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PED Coverage – Biosecurity

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The news of the PED virus in the U.S. began emerging at about the same time that I became editor of Western Hog Journal. I followed it with interest, and we’ve covered the progression of the virus in every issue since.

When it was learned we had the first case of PEDv in Canada, I was at the Banff Pork Seminar, and as always, we published an issue dedicated to covering that important industry event. But at the time, I was already planning this edition, which is dedicated almost entirely to PED.

What I wanted to create was a guide that explained where the virus came from, why it’s dangerous, what we can do to stop it, and how things might transpire in the coming months. We looked at biosecurity, transportation, vaccine development, and the roots of the virus. We probably haven’t covered everything, but rest assured that we tried our very best.

I have no doubt that our industry will overcome this challenge, and that we’ll develop a science-based solution to eliminate or at least manage the PED threat. I also have no doubt this will not be the last major disease threat this industry will face. In all likelihood, we will be exposed to more, not fewer, new diseases in the future. That’s the nature of the global economy we now live in.

It’s been heartening to see how many producers have been ramping up their biosecurity protocol, and how seriously the industry takes its responsibility to keep our animals as safe and as healthy as possible. You’ll notice as well that we included reports from Alberta Pork, Sask Pork and Manitoba Pork on what they are doing to help producers through PED.

Sometimes in times of trouble, producer groups can come under fire for not doing enough, or not acting quickly enough, or not communicating effectively what they are doing. In my years covering the cattle business, I have seen some producer groups steamrolled by a set of runaway circumstances.

Support for these advocacy organizations tends to splinter, ultimately causing division among the producers who fund them. That’s a dangerous line to walk because it can result in a fractured voice speaking to the government and like it or not, government can be our best ally through challenging times.

It’s also very easy not to notice what our producer groups are doing for the industry. Producers are busy – sometimes too busy to attend information sessions or read newsletters. It can
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be a really worthwhile endeavour to call your local group and touch base to see how they are working on your behalf. It’s also a wonderful opportunity to give them new ideas, or to let them know of challenges or issues that may be on the horizon.

I didn’t write as many of the stories in this issue as I usually do. That was a challenge for me because I tend to be very hands-on. However, the scope of PEDv is so immense, and the co-ordination of this coverage so intense that I chose to direct rather than write it. You’ll notice Bryan Passifiume authored a number of the PED pieces. Bryan is an editor of a mid-sized paper in Alberta, but I got to know him when he was working for the local paper in Pincher Creek. He’s developed a keen interest in agriculture, and he seems to have a knack for it. There aren’t enough young journalists with any understanding of agricultural issues, so I was happy to have the opportunity to bring him into the fold. It’s so important that general reporters in the mainstream media have a working knowledge of farming because they are the ones who communicate ag issues to the general public.

Effective communication is a two-way street, which makes me really excited that I finally received my first letter to the editor! It’s so wonderful to hear back from readers because it shows that people aren’t just reading Western Hog Journal – they’re engaging it. My goal with the Western Hog Journal is to inform, stimulate thought and advance the interests of the industry. I hope this special PEDv edition will do just that.

sherimonk@gmail.com

Letter to the editor

Dear editor,

Ever since I read your first introduction to Western Hog Journal I was curious about where this magazine is going. I will list some things I really like about the new direction.

- Deciding to face environmentalists and other possible opponents to the hog industry head on is exactly what needs to be done. Ignoring them and complaining about them is fruitless and counter productive. They are just people like the rest of us and making peace not war with them is by far the most effective solution to our woes.

- Focusing on markets and how they actually develop helps farmers understand why certain changes need to be made. Very helpful.

- Keeping a significant portion of the magazine oriented towards production is important as well. Lots of hog farmers need advice, and this magazine needs to keep them up to speed with what can be done to lower production costs and or improve production. Do not lose them as an audience.

- Wine and Swine me is a very cool idea and adds class. Thanks.

- Working your butt off is helping. When I read how much editorial content you have in this magazine, you must be busy. Kudos to you!

All the best and thanks for all your efforts!

James (last name withheld by request)
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PIC products can deliver:

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New territory manager at Genesis

Tony was born and raised in Manitoba and lives in La Broquerie MB.

“Genesus is very happy to have Tony join our team. We have an extensive and important client base in Manitoba that we want to service well. Tony will be instrumental in helping to make that happen. We welcome Tony to Genesis,” said Mike Van Schepdael, vice-president of Genesus.

Genesus recently announced that Tony Martel was appointed in the role of territory manager.

Tony will concentrate on customer service and production support in Manitoba. Tony brings with him over 12 years of experience in pig production with Hylife, primarily as manager of sow units of up to 6,000 sows. Tony’s extensive pig knowledge will be of tremendous value to Genesus clients.

Manitoba Pork supports updated Code of Practice

Manitoba Pork welcomes the release of the updated Code of Practice for the Care and Handling of Pigs, published by the National Farm Animal Care Council (NFACC).

“We are in full support of the updated Code and very pleased with the high standards of care required for pigs in the Code,” says Karl Kynoch, Chair of Manitoba Pork. “Codes of Practice are not new for us, but, with new knowledge and experience, we constantly work towards delivering the best animal care possible.”

