials, place non-combustible pads under the work area, and have a fire extinguisher readily accessible.

5. Participate in a risk reduction assessment with an insurance company or fire department

Many insurance companies and fire departments offer on-site reviews or risk reduction assessments for farms. Take advantage of these opportunities to help identify potential risks and get recommendations to address concerns.

6. Prepare and implement a fire safety plan

A fire safety plan can help ensure a farm operation regularly maintains safety equipment, avoids or reduces high-risk activities and is prepared to respond to a fire.

7. Regularly inspect and maintain firewalls, fire separations and attic firestops

Firewalls, fire separations and attic firestops can slow down the progression of a fire within a building and increase the time available for people to escape.

8. Regularly maintain heaters

Ensure heaters are properly installed, regularly maintained, and suspended well above combustibles and where they cannot be damaged by livestock.

9. Store and maintain motorized equipment away from livestock

Motorized equipment, such as tractors, produce significant amounts of heat, even after being turned off and stored. This heat can dry debris caught in the equipment and cause the material to ignite. In addition, motorized equipment can develop electrical/mechanical failures that provide additional sources of ignition.

10. Store combustibles in a designated location away from livestock

Combustibles such as straw or oil provide the fuel to feed a fire. Isolating these materials in a separate area reduces the risk of a fire spreading throughout the barn.

Visit Ontario.ca/preventfarmfires for more details on the top 10 ways to reduce the risk of barn fires or find out about the other resources provided by OMAFRA, including new videos on how to reduce the risk. **BP**

by
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MAINTAINING ANIMAL ROBUSTNESS

High-fibre diets and immune system stimulation increase growing pigs' threonine requirements.

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

We must identify nutrition-based alternatives to antibiotic use.

Federal legislation eliminated the use of in-feed antibiotics for growth promotion in Canada as of Dec. 1 and the industry faces increasing consumer pressure to reduce antibiotic use in animal agriculture. As a result, we must develop alternatives to antibiotic use to maintain animal performance and health during immune challenge.

An increased understanding of the interaction of nutrition and animal robustness (meaning the animal's ability to cope with an immune challenge) will be a key component in efforts to reduce and/or replace antibiotic use. Specifically, we must identify nutrition-based alternatives to antibiotic use.

Pigs are continuously exposed to microbial pathogens and immune-stimulatory antigens that negatively affect animal productivity. Pigs exposed to immune challenge, without exhibiting any clinical signs of disease, show reduced appetite and growth, and less efficient use of nutrients compared to healthy animals.

Growing pigs experiencing subclinical levels of disease exhibited a reduction in lean growth of 20 to 35 per cent and a drop in feed efficiency of 10 to 20 per cent, previous studies estimated (Williams et al., 1997; Le Floc'h et al., 2009). This decrease in performance can have a substantial effect on producers' profitability.

Stimulation of the immune system alters protein and amino acid metabolism and utilization, as amino acids are redirected from growth towards supporting the immune response. Of the amino acids, glutamine, arginine, threonine, and aromatic and sulfur amino acids are of particular importance. They serve as precursors for synthesis of many critical components of the immune response (Reeds and Jahoor, 2001).

Provision of these amino acids may be important for improving pig response and growth performance during times of stress and disease challenge, researchers believe.

Pork producers have incorporated increased amounts of co-products from the milling and biofuel industries and other feedstuffs into swine rations. These feedstuffs have higher fibre content, and variable protein content and digestibility, which may have detrimental effects on overall pig immune status and robustness.

We know that an increased level of threonine is required in high-fibre diets. However, the effect and interaction of factors such as dietary fibre and health status on requirements for specific amino acids that are used for immune response are not yet well characterized.

Details of our research

We conducted a nitrogen-balance study to determine threonine requirement for pigs for maximum

protein deposition when dietary fibre and immune system stimulation (ISS) were present alone and in combination.

We randomly assigned 90 barrows (20.5 ± 0.75 kg. initial body weight) to 1 of 10 wheat and barley-based dietary treatments (n = 9).

