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Cover Photo

Temple Grandin answers an audience question during Le Porc Show, held in Quebec City on December 6.

Photo by Sheri Monk



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Canadian Hog JOURNAL

Message from the editor

Welcome to the very first edition of the Canadian Hog Journal as we extend a hearty hello and bonjour to our new readers from across the country! It has been a bit of a learning process, as I expect it will continue to be as we continue to expand our scope of coverage.

A reader wrote to me after our last issue in which I excitedly referred to Quebec as “out East”. He (gently) informed me that if we want to be truly national, I will have to stop thinking of anything east of Manitoba as THE East, because Ontario thinks of itself as central, and Quebec is just Quebec, and anything east of Quebec is “out East”. Canada is a funny country, and how we identify ourselves geographically seems to play a large role in our cultural identity too.

I was born and raised in Manitoba, where the Winnipeg Blue Bombers were constantly shuffled between the eastern and western divisions of the CFL. My father was born and raised in Quebec. I now live in Alberta, but I spent five wonderful years in Saskatchewan before I came here. I have been to Ontario more times than I can count, but I have never been to Ottawa, nor I have I been to the East Coast – yet. It’s no wonder I feel like a rootless geographical vagabond!

Regardless, my WestJet plane definitely did head east and I certainly landed in beautiful Quebec City just in time for Le Porc Show. Just outside the gates to the old city, across from the Legislature, the setting was perfect. I had the pleasure of meeting some new people, as well as catching up with a few old friends as well! The event itself was certainly a lesson in pizzazz and class. As speakers came on stage, they were accompanied by music and thunderous applause. The lighting and ambience felt more like a game show or fun party than it did a traditional livestock conference, and it was music to my ears! The result was a very high energy audience, and I really think the production elements in Le Porc Show probably help to attract a large crowd, and certainly, a younger demographic than what I am accustomed to seeing at industry events. I was very impressed, and really grateful to have had the experience.

As I write this, Christmas is just around the corner, and so is the Banff Pork Seminar. The line-up this year looks fabulous, and like so many others in the industry, thanks to the seminar, I actually have a reason to look forward to the month of January. (I mentioned I grew up in Manitoba, right?)

Canada’s swine industry continues to surprise and impress me. It is resilient, adaptable, progressive and committed. Most of all, just like Canada, (whether west, central or east) our business is kind and generous... and no matter where you end up, it still feels like home.

See you in Banff! ■

sherimonk@gmail.com

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Sheri Monk, editor



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News and Views from Far and Near

Jefo: Major investment in Saint-Hyacinthe

Agronomist Jean Fontaine, the president and founder of Jefo, has announced a \$12M investment in the construction of a new prestige building that will serve as both a head office and a training centre. The avant-garde five-storey facility (100,000 square feet) will join the company's numerous commercial and private buildings located north of Highway 20, near Saint-Hyacinthe, Quebec.

"A seamless addition to its surroundings near the Château Fontaine Vineyard, the new building will incorporate cutting-edge technology and state-of-the-art architecture," states Jean-François Fontaine, vice-president at Jefo.

In addition to conference and meeting rooms for technical and practical training related to the animal feed industry, the new building will house a cafeteria, a gym, lounges, and more than 150 offices.

Construction is already underway, and the project will be completed in May 2017.

"The creation of a major headquarters at Saint-Hyacinthe only underscores the city's identity as a tech hub – an exclusive meeting place of various actors associated with the food biotechnology sector," explains Emilie Fontaine, Jefo's marketing and regulatory affairs director.

Investing in knowledge

"Our goal is for the training centre to become a world leader in animal nutrition," adds Jean Fontaine with a note of pride. Indeed, the Jefo Group is committed to the transfer of knowledge, drawing upon 60 trained experts in animal nutrition as well as its major commercial partners. For example, Jefo recently brought together more than 200 stakeholders from 18 countries to discuss the primary challenges facing the livestock industry. Seasoned speakers

had the opportunity to share their knowledge and exchange ideas about how to maintain healthy, profitable production methods while satisfying the ever-growing demands of consumers.

For Mr. Fontaine, knowledge, training, innovation, and growth are the keys to a future of prosperity for our agricultural industry and our farmers. Jefo's president and founder is firm in his beliefs: "We have to take pride in the work we are doing to feed the planet."

New Family Operated Animal Health and Supply Company Emerges

Rick and Luke Bergmann are pleased to announce the opening of a producer-focused animal health and supply company named Buckingham Ag. The father and son joint venture located at Steinbach, Manitoba will serve a vast region with the commitment of bringing value and a high level of service to livestock producers and manufacturers alike.

"Agriculture runs deep in our roots. The Bergmann family

has played a significant role in agriculture over multiple generations," stated Buckingham Ag's operations manager, Luke Bergmann. "I am proud to carry on the tradition and passion for agriculture through this business and I look forward to working with producers to fill their animal health and supply needs."

"The Canadian livestock industry produces a safe, healthy and affordable food supply for consumers around the world, and it is an honour for the Buckingham Ag team to be a link in the chain by supplying products and services of value to farms," added Rick Bergmann, president at Buckingham Ag.

The Buckingham Ag team brings decades of experience serving the livestock industry and understands what is important to producers. The team is committed to delivering a service with biosecurity protocols, value and effective solutions for their customers.

For further information, please contact
Rick at RBERGMANN@BUCKINGHAMAG.CA
Luke at LBERGMANN@BUCKINGHAMAG.CA
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Schippers Canada Ltd. builds for expansion

As part of the MS Schippers group, Schippers Canada Ltd., has been growing rapidly after opening storage and sales facilities in Ontario and Manitoba. MS Schippers is currently building a new office and warehouse along Highway No. 2 between Calgary and Edmonton, near Lacombe, Alberta. This new space will allow for more employees to work in the office and warehouse.



The new building will ensure that their customers experience a higher level of customer service nationwide. The new expanded 25,000 square foot warehouse will house

larger stock quantities and will avoid customers having to wait for backorders.

Schippers reaches the majority of its customers by phone due to the distance across Canada. They also have a growing number of sales reps on the road that visit livestock farmers every day. Their customer service department is highly knowledgeable. E-commerce and an easy, accessible website give a wide range of variety to constantly support Canadian farmers.

The current assortment is visible on www.schippers.ca. Because of the frequent arrival of inventory from Europe, it's also possible to order products from the European assortment at www.msschippers.com. Schippers Canada is always looking for new employees to join their young and dynamic team!

The current move-in date is set for January 2, 2016. We look forward to starting the New Year in a new space to serve its customers even better. A grand opening will be planned later this spring.

Canadian agriculture attracting interest and opportunities

There appears to be a growing interest in agriculture education in Canada, along with an increasing number of job opportunities in the industry, according to Statistics Canada data and a couple of independent surveys.

Statistics Canada data reveals there were a total of 12,168 students studying in agriculture or an ag-related program in 2014, which is a 2.7 per cent increase from the previous year and a 16.6 per cent overall increase from 2009-10.

The number of enrollments in agricultural programs grew at a rate double of all post-secondary enrollments (2.7 per cent and 1.2 per cent, respectively), while slowing down at about the same level as all other post-secondary programs over the past five years.

Agriculture programs are also more likely to see full-time enrollment than other pro-

grams (87 per cent compared to 75 per cent, respectively) and this rate has been steady over the past five years.

A recent informal Farm Credit Canada (FCC) survey of 33 post-secondary institutions offering agriculture and ag-related programs confirms agriculture has become a popular career option, especially over the past five years as the industry has grown.

"This is a testament to the strength and appeal of Canada's agriculture industry, which is generating more interest among students than ever before," said Todd Klink, FCC's chief marketing officer, who has undertaken projects to get high schools students interested in careers in agriculture. "As the industry grows, so does the need for additional talented, energetic and well-educated young people."

The need to attract skilled and educated young people to Canada's agriculture industry is highlighted in a recent study by Canadian Agricultural Human Resource Council (CAHRC).

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Agriculture 2025: How the Sector's Labour Challenges Will Shape its Future shows the gap between labour demand and the domestic workforce in agriculture has doubled from 30,000 to 59,000 in the past 10 years and projections indicate that by 2025, the Canadian agri-workforce could be short workers for 114,000 jobs. The study also reveals that primary agriculture has the highest industry job vacancy rate at seven per cent.

"The sustainability and future growth of Canada's agriculture and agri-food industry is at risk," explains Portia MacDonald-Dewhirst, CAHRC Executive Director, said in releasing this study. "It is critically important that this risk is acknowledged and mitigated in an intentional and strategic way."

FCC is committed to helping young people enter the industry by offering various loan products for young farmers and through its long-standing support for 4-H Canada clubs and programs and Agriculture in the Classroom.

"Given that one in eight jobs in Canada are tied to the agri-food industry, there are a lot of opportunities for young people," Klink said. "The growing interest in agriculture education shows we can be optimistic for the future of agriculture."

DuPont Industrial Biosciences brings fast-acting Phytase to the animal feed industry in Canada

Danisco Animal Nutrition, a division of DuPont Industrial Biosciences, recently announced the launch of its Aextra® PHY enzyme in Canada – the fastest-acting phytase enzyme product on the market. Aextra® PHY has already been helping producers in the animal nutrition industry in the United States and is increasingly being introduced into other markets around the world. Now producers in Canada will have access to Aextra® PHY.

Aextra® PHY begins degrading phytate and breaking down its

anti-nutrient effects at much lower pH levels, much earlier in the animal's digestive tract. This valuable process enables the release and digestion of the beneficial nutrients naturally present in the feed that would otherwise bypass the animal's digestive system. Less supplementation of these valuable nutrients is required, resulting in improved animal performance, efficiency and lower-cost diets with fewer of the undigested nutrients making their way into the environment.

"We are excited to bring our award-winning phytase to the Canadian marketplace," said John Van Oort, business manager for DuPont Canada. "We have broiler trials that demonstrate Aextra® PHY can enhance phosphorus and calcium release by 20 per cent and decrease feed conversion ratio by eight to 10 per cent."

"For swine, we see a body weight gain of up to 20 per cent in piglets, and a reduction in their phosphorus excretion of an astounding 57 per cent," said Van Oort. "These benefits will give animal producers the edge they need in today's com-

petitive environment, while also reducing their environmental footprint."

Additionally, DuPont offers an unprecedented approach to dosing. While some in the industry choose to super-dose feed with phytase, DuPont supports producers by recommending dosages that take into account a combination of factors – species, diet and age of the animal. Optimal dosages of Aextra® PHY prevent producers from wasting money on products that do not provide any added benefit.

The optimal recommended dose (1,000-1,500 FTU/kg, depending on species) has proved vital. Evidence shows that when used at the correct dose for the animal, the award-winning Aextra® PHY phytase doubles the rate of phytate degradation in the upper digestive tract, releasing extra nutrients, energy and protein more quickly. To ensure customers use the most cost-

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effective dose, Danisco Animal Nutrition offers producers the Optimize Feed Service™, a one-of-a-kind service that enables customers to calculate the correct dose of phytase, using matrix values based on 300 data points for poultry and 560 data points for swine. This includes 14 dosing studies across different ages of pigs on different diets, and 10 dosing studies across different ages of birds on varied diets.

"For nutritionists, this service means they can add the right dose of phytase for their specific circumstances, to drive performance while maximizing their return on investment," Van Oort said.

New innovations drive new era in farm animal feeds

In a world of farming and ranching that is increasingly shifting to natural, more efficient, bio-based approaches

for elite level animal care and performance, innovations in feed and nutrition are quickly rising to the forefront as a top game-changing factor for 2017 and beyond.

A group with a unique vantage point on this growing trend, including the big picture of where the world of feed has come from and where it is headed, is the team at Country Junction Feeds, based in Wetaskiwin, Alberta. The company is building on a remarkable 100-year history serving customers across the province, the country and into the U.S., specializing in quality bulk and bagged feeds for beef, dairy, equine, poultry, swine, goat, lamb, certified organic feeds and more.

"Advances in feed and nutrition approaches have always moved at a steady rate, but today both the pace of innovation and the interest in this area is spiking much higher than ever before," says Darrell Kimmel, manager of Country Junction Feeds. "The bottom line for farmers and ranchers is more choice, better options, and more opportunities to get more value out

of feed to greatly strengthen their results."

"A wave of emerging trends, industry developments and new science-based knowledge and tools, have all come together at the same time, toward a much stronger emphasis on feed and nutrition as a top area of opportunity," says Bernie Grumpelt, ruminant nutritionist for Country Junction Feeds.

"We're entering a new era, with a new mindset about how best to support the performance of farm animals, whether they are food production animals or working farm animals," says Grumpelt. "Artificial inputs, over-reliance on antimicrobials -- these types of approaches are on the way out. There's a lot more focus on high quality diets, top quality feed and the use of improved nutrition strategies and supplements to get the most feed value and benefits possible, while reducing waste and environmental impact."

"Today's best approaches also have strong components to support optimal animal well-

being and comfort throughout a variety of situations, including elements that support fast recovery from energy depletion and protection from the negative impacts of stress," says Grumpelt. "Many of these shifts have been coming for a while now and that has driven a lot more science and innovation to support evolving farming and ranching industries. Whether the priority is animal health, productivity, efficiency or animal care, the future is all about a much stronger focus on feed."

"Feed has always been a pivotal factor because it represents the number one cost of raising and caring for farm animals," says David Gibson, Canadian sales manager with Country Junction Feeds. "It is also arguably the number one factor affecting animal performance. But today the power of feed-based improvement has never been greater."

Country Junction Feeds was established in 1917 and is approaching 100 years of innovation, expansion and customer service. The current

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mill was built in 1973 as a division of Wetaskiwin Co-op and serves customers in broad areas of Western Canada and into the U.S. More information on Country Junction Feeds and its comprehensive offering of products and services is available at www.countryjunctionfeeds.com.