The Code of Practice is a product of NFACC and the Code Development Committee (CDC), a 17-person committee comprising representatives from the Canadian Federation of Humane Societies, pig producers, scientists, transporters, processors, veterinarians, and government.

Manitoba pork producers have had the opportunity for input, both through direct involvement in the development of the updated Code by NFACC and through an extensive comment period which drew record-setting engagement with over 4,700 comments submitted. Through consideration of these comments and a consensus around the CDC, some major enhancements have been made in the Code in the areas of sow housing and pain control.

“We are fully committed to the adoption of group-housing systems for our sows and gilts in all new constructions. The updated Code will provide strategy and guidance for the adoption of group housing that will ensure best animal care outcomes,” says Rick Bergmann, pork producer and vice-Chair of Manitoba Pork.

The Code is available online at www.nfacc.ca/codes-of-practice/pigs.

CONTINUED ON PAGE 10

Osborne releases new FIRE Hopper Extension

Osborne Industries is pleased to announce the development and release of a new hopper extension for their FIRE (Feed Intake Recording Equipment) pig performance testing feeder. The extension fastens to the top of the feed hopper, increasing the feed capacity by approximately 75 lbs (34 kg).

The FIRE hopper extension is made of corrosion-resistant, molded polyethylene and features an acrylic window on one side so visual confirmation of the feed level in the hopper can be observed. A removable lid is also available to help keep feed clean, fresh and palatable. The extension kit bolts to the feed hopper with existing fasteners and works with any of the model MK3 FIRE Feeders.

Known around the world as the “gold standard” in pig performance testing, FIRE continues to lead the industry as the most reliable ad-libitum performance testing feeder. With outstanding accuracy, FIRE completely automates the measurement of individual daily feed intake and other performance characteristics of....
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growing animals. FIRE helps identify the most efficient and superior animals for improving herd genetics, and is currently used by more genetics companies than any other system in the world. FIRE Feeders have been successfully used to test the performance of pigs, sheep, and goats.

For more information on the FIRE pig performance testing system, visit www.osbornelivestockequipment.com or e-mail info@osborne-ind.com.

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**Canadian Centre of Gene Transfer opens**

Garth Braun, general manager, proudly announced the opening of the Canadian Centre of Gene Transfer recently. The state of the art Boar Stud at an isolated location near Hamiota, Manitoba will be an exclusive Gene Transfer Centre for Genesus Genetics for domestic and international AI Production for fresh and frozen semen. Genesus is the world’s largest high health producer of purebred registered breeding stock.

This Canadian facility, with a capacity of 483,000 doses per year, will be using a state of the art CASA system with auto morphology. The facility features a system including reverse Osmosis technology and double ultra violet protection against bacteria with a Deionizer with a backup polish and continuous circulation for Type 1 water.

The Canadian Centre will be a positive pressure barn with HEPA filtration and Isolation with Noveko filter for protection against aerosol pathogens.

Garth Braun has over 16 years of reproduction and gene transfer experience with Hylife-Fast Genetics. Garth has been integral in producing more than a half-million straws of frozen semen, shipped to the EU, China and the U.S. He is a published co-author in an industry journal on frozen semen, and has helped to produce over five million bottles of fresh semen.

**Faúndez named Latin America sales representative**

Osborne Industries is pleased to announce that Claudio Faúndez has been named Livestock Equipment Sales Representative for Latin America. Along with Osborne’s customer-centric focus, Faúndez will assist in the development and distribution of Osborne’s swine management equipment and “Single Source Swine Solutions” turn-key services in Central and South America.

Faúndez joined Osborne in 2001 as a product manager for some of the company’s most notable hog production products like the Big Wheel® Hog Feeders and Stanfield® Heat Pads for baby pigs. He has been a member of the Osborne sales staff for the past two years.

Originally from Concepción, Chile, Faúndez holds a Bachelor’s Degree in Business and Administration from the University of Concepción, Chile. Faúndez has experience in sales, marketing and advertising, in many different industries.

**Alberta Pork Calls for collaboration as new Code released**

After years of planning and research, the new Code of Practice for the Care and Handling of Pigs was made public today (Mar. 6). While the work of revising the code may have ended, the greater challenge of implementing it has just begun.

The Codes of Practice are nationally developed guidelines for the care and handling of different species of farm animals. They are revised every 10 years to reflect changing conditions and public sentiment. First published in 1984, the Code dealing with the hog industry was due for an update this year. The process of writing the new code was a collective effort of producers, industry representatives, researchers and humane societies.

According to the organization that represents Alberta pork producers, this same collaborative approach is critical to taking the code requirements from the boardroom to the barn.
“We’ve all had our input into this document including the Canadian public,” said Alberta Pork Executive Director Darcy Fitzgerald. “Now it is time to allow our producers, who are very progressive, to work through those necessary changes in the time allotted. This code isn’t something that the government imposed on us. It reflects our industry’s commitment to the animals we care for and the best practices needed to do that.”

The key, said Fitzgerald, is to manage that change in a way that’s fair to everyone involved while honoring the fact that the code was developed through an agreed upon consensus process.

