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## Cover Photo

Research assistant Carson Callum places reflective markers on a sow prior to video recording the sow's walking movements for kinematic assessment of lameness as part of a Swine Innovation Pork funded project at the NCLE Swine Unit, University of Manitoba.

Photo by Laurie Connor



# Focus on Research

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## Message from the editor

Finally! Summer has arrived! I don't know about everywhere else, but for me, this was a very long, slow and cold spring – winter just didn't seem ready to let go. Summer is a busy time for producers – there are often meetings to go to, events to attend, fields to tend and summer vacations to be had – if we're lucky.

In the news business, summer tends to be a little slow – largely because the government takes so much time off. But it's also because our Canadian summers are so short that we all try to make the most of it, and business just sort of... coasts. I knew I wanted to try and dedicate the majority of an issue to the research side of the business, and our summer edition seemed like the perfect fit!

Inside this issue, we'll hear from some of the biggest players on the research side of the pork business, and we'll learn about the studies and cutting-edge science being done to keep Canadian producers at the top of their game. Of course, we always try to feature research and science in every issue – that's one feature that readers have come to rely on Western Hog Journal for – but I felt it was really important to give our scientists the opportunity to tell their stories. They are so passionate about the work they do, and let's face it – it's not likely they will ever have a large public audience for their results. We're not just their audience – we're also their partners, and their biggest supporters. We are so blessed in this industry to have such an active and enthusiastic core of researchers, and I am proud to be able to showcase their tremendous efforts right here in the pages of the Western Hog Journal.

A big shout-out to Bernie Peet, the former editor of this magazine, and the 2014 recipient of the lifetime achievement award at the Alberta Pork Congress! Bernie has a long and impressive history in the hog industry, and his work in shaping Western Hog Journal into what it is today will long be remembered. Bernie is busy these days in China, where he and his wife are working with the pork industry there to train workers and producers. Congratulations Bernie, for your well-deserved recognition!

In our next edition, we're going to take a close look at the retail world, and why we're seeing so much product on our shelves that isn't Canadian. We'll also be looking at the recent changes to the Temporary Foreign Worker Program, and our Swine and Wine Me will be back – with a new twist!

This issue marks my first full-year as editor of Western Hog Journal, and I have learned so much, and have had the opportunity to meet so many wonderful people. This year I hope to get out to some more industry events in Manitoba and Ontario, and to visit with more producers as well. As always, I love hearing from you, and receiving feedback and story ideas.

Have a wonderful, productive summer! ■

sherimonk@gmail.com



# This little piggy has a post-weaning problem

What's the problem? Post-weaning diarrhea caused by *E. coli*. In fact, *E. coli* is one of the most important causes of post-weaning diarrhea in pigs.<sup>1</sup>

And *E. coli* probably is more prevalent in piglets than you think: When surveyed, about 42% of veterinarians and producers in Canada and the United States reported a challenge from *E. coli*,<sup>2</sup> which can cause serious economic losses.

Elanco recommends a three-step approach to managing *E. coli*:

- 1) Consult your veterinarian to assess your farm's status
- 2) Test to identify the *E. coli* strain
- 3) Choose the right product to treat your herds

If you have questions about *E. coli* and its treatment options, contact your Elanco representative—and watch for more information to come.

<sup>1</sup> Fairbrother, J., Nadeau, E. and Gyles, C. 2005. Escherichia coli in postweaning diarrhea in pigs: an update on bacterial types, pathogenesis, and prevention strategies. *Anim. Health Res. Rev.* 6(1): 17-39.

<sup>2</sup> Van Der Sluis, W. June 2012. Health challenges are top obstacle to Full Value Pigs. *Pig Progress* website. Accessed 11/14/13. Available at: <<http://www.pigprogress.net/Home/General/2012/6/Health-challenges-are-top-obstacles-to-Full-Value-Pigs-PP008833W/>>.

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# News and Views from Far and Near



## Nuhn Lagoon Crawler making a splash in the market

The Nuhn Lagoon Crawler has been catching eyes locally, nationally and globally since it was first designed and manufactured in Aug 2013 where it made its debut appearance at the North American Manure Expo in Guelph, Ontario.

The Nuhn Lagoon Crawler is an amphibious vehicle designed for agitating large manure lagoons. The wheels are able to drop down, giving the vehicle roughly five feet of ground clearance. The lagoon crawler then drives itself into a lagoon, where it turns into an agitation boat.

The Lagoon Crawler is the best way to agitate lagoons. A better mix will give a higher concentration of nutrients in the manure and will increase crop yield. The Crawler blasts away sand and solid buildup increasing storage and it eliminates the costly expense of additional clean-out once the lagoon has been pumped out.

The Lagoon Crawler is a four-wheel drive system, making the crawler extremely flexible. If the Crawler gets caught up on the solid build-up, it can drop its wheels to drive itself out. Once the lagoon is emptied, the four wheels are lowered and the machine is able to drive itself out of the lagoon all while being controlled by a remote controller

When in the lagoon, the Lagoon Crawler is powered by a quad port, Nuhn Header Series manure pump. The header pump is located on the bottom of the Crawler, and is submerged at all times. 10000+GPM volumes are used to maneuver the boat through the lagoon and agitate the solids from the bottom. The Nuhn Lagoon Crawler does not need a priming system.

The technical specifications of the Lagoon Crawler are endless. For the engine, the Crawler comes equipped with a Cummins QSB6.7. A John Deere engine is also available for the Crawler upon request. It has a 10" quad port header pump, which has a 10,000 GPM capacity with 7 agitator nozzles. There are complete

wireless controls for the Crawler, so all of the machine operation functions are controlled through the wireless remote. The drive system as previously stated is four-wheel drive. It has high torque more for crawling out of the lagoons and high speed more for those times when being transported via land.

## Canarm AgSystems launches new electronic sow feeder

Canarm AgSystems recently introduced its new SowChoice Systems electronic Sow Feeder (ESF), a Canadian choice for farmers looking for reliable