National panel ranks Hypor Maxter Pork first for flavour and quality

A new pork product line launched in October 2015, that is produced nearly exclusively by the Hypor Maxter sire and sow lines has ranked first in a national consumer trial that compares hams for palatability and quality.

The high-end product line, J'aime, is produced in partnership by agri-food company Fleury Michon and animal nutrition company Avril and Sofiprotéol.

J'aime is a superior brand of pork that is produced by pigs that are raised without GMOs, are antibiotic-free, meet strict welfare standards, produce stress negative meat and that are fed a diet with linseed. Pork producers are contracted to produce 100,000 finishers annually to meet the demand for J'aime products.

"To produce a quality product, like J'aime, meat must have a good pH level and a sufficient level of backfat," says France General Manager Julien Briant. He explains that the Hypor Maxter produces a slightly higher level of backfat that helps to lower the driploss and

maintain the pH level after slaughter. Meat that has an ideal pH level has a long shelf life and produces a more desirable meat color.

"It is important for the meat to have a sufficient amount of fat, and also for it to be lean for the consumer," he says. Julien Briant adds that the Hypor Maxter has the carcass traits that meat processors want, "Pork producers receive 6.30 euros more over the standard market price to produce pigs that qualify for J'aime."

The Hypor Maxter is a stress negative boar and free of negative gene rn- since more than 15 years, that contribute to a positive effect on driploss. "We have done trials that show that the Hypor Maxter has one to two per cent lower driploss than the other sire lines that are used in the market," Julien Briant says. The driploss determines how much water is lost off the carcass after slaughter. "A one to two per cent lower driploss per pig carcass is a significant amount of meat volume when multiplied with the 23 million-head French pig herd," he says.

Briant explains that at the end of the day, the Hypor Maxter is developed to be efficient for the producer and the meat processor.

"Hypor's goal is to develop genetics that benefit all parts of the production chain—from the farm to the consumer's plate," he says. "Compared to other sire lines in France, the Hypor Maxter has a higher daily gain, better carcass uniformity," he says. "That is why we see a beautiful future for the Hypor Maxter in this market."

CONTINUED ON PAGE 12




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New CFIA-approved algae product will enable producers to bring DHA-enriched pork, milk and eggs to market

Alltech's ForPlus and All-G Rich will provide Canadian pig, dairy and layer producers with a sustainable and competitive advantage to enrich pork, milk and eggs with DHA.

Canadian consumers will benefit from DHA-enriched pork, milk and eggs in their diet.

As the first registered algae products in Canada to be heterotrophically grown, ForPlus and All-G Rich will provide a sustainable alternative to current DHA omega-3 fatty acid sources that are depleting global fish stocks.

Algae nutritional products from Alltech are now registered with the Canadian Food

Inspection Agency (CFIA) for use in the diets of pigs, dairy cows and laying hens. The DHA found within algae can naturally enrich pork, milk and eggs. Canadian dairy, swine and layer producers will be able to market their DHA-enriched products as value-added functional foods, meeting consumer demand for nutrient-rich foods and beverages.

"Consumers are becoming increasingly nutrition-focused, seeking out foods that provide specific health benefits when shopping at the supermarket," said Nikki Putnam, registered dietitian nutritionist at Alltech. "They're demanding more nutrition out of each bite while asking farmers and the food industry to keep their food fresh and flavorful. Alltech's ForPlus and All-G Rich dried micro-algae fermentation products give producers the opportunity to increase the nutrient content of pork, milk and eggs without changing the flavour and quality consumers expect."

Algae are gaining attention for their application to the feed and food industries as a

highly sustainable source of DHA. Docosahexaenoic acid, or DHA, is an omega-3 fatty acid naturally found in some species of algae and in fatty fish used for fish oil. Research has demonstrated DHA's importance as an essential nutrient for health at all stages of both human and animal life. In humans, DHA is essential for brain and eye development. Plentiful levels of dietary DHA are also linked to improved cognitive function and learning ability in children, including benefits for children with ADHD, as well as reduced risk of coronary heart disease, depression and Alzheimer's disease.

As such, Alltech is continuing to expand its algae DHA plant, one of only two plants commercially producing high-DHA heterotrophic microalgae. The facility, which is capable of producing approximately 15,000 tons of algae per year, has already been updated since its opening in early 2011.

"Alltech's newly received approval from the CFIA on ForPlus and All-G Rich is an incredible step forward in sustainable animal agriculture,"

said Stuart McGregor, Alltech Canada general manager. "This will provide the Canadian market with a renewable and competitive advantage to enrich pork, milk and eggs with DHA while also offering a sustainable alternative to current DHA omega-3 fatty acid sources that are depleting global fish stocks."

Alltech algae products ForPlus and All-G Rich will be available through Canadian feed suppliers. For more information, contact your local Alltech Canada representative at <http://go.alltech.com/the-dha-opportunity>.

Fostera® PCV MetaStim® now available from Zoetis Canada

Zoetis announced recently the availability of Fostera® PCV MetaStim®. The monovalent killed virus vaccine that helps protect against porcine circovirus associated diseases (PCVAD) caused by porcine circovirus Type 2 (PCV2) has been updated with the commonly used adjuvant known as MetaStim.

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MetaStim, the common name for the SP (squalane, Pluronic®) oil adjuvant, is an emulsion used in vaccines to help elicit a humoral and cell-mediated immune response. This preserves the vaccine components so the antigens are released slowly as compared to other types of adjuvants. This release time gives more time for the immune system to develop a response to the virus.

“The safety and efficacy of MetaStim has been well documented given its use in swine, cattle and equine vaccines for the past several years”, according to Don McDermid, DVM, Manager of Veterinary Services, Zoetis. “In fact, the MetaStim adjuvant platform is currently used in our combination vaccine – Foster PCV MH. Foster PCV MetaStim is the monovalent PCV2 fraction of the combination vaccine and it promises to deliver a similar performance profile.”

Along with the adjuvant update, Foster PCV MetaStim also carries the same label claims as the PCV fraction of Foster PCV MH. Foster PCV MetaStim has been demonstrated to aid in preventing viremia, lymphoid depletion and colonization of lymphoid tissue caused by PCV2, as well as an aid in reducing PCV2 virus shedding.² In addition, Foster PCV MetaStim is backed by the industry-leading 23-week duration of immunity against PCV2 – three weeks longer than competitors.

Foster PCV will remain in the Zoetis portfolio of swine vaccines as we transition to Foster PCV MetaStim. Foster PCV MetaStim is available in 50- and 250-dose vials and can be purchased through veterinarians. For more information on Foster PCV MetaStim, visit with your veterinarian or local Zoetis representative.

Winners of the Robert (Bob) L. Ross Memorial Scholarship announced

November 24, 2016 – Calgary, Alberta – Peter Jennen of Thamesville, Ont. and Scott Thom of Denfield, Ont. are the 2016 winners of the Robert L. Ross Memorial Scholarship, allowing them to attend the CTEAM program.


CTEAM stands for Canadian Total Excellence in Agricultural Management, and is managed by Agri-food Management Excellence (AME). During the program, farmers learn detailed financial, marketing and human relations management skills, using their own operation as a case study.

Robert (Bob) Ross was instrumental in guiding the CTEAM program, inspiring and encouraging farm management excellence across

Canada through his leadership and passion for the agricultural community. Bob fought a courageous battle with cancer, passing in March 2014.

As a tribute to his passion, leadership and legacy, Agri-Food Management Excellence, Farm Management Canada, Family Farms Group and the Ross Family, along with an additional private contributor, established the Robert L. Ross Memorial Scholarship program, rewarding two farmers with the opportunity to participate in the CTEAM program and continue on a path towards excellence, as


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The “A” team clean machine.

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About the Winners

Peter Jennen, along with his wife and three children, farm over 700 acres near Thamesville, Ont. They operate a diversified farm, cultivating a variety of crops (including processing tomatoes, pepper, strawberries, corn and soybeans) while managing an on-farm retail market. The farm employs 15 people during the busy season. The operation is very progressive, and the family has received an award for the installation of high

tunnels over their strawberry plants to extend the growing season. By taking CTEAM, Peter hopes to gain the skills and knowledge to better deal with issues and opportunities in markets, products marketing plans, risk management and relationships.

Scott Thom, not having a farming background grew up in town. He began farming modestly, initially raising 300 pigs on straw in an old rented barn. He then built a new state of the art barn in the fall of 2015. Scott has purchased another farm and now has over 13,000 pigs on feed. Scott wants to attend CTEAM so that he can learn to better understand his financial position and use that knowledge to build a plan and foundation for the future of his operation.

Genesis names Helena Echberg as new director of business development



Genesis is pleased to announce the appointment of Helena Echberg as its new director of business development.

Born in Denmark, Helena has been involved in the swine

industry throughout her entire life. After graduating from the Aarhus University of Business in 1994, Helena started her career in international swine equipment sales.

In 1997, Helena moved to Quebec, Canada, where she still resides today. Through her own distribution channels, she has represented Danish swine equipment companies in North and South America for the past 20 years.

Helena brings a wealth of production expertise, international contacts, language skills, and leadership, all of which will contribute to Genesis' global growth. Genesis is fortunate and excited to add Helena to the team.



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Idavang switches to Topigs Norsvin genetics

Idavang, with production in Russia and Lithuania, is switching to Topigs Norsvin genetics. The current female genetics will gradually be entirely replaced with Topigs Norsvin TN70 genetics. Idavang will use Topigs Norsvin terminal boars (Talent, Top Pi, Duroc) to answer market needs as well as for production requirements.

As a part of the partnership, Idavang will receive support and know-how from Topigs Norsvin in the fields of breeding, performance management and artificial insemination.

Idavang has chosen Topigs Norsvin for the total package. The TN70 sow brings higher weanability and their offspring have better meat and carcass quality. Improving the total feed efficiency of the production and, in particular, the efficiency of the finishers are also important reasons for choosing Topigs Norsvin as a partner.

"Topigs Norsvin is the ideal genetics partner for us. Not just for the quality of the genetics but also for the support and service," said Lars Christiansen, COO of Idavang Lithuania.

"We are very proud that Idavang has chosen us as a partner and that we can contribute to Idavang's success. It underlines the fact our genetics and support appeal to the important pig producers in the world," Topigs Norsvin's key account manager, Bert van Meer.

Topigs Norsvin Canada Inc. announces new Manitoba sales/technical representative

Topigs Norsvin Canada announced recently that Geraldo Shukuri has joined its staff as Manitoba sales/technical representative, based out of the Winnipeg head office. In his new role, Geraldo will be involved in business develop-

ment in Manitoba. As well he will be responsible for technical support to customers in Western Canada.

Geraldo has more than 18 years of experience in swine production and technical support for large production systems in Brazil. He spent the last 12 years with a major swine genetics company. He graduated in 1998 with his Bachelor of Science in Veterinary Medicine from the Federal University of Minas Gerais (UFMG). "Geraldo brings a wealth of experience and new ideas to the dynamic Topigs Norsvin team in Canada and will be a great asset for us," said John Sawatzky, sales manager, Topigs Norsvin Canada.

"I am truly excited about the opportunity that exists in this industry and in particular at Topigs Norsvin," Geraldo said. "I am looking forward to supporting the Canadian customer base as well as the sales and production team. I am proud and excited to become part of the Topigs Norsvin team in Canada."

Geraldo and his family will reside in Manitoba.

Porc-Ex Breeding and Genesus Inc. press announcement

Porc-Ex Breeding and Genesus Inc. are pleased to announce that Porc-Ex Breeding will begin marketing Genesus Swine Genetics. Based in Denmark, Porc-Ex Breeding has been the major marketer of Dan-Avl (Danbred) swine breeding stock in several European and Asian countries. Genesus Inc. of Canada has the world's largest herd of registered high health prolific Yorkshire, Landrace, and Duroc Breeds.

"In order to continue the good cooperation that we have built up with our customers worldwide over the past 15 years, Porc-Ex Breeding has signed an exclusive distributor agreement with the Canadian breeding company Genesus, on specific markets," said Holger B. Sorensen, CEO of Porc-Ex

CONTINUED ON PAGE 16



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Breeding. "Genesis is the international breeding company which has the most modern and innovative philosophy regarding breeding objectives and sustainability in the pig production. For this reason, this genetic is well qualified to complement those of our Dan-Avl (Danbred) customers who want, or are forced, to change genetics. As a distributor for Genesis, Porc-Ex Breeding can offer all kinds of genetic products in the form of live animals, semen and embryos. Porc-Ex Breeding has – and will establish close cooperation with leading AI stations, in order to serve our on-farm replacement customers, mul-

tiplication- and production herds with the highest quality semen from the Genesis breeding pyramid."

"The agreement with Porc-Ex Breeding creates the opportunity for more producers to get the benefit of greater profitability that Genesis Genetics brings to the pork industry. We are very proud that a market powerhouse, Porc-Ex, has chosen Genesis to enhance their customers' success," said Jim Long, president-CEO of Genesis Inc.

Genesis sends 747s of purebred stock to China

Recently, Genesis completed the successful export of two 747s of registered purebred breeding stock to COFCO



Meats. This is the largest single order to one company ever sent to China.


COFCO Meats is a listed firm belonging to the COFCO Corporation, China's largest agri-business company. COFCO Meat is moving the Chinese meat industry to its next phase of expansion and modernisation. COFCO Meats currently has 190,000 sows in production.

The Genesis animals were sent by charter plane, and great efforts were undertaken by Genesis' experienced export team to select and transport this combined order to China, while providing the best environment for the pigs along the way. The export process from


Canada was supervised by CIQ (the Chinese animal health department) and CFIA (their Canadian counterpart), ensuring that only healthy pigs were sent to China.

Genesis has the world's largest registered purebred herd, and is known for the most prolific genetics in the industry, as well as the leader in meat quality research and implementation. This made Genesis the perfect partner for COFCO, which has one of China's largest fully integrated systems. Using the newly imported breeding stock is the fastest way to get the latest Genesis genetics into herds and helps our customers get more money into their wallets faster.