Since the entire value chain was involved in driving the new code, Fitzgerald hopes that everyone will share the cost of implementing it.

“Progress is important, but can also be pricey. It will require that all sectors of the industry participate, from processors to retailers to food service, as well as consumers and humane societies, to support the efforts of producers. We all need to do our part.”

While there are a number of different perspectives on the code, Fitzgerald said there is one thing that everyone can agree upon.

“We need to allow some flexibility in applying the code requirements to reflect the unique circumstances of each farm and the skill sets of producers. They know their pigs better than anyone and understand their needs. At the end of the day, it’s about doing what’s best for the animals.”

For more on the Code of Practice, visit www.cpc-ccp.com or contact Darcy Fitzgerald at 1-877-247-7675, or by email at darcy.fitzgerald@albertapork.com.

Saskatchewan pork industry pleased with Canada-Korea Free Trade Agreement

The Saskatchewan Pork Development Board (Sask Pork) welcomed the news today that a free trade agreement (FTA) has been finalized with South Korea that will virtually eliminate tariffs on pork and level the playing field for Canadian exporters. In 2011, Canada exported $223 million in pork to South Korea which declined to $76 million in 2013.

Sask Pork Chairman Florian Possberg states, “South Korea has consistently been a top five high-value market for Canadian pork. The Canadian pork industry is eager to rebuild lost market share due to a lack of an FTA. Tariffs on Canadian pork currently range from 22.5% to 25%, which has made it difficult to compete with the United States and European Union who already have free trade deals in place.”

Possberg also said, “A recent study estimates a $10/hog benefit to U.S. pork producers from their FTA with South Korea. Canadian producers could expect a similar return. The removal of tariffs will be a huge boost to the industry and we hope the agreement is undertaken quickly so we can again become competitive with U.S. and European suppliers to South Korea.”

Canada is a globally competitive successful pork exporter ranking third in the world.
after the EU and U.S. and ships nearly $3.2 billion of pork to more than 100 countries worldwide.

TOPIGS Canada Inc. announces new appointment

TOPIGS Canada is pleased to announce the appointment of Mike Shaw to the role of director of technical services.

Mike will be responsible for the implementation of TOPIGS’ genetic program and technical support for TOPIGS customers in Canada and the United States. Mike has broad experience in genetics, production and technical support having been with TOPIGS for five years as operations manager. Before joining TOPIGS, Mike was employed by Maple Leaf Foods where he held various positions with both GAP Genetics and Maple Leaf Agri-Farms, overseeing their genetic programs and nucleus and multiplication structures.

Mike’s appointment by TOPIGS signals its continued commitment to client service and dedication as an international leader in providing world class genetics and customer support to maximize results and returns. Mike will be the conduit between TOPIGS genetic development and technical support teams in Europe and the TOPIGS North American business, transferring knowledge and experience to the team and customers.

“I am excited about the opportunity that exists in this industry, and in particular at TOPIGS,” Mike said. “I remain extremely focused on supporting both our genetic program and our customers as we continue to grow and expand. I am proud and excited to continue to be a part of the TOPIGS team.”

Mike can be reached at mshaw@topigs.ca or (204) 797-2331.

Pharmgate Animal Health launch Aivlosin in Canada

Pharmgate Animal Health announces the Canadian launch of Aivlosin® 17% Tylosin Medicated Premix for the treatment of porcine proliferative enteritis (PPE) associated with Lawsonia intracellularis infection in swine.

Ileitis can have a serious impact on swine producers’ profitability. Dr. Dan Rosener, technical services manager for Pharmgate Animal Health, North America, summarizes, “The launch of Aivlosin 17% Tylosin Medicated Premix allows animal health professionals greater flexibility when dealing with the treatment of subclinical, chronic and acute cases of ileitis. Outstanding benefits have been demonstrated. With global concerns about the use of antibiotics this new treatment option with its low therapeutic dose rate, short treatment time and 0-day withdrawal period fulfills the requirements for the judicious use of antimicrobials”.

FCC recognized among Canada’s most responsible corporate leaders

Farm Credit Canada (FCC) was recognized in April as being among the “Future 40” most responsible corporate leaders in Canada by Corporate Knights Magazine.

In its inaugural ranking for organizations with less than $2 billion in revenue and fewer than 2,000 employees, the Toronto-based media and research company placed FCC on the “Future 40” list out of 213 eligible companies in Canada.

The ranking recognizes FCC’s ongoing commitment toward corporate social responsibility in a number of areas, including economic contribution, employee health and safety, and greenhouse gas emissions.

“At FCC, we’re committed to having a positive impact on Canadian agriculture, local communities, our customers, employees and the environment,” said Brenda Stasuik, FCC Director of Corporate Social Responsibility. “We take corporate social responsibility seriously. It’s part of who we are and how we operate.”

FCC is a self-sustaining federal Crown corporation with more than 1,700 employees working in over 100 offices across Canada, including its corporate office in Regina.

“Our focus on corporate social responsibility helps us identify areas of improvement as we continue to advance the business of agriculture and strive to make a positive difference,” Stasuik said. “It’s one of the many things that make FCC a great place to work.”