Diets consisted of low fibre (12.5 per cent total dietary fibre) or high fibre (18.5 per cent total dietary fibre from sugar beet pulp and wheat bran added at 15 per cent of the diet in a 2:1 w/w ratio) with graded levels of threonine (0.49, 0.57, 0.65, 0.73 and 0.81 per cent standardized ileal digestible) fed at 2.2 times maintenance metabolizable energy requirements.

After an eight-day adaptation period, we conducted two four-day nitrogen-balance collection periods (pre-ISS and ISS). We induced immune stimulation by repeated injections of increasing doses of *E. coli* lipopolysaccharide.

We determined the threonine requirement in each period based on the response in nitrogen retention to dietary threonine content using a quadratic regression statistical model.

Our findings

Feeding pigs high-fibre diets and stimulating the immune system both independently increased the threonine requirement for nitrogen retention when compared to low-fibre and non-stimulated pigs, resulting in an estimate of 0.78 and 0.76 per cent SID threonine, respectively, compared to 0.68 per cent SID threonine.

The threonine requirement also increased when pigs received both high-fibre diets and the immune stimulation (0.72 per cent SID threonine). However, this was not further increased above what was determined for fibre and immune stimulation alone.

We do not know the exact mechanism behind the interaction of fibre and immune challenge but this mechanism may be indicative of a protective effect of fibre.

Stimulation of the immune system resulted in an increase in the variability of pig response to dietary threonine content, highlighting the difficulty in determining nutrient requirements and development of feeding programs during disease challenge.

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

Feeding pigs high-fibre diets and stimulating the immune system both independently increased the threonine requirement for nitrogen retention when compared to low-fibre and non-stimulated pigs.

Conclusions

This study was the first to confirm an increased threonine requirement during immune challenge in pigs and the first to determine the interactive effects of both fibre and immune stimulation. This information will be important for the development of feeding programs that decrease feed costs and maintain animal performance while reducing reliance on antibiotics. **BP**

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MOE'S MARKET MINUTE

by
MOE AGOSTINO
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FORECASTING 2019 U.S. PORK EXPORT DEMAND

While the U.S. pork sector faced challenges last year, its strong export momentum should carry into 2019.

Iakov Filimonov/iStock/Getty Images Plus photo

Despite some significant obstacles, including Chinese and Mexican tariffs, U.S. pork exports remain strong.

The U.S. exported 207,725 metric tons (MT) of pork in October, the U.S. Meat Export Federation (USMEF) said. This figure was 2 per cent below Oct. 2017, as American exporters shipped less variety meat to China.

In Oct. 2018, these exports fell 28 per cent in volume (194,472 MT) and 15 per cent in value (US$512.4 million). These drops can be connected to the American-Chinese trade tensions.

Notably, however, while American pork's total export value of US$536.5 million in October was 5 per cent below a year ago, it was also the largest value since May.

Cumulative U.S. pork exports from January through October were 1 per cent above 2017's record pace at 2.02 million MT, and value was also up 1 per cent to US$5.33 billion. U.S. pork exports in this period accounted for 25.8 per cent of total production, down just slightly from 26.4 per cent in 2017.

The American pork industry also faced some challenges in Mexico, which is the U.S. industry's leading volume market. American pork exports to Mexico were down for the fifth straight month in Oct. 2018 but this figure remained steady with 2017's record pace at 656,284 MT.

"Export value, (however), pressured by the retaliatory duties first imposed in June, declined by 9 per cent to US$1.12 billion," USMEF said.