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Canada well positioned to capture export growth, FCC report says

Diversity, technology and innovation in agriculture are key to maintaining Canada's competitive position in supplying food to the world, according to Farm Credit Canada's (FCC) latest Canadian Agriculture's Productivity and Trade report.

"The wide variety of sectors is an underlying strength of Canadian agriculture as far as trade is concerned," said J.P. Gervais, FCC's chief agricultural economist. "When markets decline in

one sector, demand and output may increase in other sectors. Identifying and taking advantage of different market opportunities can lift the output of multiple sectors and allows

Canadian agriculture to maintain our competitive position as a reliable supplier of safe, high-quality food."

Canada was the world's fifth largest agriculture exporter in 2015, behind the United States, China, the Netherlands and Brazil, according to the report.

The U.S. was by far the world's largest single-country agricultural exporter in 2015, with almost 15 per cent of global exports worth US\$118.7 billion. The U.S. also continues to be Canada's single largest agriculture export market, taking in 35.4 per cent of Canada's total agriculture exports worth US\$9.3 billion.

Canada was the world's largest exporter of wheat, canola, lentils and canary seed in 2015. Canada also ranked among the top 10 exporters of 13 different agriculture commodities. Only France shipped more cattle in 2015, while Canada ranked among the top five exporters in no less than six other commodity categories: oilseeds, cereals, soybeans, barley, edible vegetables and hogs.

The global demand for food, feed and non-food uses of agricultural commodities is growing. However, Canada and the rest of the major exporting countries cannot increase their agricultural output simply by putting more land into production, according to the report.

All major exporters, except Brazil, Mexico, India and China, lost agricultural land as a proportion of their total land base between 1961 and 2013. This means innovation and technology are key to increasing production to meet growing world demand and maintaining Canada's competitive export position, according to Gervais.

Through innovation and technological advances, Canadian agriculture produced as much food in 2006 as in 1961 using half the inputs, the report notes, citing Agriculture and Agri-Food Canada data.

"The global landscape of agriculture is evolving. Amidst trade agreements, a slowing global economy and weather






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disruptions, Canadian producers can remain competitive by focusing on efficiencies,” said Gervais, adding that having a risk management plan to protect against unforeseen circumstances is also a good idea. “Higher productivity and the ability to produce more using fewer inputs holds the most promise for long-term success.”

As one of the world’s largest agriculture and agri-food producing countries, Canada is already well positioned to capture this growth, Gervais concludes.

FAST GENETICS hires Tim McCammon as senior account manager

Fast Genetics hires Tim McCammon as a senior account manager.

Previous strategic account manager with Zoetis and senior territory manager with Pfizer Animal Health, Mr. McCammon brings years of

sales and customer relationship management experience to Fast Genetics’ team. He obtained his Bachelor of Science in Animal Science from Purdue University.

Mr. McCammon will be responsible for maintaining current business and developing new relationships with key producers. He will report to Steve Sornsen, Fast Genetics’ director of U.S. business development.

New research alliance to improve breeding programmes

Hendrix Genetics, Hypor’s parent company, and the University of Edinburgh’s Roslin Institute have established a research agreement to pursue improvements in the sustainability of animal production.

Researchers will focus on driving innovations that lead to greater disease resistance in farmed animals and better selective breeding programs.

“This partnership with Roslin, a world leading research institute, offers a unique opportunity to improve our breeding

programs through applied research projects using the latest genomic technology,” says Dr Johan van Arendonk, chief innovation and technology officer at Hendrix Genetics.

Hendrix and Roslin already have a strong research relationship concerning farmed salmon disease genetics and see the new agreement as an opportunity to collaborate on breeding developments with other livestock species, including pigs and poultry. “Working with Hendrix Genetics across a number of commercial species offers exciting opportunities for the science that Roslin pioneers,” said Professor Bruce Whitelaw, deputy director and head of the division of developmental biology at The Roslin Institute.

The existing collaboration on salmon, which has been running for several years, has already yielded the discovery of a gene that makes salmon more resilient to a viral disease. This has led, in turn, to the development of genetic tools that have improved the selective breeding of salmon with resistance to sea lice.

Hendrix and the Roslin Institute are now strengthening and extending their relation-

ship, allowing them to explore precision breeding technology, not only in aquaculture, but also in pig, chicken and turkey breeding. Their goal is to reduce losses and improve welfare in the fish farming and livestock industries.

Everything an ESF sow needs to know she learned in gilt training

Patience and consistency are keys to successful training, Missouri producer says.

Have you been thinking about using electronic sow feeding (ESF) in group gestation pens? Before you get too far along in planning, remember to put “gilt training” at the top of your priority list.

“Thoroughly trained gilts develop into sows that are comfortable and productive in group gestation pens with ESF,” says Brad Carson, sales manager for Nedap U.S. “A good training plan includes putting the right employees in place and creating an optimal structure and timeframe for training.”

The Laut family has made gilt training a priority at Jayce

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Mountain Pork, a 3,500-sow farrow to wean operation that has large-group gestation pens with ESF in southeast Missouri.

"Training gilts is a simple process if done properly, but it

takes discipline," says Walter Laut, who owns and operates Jayce Mountain Pork with his brothers, Don and Doug. "We recommend any producer who wants to transition to group housing with ESF develop a plan that works for them and follow through with it."

The Jayce Mountain Pork gestation barn has pens with

about 275 sows divided by parity. Each pen has six Nedap Electronic Sow Feeders. To prepare them to succeed in group pens, the gilts are trained in two specially designed pens within the gestation barn. For all gilts, the first couple of weeks in the barn are key to their future success.

Here's what happens in the first two weeks:

Week 1: Pre-training

The pre-training pen is divided in half with ad lib feeders on one side and a resting area on the other. A gate just like the ones on the backs of the electronic sow feeders is built into the pen divider.

On their first day in the facility, gilts are left alone to acclimate. Starting on Day 2, gilts

learn how to use the gate to cross from the resting area to the side of the pen with the ad lib feeder. At Jayce Mountain Pork, one person will spend a five-to-six-hour shift moving the group through the training gates. This job isn't necessarily difficult, but it is crucial and requires employees with the right skillset.

"The ideal gilt trainer is someone who can keep calm and focus on the gilts' behavior," Carson says. "Patience in this position is a necessity."

The work shift should be structured so the trainer can get the work done without having to rush or get frustrated.

"Under no circumstances do you want this to be a negative experience for the employee or animal," Laut says.

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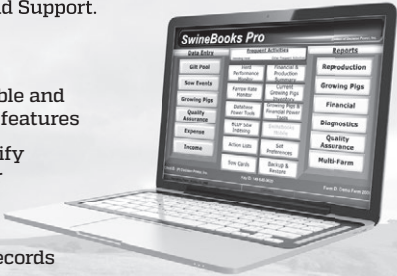
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Week 2: Training

Next, the gilts move into the training pens with ESF feeders. In this phase, the gilts learn to position themselves in the feeders and use their RFID ear tags to dispense feed.

Consistency is crucial to successful gilt training.

"The person doing this job has to be very disciplined and stick to the plan you've put in place," Laut says. "You're going to teach the animal one thing

every day. As long as you do that and stick to the plan, the plan works well."

Have a backup plan

Some swine management experts suggest about 10 percent of gilts are untrainable. At Jayce Mountain Pork, the team has found less than 1 percent of their gilts can't learn to manage the ESF system. The Lauts chalk up much of that success to their employees' dedication to the training plan.

Walter Laut says the gilts that don't learn to manage the feeders seem to be "noncompetitive" rather than "untrainable."

"They just don't have that motivation to make the walk through the large pens to the feeders," Laut says. "They don't want to do that lap."

Strong foundation

After more than a year in operation, the Lauts are pleased with the results they are getting in their group gestation pens. The sows are calm and easy to handle, and the ESF system allows them to feed each sow individually within the group.

"Decide up front what you want to accomplish in the training pens and make a plan to do it," Laut says. "Then, no matter what, stick to that plan."

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A Fall to Remember



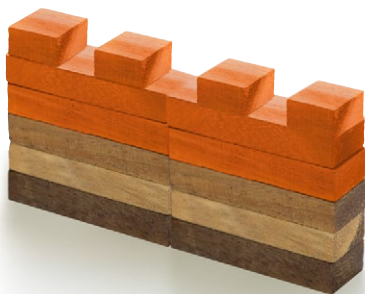
By Kevin Grier

The fall of 2016 should be remembered as one of the most fascinating and positive periods for the pork industry in many years. I know it seems strange if not callous to say that considering Canadian hog producers were losing about \$20-\$30/head this fall. Furthermore, with pricing trending down to the \$110 range, it seems peculiar to talk about this being a positive period. With all of that acknowledged, I still say it was a very positive fall and early winter.

On one level I say this because it could have been worse. On another level I say this because I see that the industry accomplished an exceptional feat.

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Take the first point: For months I have been pointing out in my bi-weekly report, the *Canadian Pork Market Review*, that the industry in the United States was in danger of marketing hog volumes that were in excess of industry capacity. The last time that happened at a sustained level was in 1998 and it led to a complete hog price collapse. The concern was the same for this fall if the industry consistently breeched capacity with unyielding numbers of hogs.

The concept of plant capacity is fluid, but it basically means the maximum throughput in terms of hogs per hour or per day or week. The fluidity comes in the definition of a day, or a week. Most U.S. plants do a double shift and the midnight shift might be a time of clean-up and maintenance. But that does not mean there cannot be overtime on a given day. There is some flexibility on what can be done in a day. Even if there is no overtime, and even if union rules put a cap on hourly throughput, there is still the issue of what constitutes a week.

Most companies are glad to work on a Saturday. Saturday work helps defray the plant overhead. If a company is working Saturday, it usually means that demand is strong and margins are good, otherwise they would not bother with Saturday overtime pay rates. If a mid-sized Canadian plant of 9,000 head per day has weekly overhead of \$400-500,000 and its per head kill costs are \$30 on five days, it can reduce its per head costs by \$2-3/head by putting in a Saturday kill. One extra day helps reduce the entire kill for the week by a couple dollars. As such the idea of working a Saturday is not a problem. In addition, Sundays are unusual in the industry, but they can be done as well with the same economies of scale noted.

The downsides of overtime and weekends is that workers and plants get tired. Even with overtime pay there is only so much overtime work that employees will want to do before absenteeism comes into play. Plants need maintenance, and continual overtime and weekend work leads to breakdowns and slowdowns.

All of that is a long way of saying that plant capacity is not easily defined and its definition can vary based on circumstances.

No matter how capacity is defined, I expected that a good number to use for capacity in the United States would be about 2.4 million a week. That number had been blown away almost every week since September with no problem (well that might be an exaggeration if you talk to plant supervisors and union reps). Weekly kills of well over 2.5 million head have been common.

The point of course is that when I said, "It could have been worse," that is exactly the case. If capacity had indeed been fixed at what I thought it was, then packers would not have been able to procure those hogs and prices would have tanked by far more than they did in the fall.

Another exceptional feat is that despite the historic kills and production this fall, packers managed to keep the pork cutout value strong. The pork cutout value is the composite value of the carcass taking into account the yields and value of each of the primal cuts such as hams, bellies, etc. It is very noteworthy that as of the beginning of December, the cutout value had actually increased over the fall. Packer marketers were able to maintain and increase the value of the cutout in the face of huge production volumes. That is impressive.

The higher cutout value, efficient plant operations and of course lower hog prices meant that packers had a fantastic fourth quarter in terms of profitability. That of course made them all the more willing to run at full speed.

The other point of credit should be given to producers. Hog farmers knew it was going to be a tough fall. In like of declining futures prices, hog farmers made sure that they stayed ahead on marketings. Producers stayed current and even marketed hogs ahead of schedule. Weights did not build and there was no back up. That also kept this fall from deteriorating.

Demand Continues Strong

Part of the reason the cutout stayed firm, as noted above, is that pork demand continues to be a positive force in the industry. If demand had been weak, packers would not have been able to keep the cutout firm. If demand was weak packers would not have wanted to keep kill schedules as robust.

Looking specifically at Canadian demand in 2016, the Agriculture Canada Red Meat Section calculated that Canadian pork disappearance (consumption) increased nearly two per cent in the third quarter this year (latest). Canadian consumer pork prices, as measured by the Statistics Canada Consumer Price Index, increased by about one per cent in the third quarter. When you combine the fact that Canadians ate more pork with the fact that pork prices increased, it says very good things about pork demand. In other words, despite the higher pricing, Canadians continued to step up to the meat case and purchase pork products.

Price Formula

The discussion of pricing formulas that is taking place in Alberta this fall is sometimes centred on which is the right U.S. ref-

erence point. In other words, which is the most appropriate U.S. price in which to base Canadian hog price formulas. The merits of the Iowa-Southern Minnesota or the CME index or the pork cutout are central to the debate.

Currently the industry prices off the U.S. hog through a formula that includes a division or multiplication factor, in addition to premiums and discounts. Those factors are ultimately the local or regional pricing basis which reflects local or regional supply and demand. To me, this is the real issue. While the choice of U.S. reference is central, the most important pricing component is the local basis as reflected

CONTINUED ON PAGE 26



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in the factors and premiums. This reflects packer demand and local supplies.

In the case of Alberta, if Olymel decided that it made sense to change the reference from ISM to the U.S. cutout, the most critical issue then would be the factor to bring the price back to Alberta hogs.

Ultimately it is up to the packers to decide the price that they need to attract enough hogs to the plant. This is within the context of their own supply base, which in the case of Olymel Red Deer is material in the 50-60 per cent range. Producers then decide whether that is enough money to make the investment in the business worthwhile. The decision is whether they will ship weaners south, finish hogs for the prairie competitors or leave the business.