To learn more about FCC’s corporate social responsibility, go to www.fcc.ca/csrreport.
PEDv and the market

PEDv is a terrible virus, but it’s going to drive prices up  By Kevin Grier

PEDv and the Market
Given that this issue is devoted to coverage of the Porcine Epidemic Diarrhea Virus (PEDv), it is worthwhile taking a look at its market ramifications. The market impact of PEDv ranks at least in the top three consequences associated with or resulting from the disease. That is, there are many important factors and elements to the PED outbreak, but the market impact is clearly among the most important.

With that said, however, the market impacts are relatively simple:

1. PED results in lower hog marketings.
2. Lower hog marketings results in tighter supplies and higher prices.

Those two points are simple enough because we all know that generally, lower supplies lead to higher prices and vice versa. The tougher part of the two points was being able to get a handle on just how tight supplies were going to become during 2014. The marketing impact is going to take place primarily through weaner pig deaths and lost productivity.

Specifically, the problem was to determine just how much PEDv was going to reduce hog marketings during the year. The issue was to calculate reduced marketings due to PEDv compared to marketings that were expected, considering recent USDA Hogs and Pigs Reports.

That was the question, but nobody seemed to be able to gauge the answer. Going into late 2013 and early 2014, I was working with estimates that market hog numbers would be reduced by 0 – 2 per cent in the first four months and then up to four per cent or so in the summer. Again, those reductions were in comparison to what was originally expected based on Hogs and Pigs reports. Through February and March 2014 however, it became apparent that my estimate of the impact was too small. Better estimates now place summer slaughter as being up to 10 per cent less than previously expected. That is a huge difference in a supply-sensitive market.

Needless to say, that’s had a big impact on current and expected prices. For example at the end of 2013, the June lean hog futures contract was trading at a steady $102. By mid-March this year, that same June contract was trading at the extraordinary, dizzying height of $127! That is nothing short of incredible, and it is almost all due to the impact of PEDv on expected production in the spring and summer.

Getting annoyed with dumping

With regard to the Canada and U.S. pork trade, Statistics Canada data shows that Canada had a 100,000 tonne surplus in 2013. That surplus was up by nearly 70 per cent compared to the 59,000 tonne surplus in 2012. In other words, the
Canadian pork trade surplus with the U.S. bounced back sharply in 2013, although off its five-year peak of 142,000 tonnes. U.S. pork shipments to Canada decreased by three per cent in 2013 while Canadian volumes of total pork going to the U.S. increased by over 12 per cent, according to the USDA’s Foreign Agricultural Service (FAS).

On the pricing side, the FAS reports that the average value of all pork shipped to Canada from the United States during 2013 amounted to US$3.90/kg. The average value of pork shipped to the U.S. from Canada averaged US$3.27/kg. The value of the U.S. exports to Canada increased by two per cent per kilogram while the Canadian value of pork shipped to the U.S. increased by less than one per cent. Compared to 2011, the value of U.S. pork exports to Canada was also up by about two per cent per kilogram while the value of Canadian pork exports to the U.S. actually declined by two per cent.

More specifically, with regard to fresh pork cuts (not including hams shipped to Canada), the U.S. volume declined by 13 per cent in 2013 compared to 2012. The value of those pork cuts shipped to Canada increased by one per cent. The volumes of fresh cuts shipped from Canada to the U.S. increased by 19 per cent in 2013, while the unit value increased by seven per cent.

The volume of fresh pork cuts (not including hams) is an interesting classification to look at given that would be the type of pork that often finds its way to Canadian grocery fresh meat shelves. It would also be the classification that finds its way on the front pages of grocery flyers. Despite the increasing average values of the product shipped to Canada and the declining volumes, there is still the perception in the Canadian industry that U.S. pork is “dumped” into Canada.

Even if prices were not higher and volumes not lower in 2013, the dumping arguments are specious – the word is ludicrous from a pork marketing and selling perspective. It is not a sustainable corporate tactic and it is not something that U.S. packers would find advantageous. U.S. packers are obsessed with three things: maximizing throughput, product yield, and sales realizations. Ramming large volumes through Costco or anywhere else at a loss is a surefire way for any meat executive to “spend more time with his family”.

Additionally, if a Canadian grocer wants large volumes for a national or even regional front page ad, it is much easier to get the business done with a U.S. packer. The volumes necessary would often require more than one Canadian packer. At that point, the grocer faces less opportunity to drive home the desired price point for the ad. Furthermore, if the volume could be done with one packer in Canada, it would not likely be in the interest of the packer to work towards the grocer’s price point. In the U.S., one of the big three or four packers could easily put together the feature volume. This of course does not mean there are not times when moving product off the U.S. market makes good tactical sense, just as it does for Canadian packers at times. It is not, however, a sustainable practice.

Every time I read about the benefits of traceability I think to myself, "Is that it? Is that all there is?"

From a legal or trade law perspective, dumping is notoriously difficult to prove and it’s even more difficult to prove damages. If dumping cases were easy to launch and win they wouldn’t be such a rarity in global meat trade. In manufacturing, they are much more commonly pursued. Whatever the proponents of dumping cases may say publicly, the goal is always the same – to restrict imports from country X. There are many simpler and more cost effective ways to impede the pork trade than launching a dumping case. Just ask the EU or Russia.