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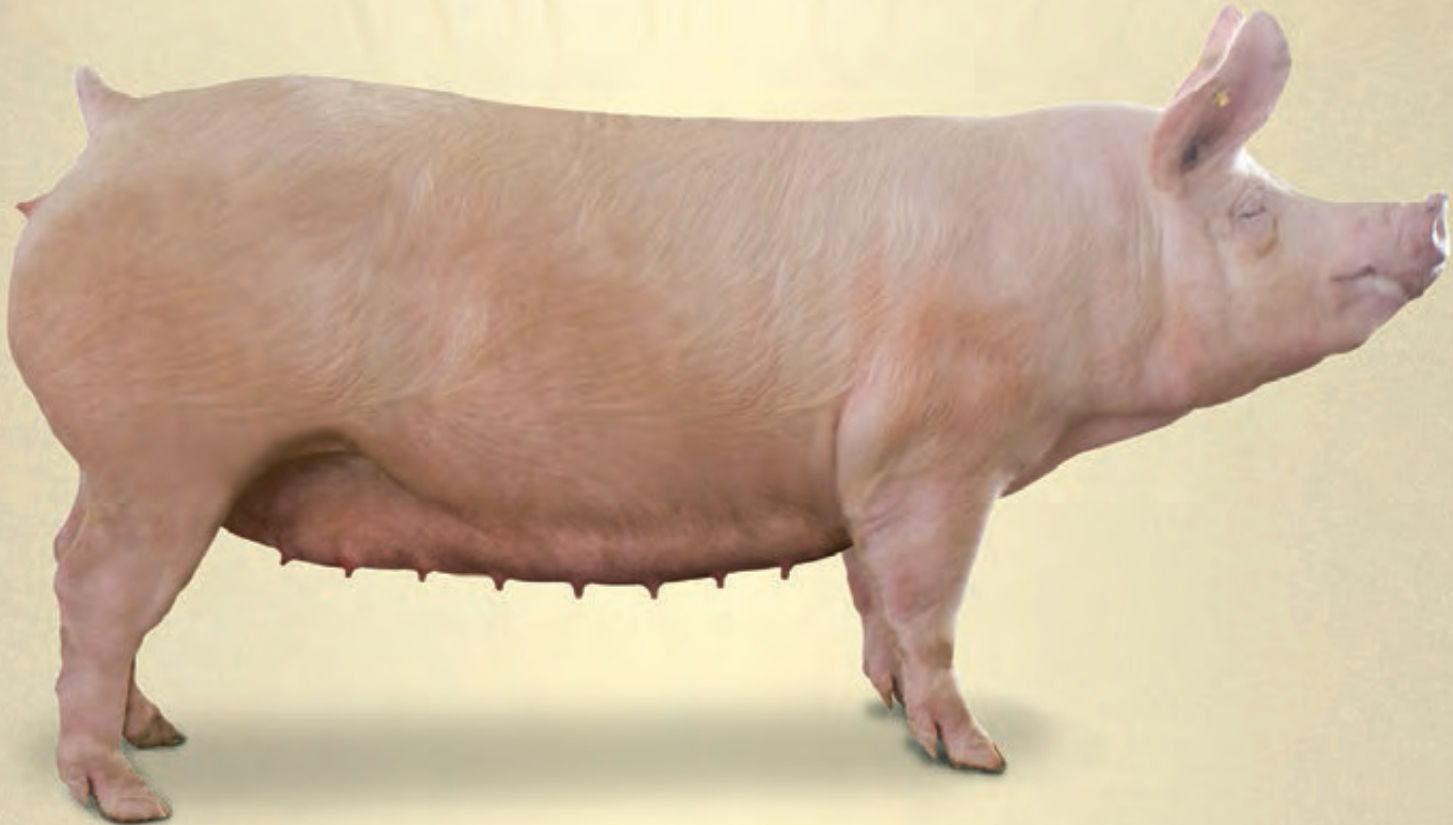
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and efficient options to feed sows in loose sow housing systems. The SowChoice Systems ESF combines input from hog farmers, dealers and Canarm AgSystem's 80 years of experience in designing hog equipment. The result is one of the only ESFs made in North America, Canadian-made, using readily available industrial parts for easy servicing.

The SowChoice Systems ESF is the only fully interconnected ESF on the market, combining the global engineering and manufacturing prowess of Canarm Inc. with the power of PigCHAMP, the world's leading swine software company. The ESF system will integrate with both PigCHAMP and most other hog management systems on the market.

"We spoke with a lot of people involved in hog production as we designed the SowChoice Systems ESF," says Curtiss Littlejohn, Swine Products Manager with Canarm AgSystems. "That's why we

believe this ESF can find a home in any loose sow housing barn."

Electronic sow feeders allow an individual sow to enter a feeding station. There, she is protected from other sows as she receives a ration customized for her stage of lactation. Electronic sow feeding systems require less stabling to be installed and barns can be more economically constructed compared to other loose sow housing systems.

The SowChoice Systems ESF comes with standard 304 stainless steel construction for added durability. It is one of the highest throughput ESFs on the market, with a capacity of 80 sows per unit, thanks to the design of its feed tray and the route of sows through the feeder. The SowChoice Systems ESF is backed by the strength and depth of Canarm Inc., a Canadian company employing 350 people with operations in Canada, the U.S. and China, with business units in agriculture, HVAC and residential fans and lighting.

## Manuel Araullo joins the Genesis team

Genesis is pleased to announce the appointment of Manuel Araullo, BSc, P. Ag to the position of director of nutrition. In his new role, Mr. Araullo will provide leadership in the Animal Nutrition area domestically and globally, in addition to collaborating with other Genesis staff on a variety of research and development projects.

Manny has a BSc in Agriculture and is a member of the Manitoba Institute of Agrologists and was part of the International Educated Agrologists Program at the University of Manitoba.

After finishing his studies at University of Manitoba, He joined RWayAg and Manitoba Agriculture and Food and Rural Initiatives.

Manny has been involved in swine production, sales of animal nutrition products, formulating pig diets, farm consultancy and researches in animal nutrition. Manny's experiences with MasterFeeds and Cargill Animal Nutrition

has given him strong experience in formulating feeds for swine production units. His nutritional obligations had him regularly visiting barns and providing information that would improve farm efficiency especially those related to nutrition.

"We look forward to the contributions Manny will make to the Genesis Swine Nutrition programs and research and development. His work experiences in swine production and nutrition will add to his capabilities in performing his duties as Director of Nutrition," said Jim Long, President and CEO.

## FCC donates \$100,000 to help injured farmers return to work

Following a two-week social media campaign called Back to Ag, Farm Credit Canada (FCC) donated \$100,000 to a program aimed at helping farmers and agricultural workers return to work after a life-altering injury.

CONTINUED ON PAGE 10

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“We exceeded our expectations in terms of reaching people and raising awareness of this important issue and we sincerely thank the thousands of people, the media and online community who responded,” said Greg Stewart, FCC president and CEO. “It’s such a worthy cause, and the response was truly overwhelming and heart-felt.”

Launched on May 29, the Back to Ag social media campaign achieved over 18,000 tweets, retweets, likes and shares on Twitter and Facebook and potentially reached as many as 2.3 million Canadians. FCC offered to donate \$1 (up to \$100,000) to the Back to Ag program for every tweet or retweet on Twitter and every like or share on Facebook, but decided to donate the full amount as a result of the positive response to the program.

“Safety is so important on the farm but the reality is

incidents sometimes happen. We wanted to raise awareness that returning to work post-injury is possible in many situations, and this program will help make that happen,” Stewart said.

The Back to Ag program is also supported by the Rick Hansen Foundation, which is dedicated to improving the lives of those with spinal cord injuries and other disabilities, and the Canadian Agricultural Safety Association (CASA), a national non-profit organization dedicated to improving the health and safety of farmers, their families and workers.