As I have noted in the *Canadian Pork Market Review* many times, it seems to me that the packers have determined that making pricing more attractive on the prairies would be a zero sum game. Based on their actions they must consider that higher prices would not result in more production and greater supplies. Instead it would simply mean packers get into a battle with each other with no net gain. Whether that is right or not is beside the point.

Recent actions however, are indicating that the packers are starting to use price to compete more vigorously. Olymel's signing bonus, Maple Leaf's Sig 3&4 blending and top up, as well as the new formulas from Donald's Fine Foods are testimony to that. Whether this is enough to generate more production or simply results in shuffling numbers between packers is the critical issue.

For their part, producers must also consider the prairie barriers to expansion. These barriers are just as important or more important than price. Construction costs on the prairies far exceed those in the U.S. That plus the environmental regulations and the animal welfare changes make every producer's expansion plans much more challenging, in addition to the pricing issue.

The reality is that the industry now has so few players that it is necessary for both packer and producer to address all barriers to expansion and growth, including price. Packers need to have producers on board more than ever and vice versa. ■

Kevin Grier Market Analysis and Consulting provides industry market reports and analysis, as well as consulting services and public event speaking. You can reach him at kevin@kevingrier.com to comment or to request a free two-month trial of the Canadian Pork Market Review.



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HOT ISSUES

Quarantine experience in 2009 offers learning lessons

By Geoff Geddes

Can you think of anything worse than putting your heart and soul into building your business, only to see it wiped out before your eyes? What if you had to be a part of the destruction? Seven years ago, one pork farmer didn't have to imagine it.

He lived it.

In May of 2009, a central Alberta producer reported flu-like symptoms in his animals. When test results revealed the presence of H1N1, a new strain of influenza, it threatened to leave the farm and throw the industry in critical condition.

"Influenzas are very unstable and mutate easily, so we're constantly faced with new versions," said Dr. Gerald Hauer, chief provincial veterinarian for Alberta at the time.







Prior to the discovery on this particular farm, reports were circulating of a new strain that was spreading among humans in Mexico and causing a high level of mortality.

Because it was associated with pigs it was dubbed "swine influenza", much to the chagrin of the pork industry.

Calling in sickness

"Our office and other provincial agriculture departments were notified by the Canadian

CONTINUED ON PAGE 28

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Food Inspection Agency (CFIA) to keep an eye out for this virus and advise them if any cases emerged,” said Dr. Hauer. “We sent a notice to swine veterinarians and Alberta Pork did the same with producers.”

Sure enough, a few days later a veterinarian reported sick pigs at one of his client’s barns where some people had recently returned from Mexico. Test results came back positive for H1N1 and, as instructed, Alberta Agriculture and Rural Development (ARD, now known as Alberta Agriculture and Forestry) contacted the CFIA and worked with them on how to respond.

“As far as we knew, it was an urgent situation where people could get sick and die, so the decision was made by the CFIA to put the farm under quarantine.”

CFIA placed the quarantine on April 28, 2009.

In his role as executive director of Alberta Pork during this period, Paul Hodgman vividly recalls the decision and the aftermath.

“I’ll never forget receiving that call from Gerald on a Friday afternoon,” said Hodgman. “We knew right away that this was a big issue.”

On Saturday, Hodgman and key staff members gathered at the Alberta Pork office to review their crisis management plan and get to work. And with a major issue blooming on a provincial and national level that would drag on for six weeks, they had their work cut out for them.

“Our first priority was to be on farm to support the producer and his family. They were under tremendous pressure because nobody was sure what we were dealing with. There was a real concern about this virus jumping to humans and causing a mass panic.”

That concern was evident when office phones started ringing. By the time they stopped, Alberta Pork had received hundreds of calls from media across North America.

Due to the realities of the pork business, things quickly devolved from there. With no way to sell his market hogs, the producer ran out of room to house them all.

“The barns got crowded because pigs kept being born and you can’t turn off the tap,” said Dr. Hauer.

Reality check

This prompted a flurry of activity and ultimately some tough decisions. One person who can attest to that firsthand is Murray Roeske, a longtime pork producer who was working with Alberta Pork during this period and trying to assist the affected farmer.

“I recall him and me looking at each other and saying ‘you know what we have to do, don’t you? We have to euthanize these pigs,’” said Roeske.

Aided by ARD, the farm performed two culls. The first on May 8 was done from an animal welfare perspective to create more space and buy time until the situation was resolved.

As it turned out, the resolution brought good news and bad news.

Let’s hear it for hindsight

“After a few weeks, it became apparent that the virus wasn’t as deadly in people as first thought,” said Hauer. “It may have been slightly worse than regular influenza but not significantly different.”

Officials also discovered that H1N1 was already in the human population and passing around. At that point, Hauer and others realized that putting movement controls and quarantines in place and euthanizing animals was not an effective way to protect public health – it simply wasn’t necessary.

That was great for the pork industry, but did little to help the affected producer.

“Because of the quarantine, the farmer had the stigma of being the first farm in the world diagnosed with the virus,” said Hauer. “Even with the quarantine lifted, processing plants were reluctant to take his pigs.”

Consequently, the producer made a business decision to depopulate his farm and start fresh. In collaboration with ARD, CFIA and Alberta Pork, he culled 3,000 pigs from June 4-6,

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cleaned and disinfected his facility, brought in healthy pigs and resumed operations.

Thus began a lot of second-guessing and a complete review of what happened and why.

Bridges burned and lessons learned

“One thing we learned was that there’s no need to quarantine farms with H1N1,” said Hauer. “We applied that lesson right away as many other farms had diagnosed the virus that summer and we didn’t put quarantines on them.”

The second lesson stemmed from the fact that H1N1 was a classic example of an emerging disease.

“As a province, we are prepared for known diseases. This one, though, hit us suddenly so was tougher to manage.”

While specific preparation for this virus was almost impossible, Hauer said they realized that readiness for these types of situations was within reach.

“After this incident we adopted an incident command system (ICS) to deal with any emergency. We trained ourselves and practiced and used this system for disease situations like PED.”

The ICS has also benefitted other agriculture sectors, addressing salmonella in the poultry industry and, most recently, the

bovine tuberculosis outbreak in Alberta and Saskatchewan.

Of course, these developments can’t undo the financial and emotional toll that H1N1 and the quarantine exacted on an Alberta producer and his family.

“You can’t just slap these things on and not consider the welfare of the people involved,” said Murray Roeske.

Though he feels the initial decision was probably justified given the uncertainty, Hodgman said Roeske has a point.

“I do think governments need a plan to deal with producers like this and get them compensation so that events beyond their control don’t cause them to lose everything.”

In this case, the producer applied for and received compensation through AgriStability and AgriRecovery for all animals culled on the farm, but nothing could turn back time.

When he and his veterinarian made the phone call seven years ago that touched off a firestorm, they could never have imagined the results.

“At the end of the day, it made us better at preparing for, responding to and recovering from disease outbreaks,” said Dr. Hauer. “That was a silver lining for a most unfortunate event.”

Would the producer and his family agree?

One can only imagine. ■

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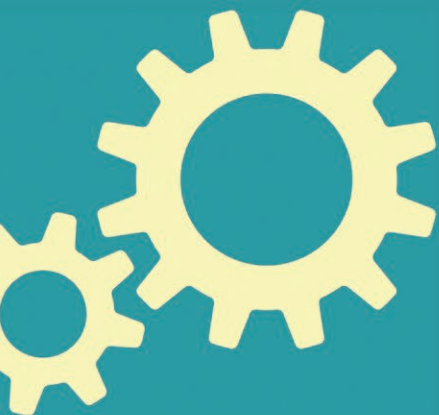
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Pig breeding in Canada - Part 1

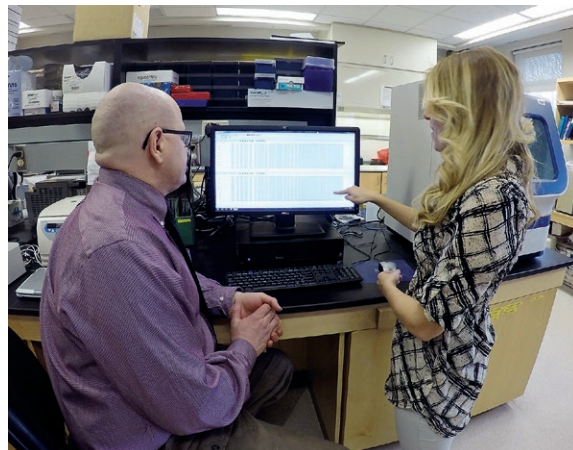
A look at how porcine genetics are being preserved in Canada, and the potential value of heritage breed genes

By Treena Hein

It's not terribly unusual for scientists to visit farms, like Dr. Carl Lessard did in the fall of 2016 in Ontario and Quebec, but the reason for the visits – and the reason Lessard and his colleagues are calling out to purebred swine producers and other livestock producers across the nation for donations – is a little unusual. It could potentially save Canada's pork industry down the road.

Lessard is the curator of the Canadian Animal Genetic Resources program (CAGR) at the University of Saskatoon in Saskatchewan. With his colleagues (director of national collections Dr. Michèle Marcotte, associate director of national collection Dr. Anissa Lybaert, field specialist Crissandra Auckland, genetic analyst Pamela Hind and bio-informatics biologist Dr. Wen-kai Fu), Lessard is creating a germplasm repository for pigs and all other types of Canadian livestock. "We are looking for donations of sperm and eggs from purebred animals in all areas of the country, including poultry, bison, cattle, sheep, goat, horse, pig, deer, elk and more," he said. "It's going well, and we're getting more and more participation from livestock associations and individual producers."

In terms of pig genetics already gathered, CAGR has collaborations in place with a few commercial purebred producers and with one of the few producers of the Lacombe breed. But what value are the genes from heritage breeds in breeding efforts



Dr. Carl Lessard and technician Pamela Hind categorize genetic material in the CAGR lab in Saskatoon. Photo credit: CAGR.

now, or in the future? Lessard starts by noting that with the industrialization of the pig production, several heritage pig breeds were progressively discarded from commercial production. "Today, several breeds are considered critical or endangered, based on the number of registered animals," he notes (see the Rare Breeds Canada list at <http://www.rarebreeds-canada.org/conservation-list>). "So, the

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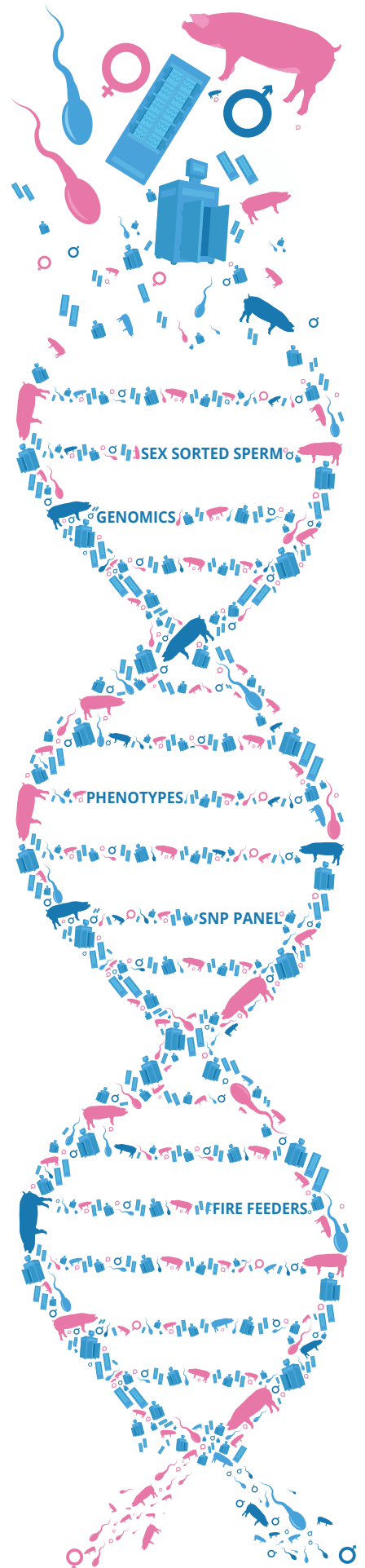
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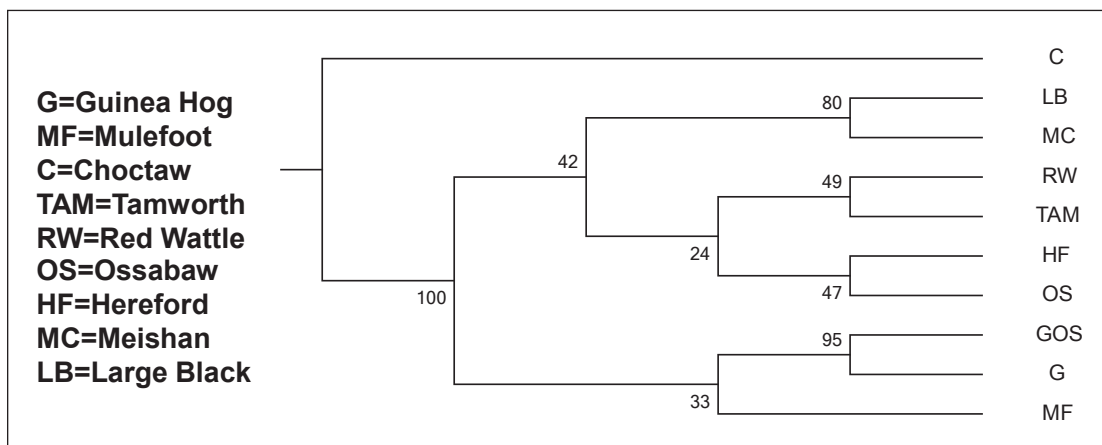
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This figure is a phylogenetic tree of all pig breeds analyzed using a panel of 34 genetic markers. A genetic tree serves as a visual representation of the genetic relatedness between populations, in this case different pig breeds in the United States. The tips of the tree represent groups of descendent pig breeds and the nodes on the tree represent the common ancestors of those descendants.