Traceability Regs in place, so what?

Nationalhogfarmer.com, February 28 reported the following:

After years of development and research, on February 26, Canada announced that regulations were officially put into
The evolution of electronic sow feeding

The new SowChoice Systems™ Electronic Sow Feeder delivers the best features found on any sow feeder available. Developed by combining farmer expertise with our decades of experience in hog equipment; it features all 304 stainless steel construction, environmentally sealed electronic controls and a retractable feed manger for fast throughput. Powered by PigChamp, this ESF is Canadian built and serviced for extreme reliability.

Sow care is evolving.
And Canarm is ahead of the curve.

www.sowchoicesystems.com
place instituting a national pig traceability system throughout the country. Health of Animal Regulations, which have been published in the Canada Gazette, Part II, are regulations for a hog tracking system, which documents whenever an animal is moved from place-to-place.

Jeff Clark, the manager of PigTrace Canada, noted that the need for a mandatory traceability program first took shape in 2002, when producers worried that a large scale disease breakout could hit the Canadian hog industry. He noted that the traceability system is a great tool to have in place, especially right now when most of Canada and the U.S., are dealing with outbreaks of porcine epidemic diarrhea virus (PEDv).

“First and foremost the traceability program was built for emergency response,” Clark said, adding that what took producers and veterinarians days and weeks to diagnose concerning PEDv would only take a minute in the future.

Thepigsite.com, February 27 reported:
The Government has amended the Health of Animals Regulations to require pig farmers and other pig industry custodians to keep records and report all movements of pigs, from birth or import to slaughter or export. The regulations also detail how farmed pigs and farmed wild boars are to be identified.

Every time I read about the benefits of traceability I think to myself, “Is that it? Is that all there is?”

Most in the industry would acknowledge that having some form of demonstrated verification of livestock movement would be useful if there was a major outbreak of FMD. FMD last occurred in Canada in 1952. Some demonstrated movement verification might result in quicker return to export markets when trade restrictions are imposed. It might also result in isolation of regions if there were an outbreak thus resulting in only regional trade restrictions. Of course it might not result in either possible benefit occurring. Furthermore, it is also likely that demonstrated and verified isolation of disease would occur without a regulated traceability system.

In any event it is good that the only benefits of traceability that were cited in the article above were focused on emergencies. Many proponents of traceability over the years have ascribed many other benefits such as increased demand for Canadian pork in both domestic and export markets. Those demand arguments are specious. Pork traders who know a thing or two about market demand do not say that export markets or buyers are demanding a regulated traceability system. If they did want traceable product, packers would be able to easily document the source and production system of all of their supplies. That could occur without a government regulatory system in place.

The same is true on the domestic demand side. Traceability is not going to positively impact domestic pork demand. Pulled pork positively impacts domestic pork demand – traceability does not. Of course there are those niche market programs that try to appeal to the life-stylers that want to know their pork chop was once part of a happy pig. Those programs and consumers can also be easily comforted without a regulatory system.

Kevin Grier is the senior market analyst at the George Morris Centre. He provides industry market reports and analysis, as well as consulting services. You can reach him at kevin@georgemorris.org to comment or to request a free two-month trial of the Canadian Pork Market Review.
PED – what exactly is it?

Figuring out where the disease came from is one of the first steps to beating it.

By Bryan Passifiume

It’s been described as one of the biggest threats to the North American pork industry since Foot and Mouth disease. It is hard to control, difficult to contain, and a common axiom suggests that a single thimble full of infected feces could potentially kill every piglet in Canada.

The road to identifying what we now call Porcine Epidemic Diarrhea started on a laboratory slide in Great Britain over 40 years ago.

Back in 1971, unusual cases of chronic diarrhea were identified among young hogs in the United Kingdom. At first thought to be common Transmissible Gastroenteritis Virus (TGEv,) researchers were puzzled when tests for the pathogen kept coming up negative.

As the 1970s wore on, more and more cases of this TGEv-like virus showed up in swine populations across western and...
HOT ISSUES CONTINUED

central Europe, specifically in England, Belgium, Germany, Spain, France, Holland and Switzerland. Dubbed *Epidemic Viral Diarrhea* by veterinarians, the disease seemed to affect swine of all ages, but proved especially deadly for suckling pigs.

By the late 1970s, veterinary researchers managed to isolate the virus as a *coronavirus*, confirming early theories suggesting this new disease was similar to other coronavirus infections, including TGEv.

While virologically in the same family as species-specific enteritis and bronchitis-causing coronaviruses (including the infamous SRS VIRUS), PED bears no serological similarities to anything identified thus far.

As well, PEDv does not respond to existing coronavirus inoculations or treatments. Additionally, while PED is proving to be just as contagious as TEGv, the PED virus is able to survive a lot longer outside of its host than similar coronaviruses.

Meanwhile, farms across Europe were coping with the virus as it spread across its swine herds. Hog farms in Holland were hard hit, with PED becoming endemic in both finishing and breeding herds, becoming common in both young gilts and sows for about two years after initial infection.