CASA will manage the Back to Ag program, which will allow injured farmers and agricultural workers to apply for funding for the purchase of specialized equipment or adaptation of existing equipment in order to get them back to farming. Applications and “how to apply” instructions will be available this fall on the CASA website at [www.casa-acsa.ca](http://www.casa-acsa.ca)

## Purina launches new and revised swine diets

Purina recently launched new and revised Swine Prestarter and Starter diets. The revisions are a result of merging the Cargill and Provimi nutritional knowledge into one formulation format called the “Cargill Nutrient System” (CNS). The CNS will better define the neonatal and young pig’s growth requirements, enhance ingredient evaluation plus incorporate the research knowledge from both companies into new specifications. The resulting diets will have superior formulation precision, more highly digestible ingredients and a new flavor to generate better intakes and improved feed costs. The key updates are as follows:

1. A new Pig Tech “First,” which is a pelleted product to be fed to nursing piglets from three days of age up to a few days post weaning. This product is to supplement the sow’s milk and is high in milk products and sweeteners to

encourage early intakes, bloom and growth.

2. Pig Tech Early Wean, Wean, and Late Wean have been modified with the new CNS formulation system and flavor additives to improve intake and performance.

3. Pig Tech Early Wean, Wean and Transition “Select” products are diets free of plasma and other porcine proteins. These diets are more expensive than their plasma-based alternatives, but are manufactured to specifically exclude the presence of all porcine proteins. As well, these diets have been formulated with the new CNS format.

All Pig Tech diets include “microencapsulated zinc oxide” which respects the maximum legal level of 500 ppm Zn but offers a higher potency level and may eliminate the need for scripted higher levels of Zn depending on the specific situation. HO Pig Startena, HP Startena, Pig Startena Plus, and the Optimum/Associate Starter products have been updated using the new CNS format.

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Customers moving to these new and revised prestarter and starter diets should see better intakes, improved performance and lower costs per kilo of gain. For more information call your Purina Swine Team contact.

## Maple Leaf Foods (Brandon) announce temporary plant “brown-out”

In May 27, Maple Leaf Foods (Brandon) announced it had started a reduced processing schedule by cutting one day per month, for five months. “This temporary ‘brown-out’” is because of a lack of market hogs. This situation will not improve until producers build more barns to produce market hogs,” says Karl Kynoch, Chair of Manitoba Pork Council (MPC).

Kynoch indicates producers will invest in new barns but the current environmental regulations are killing that investment opportunity. “We have better technologies that protect the environment, but are more cost effective for producers,” says Kynoch.

MPC has been meeting regularly with government and processors for the past five years to resolve the challenges of insufficient market hogs not matching processing capacity. MPC and processors have developed financial packages to lever new private capital investment at the farm level, with some short-term support from government. For example, MPC met last week in Ottawa with government and industry officials to explain the core programs, which would resolve the lack of market hogs.

“It has been a very frustrating exercise. We developed programs which are market-driven, would bring in millions of dollars of new investment, and create thousands of new jobs,” says Kynoch. He also pointed out that, “The number of market hogs could be increased as we have the sow-base and the processing capacity to take the pigs. But we need some help to lever more private capital investment on-farm, and for government to stop forcing regulations, which discourage investment and do nothing for the environment.”

## TOPIGS and Norsvin merge into Topigs Norsvin

The world’s most innovative swine genetics company TOPIGS International and Norsvin International AS have merged their international activities into a new company with the name Topigs Norsvin. The merger of these two companies has resulted in a world-leading swine breeding company with annual revenues exceeding US\$179 million/€ 130 million. The head office will be in Vught, the Netherlands. TOPIGS Nederland, Varkens K.I. Nederland and Norsvin SA are not part of the merger.

TOPIGS and Norsvin are farmer-owned, with an identical philosophy of paying dividends through genetic progress from applied research and development (R&D). Farmer-owned meat processors and a feed supplier are minority shareholders.

TOPIGS and Norsvin are aligning their R&D activities for more and smarter investments to accelerate genetic progress and develop new products. TOPIGS and Norsvin have cooperated successfully on selected R&D projects for

many years and are now fully aligning all R&D activities. The combined R&D budget is about US\$ 25 million/€ 18 million, equaling 14% of the revenues. The combination of high-throughput phenotyping, large-scale computer tomography of boars, global nucleus breeding, massive gathering of production data and genomic selection will accelerate genetic progress and add value to the entire production chain.

Topigs Norsvin has a complementary product portfolio with increased value to customers. The current products of both merging companies will remain available.

## Swine Research Cluster receives \$13 million for research

On May 29, the Canadian pork industry welcomed today’s news of \$13 million in funding for the Swine Innovation

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\* In the event of high maternal antibodies, vaccination of 3 days of age is not recommended. <sup>1</sup> Data on file

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CI R005-13E-AD-B



Porc (SIP) Science Cluster under Growing Forward 2. The investment will support strategic research to enhance competitiveness, drive innovation, and promote the long-term growth and sustainability of the Canadian swine industry.

“Swine Innovation Porc has become an organization with a deep understanding of science innovation that is relevant to its partners’ needs,” stated SIP’s Chair, Stewart Cressman. “The federal government’s contribution together with contributions from industry and direct investments from provincial pork industry groups to this cluster bring the total investment to \$17 million.”

“Thanks to Minister Ritz’s leadership, this investment in the Swine Research Cluster will allow our industry to engage the best Canadian scientists on critical production and product issues,” stated CPC’s Chair, Jean-Guy Vincent. “Our focus is on research that is aimed at reducing cost and creating

more ‘game changers’ through greater and quicker innovation breakthroughs that will further strengthen our industry.”

Fifteen research projects have been identified to achieve objectives related to:

- Reducing production and feed costs
- Increasing product attributes and prices
- Accelerating knowledge transfer
- Enhancing adaptability & sustainability

SIP is committed to provide national leadership in coordinating and facilitating research, knowledge transfer and commercialization initiatives to enhance the competitiveness of the Canadian swine industry.

The CPC serves as the national voice for hog producers in Canada. A federation of nine provincial pork industry associations, our organization’s purpose is to play a leadership role in achieving and maintaining a dynamic and prosperous Canadian pork sector. For more information, visit [www.swineinnovationporc.ca](http://www.swineinnovationporc.ca).

## Enhanced Bio-Dri System for virus protection during transport

AP (Automated Production Systems), a division of GSI, is adding new, automated controls to enhance Bio-Dri, its thermo-assisted drying and decontamination (TADD) system. Bio-Dri is a quick and thorough method for heating and drying livestock trailers after wash down to help prevent the transmission of swine viruses during animal transport.

The Bio-Dri System is an independent, dedicated structure designed for high-speed, high-temperature heating and drying of livestock transport trailers to help prevent the spread of viruses and pathogens on the trailer’s surface. Studies have shown that thorough heating and drying of trailers after washing greatly reduces the risk of introducing viruses, such as porcine epidemic diarrhea (PED) and porcine respiratory and reproductive syndrome (PRRS), to pigs during transport.

Because weather conditions and lack of downtime between loads can make adequate natural drying difficult, the Bio-Dri System utilizes high-volume, high-velocity blowers and gas-fired burners to deliver heated air to all parts of the trailer, inside and out. The heated air is recirculated through the system for maximum drying and fuel efficiency and then purged from the chamber at the end of each drying cycle.