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first point to understand is that all breeds have basic value in helping us understand genetic diversity.”

To determine diversity across the North American pig population, Lessard and his colleagues collected samples from many different pig breeds in collaboration with the Livestock Conservancy, and they've also received several DNA samples from the Canadian Centre for Swine Improvement, which will be analyzed in future. Lessard states “Our analysis revealed a distinct genetic relationship between breed, demonstrating the importance of keeping genetic material from heritage breeds. If you look at the genetic ‘tree’ of all pig breeds that



Recording weights of individual piglets using Bluetooth-enabled scale and ring scanner. Photo courtesy of Hypor Inc.

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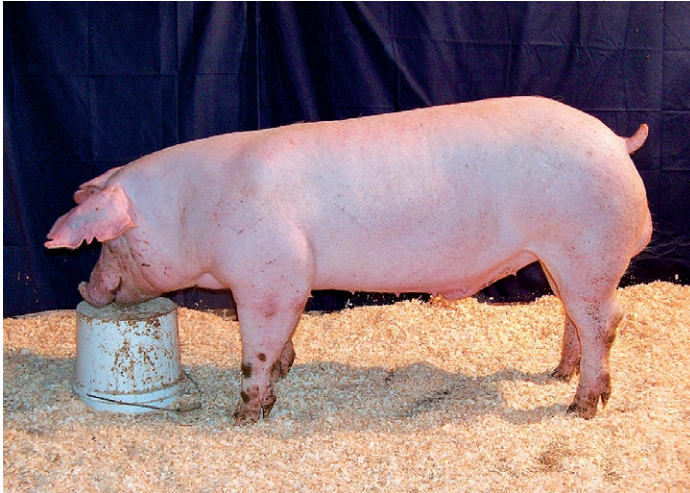
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we analyzed using a panel of 34 genetic markers, you can see the genetic relatedness.”

The tips of the tree represent groups of descendent pig breeds and the branching points or nodes represent the common ancestors of those descendants. Two descendants that split from the same node are called sister groups. CAGR genetic analyst Pamela Hind notes, “For instance, the Large Black (LB) and the Meishan (MC) pigs are considered to be sister groups, and thus are more genetically related. Meishan pigs, also known as ‘oriental stock,’ were used extensively in early breeding in European pigs to improve litter size, so this is an example of results based on historical genetic evidence.”



Lacombe pig. Photo credit: PEAK Swine Genetics.

The Lacombe is a breed that may hold particular interest in future breeding efforts. It originated at the Lacombe Research Station in Lacombe, Alberta. During the late 1940s and early 1950s, Dr. Howard Fredeen created the Lacombe from Danish Landrace, Chester White and Berkshire pigs. In 1957 and 1958, groups of five Lacombe pigs (four females and one male)

were distributed to many swine breeders across Canada, including the parents of three of the present-day shareholders of Peak Swine Genetics. This Leduc, Alberta-based firm has been actively improving the Lacombe breed over the last 21 years. President Walter Preugschas notes that the Lacombe has many positive traits that should be preserved, including large, strong piglets at birth, docile sows and boars, fast growth rate, strong frame, good muscling and excellent meat quality similar, to the Duroc.

Nuts and bolts of preservation

In terms of how CAGR is preserving pig genetics, the best way to preserve the full genome of any mammal is through the embryo, which requires donations of egg and sperm. “CAGR is developing methods to produce embryos in the lab and freeze them for long-term preservation,” Lessard explains. “We’ve successfully developed methods to collect eggs, ship them to our facility, produce embryos using the eggs and selected semen, and use vitrification to preserve the embryos, which then can be stored indefinitely.” (While cryopreservation involves slow freezing, with vitrification, the sample is treated with ample cryoprotectant and chilled rapidly through a plunge in liquid nitrogen. The material is not technically frozen as there’s no ice crystal formation, but maintained in a glass-like ‘vitreous’ state at a very low temperature.)

“Right now, our group is currently seeking funding to demonstrate that the stored embryos can be transferred and grow successfully in a recipient,” Lessard explains. “If we are successful, our preservation techniques will become new tools for purebred producers and the overall swine industry to securely distribute their genetics to national and international clients.”

Lessard and his colleagues hope that in the near future, it will be possible for producers to salvage the eggs from their herds without having a CAGR team member visit the farm, which

CONTINUED ON PAGE 36

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would save time and expense and allow the different biosecurity rules of farms to be respected. Producers will do this by harvesting ovaries from culled sows, collecting the eggs with a syringe, diluting them with CAGR's special 'extender,' and shipping them off. CAGR also needs many more pig sperm samples, especially from heritage breeds. "Our group cannot visit and collect semen from different purebred boars on farms, so we have to rely on the experience of producers to collect and ship semen to our facility," Lessard says. "Semen collection requires time and knowledge."

If we are successful, our preservation techniques will become new tools for purebred producers and the overall swine industry to securely distribute their genetics to national and international clients. ~ Dr. Carl Lessard

CAGR would like to hear from all purebred pig producers about contributing genetics (semen and/or embryos) to its repository. Please contact Dr. Carl Lessard by email or phone at Carl.lessard@agr.gc.ca or 306-956-7221.

CAGR is now putting finishing touches on an online database letting the public know what has been contributed and it should be going live in early 2017.



Recording feed intake on dam line animals for calculation of feed conversion efficiency and residual feed intake. Photo courtesy of Hypor Inc.

Other thoughts on genetic diversity

We asked several major pig breeding companies, along with the Canadian Centre for Swine Improvement (CCSI) to weigh in on genetic diversity and preservation going into 2017. All those who responded agreed that there is value in genetic preservation, and that genes from heritage breeds may be useful someday when technology is more advanced. CCSI geneticist Dr. Mohsen Jafarikia says one potential application of heritage breed genes is their use as genetic markers, which can be used to improve certain traits in commercial breeds. Abe Huisman, research and development director at Hypor, agrees that future value of heritage breeds could lie in assisting in the improvement of specific commercial traits such as meat quality or in potential resistance to certain diseases.

Jafarikia echoes Lessard in the belief that one of the main requirements for progress in breeding is genetic diversity.

CONTINUED ON PAGE 38

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He points to the example of rapid progress with growth rate, where Canadian pigs reach the market weight of 100 kg a day faster every year since evaluation of this trait started about 35 years ago. "Preservation of animals from different genetic backgrounds guarantees the availability of variation in the future, in case of unpredicted environmental changes such as global warming and the potential for new bugs to emerge," he said. "This can potentially impact the future of the Canadian pig industry, which is famous around the world for its health."



Dr. Lindsay Case, Genetic Services Manager at PIC North America. Photo credit PIC North America.

Dr. Lindsay Case, genetic services manager at PIC North America, is also of the opinion that preservation of distinct breeds may provide value to the industry through various potential strengths. "While all cost and revenue sources of pork production must be balanced within a genetic line," Case notes, "different production systems may make the most profit from relatively higher genetic potential for robustness, growth rate, feed efficiency or meat quality."

Dr. Bob Kemp, geneticist and partner at Genesus, also believes that preservation of genetics is a long-term factor at the global level with respect to "truly unique traits."

Topigs Norsvin Canada believes in genetic preservation and participates in a gene bank. "Semen of breeding lines not being used anymore is cryopreserved," says director of genetics Arjan Neerhof. "In the Netherlands, we support organizations to keep old breeds like Dutch Landrace and Berkshire alive by giving them access to database and semen logistics." For its part, DNA Genetics has also participated in genetic preservation through contributions to the US Department of Agriculture's swine germplasm preservation program.



Measuring back fat and loin depth on dam line animals using real time ultrasound. Photo courtesy of Hypor Inc.

Jafarikia believes that in the future, heritage breed genes may become relevant through the use of novel techniques. He says new technologies such as 'gene editing' can help breeding companies 'to change animals' genome in a very specific manner," but cautions that "this technology is still under research and might receive controversial reactions from the public." Neerhof at Topigs Norsvin and Dr. Tom Rathje, chief technical officer at DNA Genetics, both agree. However, Neerhof believes that phenotyping, genotyping and storage of DNA might become more relevant than saving genes. "In this context, the use of heritage breeds will be through understanding why they are different," he says, "more than through bringing them back alive."



Dr. Tom Rathje of DNA Swine Genetics. Photo credit DNA Swine Genetics.

Rathje warns that because the development of pork products will continue to be driven by the demands of consumers, this "will limit the gene pool" over time. "We need to capture and preserve genetic variation," he concludes, "[for use] when needed in the future." ■

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Submitted by the Canadian Pork Council

In 1966, hog producers in Canada formed the Canadian Swine Council for the purpose of negotiating and developing a new grading system. At that time, it became clear that a national industry group for the hog sector was necessary. Over the years the organization, later renamed the Canadian Pork Council (CPC), has continued to grow as new policy and programming responsibilities have been added to its mandate.

Today, CPC is the national voice of the hog sector, with a board of directors made up of producers from coast to coast. The board plays a crucial role in the advancement of the council's efforts, as well as the Canadian hog sector.

The CPC serves Canada's 12,000 pork producers through its national and international policy advocacy efforts, as well as through the development and implementation of initiatives dealing with food safety, animal care, traceability, animal

health, environmental management, international trade and nutrition. Our leadership has played a key role in allowing the Canadian pork industry to reach and maintain its position among the best in the world. As its 50th anniversary year draws to a close, the Canadian Pork Council remains focused on several key issues currently impacting the hog industry.

Trade

Bilateral and international trade issues have the CPC engaged in a variety of discussions on the Canadian pork industry's behalf. Of particular focus is the Trans-Pacific Partnership (TPP), as it appears implementation will be at best unduly delayed based on talk in the United States.

"It would be risky for Canada to simply wait until others decide on the outcome of the TPP. We need to show leadership by

CONTINUED ON PAGE 40



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undertaking a vigorous strategy of bilateral or regional trade negotiations in high-priority markets,” says CPC chair Rick Bergmann. “A globally competitive, Canadian hog and pork industry generates \$13.1 billion in economic activity for communities across the country, 31,000 on-farm jobs, plus another 69,000 Canadians rely on the pork sector for their livelihoods.”

Maintaining existing pork markets and opening up new markets to pork is critical to the Canadian hog industry, which plays a vital role within Canada’s agriculture and agri-food sector. Well over 70 per cent of the industry’s output is now exported, with pork and pork products shipped to nearly 100 countries.

“Certainly hog producers and processors benefit from improved market access; however, so do Canadians,” says Bergmann. “Recent polling has shown that the top concerns of Canadian consumers are the rising cost of food and keeping healthy food affordable.

“Canada is a globally competitive producer and exporter of pork and pork products,” stated Bergmann. “We have worked hard to develop a global reputation as a reliable supplier of safe, wholesome, high-quality pork. The key to sustaining our success is the ability to access a wide variety of markets.”

Canadian Pork Excellence

Assisting with market access is the CPC’s commitment to continuous improvement to industry on-farm programs. Recently, the CPC updated pork producers’ on-farm food safety and animal care programs. The revised programs are the foundation for the Verified Canadian Pork initiative launched by Canadian Pork International earlier this year. This brings together the on-farm food safety (now PigSAFE), biosecurity and animal care (now PigCARE), and traceability (PigTRACE) programs under the single platform of Canadian Pork Excellence.

“The revised programs provide additional transparency while presenting the same proven content that has garnered respect and benefitted the Canadian pork industry in gaining market access internationally and domestically,” says CPC executive director John Ross.

The new program launched in December 2016 beginning with a pilot project on more than 50 farms. Feedback from participating producers and validators will be used to finalize the program, which will be available for use in individual operations in 2018 as part of a farm’s normal validation cycle.

Public Trust

In the half century that the CPC has served as the voice for Canada’s hog producers, the industry has changed dramatically as producers worked together to improve and modernize their practices and in recent years, address pressing sustainability issues. Despite that, Bergmann says the work they do and their collective achievements, are not always understood or appreciated by governments, consumers or the general public.

In short, social responsibility has become a hot topic in the agri-food business and our sector – especially the meat industry – is under considerable scrutiny.

~ Rick Bergmann, CPC chair

“The fact is that we are evolving in an era where consumers are increasingly conscious of what they eat and how their food is produced,” he says. “Retailers are more engaged in managing their supply chains, while federal and provincial governments are understandably concerned about environmental issues and the working conditions of their citizens. In short, social responsibility has become a hot topic in the agri-food business and our sector – especially the meat industry – is under considerable scrutiny.”

The CPC recognizes that all industries must earn their social licence. Canadian hog producers and their national and provincial farmer-run organizations recognize they must continuously improve their practices and be transparent about their performance. The time is right for the CPC to underscore its commitment to responsible hog production and explain how the Canadian pork industry takes action to address sustainability. ■



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Latest award winner at Alberta Pork Congress shocked and awed

By Geoff Geddes

When most people win something, their reaction involves tears, screams or a hearty “thank you”. But when a member of the Pork Progress planning committee called Murray Roeske with the great news about his 2016 Industry Ambassador Award, the initial response was a bit more subdued – silence.

“I was genuinely pleased, but I guess a bit surprised,” said Roeske. “I try not to toot my own horn very much so I never expected this.”

According to the Pork Congress website, the Industry Ambassador award honours individuals or companies whose efforts reflect a commitment above and beyond the accepted expectation of the pork industry in Alberta. It recognizes individuals or companies whose actions have become a valuable asset to the pork industry and have made them models for peer recognition. If that’s the criteria for choosing a winner, few in the industry would argue with the choice.

Pure success

For over 30 years, Roeske ran a consulting service of seed-stock (purebred) swine production within the Canadian purebred industry under the name Rose Briar Farms. As if running a farm and a business weren’t enough to fill his time, Roeske assumed a number of leadership roles. They included president of both the Canadian and Alberta Swine Breeders Associations, chairman of the Animal Industry Advisory Committee with Alberta Agriculture and director of the Canadian National Livestock Records.