Cases were also popping up on farms in eastern Europe, including cases in Hungary, the Czech Republic and Romania.

By the early 1990s, Taiwan became the first country outside of Europe to report infections. Northern India soon followed, with the disease eventually spreading to China, Korea, Japan and Southeast Asia.

Unlike its somewhat mild experience in Europe, PEDv hit Asia with a vengeance. Korea saw almost 60 per cent of its swine herd in the early 1990s infected, with Japan taking an even heavier hit. Nearly 15,000 deaths were recorded in Japan’s swine herd during an eight month stretch in 1993, with a 1996 outbreak across 108 Japanese farrow-to-finish farms only sparing 20,000 out of the country’s nearly 60,000 piglets.

More recent Asian outbreaks include one in 2007 in Thailand, several between 2009-2011 across China and isolated cases in Vietnam, Laos and the Philippines.

It certainly appears that North America’s exposure to PEDv is closely paralleling the Asian experience – and with good reason.

According to a report published last October by the American Society for Microbiology, three distinct strains of PED are currently making the rounds in the United States.

In an interview with *Western Hog Journal*, Dr. Paul Sundberg, vice president of science and technology the National Pork Board said that researchers at Virginia Tech managed to genetically isolate the genome of the American viruses and trace their lineage to a virus responsible for a severe outbreak in China. Researchers were even able to determine that the American strains originated from an outbreak in Anhui province, near Shanghai.

“The virus has been sequenced, and it has 99.6 per cent the same sequences as the virus in China,” Dr. Sundberg said. “That, however, doesn’t mean it came to the U.S. from China. We don’t know how it got into the U.S., we’re still looking into that.”

The American Society for Microbiology report also found that these Asian strains bore striking genetic similarities to a coronavirus commonly found in bats, suggesting that the virus is capable limited transmission between species.

While Porcine Epidemic Diarrhea affects hogs of all ages, its effects are especially felt in younger animals. The mortality rate for suckling pigs is very close to 100 per cent, which drops off dramatically once animals are weaned, with death only occurring in one to five per cent of finisher animals.

Similar to TGEv, PED presents in infected animals with copious amounts of watery diarrhea. As the only outward sign

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of the disease, diagnosis of a PEDv infection can only be made in the laboratory. Older animals normally recover in a few weeks, but the prognosis for piglets under a week old is almost always fatal after only three days, usually from dehydration.

Animals usually present symptoms less than 24 hours after infection. As soon as the virus enters the animal, viral replication takes place almost immediately in the epithelial cells of the animal’s lower digestive tract – usually starting in the small intestine and moving to the colon. Laboratory analysis found that intestinal cells start showing irreversible effects from the virus within 10-14 hours of infection.

Mortality with PED infections lies in the length of the host animal’s intestinal villi. Neonatal hogs have exceptionally long villi that shrink as the pig matures past its first week of life.

Like many enteritis-causing coronaviruses such as PEDv, the virus infects enterocytes, epithelial cells that make up the villi in an animal’s intestines.

Villi are microscopic finger-like projections that line the intestinal walls of most animals. Ranging from half a millimetre to two millimetres in length, a villus serves to increase the surface area of the intestine, allowing a greater amount of nutrients to be absorbed from the passing food.

As a piglet is born and it starts to suckle from its mother, its long villi serve to absorb nutrients from her milk while the animal rapidly grows in its first few weeks of life. The large number of enterocytes also present a fertile breeding ground for the PED virus. The infection ravages the piglet’s villi, either by blunting the vellum or causing them to slough off the intestinal walls. The virus quickly renders large parts of the animal’s intestinal tract incapable of absorbing nutrients or water.

With its mother’s milk passing through the piglet’s system without being digested, the animal will eventually die of dehydration. Post mortem analysis of some piglets found their intestines full of undigested milk curds.

The sloughing of infected epithelial cells is the key to the disease’s virility. As the virus is capable of extremely rapid growth within an infected animal, the animal’s near constant diarrhea contains a massive amount of infected enterocytes stripped from the animal’s small intestine. This fertile bed of viral material is easily spread to another animal through feed or water, or transported off the farm in the treads of a boot or a feces-splashed transport truck – ready to spread to another herd. ■
Biosecurity: the first and last step

By Bryan Passifiume

Keeping Canada’s swine herd healthy and free from disease is a complex challenge.

Not only are veterinarians, farmers and producer organizations tasked with keeping tabs on existing outbreaks, their job becomes even more frustrating when new pathogens emerge on the scene.

Canada’s introduction to PED, in some ways, was a best-case scenario for our country’s agricultural virology researchers. With no disrespect to American producers, Canada was able to use their experiences with the disease to prepare for its inevitable trip north -- and when it did show up, we were prepared to deal with it.

The danger with the PED virus lies in its extreme hardiness. To the dismay of experts who hoped the winter would slow the spread of the disease, it was found that the virus actually thrives in cold temperatures and can survive being frozen for extended periods of time. As well, existing biosecurity protocols are more challenging to follow in the colder months, leading to lax procedures and more avenues for pathogens to get a foothold.