“The Bio-Dri System has a proven track record in reducing the risk of introducing viruses and pathogens to pigs during transport in all weather conditions,” said Rieck. “With its new, automated controls, Bio-Dri can be an even more effective tool in a swine producer’s biosecurity protocols.” He added that the upgraded system has Intertek certification meeting U.S. and Canadian standards.

The new Bio-Dri System will made its debut at the 2014 World Pork Expo, June 4-6, and will be available to the market in August 2014. ■

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## High prices and media coverage



By Kevin Grier

There was an exceptional amount of media attention given to the high prices for beef and pork in grocery stores this spring. I received many calls and requests from radio, TV and print media asking for interviews and backgrounders on the reasons why prices at retail were so high. Calls were from the mass media such as Canada AM, CTV News, CBC radio and the Globe and Mail. High beef and pork prices at

retail was seen as big news. The stories invariably begin with a discussion of the fact that consumers are going to be very disappointed when they go to purchase items for their grill.

This can be a sensitive topic for hog producers. That is, given the financial stress that the industry has seen, there is little sympathy for the fact that consumers are now paying more for pork. Some producers express outright animosity that higher consumer prices are even an issue worth discussing. Interestingly though, it seemed like most of the reporters that interviewed me were fully aware that farmers had seen stress and that the higher prices were good news for producers.

The main point that I had to emphasize in the interviews was that the sharp increase in price was mostly due to supply reductions. In the case of beef I noted that the reduction in supply was the consequence of over ten years of herd reduction. On the pig side I noted the issues associated with PEDv. Of course I also could not miss the opportunity to blame U.S. and Canadian ethanol subsidies and mandates for driving the cost of grain higher and driving meat production out of business. It would be good for consumers to know that a large part of the reason they are grilling hot dogs instead of back ribs is because of misguided ethanol policies in Canada.

Another point that is of interest is the fact that grocers have tended to be pleased that there was media coverage of this sort. They were pleased because consumers were made aware that the cause of the increase was not blamed on them randomly hiking prices just in time for BBQ season. They believe that an educated consumer is beneficial for them in this case.

## Mixed Messages on Demand

It is important to examine what the impact of the high retail prices are having on consumer purchases. Perhaps not surprisingly, the fact is that the data shows that consumers are

buying less pork and beef in response to the higher prices. They are buying more chicken and they are trading down to lower priced items. In other words, we are reacting rationally.

With that noted, the overall expenditures on beef and pork during the first half of the year appears to be higher. So generally speaking, Canadians have cut back on red meat volumes, but the dollars spent have increased on a year-over-year basis. That indicates that Canadian demand for red meat has been strong during the first half of 2014.

With regard to demand, however, it is important to take a step back and look at the big picture. Statistics Canada recently released the final consumption numbers for 2013 and once again, pork per capita consumption declined. On a carcass basis, pork per capita consumption declined to 21 kilograms in 2013 compared to 22 kilograms in 2012. Consumption of pork has fallen in five of the last six years. That is not good.

We can however, try to take some solace in the fact that overall demand means more than just consumption – demand is the combination of price and consumption. In that regard, demand for pork might have hit rock bottom in 2010 and has solidified in the 2011 to 2013 period.

## Pork Export Myths

At the May Canadian Meat Council annual meeting, I was asked to speak on the topic, 'Does the Meat Follow the Money?' This is a question of whether Canadian beef and pork products flow to the highest prices and best returns. For

CONTINUED ON PAGE 14

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most industry participants the answer is, "Of course it does, where else would it go?" Canadian packers, processors and traders ensure that product moves to the highest priced market whether locally, nationally, to the U.S., or overseas.

Many producers, academics, government officials and consultants however, believe that Canadian packers, processors and traders are missing out on profitable opportunities, particularly internationally. In other words, they believe the meat does not follow the money.

Not only is the charge that they are missing out on profitable markets, but the assertion is also that packers are missing opportunities due to a lack of marketing proficiency. The charge is that packers and traders have failed to capitalize on the "Canada Brand", the Canadian food safety record, or Canadian traceability. They also say that if Canada were to market meat products using "traditional" or technology-free production methods, such as no ractopamine, there would be big gains. The lack of these efforts on the part of Canadian packers and traders is seen as a trading loss for the industry.

In addition, it is often stated that Canadian traders are far too reliant on the U.S. as an easy destination. Finally, the often stated charge is that Canada cannot trade to its fullest benefit because it is simply not competitive in the meat industry.

In other words, the concern is that while it is true that meat

might follow the money, not nearly enough meat is following the most money.

A case in point were the comments of Dr. Michael Bloom, of the Conference Board of Canada, another speaker at the Canadian Meat Council meeting in May. Bloom asserted that Canadian exporters need to market internationally using the Canadian brand and Canada's food safety system. Bloom argued that an important strategy was to build a Canada Brand to reinforce food brands and products using positive images of Canada's natural environment and culture, and our reputation for product quality and safety. Another key according to Bloom was to "Promote more comprehensive food traceability for food supply chains and value chains." Furthermore making "Make premises identification mandatory," was also seen as important. An emphasis on sustainability was also seen as a benefit for the industry.

Of course meat industry conferences have been hearing that kind of advice from consultants and academics for at least ten years. These are all old ideas. No doubt every company can and should do better on the trade front. The question however, is whether the old advice from the consultants and academics is right or not.

First of all, Canada is the seventh largest pork producing nation in the world but the third largest exporter. Canada has between 10-20% share of most of the major pork importing nations of the world such as China, Russia, Japan, Mexico, Korea and Australia. In other words Canada is a major global competitor. The trade data makes it hard to argue that Canada is not globally competitive. Furthermore, the US share of Canadian exports have fallen from about 50% ten years ago to just 30% in recent years. It is hard to argue that Canada is simply shipping to the U.S. as an easy alternative.

The reality is that there are no untapped, market jewels just waiting to be taken if only our packers would wake up to the opportunities.

The question then becomes could Canada do better if the industry would only trade on the "Canada Brand", food safety, traceability, sustainably etc? Well no, not likely. Individual Canadian firms have reputations based on their own product quality, service and pricing, not based on the "Canada Brand" but based on their own performance.

Can Canadian firms compete better by the industry as a whole trading on Canada's food safety system? The answer is no. Canada's two main competing pork producing nations, the U.S. and the EU, have systems that can deliver safe pork. Besides, given the CFIA's performance during the XL Foods crisis of 2012, I am not sure that we can trade on our food safety reputation. The same is true of the other dubious recommendations like trading on food traceability, sustainability, traditional production, etc.