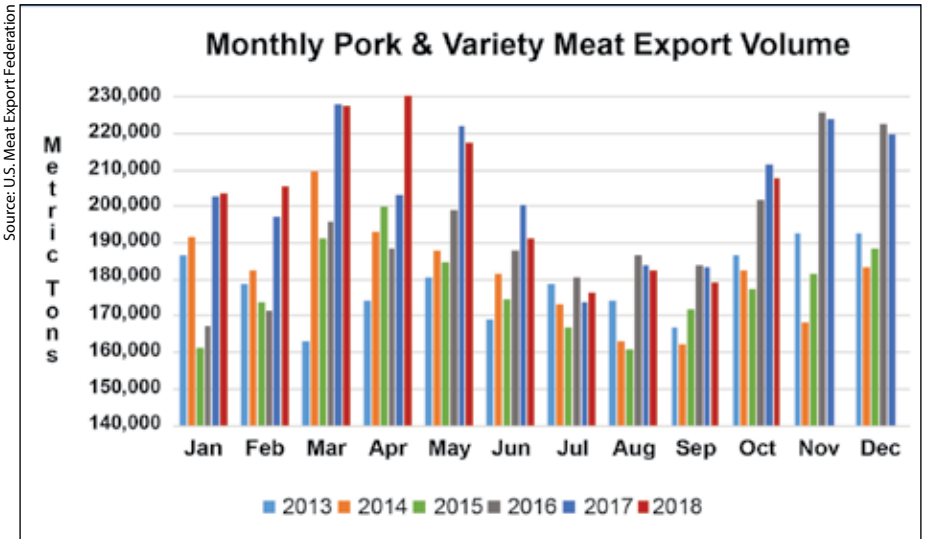
While the American pork industry certainly faced some difficulties in 2018, it also has some market opportunities heading into 2019.

Historically, China and Hong Kong served as the main destinations for U.S. pork variety meat exports and China is now desperate for pork. The country is dealing with African swine fever (ASF) outbreaks and had to cull over 631,000 pigs between August and mid-December.

Despite a 62 per cent Chinese tariff on U.S. pork, China bought this meat between Nov. 26 and Dec. 14. Indeed, China was the third-largest buyer of pork, USDA weekly data released on Nov. 29 showed.

China's 3,300 MT purchase was the country's largest buy since Feb. 2018, which was a month before China imposed its tariffs on American pork, Bloomberg reported.

Source: U.S. Meat Export Federation



As of mid-December, market analysts thought the U.S. pork industry would end the year on a record-setting export pace.

"The USDA also reported sales of another 9,400 tons to China in 2019," Bloomberg said. This reopening of trade could be a "game changer" for the pork sector.

The USDA raised its 2019 projected pork exports by 250 million pounds, the December World Agricultural Supply and Demand Estimates (WASDE) report said. This figure was up 7.8 per cent year over year based on continued strong global demand. Interestingly, in its projections, the USDA made no mention of China or ASF.

As of mid-December, the USDA forecast American pork exports for 2019 to be 23.3 per cent of U.S. pork output, which was just slightly higher year over year, the report said.

Despite some significant obstacles, including Chinese and Mexican tariffs, U.S. pork exports remain strong. President Trump signed the United States-Mexico-Canada Agreement in November and Chinese-American trade returned with the 90-day trade truce that started in December. As of mid-December, Chinese news outlets reported that the country agreed to triple its 2019 American pork imports compared to 2018 levels.

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The American pork sector is well positioned to regain the momentum it displayed in early 2018.

The start of trade negotiations with Japan on Jan. 14 are also critical for U.S. pork export demand.

Because of these global markets, the American pork sector is well positioned to regain the momentum it displayed in early 2018.

If China and Mexico drop their tariffs on American pork, more aggressive fund trader buying might occur.

CME lean hog futures had priced in expectations for better-than-normal demand from China soon. Any news suggesting a lack of progress on this front could spark some speculative long liquidation selling and a short-term correction. **BP**