Canada takes the biosecurity of its agricultural industry very seriously. The efforts of our national and provincial pork boards and swine health organizations have resulted in one of the most secure pork markets in the world, both financially and biologically. The incredibly virulent nature of the PED virus notwithstanding, our standards and practices have ensured that when the dread disease did rear its ugly head, we were prepared.

“The Canadian Swine Health Board’s biosecurity standards and implementation initiatives ensured that virtually all producers had exposure to principles and practical applications of biosecurity,” said Dr. Chris Byra, manager of the Canadian Swine Health Intelligence Network (CSHIN). “It was fortuitous that this preceded PED in the United States, and likely helped to delay the first cases in Canada.”

Created in 2012 by the Canadian Swine Health Board, The CSHIN is a national health information network that collects, interprets and disseminates up-to-date information on the current health of Canada’s pork industry. Confidential information is submitted to the network directly from the field by veterinarians and animal health practitioners reporting any data related to current outbreaks, trends and observations. Information received and transmitted by the network is completely confidential, satisfying both doctor-client confidentiality and privileged information regarding individual farms and operations.

CONTINUED ON PAGE 22
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The 2004 Circovirus outbreak demonstrated the need for such an information network. The slow response by both industry and producers alike was blamed on an acute lack of information. The information that helps track the spread of disease is often information that producers were reluctant to share with their competitors, and veterinarians were bound by confidentiality concerns to not release.

While keeping an eye on the unfolding crisis in the United States, the Canadian Swine Health Board, through the CSHIN, was able to keep tabs on the state of Canada’s pigs. When the first case of the virus was detected on Jan. 22, the alarm was sounded almost immediately.

“We learned from our American counterparts, in terms of clinical expression of the disease, how it is transmitted and had access to all of the research done on the virus. We had eight months to prepare,” Byra said. “The Canadian Swine Health Board, the provincial pork boards and provincial governments developed PED prevention and response plans – including what testing would be done, communication strategies and protocols for positive herds.”

Even in Ontario, where the virus has had the most impact in Canada, Byra says stringent biosecurity protocols have kept the virus from spreading. Even though over 30 cases had been identified in Canada at the time of this writing, PED had infected less than five per cent of the total herd.

Simply put, good biosecurity practices keep your herd healthy. How farms do this varies greatly from facility to facility and from operation to operation, but the basic principles are the same. Biosecurity is about knowing the routes that diseases can enter farms and ensuring these avenues are protected. Factors such as the production model, the type of operation that exists, the size and location of the farm, and historical outbreaks in the vicinity all play into developing an effective biosecurity protocol.

Canada takes the biosecurity of its agricultural industry very seriously. The efforts of our national and provincial pork boards and swine health organizations have resulted in one of the most secure pork markets in the world, both financially and biologically.

The biggest challenge for producers is ensuring that everything coming into the farm, be they visitors, supplies, feed, fomites, vehicles or even what’s carried on the wind, poses little risk of contaminating the herd.

A study conducted earlier this year by the University of Minnesota found a shocking correlation between infection rates in the US and biosecurity practices.

The study, which analyzed data from 24 infected facilities versus 24 clean control sites, concluded that infection rates skyrocketed among those that didn’t follow stringent biosecurity procedures.

For example, the number of infected sites that allowed entry of unauthorized or unsanitized outsiders was nearly double those that weren’t infected. Infected sites saw nearly 60 per cent more visits from pig haul trucks than those that saw no infections. Wildlife incursions into barns and problems with birds were twice as likely to occur at facilities that saw PED outbreaks.

The Canadian Swine Health Board developed a comprehensive guide for developing a biosecurity plan, with suggested best management protocols that can greatly reduce the risk of outside contamination.

Establishing separate access zones within the facility is recommended. Limiting access to the herd by outside trucks, people and supplies, according to the CSHB, is a good way to maintain biosecurity.

The area around buildings where animals are housed is referred to as the controlled access zone (CAZ). Access to the CAZ is only permitted via secured gates, and even then only approved people, equipment and supplies should be permitted inside.

Within the CAZ, producers should designate the buildings or designated animal areas as restricted access zones (RAZ).
These zones, where direct access with swine is possible, should be limited only to essential workers and only where strict washing and sanitation protocols are followed. Many facilities require those entering restricted areas to go through what is referred to the Danish entrance procedure.

Danish entrance procedures ensure all visitors to restricted access areas eliminate avenues for pathogens to enter or leave the facility. It establishes dirty and clean zones, with a secure ‘grey’ zone in the middle to help the visitor transition from one to the other.

A common Danish Entrance set-up is laid out thusly – a visitor, prior to entering the building, steps into plastic bags to cover his shoes while still outside. Upon entering the barn, they sign the necessary logbooks and surrender all non-essential items such as wallets, keys, phones, and jewelry. Next, they move into a ‘grey room’ where they remove their shoes (while still in the protective bags) and step onto a protective mat in their stocking feet while they wash and sanitize their hands and put on facility-owned protective clothing and sanitized boots (usually stored in a sanitizing liquid). Alternately, the grey area is replaced by a ‘bench barrier’, an obstacle that requires the user to sit upon it to cross from the ‘dirty’ zone to the ‘clean’ zone, which encouraged visitors to change into the provided boots.