It is a small world. Importing traders know each exporting company and what they can deliver based on what they need. Product trades on price, quality and service. Based on that, Canadian firms have done very well, without heeding the advice of the academics or consultants. ■



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## Tales from the field - monitoring for PEDv in Alberta

By Dr. Egan Brockhoff, Prairie Swine Health Services, Red Deer, Alberta

egan@prairieswinehealth.com Twitter @eganbrockhoff

How can we protect our pork industry from foreign and emerging diseases such as Porcine Epidemic Diarrhea (PED) virus? As I travel around the world working with swine health and production at a global level, I am constantly reminded how important disease monitoring is to the security of our industry. Unfortunately, monitoring is often limited to reportable foreign animal diseases or some loosely categorized emerging disease. This is not enough! Protecting our industry can't be limited to these traditional notions. Monitoring and surveillance in a globally competitive industry must be active and move beyond the traditional regulatory scope. Maintenance of a high health industry is more important today than it was yesterday, and is certainly more important than in years past. Canada is truly a producer of high-health, high-value pork and protection of that value has become more important than ever. Now is the time to capitalize on global high-value markets where fewer players can offer high-health pork.

Alberta Pork, like most of Canada's pork industry, is actively monitoring for PED virus. Without question our primary goal is early detection for the purpose of bio-containment. Along that vein, early detection is also an important instrument in our secondary goals of bio-exclusion and bio-management of PED virus. However, we cannot limit our attention to just PED virus. At this very moment, African Swine Fever continues to make its way into western Europe from its eastern neighbours. Large pork producing countries such as Germany are clearly at risk of this virus and its continued spread in both wild and domestic pigs.

The Alberta Pork PED Monitoring and Education plan began during the Banff

Pork Seminar, and for the past 10 weeks has processed 5158 PCR's from 859 sampling events at Alberta Agriculture and Rural Development's Agri-Food Laboratories Branch in Edmonton. 1547 of those PCR tests have been on pig trailer wash fluid samples and transport wash bays (Figure 2) while the remaining 3611 of those PCR tests have been on fecal samples from both the processors and assembly sites of pigs destined for market (Figure 3). All samples in Alberta have tested negative to date despite considerable transport risk. We have to give credit to the leadership of Alberta Pork and all of the considerable efforts toward increased biosecurity and sanitation

*CONTINUED ON PAGE 16*

Sampling by Pig Gathering Type

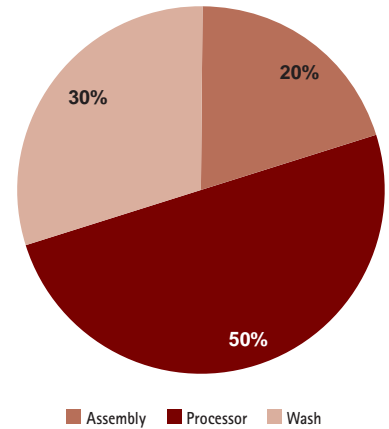


Figure 1: Alberta Pork PED Environmental Sampling by pig or pig transport gathering type.



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by producers, processors, assembly sites, truck washes, and the Alberta swine veterinarians.

Monitoring for the early detection of Porcine Epidemic Diarrhea Virus (PEDV) provides the pork industry with the opportunity to set our own stage and not be caught off guard with a disease that spreads so quickly. Many of the professors and veterinarians I have worked with on my latest trip to Asia commented that once a disease arrives in their industry there is no mechanism to control and eradicate these diseases unless they fall within the reportable disease list. Of course PED virus is not a reportable disease globally. In Canada we have been incredibly fortunate to have the Canadian Swine Health Intelligence Network (CSHIN). This industry initiative of the Canadian Swine Health Board (CSHB) has proven invaluable in bringing Canada together in a harmonized manner to ensure our response to PED virus is coordinated and effective. We should be extremely proud of this accomplishment – it is the envy of the world right now. Let's not get too comfortable though, funding for these organizations is not guaranteed moving forward. I do not want to imagine where we would be today without the past two years of biosecurity training, veterinary audits and industry cooperation on monitoring that the CSHB has facilitated. Our picture may have looked much more like that of our cousins to the south.

In Alberta, we chose to monitor eight of our high pig traffic, high risk areas for early viral detection. Early detection at any one of these sites is critical to bio-containment not just for Alberta but for regional interests across Western Canada. PED is spread via the fecal-oral route from infected pigs, from contaminated pig transport trailers exposed to the virus either through live pigs, the loading docks of infected premises or from a contaminated wash station, and from contaminated objects brought into a barn such as footwear or wash hoses. With that understanding of viral transmission patterns, the sites we chose to monitor were a combination of the loading docks at high volume federally inspected processors, cull sow assembly sites and truck washes with significant truck traffic direct to the U.S. midwest or via Manitoba from the U.S. midwest (Figure 1). Based on a relative risk assessment and pig exposure volume



Figure 2: Trailer samples for PED PCR from washed trailers. Auditing washed trailers is critical to ensuring clean transports arrive at your farm.



Figure 3: Fecal sampling kit for assembly, processors or replacements quarantine.

each site is sampled from one to five times weekly. The more pigs each site represents or the greater the connection to the U.S. midwest the more sampling was proposed.

Introduction of PED virus into a naïve sow herd is a devastating event for your young pigs, the barns production and the people working with those pigs in that barn. Infection of a naïve sow herd typically results in acute outbreaks of severe diarrhea and vomiting in most, if not all, of the pigs in the barn. Mortality is variable but will approach 100% in young pigs. In grow finish pigs the disease is often much more subtle with clinical diarrhea often hard to identify and mortality being much lower. I first visited Asia as a Swine Veterinarian in 2009. During my first visit I expected barn managers and farmers to ask questions about PRRS virus, Classical Swine Fever and Porcine Circovirus to name a few. Without question, every single farmer I worked with asked about managing endemic PED. Now, many years later, the level of frustration with this disease has not subsided. It has in fact increased with newer, more pathogenic strains causing more devastation. ■

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University of Manitoba

# Partnerships for a stronger pork industry - the Manitoba example

By Christine Rawluk

National Centre for Livestock and the Environment,  
University of Manitoba

Communication, communication and more communication is the mantra for any successful enterprise. A progressive and productive research, education and outreach program is no exception.

## Partnerships in Growing Knowledge and Capacity in Manitoba

The pig-related research and extension community in Manitoba is a relatively small group that regularly shares ideas and knowledge. These relationships add up to greater connectivity between the needs of the industry and the research and extension required to address these needs. Equally

important to this community is the injection of new ideas and fresh perspectives recent graduates bring with them as they enter the workforce. Education and training programs equip graduates and young researchers with the knowledge and skills to go on to be contributing members in the swine industry.

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**Progressive and productive research, education and outreach program is no exception.**

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The University of Manitoba's National Centre for Livestock and the Environment is one of a number of groups working together with Manitoba Pork to advance the combined economic, environmental, and increasingly important, social components that impact the sustainability of the pork industry in Manitoba. We also work closely with partners such as Prairie Swine Centre, Manitoba Agriculture, Food and

Rural Development, and the Manitoba Livestock Manure Management Initiative so that our research outcomes are addressing the needs of the pork industry and that this information is reaching the broader pig-producing community.

The National Centre is built upon partnerships between communities in science, education, industry, and government. Our initiatives focus on better understanding the links within whole production systems, whether that system is at a farm level or regional in scale, to improve the sustainability of the whole system. Our approach unites scientific expertise in animal, soil, plant, food and microbiological sciences, as well as in human nutrition, engineering, economics and policy. The *system* includes animals, manure, crops for food and feed, and the resources that support optimal plant and animal growth - soil, water, air and nutrients.