He also spent many years assisting producers with Alberta Pork, where his work on cost of production, feed costs, energy consumption and a host of other initiatives had a big impact on the industry.

Along the way, he amassed some impressive honors such as the 1993 Progressive Pork Producer Award from the Alberta Pork Congress and the Swine Breeders Merit Award in 2008 from the Canadian Centre for Swine Improvement. He is most proud of his Farmer of the Year Award in 1997 bestowed by the SPCA, as it was “the first time a pig producer has won that award”.

Clear choice

One product of all that success was an easy decision for the Alberta Pork Congress board of directors.

Murray was a great candidate for the ambassador award as he has worked tirelessly in a variety of roles to improve our industry,” said director Alastair Bratton of Pinnacle Swine Inc.

“His continued commitment highlights his passion and drive to help farmers succeed through good times and bad.”

In his acceptance speech, Roeske was quick to share the credit.

“Our main asset in the pig industry isn’t an abundance of feed or fresh air, it’s the entrepreneurs that form our foundation. Without the farmers, feed guys, processors and veterinarians who invest time and money to make this work, I wouldn’t have a career.”

CONTINUED ON PAGE 42

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Break out the highlighter

It's always hard to pinpoint a single highlight from such a long and varied career. When pressed, Roeske chose one with far-reaching implications beyond the pork industry.

"We did a research project with Dr. Austin Murray from the Lacombe Research Station regarding the malignant hypothermia gene, or the porcine stress syndrome gene as we called it."

Using cutting edge Swedish blood marker technology, they developed a DNA probe to identify animals that were positive for the gene.

"They actually collected blood samples on our farm to test the probe, and the technology was used both in Canada and around the world."

Most gratifying for Roeske was that this development wound up benefiting humans as well. Because people with the gene can react negatively to the anesthetic Halothane, the DNA probe was used at SickKids Hospital in Toronto to single out children and adults who could be at risk. Not to minimize the other work he has done over 30 years in the industry, but helping to save lives must be right up there.

What's the meaning of this?

So with all the accomplishments and recognition, where does this award rank?

"I appreciate everything I've been given. At the same time, a lot of my previous awards were specific to the genetic aspect of dealing with pigs. What sets this award apart is the recognition by industry that all the things I've done in the past were worthwhile. That makes it a bit more meaningful."

Of even greater meaning was the chance to share the award with Millie, his wife of 45 years, along with his two sons and granddaughter.

"Whether it's working the farm or developing a business, if you don't have a loving and supportive partner helping you out, it's impossible. Millie deserves the award as much as I do."

With an attitude like that, he's bound to succeed at whatever lies ahead. Congratulations Murray! ■

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Developing effective enrichments for group-housed sows

By V. Kyeiwaa, J. Brown, Y. Seddon and L. Connor

The increasing trend towards group housing and new Code of Practice requirements for enrichment has generated a need for research into effective enrichments for sows. The University of Manitoba and Prairie Swine Centre have joined forces to study this question in their respective sow herds. The overall aim of these studies is to develop suitable enrichments for sows by identifying simple, safe and cost-effective enrichments that can be added to group sow housing systems, and form part of their routine husbandry practices.

Aggression, fear and stress in a social environment are difficult to eliminate because hierarchies will always be established. Sows in groups exhibit some of these negative behaviours, especially vulva-biting, stereotypies, as well as overt aggression, which can increase the chance of abortions. These behaviours can potentially lead to economic losses as animals that are injured, fearful or stressed may have lower than average conception rates and production.

Multiple studies in growing pigs have shown that providing an enriched environment can reduce fear, stress, aggression and boredom in the group environment.

Multiple studies in growing pigs have shown that providing an enriched environment can reduce fear, stress, aggression and boredom in the group environment. They can also cause an increase in positive behaviours such as exploration and play. However, there is very little research on the use of enrichment objects in group gestation systems. The most effective type of enrichment, and what influence it can have on group behaviour and overall welfare has not been reported.

In this study we provided four different enrichment treatments to sows in group housing. Each enrichment object had properties known to be attractive to pigs. Our objective was to compare the time spent interacting with different enrich-

ments, and the daily activity patterns of sows to identify the most effective enrichment for sows. The effects of social status on sow behaviour and stress physiology was also studied.

Enrichment use and Behavioural observations

Two parallel studies have been completed at the Prairie Swine Center (PSC) and the University of Manitoba. We provided four treatments which consisted of: 1) constant provision of wood on chains (Constant), 2) rotation of three objects (rope, straw, wood on chain: Rotate), 3) rotation of three objects with an associative stimulus (bell or whistle: Stimulus), and 4) con-

CONTINUED ON PAGE 44



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trol (no objects: Control). All enrichments were located in the middle of the pen to allow greater access, and were suspended to keep them clean and in place. Cameras were mounted over the pens and time-lapse photos were taken on different days to determine enrichment use, activities and postures of sows.

Direct observation of sows was carried out during the initial provision of the enrichments in the Rotate and Stimulus treatments. This was to determine if sows' reactions to enrichment can be increased by pairing it with an 'associative stimulus'. Six focal sows (three dominant and three subordinate) were selected at the beginning of each trial using a feed competition test. Sows were then studied to see if dominant and subordinate animals exhibit different levels of enrichment use, or interact with enrichment at different times in the day. Saliva samples were collected at the beginning and end of gestation to determine the stress levels in sows. Stereotypic behaviours and levels of injury due to aggression were also recorded.

Habituation is a major challenge when developing effective enrichment, as most animals tend to lose interest in objects over time. In an attempt to reduce habituation and sustain the interest of the sows, enrichment materials were switched three times per week in both the Rotate and Stimulus treatments.

Initial results



Data analysis from the study is ongoing, but initial observations at PSC show that, regardless of the treatment provided,



on average 15 per cent of sows were out of their free-access stalls and present in the loafing area of the pen throughout the day. More sows spent their time contacting and near the enrichment when the materials were rotated (Rotation and Stimulus treatments) than when the constant enrichment was used (percentage of sows within 1 m; Constant: 0.65 per cent; Rotate: 4.23 per cent; Stimulus: 2.61 per cent). The enrichment treatments had no effect on sow postures: overall, sows spent 78 per cent of their time lying, 20 per cent standing and two per cent sitting throughout the day.

In the Rotation and Stimulus treatments, straw (300 grams/sow) was placed on an area of solid floor on days three and 10. Observations of Rotation sows on day 10 showed that 24 per cent of sows were present in the enrichment area when straw was provided, compared to 12 per cent when no enrichment was provided (Control).

The presence of the enrichment objects in the pen resulted in sows spending time exploring the objects – this was observed particularly in the mornings after feeding. Our initial results

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show no significant differences in time spent exploring the different enrichments, however, the lowest level of interaction was observed in the Constant treatment. This is likely the result of habituation, as sows lost interest more quickly when the same object was left in the pen continuously.

Conclusion and implications

These initial results suggest that provision of enrichment to group-housed sows can help increase the use of pen space, and that rotating enrichments can increase sows' interactions with the enrichment. The straw enrichment produced the greatest response resulting in the largest number of sows interacting with the enrichment. This is likely because sows can ingest the straw making it very attractive as an enrichment, and additionally, it was spread over the floor, creating a larger surface area for simultaneous interaction by multiple sows. Further analysis is needed to compare the results at PSC and the University of Manitoba, and to examine the effects of sows' social status on their enrichment use, stress, aggression and stereotypies. These results, along with the additional studies described below, will form the basis for recommendations to producers on suitable enrichments for sows.

Plans for Future Research

Previous studies have indicated that young animals are highly motivated to explore object enrichments, whereas older

animals generally prefer enrichments that can be consumed. Because sows are feed restricted, they are more motivated to interact with feed-based enrichments, such as straw, beet pulp, corn husks or other high fibre materials. The problem with providing these materials has been how to present them conveniently, at a low cost, and without causing problems to liquid manure systems. Future studies at PSC will compare the effects of object versus fibre enrichment, and the number of enrichments provided per pen on sows' use of enrichments.

Sows will be given either pelletized straw or wood enrichments. Pelletized straw is produced using a steam-heating process which produces a clean, uniform material that is easy to handle as well as being more digestible. Fibre will be provided using a feed dispenser that sows must actively root, turning a rotor to dispense feed onto the floor. By comparing fibre and object enrichments we can quantify the benefits to sows and costs of each treatment, giving producers valuable information when considering effective enrichment materials for sows.

This research will be completed in December 2017, with results available in 2018. This project is funded by Swine Innovation Porc within the Swine Cluster 2: Driving Results Through Innovation research program. Funding is provided by Agriculture and Agri-Food Canada through the AgriInnovation Program, provincial producer organizations and industry partners. ■



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RESEARCH AND INNOVATION

Managing feeding to reduce feed wastage in lactation

By: Dan Columbus, PhD, research scientist, nutrition, Prairie Swine Centre, Inc.

Feed is the single largest cost associated with producing pork, ranging from 50-70 per cent of the total cost of production. When looking to save money in their feeding programs, producers typically consider the finishing herd as it represents approximately two-thirds of the total feed cost. One area that can be easily overlooked is lactation feeding strategies and delivery.

Traditionally, most producers feed lactating sows manually, feeding sows up to three times per day in order to maximize feed intake and optimize litter performance. However, providing large quantities of feed may result in increased feed wastage or spoilage. Technologies pork producers have utilized to maximize lactation performance are electronic feeding systems for sows during lactation. These systems have multiple advantages over manual feed delivery including collection of feed intake data, controlled delivery of fresh feed, reduced feed wastage, and lower labour costs. However, these feed systems can be costly to install and maintain.

A project at Prairie Swine Centre set out to develop a modified feeding system that provides the advantage of the delivery of fresh feed to the sow without

Table 1: Sow characteristics and performance

	Feeder				
	MANUAL (n=15)	ELECTRONIC (n=15)	MODIFIED (n=14)	SEM	P-VALUE
Body weight (kg)					
Initial	286.7	272.9	288.3	10.3	0.49
Final	263.7	241.3	257.3	10.8	0.31
Change	23.0	31.6	31.0	4.2	0.26
Body condition score (1-5)					
Initial	3.1	3.3	3.2	0.12	0.71
Final	2.7	2.7	2.8	0.14	0.80
Change	0.47	0.53	0.44	0.17	0.92
Backfat (mm)					
Initial	16.8	17.0	16.9	0.39	0.90
Final	15.4	14.7	15.5	0.57	0.54
Change	1.39	2.33	2.05	0.54	0.41
Liveborn	14.8	13.0	13.3	0.8	0.21
ADFI (kg/d)					
Week 1	5.13 ^a	3.46 ^b	2.68 ^b	0.32	<0.001
Week 2	6.80 ^a	5.55 ^b	5.12 ^b	0.35	<0.01
Week 3	5.95	5.36	5.87	0.32	0.41
Total	5.69 ^a	4.80 ^b	4.49 ^b	0.29	0.01

the expense of the electronic feeding system. A simple feeding system was developed consisting of a feed drop tube that extends to approximately one inch above the base of the feeder, which required the sow to manipulate the tube to release small quantities of feed.

A total of 45 sows and litters were randomly assigned to one of three feeding systems – manual feeding, a commercially available electronic sow feeder, or the modified system. Each sow's body weight, back fat, and body condition score was recorded when moved into

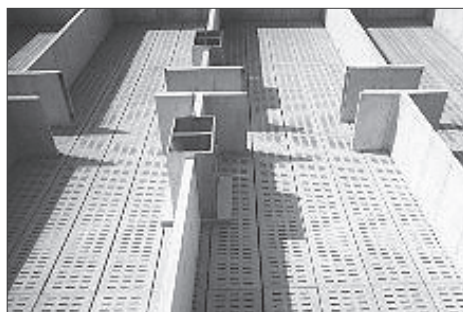


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Table 2: Litter growth performance

	Feeder			SEM	P-VALUE
	MANUAL (n=15)	ELECTRONIC (n=15)	MODIFIED (n=14)		
Litter size					
Day 0	12.6	12.6	12.4	0.2	0.71
Day 7	11.8	12.2	12.0	0.2	0.53
Day 14	11.6	11.9	11.5	0.3	0.64
Day 21	11.6	11.9	11.4	0.3	0.46
Litter weight (kg)					
Day 0	18.1	17.9	17.4	1.02	0.87
Day 7	32.1	30.7	29.8	1.74	0.63
Day 14	54.6	52.0	52.8	2.75	0.78
Day 21	72.2	70.1	67.6	3.56	0.65
Litter weight (kg/pig)					
Day 0	1.46	1.42	1.40	0.08	0.87
Day 7	2.74	2.51	2.49	0.12	0.26
Day 14	4.73	4.44	4.50	0.16	0.39
Day 21	6.51	5.91	5.91	0.24	0.12
ADG (g/pig/d)					
Week 1	170.0	149.7	148.6	12.3	0.37
Week 2	277.5	266.0	274.1	11.2	0.74
Week 3	292.8 ^a	253.6 ^b	260.5 ^{ab}	12.2	0.05
ADG (kg/d)	2.79	2.63	2.59	0.14	0.56

the farrowing room and at weaning, 21 days post-farrowing. Sow feed intake was recorded daily with any spoiled feed being removed, weighed, and feed intake adjusted. Litter growth performance was measured weekly over the three-week lactation period.

What did we find?

The type of feeding system used had no effect on sow body weight, body condition score, or back fat. There was a slight

decrease in litter average daily gain in the third week post-farrowing with the electronic feeding system when compared to manual feeding, however, this did not result in a difference in overall litter weight. Sow feed intake was significantly higher with manual feeding when compared to the other two feeding systems in the first two weeks of lactation, but this difference was no longer evident in the third week.