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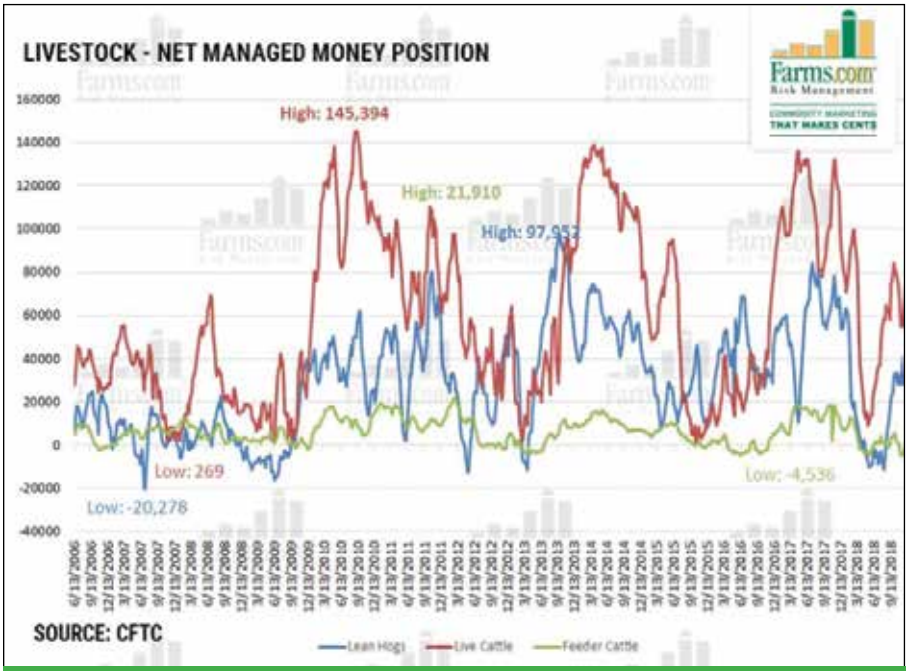

This graph shows the number of contracts between June 2006 and September 2018. While funds are long, they are not record long, so there could still be more room to the upside in futures.

by
RICHARD SMELSKI

DO YOU PLAY TO WIN OR PLAY NOT TO LOSE?

A cautious approach to managing your operation might be holding you back from achieving greater success.

I recently visited two swine operations that follow different business philosophies. One emphasized predictability and the other was in a constant state of flux searching for improvements. One plays not to lose while the other plays to win.

A good example of the effect of playing not to lose or playing to win was the 1994 Olympic hockey championship game between Canada and Sweden in Lillehammer, Norway.

After three intense periods of hockey, the score was tied. In overtime, neither team scored. This situation meant the winning team would be determined by a shootout.

Imagine the adrenaline rushing through the players' veins during the shootout. And think of the reaction of sports fans when, during the final round, the Swedish coach sent a rookie to take the last shot instead of one of the seasoned players.

The rookie scored and the Swedish team won its first Olympic gold medal in hockey.

Was the coach's strategy a gamble or a calculated risk?

After the game, the press asked the coach why he selected a rookie in such a crucial moment, when he had several skilled players to choose from. The coach replied that rookies play to win while other team members play not to lose.

Now let's return to the swine facilities I visited. The first operation was pristine, orderly and very predictable. The team displayed the list of standard operating procedures prominently and followed them very closely. The workers kept detailed and up-to-date records. The operation depended on suppliers and veterinarians for its information.

But employees were reluctant to make changes for fear of mistakes and the subsequent domino effects that might occur.

The second swine operation I visited plays to win.

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Can you encourage a continual quest for improvement in your business?

Management encouraged employees to continuously seek new methods for improvement.

In fact, the staff had just developed a farrowing crate feeder that significantly increased nursing sow feed consumption with less labour. The employees' initiative and commitment to improvement resulted in improved sow health, heavier weaning weights, better breeding and calmer sows.

Throughout the development phase, staff thoroughly documented all the important details. The employees' enthusiasm was exhilarating and they were excited about their newly designed feeder.

And the team has undertaken several trials over the years. The team did not view the experiments as win or lose situations. Instead, the staff viewed them in a spirit of continuous improvement.

We can track business progression through four phases: innovation, growth and stagnation followed by decay unless regeneration occurs. Regeneration or reinventing the business in the last phase is necessary to grow and stay in business.

Can you incorporate change into your operation? Can you encourage a continual quest for improvement in your business? Or is status quo and stagnation acceptable?

For many, familiarity provides a sense of security. Even if we introduce change, we can sometimes experience the tendency to revert to the old ways of doing things. A common refrain is that "If I repeat the same old patterns, I know what will happen."

But to discover new boundaries, we need to be willing to step outside of our comfort zones.