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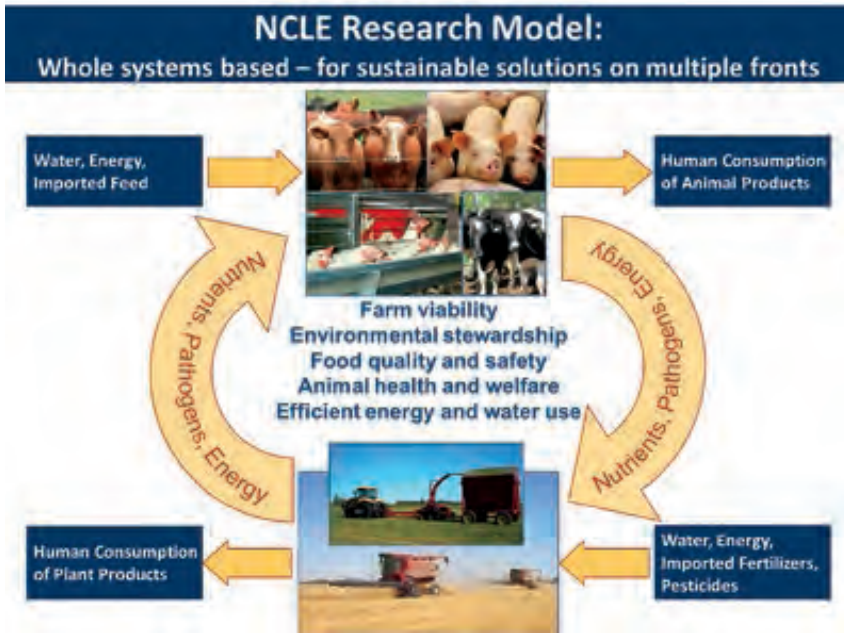


Photo by Laurie Connor

systems. One system features slatted concrete flooring in the barn and liquid-based manure storage and handling. The other system features a barn with solid concrete flooring, straw bedding and solid-based manure storage and handling. A recent grant from Western Economic Diversification, in

partnership with Manitoba Pork, has added capacity for processing both liquid (separation technology) and solid (composting) manure streams. Both group housing barns feature two types of sow feeding systems – free access stalls and electronic sow feeders for individualized feed management.

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Manitoba Pork's support of our research is critical for attracting matching research grant funding. Research at the University of Manitoba addresses priorities established by Manitoba Pork's Sustainable Development and Research Committee and those of the Canadian Swine Research and Development Cluster.

University of Manitoba animal scientists work with colleagues across Canada tackling national research priorities, namely improved productivity through advances in swine nutrition, disease mitigation and animal health, as well as animal welfare topics such as lameness, longevity and sow housing.

Research teams are also working to address Manitoba-specific challenges to pork production arising from Manitoba's phosphorus-based nutrient management regulations. Concerns related to phosphorus pollution of waterways are behind the current moratorium on hog operation expansions within the

province. To tackle these constraints, University of Manitoba nutritionists are working with the feed industry to reduce phosphorus levels in animal diets, and engineers and soil scientists are developing new strategies to better manage pig manure nutrients at a whole-farm or systems level.

This issue of Western Hog Journal features three articles on current Manitoba-led partnerships delivering new information in swine nutrition, sow group housing and manure management addressing the priorities of pork producers in Manitoba and elsewhere in Canada.



Photo by Christine Rawluk

### Partnerships in Public Engagement

The Bruce D. Campbell Farm and Food Discovery Centre is the Faculty of Agricultural and Food Science's public outreach facility, connecting the public to modern agriculture. This Centre, co-located with the National Centre for Livestock and the Environment (NCLE) at the Glenlea Research Station/Farm,

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Photo by Laurie Connor

is another example of working together with the agriculture community. Physically and virtually connected to both types of pig barns on site, visitors can view our pigs in real-time, which can sometimes include farrowing if the timing is right.

*Food from the Land*, a new program at the Bruce D. Campbell Farm and Food Discovery Centre, introduces Grade 10 students to real issues in agriculture and to the science that is helping farmers overcome these challenges. For the April launch of the program, individuals in

the agriculture and science communities shared their knowledge and experiences surrounding animal welfare and environmental pollution with the students. For many students, this was their first time hearing the other side of the story, learning why certain practices are in place as well as the science behind these practices.

Mark Fynn, Animal Care Specialist with Manitoba Pork, walked students through the different pig production stages - breeding, gestation, farrowing and weaning - as students stretched to see the sows and piglets through the viewing windows into the attached pig barn. Along with a general introduction to raising pigs, Mark also addressed animal welfare topics, explaining why sows are kept in farrowing crates and how science has advanced our capacity to manage group-housed sows as individuals.

Nadine Meade discussed animal welfare and the evolving role it is

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playing in Canadian food production, providing an introduction to some of the components of good welfare and how welfare science is influencing farm practices. An overview of the uniquely Canadian science-informed process for developing Codes of Practice for the Care and Handling of Farm Animals was also shared with the students to help deepen their appreciation for the complexities associated with moving animal welfare forward in a sustainable manner. Nadine worked for the National Farm Animal Care Council, serving as Code Secretary for three industry groups during the recent Code revisions project.

On the environmental sustainability front, Mitchell Timmerman, Nutrient Management Specialist with Manitoba Agriculture, Food and Rural Development, and Christine Rawluk, NCLE, tag-teamed to demonstrate how manure and synthetic fertilizer nutrients move within cropland and livestock systems. Together they challenged students to identify management practices to keep nutrients such as nitrogen and phosphorus in the soil for crop growth and out of waterways to avoid unsightly and detrimental algal blooms. Rounding out the environmental topics, Taryn Dickson, Department of Soil Science, University of Manitoba, introduced students to the main agricultural greenhouse gases and ways of reducing agriculture's contribution to global emissions.

"We have so much to learn from the everyday experts in our agriculture community. Our programs are a collection of that expertise, packaged in a way that stimulates students of all ages to think and act, not just observe," says Thea Green of the new programs she developed for the Discovery Centre, working with various commodity groups in Manitoba.

"Our goal is to stimulate students to think critically about the connectivity between food and the land - to take them beyond the supermarket to where their food is grown. And we want them to keep thinking about agriculture after they walk out our doors," says Green. ■



MB Pork Producers tour NCLE

Photo by Christine Rawluk



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## University of Manitoba

# Making manure a better fertilizer

### Rising food costs mean getting creative can pay off

By Christine Rawluk

National Centre for Livestock and the Environment, University of Manitoba



Photo by Mitchell Timmerman

We know manure provides many nutrients essential for crop growth. The challenge comes in supplying those nutrients where they are needed, when they are needed and in the amounts and forms required for optimal crop growth. An added challenge is protecting the environment at the same time.

Just like any other source of nutrients, manure can pollute surface and ground waters if managed improperly. Take phosphorus for example. Aquatic plants and algae are not the same as wheat and canola. What is an insignificant amount of phosphorus loss to a crop is a bonanza for algae if that tiny amount of phosphorus reaches surface waters, generating unsightly and potentially harmful algal blooms.