For pork producers, what's the most important impact?

This study demonstrated that manual feeding of sows during lactation can result in higher feed usage with no corresponding increase in sow or litter productivity. At today's feed prices, the reduction in feed intake associated with the electronic or modified feeding system would save producers an estimated \$8.50 per lactation when compared to manual feeding. Therefore, the electronic and modified feeding systems should be considered to minimize feed wastage and maximize returns. While both systems would reduce feed usage and labour costs associated with feeding, higher costs associated with the electronic feeding system needs to be weighed against additional benefits, such as automatic recording of feed intake when considering which system to implement in their facility.

Funding for this project was provided by the Government of Saskatchewan Agriculture Demonstration of Practices and Technologies (ADOPT). ■

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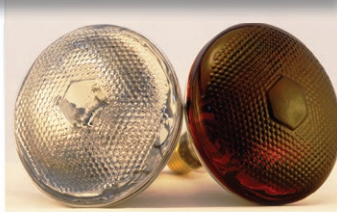


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Feeding lower than typical nutrient dense diets based on barley or wheat grain to weaned pigs

X. Zhou¹, Eduardo Beltranena^{1,2},
Lifang Wang¹, and Ruurd T. Zijlstra^{1*}

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Take Home Message

Weaned pigs fed barley-based diets grew 41 grams per day (g/day) faster and converted feed into gain six per cent more efficiently than those fed wheat-based diets. Diet nutrient density had no effect on growth performance, but lower than typical nutrient density reduced feed cost and cost per kilogram of gain. Producers could therefore consider lower nutrient density and including more barley in nursery diets as long as pigs are able to maintain feed intake.

Feeding low or high nutrient diets

Energy is the most expensive component of feed. Cereal grains, protein and fat sources provide most of the energy in diets accounting for approximately 90 per cent of feed cost. Thus, reducing oil (primary source of fat) inclusion and swapping wheat for barley grain (primary source of starch) may reduce nursery feed cost. As nutrients in diets are formulated in relation to energy, a further reduction in nutrient density and feed cost could be attained reducing the inclusion of specialty protein ingredients in nursery diets.

Barley is the third-most produced cereal grain in Canada after wheat and corn, with 65 per cent consumed domestically as feedstuff. Barley grain is the major dietary energy source for growing-finishing pigs and for beef cattle in western Canada, but concerns exist about feeding barley grain to weaned pigs. Its dietary energy value is lower than wheat or corn grain as it contains more fibre that may affect feed intake and thereby the growth of young pigs. However, previous studies showed that pigs can maintain or increase growth performance when barley replaced wheat, corn or oat groats. In the past, pig diets were not formulated using the net energy (NE) system that accounts for the greater heat production of pigs consuming fibrous feedstuffs. Nor were diets formulated based on standardised ileal digestible (SID) amino acids that better accounts for what pigs really absorb subtracting what gut microbes use up. Because of the potential for feed cost savings, we wanted to evaluate feeding lower than typical nutrient dense diets based on barley or wheat grain to

nursery age pigs to look at effects on nutrient digestibility and growth performance. Diets were formulated based on net energy and standardized ileal digestible amino acids.

Diets and nutrient profile of barley and wheat

Four diets providing either reduced (2.3) or typical energy (2.4 Mcal NE/kg) level based on either barley or wheat grain were formulated. The two dietary energy concentrations were achieved by reducing canola oil inclusion. Differences in nutrient density within diets of equal energy level were achieved reducing the inclusion of soy protein concentrate and fish meal. All four diets provided 4.5 g SID lysine per Mcal NE and other key amino acids were balanced to lysine. Diets were mixed and steam pelleted. Hard Red Spring wheat (58 per cent starch, 12 per cent protein) and hulled, six row barley (49 per cent starch, 14 per cent protein) were fed.

Weaned pig trial

The trial was conducted at the Swine Research and Technology Centre, University of Alberta in Edmonton. In total, 208 pigs (Duroc × Large White/Landrace F1; Hypor, Regina, SK) with an initial weight of 8.5 kg were involved in this three-week trial that started two weeks after weaning. After weaning at 20 ± one days of age, pigs were fed sequentially commercial pre-starter and starter diets (Hi-Pro Feeds, Sherwood Park, AB) for two and 12 days, respectively,

before feeding the test diets. Pigs were housed in nursery rooms in pens containing two barrows and two gilts each. Pigs had free access to feed and water during the entire 21-day study. Pigs, feed added and feed remaining were weighed weekly. Feces were collected the last two days on test to calculate digestibility of key nutrients.

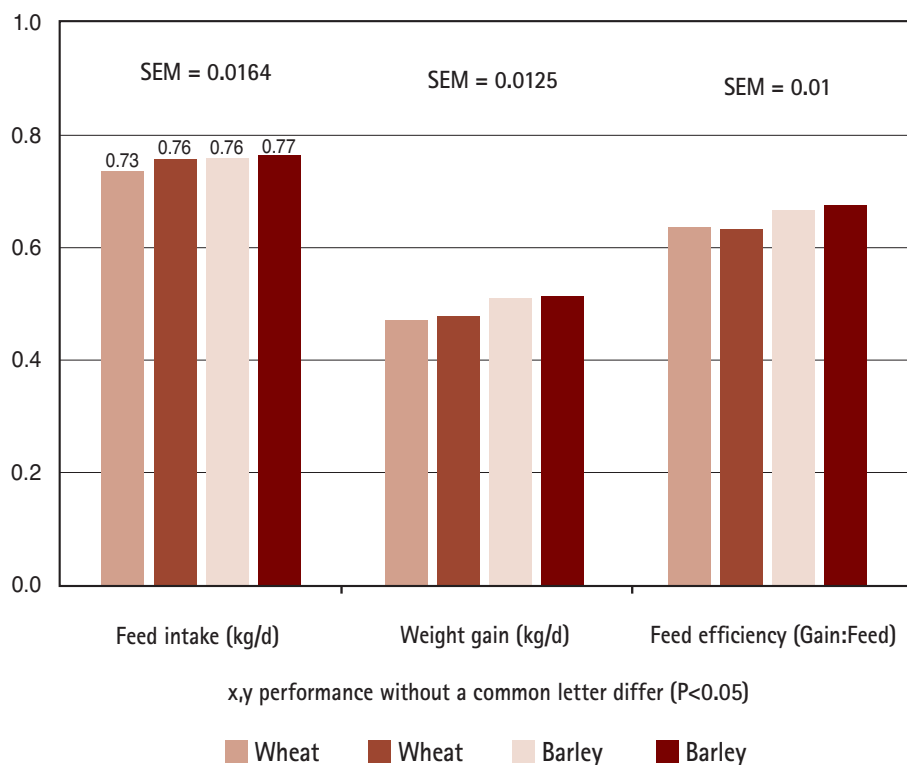
Trial results

All pigs remained on test and signs of diarrhea were not observed. Compared

with wheat-based diets, feeding barley-based diets reduced the digestibility of dry matter, gross energy and protein somewhat (2.7, 3.0, 4.4 per cent, respectively) most likely due to the greater fibre content of barley grain. Hull fibre cannot be digested by the pig's own gut enzymes, thus reduces the digestibility of other nutrients and increases protein excretion in feces. Soluble fibre in the kernel may also reduce nutrient absorption by physical preventing contact between gut enzymes and nutrients.

CONTINUED ON PAGE 50

Figure 1. Growth performance of piglets fed low and typical nutrient density diets based on barley or wheat grain.



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Compared with typical nutrient density, feeding low density diets reduced the digestibility of dry matter, gross energy and protein similarly (2.6, 1.8, 2.3 per cent, respectively). This finding is explained by the reduced fat and increased fibre content of the low density diets.

For the entire 21-day trial, pen daily feed intake did not differ between pigs fed wheat or barley-based diets. However, feeding barley increased weigh gain by 41 g/day and feed efficiency (gain/intake) by six per cent compared with wheat grain. Dietary nutrient density did not affect feed intake, weight gain or feed efficiency. Final body weight of pigs was greater for pigs fed barley than wheat-based diets, but was not affected by nutrient density. In contrast to most barley studies, feeding barley grain in the present study increased weight gain mainly due to increased feed efficiency. This result may be partially attributed to properly formulating the diets based on net energy and standardized amino acids. Otherwise, the effect of fibre on extra heat production and reduced amino acid digestibility would have been neglected.

Cost vs. benefit

Prices per metric tonne were as follows: Wheat \$199, barley \$165, soybean meal \$562, soy protein concentrate \$1,500, her-ring meal \$2,650, canola oil \$1,100, limestone \$109, mono-/

di-calcium phosphate \$965, L-lysine-HCl \$2,150, L-threonine \$3,050, DL-methionine \$5,850, L-tryptophan \$14,000. Dietary inclusion of barley to replace wheat grain increased feed cost by \$1.95 and \$4.84 per tonne of low or typical nutrient density diets, respectively, but slightly decreased feed cost per kg of body weight gain. Formulating diets with low nutrient density reduced feed cost \$42.74 and \$45.63 per tonne of wheat or barley-based diet, respectively, and slightly reduced feed cost per kg of body weight gain.

Recommendation

Feeding barley instead of wheat grain in diets to weaned pigs increased weight gain and feed efficiency. Nutrient density had no effect on growth performance, but lower than typical nutrient density reduced feed cost and cost per kg gain. Producers could therefore consider lower nutrient density and progressively including more barley in nursery diets to allow the pigs to adapt by increasing gut capacity. Barley fibre likely has a prebiotic effect in the intestine favouring microbes that promote gut development and health.

Acknowledgements

Research funding from Alberta Barley Commission and Alberta Crop Industry Development Fund is acknowledged. ■



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Immune stimulation increases amino acid requirements in nursery pigs fed antibiotic-free starter diets

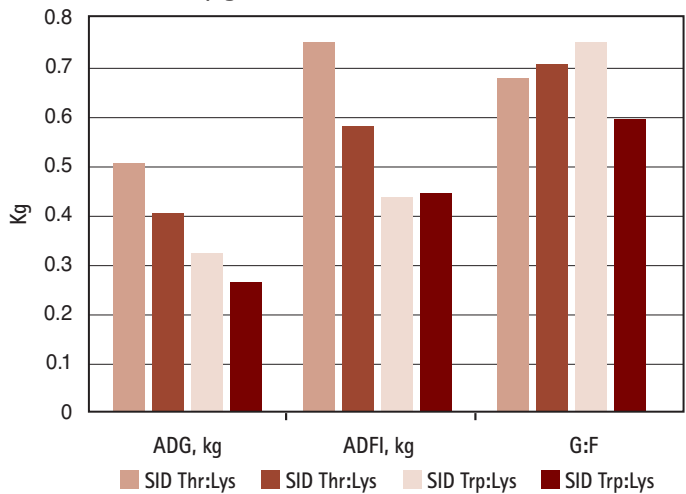
B. Jayaraman, and C. M. Nyachoti, Department of Animal Science, University of Manitoba

Weaning is an abrupt and stressful period in a pig's life that can have both immediate and lasting economic impacts. Antimicrobial growth promoters (AGP) have been used in swine starter diets to minimize the negative effects of weaning such as reduced feed intake, diarrhea and poor weight gain that can accompany this transition period. However, mounting public pressure and growing concerns around antibiotic resistance is propelling an industry-wide move to eliminate the use of in-feed AGP.

Under immune-challenge conditions, amino acid (AA) metabolism is altered, resulting in AA being redistributed away from growth and production functions to immune functions. As such, the AA requirements for weaned piglets might be higher with AGP-free starter diets than the NRC-recommended inclusion rates, particularly if piglets are exposed to unclean sanitary conditions. Threonine (Thr) and tryptophan (Trp) are the third or fourth limiting AA in commercial swine starter diets after lysine and methionine. In addition to protein accretion, Trp regulates feed intake and acts as a modulator for controlling immune response and maintaining health in disease-challenged pigs. Thr, in addition to protein synthesis, is essential for maintenance of gut integrity and immunity. For pigs between seven and 25 kg, NRC (2012) recommends a diet with a SID Trp:Lys of 16 per cent and a SID Thr:Lys of 59 per cent, but this does not consider the health status of pigs. Moreover, this value is derived from different studies in piglets fed diets containing AGP.

The Swine Nutrition Program at the University of Manitoba recently concluded a series of trials to determine the optimal SID Trp:Lys and SID Thr:Lys ratios for weaned pigs fed AGP-free starter diets and subjected to immunological challenge. In this research project, sanitation and *Escherichia coli* K88 (*E. coli* K88) models were used to challenge the weaned piglets.

Figure 1. Effect of sanitation on growth performance of weaned piglets.



Optimal SID Thr:Lys and SID Trp:Lys of piglets under clean or unclean sanitary conditions

Optimal SID Thr:Lys – A total of 180 weaned piglets were fed AGP-free starter diets with one of five dietary SID Thr:Lys levels (55, 59, 63, 67 and 71 per cent) under clean (n=90; 21 d period) or unclean (n = 90; 21 d) sanitary conditions. Subjecting weaned piglets to unclean sanitary conditions was used as a model of immune system stimulation. Piglets under unclean sanitary conditions had reduced growth performance (average daily gain; ADG and average daily feed intake; ADFI) compared to those under clean sanitary conditions (Figure 1). The optimal SID Thr:Lys based on feed ef-

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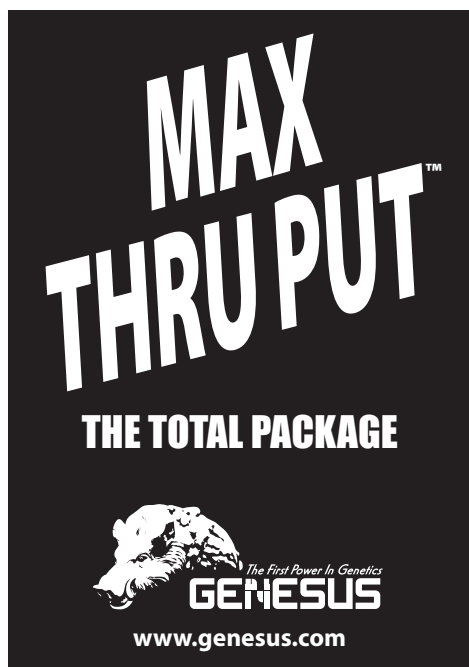
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iciency (gain:feed; G:F) as a response criteria was 65 per cent and 66.5 per cent for weaned pigs under clean and unclean sanitary conditions, respectively (Table 1).