If it is not broke, break it! And remember Albert Einstein's words of wisdom: "No problem can be solved from the same level of consciousness that created it." **BP**

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

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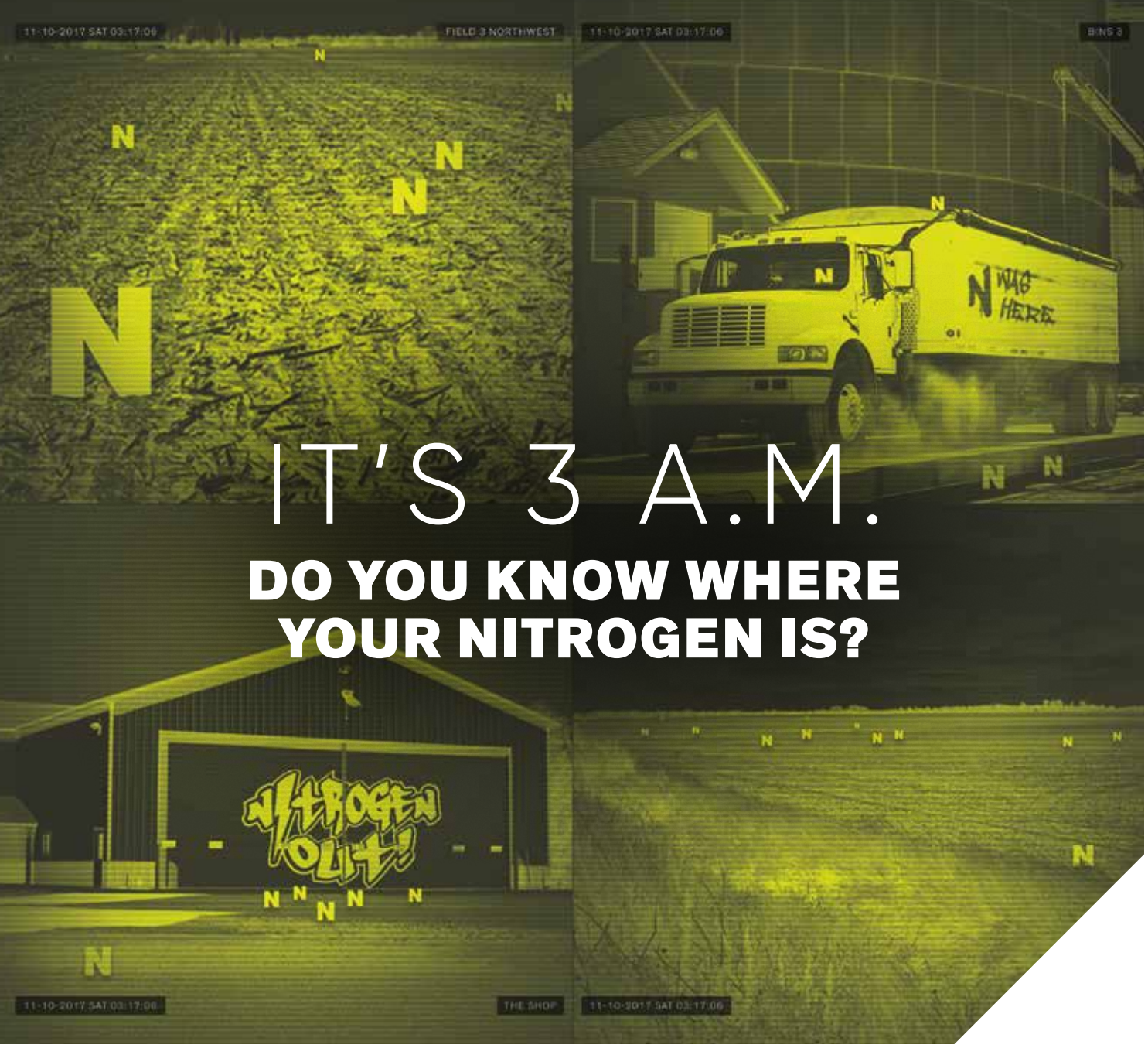

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