Triggered by growing concerns of excessive nutrient loading to Lake Winnipeg, the implementation of strict nutrient management regulations in Manitoba provide additional incentive to manage agricultural nutrients properly.

Applying manure to land is now a balancing act between agronomics, economics and the need to minimize environmental risks. Research is one tool that can help producers juggle these complex issues. A group of scientists with the National Centre for Livestock and the Environment at the University of Manitoba is working with partners in industry and government to get a better handle on what happens to manure nutrients over time in different cropping and fertility management systems, to identify options for making manure a better fertilizer, and to share this information within the agriculture community.

Don Flaten, soil science professor, refers to the phosphorus situation in Manitoba as “a distribution challenge rather than a surplus P problem.” That is because aside from a small area in the southeast part of the province, most agro-Manitoba soils are deficient in phosphorus and require additional phosphorus to offset crop removal. All the manure produced in Manitoba in a given year is not enough to correct this deficit.

“The problem is that manure does not provide nitrogen and phosphorus in the same proportions that crops require,” adds Mario Tenuta, soil ecology professor. “Applying manure at a rate to meet crop nitrogen needs supplies more phosphorus than the crop can take up, so applying manure annually on this basis will increase soil phosphorus levels.”

Working with a local producer, Tenuta led a study where hog manure was applied on a nitrogen basis to grassland annually over a six year period. The manure used in this study contained nitrogen and phosphorus in a ratio of about two to one, while

CONTINUED ON PAGE 26



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Photo by Mitchell Timmerman

the amounts of nitrogen and phosphorus harvested with the hay was at a ratio of about six to one. As a result of this nutrient imbalance, by the end of the study soil phosphorus concentrations had increased from deficient to a level close to triggering a regulatory shift where manure rates are based on the combined amount of phosphorus in the manure and the soil, rather than on crop nitrogen needs. The rapid rate of phosphorus accumulation may be attributable in part to severe moisture limitations with the site's coarse soil which restricted later season plant growth and nutrient uptake in some years.

Long-term study sites like this are important for developing sound manure management practices that account for changes over time with different soil types and cropping systems. For the past seven years Flaten has been tracking nutrient accumulations in soil and crop nutrient uptake for different manures applied either annually based on

crop nitrogen requirements, or intermittently to match crop phosphorus removal on a heavy clay soil. "When we compared agronomic factors such as crop yield, plant nutrient uptake and soil concentration of nitrogen, liquid pig manure and urea were overall similar, but the nitrogen fertility value of the solid manures was substantially lower," says Flaten. Unlike with solid manure, nitrogen and other nutrients in liquid manure are in forms that plants can use more quickly, and injecting liquid manure into the soil also places the nutrients close to plant roots.

**Large differences between urea and liquid manure appeared when they looked at soil test phosphorus concentrations.**

However, large differences between urea and liquid manure appeared when they looked at soil test phosphorus concentrations. "In our liquid pig manure treatments, soil test phosphorus levels have doubled since the start of the study when applied annually at nitrogen-based rates of application, and they have gone up at least four-fold in the equivalent solid pig manure treatments. In fact, our solid pig manure treatments exceeded the first regulatory threshold for phosphorus (60 mg/kg) after only two years of manure application." In contrast, when manure was applied intermittently based on crop removal of phosphorus, soil phosphorus levels were the same as for plots receiving synthetic fertilizer by year six, showing draw down of phosphorus on high phosphorus soils is possible over time. In the years when manure was not used, crop nutrient needs were supplemented with synthetic fertilizers.

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Photo by Mitchell Timmerman

The nitrogen to phosphorus ratio of manure can also be made more plant- and environmentally-friendly through physical and chemical means. Liquid manure contains both dissolved and particulate forms of phosphorus, the majority being particulate, which are associated with solids in the manure. Physical or chemical separation of liquid hog manure concentrates phosphorus in the solid fraction, leaving a high nitrogen/low phosphorus effluent well suited to use on soils with elevated soil test phosphorus. The concentrated phosphorus-rich solid fraction can then be transported more economically to soils with lower phosphorus levels, helping to address the 'distribution' challenge. The amount of phosphorus removed depends on both the process and the manure.



Recovering phosphorus from liquid manure as struvite is one approach Nazim Cicek and Joe Ackerman, biosystems engineers, have been working on. Struvite, a slow release fertilizer, is a combination of ammonium, magnesium and phosphate. “We started out first seeing if this could be done. Once we realized we could create this new phosphorus “fertilizer” from hog manure, we looked at how we could increase phosphate recovery based on how the manure was stored or treated,” says Ackerman.

One approach teases out more manure phosphorus into solution to increase the number of struvite crystals without the costly addition of chemicals such as magnesium. Ackerman explains the chemistry behind this process, “I designed a pilot ‘precipitator’ where I can bubble carbon dioxide through the manure, playing with the pH level until I create the ideal chemical environment for magnesium, ammonium and phosphate in the manure to form crystals and eventually settle out of the solution.”

Complementing this research, soil science professor Francis Zvomuya and graduate student Yeukai Katanda are assessing the agronomic performance of struvite compared to monoammonium phosphate (MAP) and coated MAP. In their

preliminary greenhouse studies, struvite performed as well as both commercial fertilizers when either seed-placed or side-banded at two different rates in a canola-wheat rotation.

New research developments, along with emerging management strategies and technologies, are showcased at field clinics and tours. Plans are underway for the 2014 field day at the University of Manitoba Glenlea Research Station/ Farm. Partnering with Manitoba Agriculture, Food and Rural Development, the National Centre for Livestock and the Environment will host producers, agronomists, practitioners, students and others from the agriculture community. Preliminary topics include manure separation technologies, biosecurity practices for custom manure applicators to avoid PED and other disease transfer between farms, and revisiting manure application rate calculations, based on the findings of our long term manure management trials.

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# Canola meal an alternative protein source for nursery pigs

**Rising food costs mean getting creative can pay off**

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Rising feed costs make it imperative to consider feeds that have traditionally not been used in formulating diets for certain classes of livestock. One such feed is canola meal. Conventionally, canola meal is widely used as a protein source in older swine diets. This is because the presence of glucosinolates and high fibre content of the protein-rich canola meal limits its use in young pig diets. Advances through plant breeding have improved the seed quality traits of some varieties leading to lower fibre and glucosinolates content. Thus, there is a growing interest in the use of canola meal in formulating diets for baby pigs. The Swine Nutrition Program at the University of Manitoba recently concluded a series of research studies using canola meal from black seeded (*Brassica napus*) and the yellow seeded (*Brassica juncea*). In order to distinguish between the meals, BNB canola meal will be used to refer to the meal processed from black seed *Brassica napus*, and BJY canola meal will be used to refer to that from the yellow seed *Brassica juncea*. The meals were produced in a commercial-scale canola crushing plant using feed grade canola meal processing procedures.