Optimal SID Trp:Lys – A total of 180 weaned piglets under clean (n=90; 14 d) or unclean (n = 90; 14 d) sanitary conditions were fed AGP-free starter diets with one of five dietary SID Trp:Lys treatments (18, 19, 20, 22 and 24 per cent). Under unclean conditions, piglets had reduced growth performance compared to those under clean conditions (Figure 1) and a higher optimal SID Trp:Lys than piglets under clean conditions (20.5 per cent vs. 19.7 per cent), based on ADG (Table 1).

Optimal SID Thr:Lys and SID Trp:Lys of piglets challenged with *E. coli* K88

Optimal SID Trp:Lys – 30 weaned piglets were fed AGP-free starter diets with one of five dietary SID Trp:Lys levels (16.1, 18.6, 20.3, 22.9 and 24.6%) and challenged with *E. coli* K88. Based on ADG and G:F, the optimal SID Trp:Lys for weaned piglets subjected to *E. coli*

K88 challenge were 21.7 and 20.1%, respectively (Table 1).

Optimal SID Thr:Lys – Thirty weaned piglets were fed AGP-free starter diets with one of five dietary treatments (SID Thr:Lys 53, 59, 65, 71% and 59% SID Thr:Lys with AGP) and challenged with *E. coli* K88. The optimal SID Thr:Lys based on villous height: crypt depth and plasma urea nitrogen in weaned piglets challenged with *E. coli* K88 was 65.6% and 60.3%, respectively (Table 1).

Summary of findings

Raising nursery pigs under clean sanitary conditions is one of the most important management strategies to reduce pathogenic infections in the swine barn. Dietary nutrient requirements could increase for piglets fed AGP-free starter diets and reared under unclean sanitary conditions. The results from our study demonstrate that weaned piglets raised under sub-optimal sanitary condi-

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tions and fed AGP-free diets need higher dietary threonine:lysine and tryptophan:lysine requirements (Table 1) than NRC (2012) recommendations. Ensuring adequate amino acids in AGP-free starter diets will aid in maintaining good performance under unfavorable health conditions.

Acknowledgements

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For more information, contact Dr. C. M. Nyachoti at martin_nyachoti@umanitoba.ca. ■

Table 1. Estimated optimal SID threonine:lysine and tryptophan:lysine ratios in weaned pigs fed antibiotic-free starter diets.

Items	Response criteria	Estimated Optimal AA:lysine (%)	NRC (2012) (%)
SID Thr:Lys			
Clean	G:F	65	59
Unclean	G:F	66.5	
SID Trp:Lys			
Clean	ADG	19.7	16
Unclean	ADG	20.5	
SID Trp:Lys			
<i>E. coli</i> challenge	ADG	21.7	16
	G:F	20.1	
SID Thr:Lys			
<i>E. coli</i> challenge	VH:CD	65.6	59
	Plasma urea nitrogen	60.3	

G:F – gain:feed; VH:CD- villous height:crypt depth

Key points

- Providing clean sanitary conditions is one of the most important management strategies to reduce pathogenic infections in nursery pigs
- Under antimicrobial growth promoters-free (AGP-free) feeding, piglets could have elevated nutrient requirements that exceed NRC recommendations
- Under AGP-free feeding, nutrient requirements for piglets in unclean sanitary conditions appear to be even higher than under clean conditions
- Ensuring adequate amino acids in AGP-free starter diets will aid in maintaining good performance

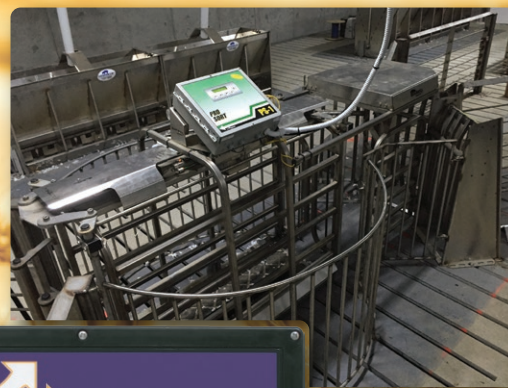


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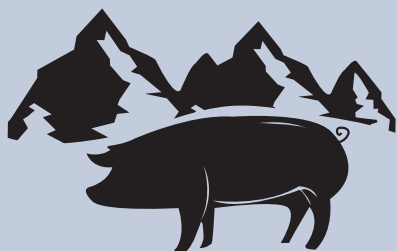


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Using canola meal as a major protein source for lactating sows

Deepak E. Velayudhan and Martin Nyachoti, Department of Animal Science, University of Manitoba

Canola meal, the main co-product of the canola seed crushing industry, is a commonly used protein source for swine. Compared to soybean meal, canola meal has a lower protein and amino acid content, with around three times the fiber. In recent years, the development of canola meal with low glucosinolate content has increased its usage in swine diets even though the higher fiber content can reduce energy and nutrient digestibility in swine.

Earlier studies at the University of Manitoba have shown that when feeding canola meal at higher inclusion rates (e.g. up to 25 per cent) to weaner pigs, formulating diets based on net energy and standardized ileal digestible amino acid content can overcome the potential negative impact on growth performance. However, not much research has been conducted to evaluate the effects of feeding higher levels of canola meal on lactating sow and piglet performance. If sow nutrient requirements are not met, mobilization of body reserves could occur, having detrimental consequences on both reproduction and piglet survivability.

For our study we hypothesized that optimal performance in lactating sows can be maintained by feeding diets containing higher levels of canola meal if they are formulated on the basis of net energy and standardized ileal digestible amino acid systems.

The study

Objective: to determine the effects of higher dietary canola meal inclusion in lactation diets on reproductive performance of sows with diets formulated on the basis of net energy and standardized ileal digestible amino acid.

The study was conducted at the Glenlea Swine Research Unit, University of Manitoba with 45 (Yorkshire × Landrace) sows and their litters. A week before the expected day of farrowing, sows were moved from gestation pens to individual farrowing crates and were fed one of three experimental diets until weaning. The three experimental diets consisted of a corn-soybean meal basal diet containing 0, 15 or 30 per cent canola meal. Sows were fed 3.0 kg of their respective experimental diets once daily until partu-

rition. After farrowing, feed was gradually increased over a one-week period, after which the respective diets were offered *ad libitum* until weaning. The quantity of feed provided and the feed refusals per sow were recorded daily to determine the average daily feed intake (ADFI) by sows. Sow body weight and backfat depth were measured and recorded on day 111 of pregnancy, immediately after farrowing (day 0), day seven post-farrowing and at weaning (day 21). Milk samples were collected from sows on day 0, seven

CONTINUED ON PAGE 56

Key points

- Canola breeding has resulted in cultivars with low concentrations of anti-nutritional factors (mainly glucosinolates), making it a suitable feedstuff for swine
- Sow and litter performance data from the current study indicate that when diets are formulated on the basis of net energy and standardized ileal digestible amino acid systems, canola meal could be incorporated as a major protein source in lactating sow diets

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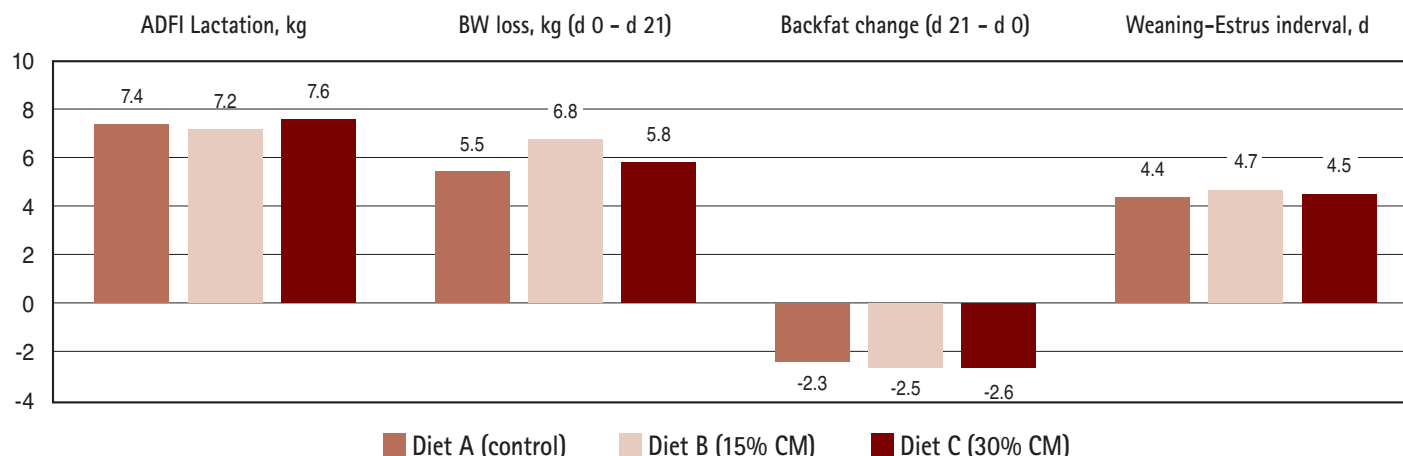
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Figure 1. Effect of high dietary canola meal inclusion on growth and reproductive performance in lactating sows



and 21 post-farrowing to determine the milk composition. Total number of piglets born alive and number of piglets weaned per sow was recorded and litters were weighed on day 0, 7 and 21 to calculate average daily body weight gain (ADG). Since excessive mobilization of body reserves can result in lack or absence of the

expression of estrus in sows, detection of estrus was conducted post-farrowing to determine weaning to estrus interval.

Results and discussion

The results from the study showed no negative effects of higher dietary canola meal on lactation feed intake, sow body

weight and backfat change and weaning to estrous interval (Figure 1). Sow milk composition (fat, protein, lactose and urea) was also unaffected by higher rates of canola meal inclusion (data not shown). There was no negative effect of dietary canola meal inclusion on litter ADG (Figure 2).



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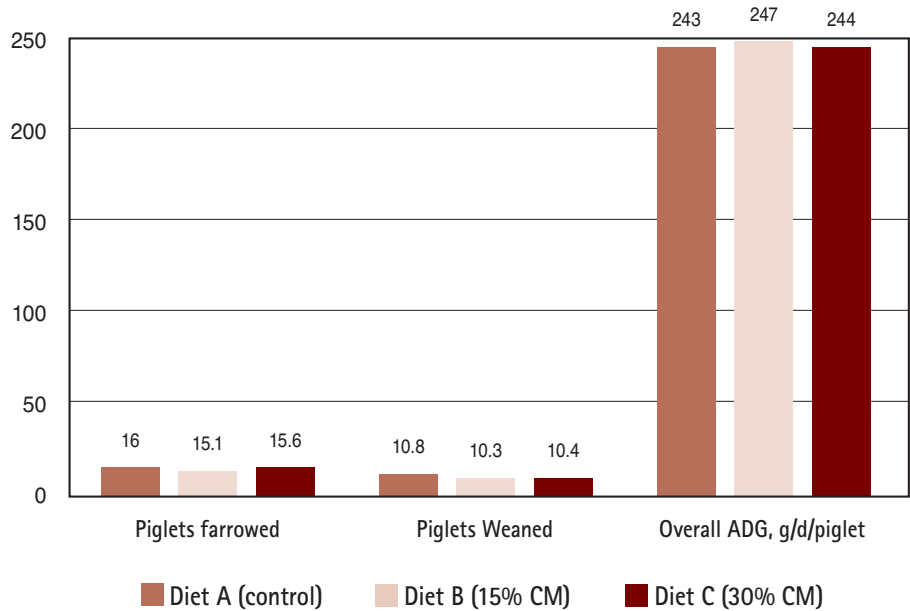
Sows can tolerate a maximum level of 4 $\mu\text{mol/g}$ total glucosinolates in diets, above which their reproductive performance has shown to be negatively affected. Standard canola breeding techniques have led to a considerable reduction in glucosinolates levels in canola meal. The canola meals used in this study contained moderately low levels (7.9 $\mu\text{mol/g}$) of glucosinolates, equivalent to 1.32 $\mu\text{mol/g}$ and 2.82 $\mu\text{mol/g}$ for diets with 15 and 30 per cent canola meal, respectively. Thus, the lack of a difference in ADFI between sows fed the control diet and canola meal-containing diets in the current study could also be due to the fact that the concentration of glucosinolates in diets was within the tolerance level for sows. In the present study, the milk composition was also un-affected with higher canola meal inclusion; perhaps because the diets were formulated to contain similar standardized ileal digestible amino acid contents.

Conclusion

Net energy system enables more effective utilization of high fiber ingredients like canola meal without affecting the animal performance. Based on the absence of negative effects of higher dietary canola meal inclusion on sow ADFI, sow milk composition and pig-

let ADG, we conclude that inclusion of up to 30 per cent canola meal in lactation diet can support satisfactory sow and suckling piglet performance when such diets are formulated on the basis of net energy and standardized ileal digestible amino acid systems. Currently, a study is underway at the University of Manitoba looking into the effect of high dietary canola meal inclusion from early gestation on lactating sow and litter performance.

Figure 2. Effect of high dietary canola meal inclusion on litter performance



Acknowledgements

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For more information, contact Dr. Martin Nyachoti at Martin_Nyachoti@umanitoba.ca. ■



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