Canola meal from these two varieties have slightly different fibre contents but previous studies at the University of Manitoba have shown that BJY and BNB canola meals have similar amino acid digestibility. This is important in a comparative study to determine the ability of either meal to supply amino acids in the quantities that are required to meet the animal's requirements. Thus, the objectives of the studies

were to determine if the similarity in amino acid digestibility translated to similar animal performance, and to determine the maximum inclusion level of canola meal that the young pigs can tolerate in their diets without adverse effects. In their study, BNB and BJY canola meals were used first to determine the standardized ileal digestibility (SID) of amino acids. The SID closely represents amino acid available for use by the animal. With that data on SID, diets were then formulated so that they contained 5, 10 or 15% of either BNB or BJY canola meal. A wheat-soybean meal-based diet was included in the trial as a control against which the canola meal-containing diets were compared.

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**Because of their limited gut capacity, it is important to ensure that high energy dense diets are formulated for young growing animals.**

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These diets were then fed to nursery pigs for 28 days and growth rate (ADG), average daily feed intake (ADFI), and feed to gain ratio (F:G ratio) were measured. These measurements are important in assessing the efficiency of utilization of the diets. Feed intake, growth rate and feed to gain ratio were similar for the pigs on diets that contained canola meal compared to the wheat-soybean-meal control diet. In other studies, there was no evidence that substituting a proportion of the protein-rich ingredients commonly used in pig starter diets with canola meal had any ill effects. Thus in the context of this study, depending on relative cost, canola meal could be an economical partial replacement to soybean, which is a more expensive ingredient in swine diets.

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Since performance was similar across treatments, only averages for the two types of canola meals are presented in Table 1.

	Dietary Treatments*		
	Control	BNB Canola meal	BJY Canola meal
ADG, g/d	452	464	446
ADFI, g/d	741	770	745
G: F ratio	0.6	0.60	0.60

Diets that were fed during weeks 1-2 and weeks 3-4 were formulated to contain 2,400 and 2,300 kcal/kg of energy, and 5.1 and 5.0 g/Mcal NE of lysine, respectively.

\*Dietary treatments are means for each of 3 diets containing 5, 10 and 15% canola meal.

Since canola meal has high fiber content, animal performance may be adversely affected at high inclusion levels due to lower digestibility of the fibre fraction, which would reduce digestible energy (DE) content. Because of their limited gut capacity, it is important to ensure that high energy dense diets are formulated for young growing animals. Therefore, the other objective of these studies was to determine if adding a carbohydrase enzyme preparation could be used to improve energy supply. The carbohydrase preparation contained pectinase, cellulase, xylanase, glucanase, mannanase, galactanase, invertase, protease and amylase, which were added to the diet according to the manufacturer's

specification. Incorporating the enzyme cocktail to diets that contain high levels of canola meal could theoretically improve dietary DE content. To test this theory BNB and BJY canola meals were included at even higher levels than previous trials and were added to diets at 20 and 25% of the diet. Diets were formulated to contain 20 or 25% of either BNB or BJY canola meal with or without the enzyme cocktail. The wheat-soybean meal control was also added as the ninth dietary treatments.

**Table 2: Effects of canola meal type and enzyme supplementation on growth performance of weaned pigs.**

	Treatment		
	Control	20% CM	25% CM + Enzyme
ADG, g/d	400	385	397
ADFI, g/d	617	614	620
F: G ratio	0.63	0.63	0.64

Data represents averages across the two types of canola meal (i.e. BNB and BJY). All diets contained similar amounts of SID lysine (i.e. 5.2 - 5.3 and 4.5 - 4.6 g/Mcal NE for d1-14 and d 15-28 of the study, respectively), and comparable NE content (i.e. 2,322 - 2,398 and 2,218 - 2,299 kcal/kg also for d1-14 and d 15-28 of the study, respectively)

The animal performance results from this part of the study are summarized in Table 2. Because animal performance was similar for both canola meal types, results have been presented as averages across canola meal type. Interestingly, animal




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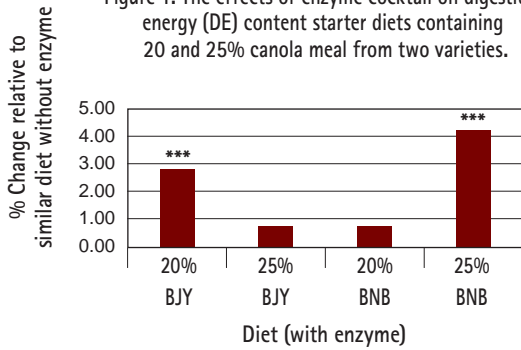






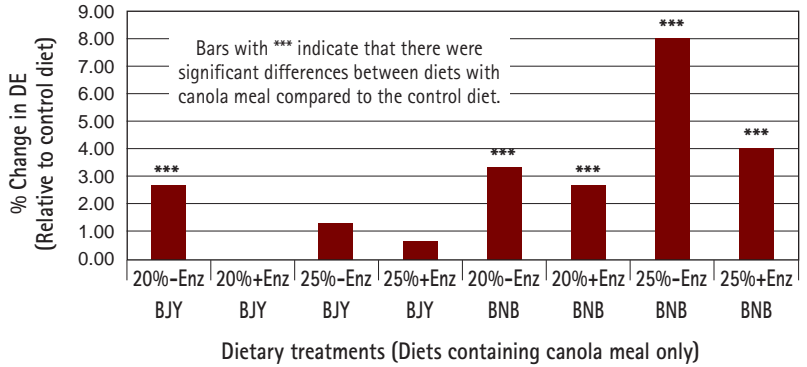


Figure 1: The effects of enzyme cocktail on digestible energy (DE) content starter diets containing 20 and 25% canola meal from two varieties.



Bars with \*\*\* indicate that there were significant differences between canola diets with enzyme compared to similar diets without added enzyme.

Figure 2: The effects of enzyme cocktail and canola meal type on the digestible energy of starter diets containing 20 and 25% canola meal from two canola varieties.



performance was similar among the diets without enzymes compared to the same diets that contain the carbohydrase preparation. This suggests that under the conditions of the study, the enzyme cocktail was not effective in improving animal performance. However, a closer look shows that adding the enzyme cocktail had some effect on nutrient supply as indicated by increases in DE content of some diets. Adding enzymes marginally increased dietary DE content for the 20% BJY and the 25% BNB canola diets (Figure 1).

Also compared to the control diets, DE contents were marginally lower for all diets except for the two 25% BJY diets. Digestible energy content was noticeably lower for all BNB diets and this was in line with initial analyses that showed that BNB canola meal had slightly higher fibre content compared to BJY canola meal (i.e. 30.3% vs 24.9%)

Together, these results show that provided nutrient supply is adequately taken into account and diets are properly balanced, (especially through the use of NE and SID systems) canola meal from BNB and BJY can replace protein ingredients in starter diets for pigs without compromising performance. Even though the effect of enzyme on digestible energy content was not consistent across treatments, further work may be necessary to determine the role of these enzyme preparations on improving DE content of diets with high levels of canola meal inclusion. This is because the concomitant increase in dietary fibre could potentially reduce dietary DE content. ■

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