Upon exiting the grey area, visitors are free to access the animals. Consumables such as paper and pens should be

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provided because outside writing instruments are difficult to sanitize.

Upon exiting the building, the reverse procedures are followed. Contaminated boots and clothing are removed and placed into disposal bins before entering the grey room, hands are washed and sanitized and bagged shoes are put back on. Only after leaving the barn proper should the bags be removed from shoes.

A risky venture for producers are incoming biological products, be they pigs, semen, embryos, feed, bedding, water or tools. The CSHB suggests using as few suppliers as possible, and only receive goods from known and trusted firms.

Producers should develop a sound animal introduction protocol that outlines specific steps to maintain the biological integrity of the operation. This protocol should state the specific procedures for quarantining, monitoring, testing and discharging animals to ensure they don’t pose a risk to the rest of the operation.

New animals, especially boar studs, should always be quarantined. Stringent monitoring for signs of disease should take place, with accurate and precise logs kept on all animals brought into and out of quarantine, especially those who don’t survive long enough to meet their potential herd-mates. This quarantine area should be far enough away from the main facility to prevent any chance of animals mixing and to contain any outbreaks that may enter the farm. The

Clean coveralls are an important biosecurity measure.
quarantine area should be thoroughly cleaned and disinfected between animal shipments.

When purchasing animals, the CSHB stresses that verifying the health and origin of all incoming pigs is critical. Producers should speak to the veterinarian responsible for the incoming animals to determine where the animals are coming from and obtain documentation certifying health. Producers should also ensure they are contacted immediately if the animal’s health changes. In addition, producers need to ensure that the source of the animals has sound biosecurity protocols in place.

While contaminated porcine blood products found in certain types of pig feed has been eyed as a possible vector for the introduction of PED to previously unaffected facilities, preventing cross contamination of feed, bedding, water and other consumables that come in direct contact with animals should be a priority.

With many questioning the inclusion of porcine plasma in piglet feed, a study undertaken by Kansas State University recommends replacing porcine-derived blood with bovine-derived plasma in current feed formulations.

Researchers, however, feel that transmission of PED through feed is unlikely, as the heat during the rendering and feed manufacturing process would kill the virus.

Concern about PED infected blood in feed was fuelled by media reports that suggested that a southwestern Ontario supplier was responsible for the Canadian outbreak. It was enough to get the CFIA’s attention, which prompted the firm to voluntarily recall the suspected feed.

The Canadian Food Inspection Agency agreed with the conclusions made by the KSU study, and issued a report on March 3 stating it could not prove that porcine blood in feed had anything to do with the current outbreak.

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To that end, many researchers stress that producers should be more concerned with feed being contaminated during the shipping process than the virus entering their herd through blood ingredients in the feed.

For producers, the CSHB suggests that deliveries be made to bins located outside of the farm’s controlled access zone, with internal delivery systems in place to move the feed to the animals by facility staff. Farmers should maintain open lines of communication with their suppliers, ensuring that high risk or infected farms are the last stop on their delivery routes.

Sourcing water from known, trusted sources is also important. When surface water is used, the CSHB recommends fencing the source to ensure only the herd has access. Surface water should be chlorinated and tested at least annually for coliform and E. Coli. Standing water within easy access of the herd should be drained diligently to prevent pigs from drinking it.

Pathogens can be carried by workers on their tools. Establishing a protocol for tools is important, ensuring that only a closed and dedicated system of equipment is used around the herd. Equipment that needs to be brought in should be sanitized to reduce the risk of outside contamination. Outside contractors are always a risk, and those used to working around farms will understand the need for biosecurity protocols.

Opened medical supplies, including medicines, should never be brought onto a farm, especially if they were used at a different facility. Consultations with your veterinarian will ensure that medical treatment of the herd doesn’t end up doing more harm than good.

Visitors to the facility should be logged, monitored and educated on current biosecurity procedures. The history of the visitor’s movements should be known, with appropriate downtime rules regarding their last contact with pigs or other animals limited to once every 24 hours. Good biosecurity protocols usually dictate only essential visitors have direct access to animals. Foreign visitors, due to their exposure to otherwise unknown pathogens, are often forbidden on most farms without following special procedures.

Danish entrance procedures ensure all visitors to restricted access areas eliminate avenues for pathogens to enter or leave the facility. It establishes dirty and clean zones, with a secure ‘grey’ zone in the middle to help the visitor transition from one to the other.

Of most interest to producers is maintaining transportation biosecurity. While researchers aren’t sure exactly how PED was introduced to Canada, a popular theory is that infected feces in a muddy boot print hitched a ride back into Canada after offloading a shipment of Canadian pigs onto an infected farm. The theory suggests that the virus not only survived the trip back into Canada in this boot print, but survived an either nonexistent or ineffective trailer cleaning.

As such, maintaining proper biosecurity protocols on vehicles entering the facility is essential. A recommended practice involves the driver changing into an approved uniform outside of the facility, standing on a mat that keeps the clean uniform from contacting the ground. Upon entering the double-doored segregated loading area, the producer verifies the cleanliness of the trailer (without coming in direct contact with it or the driver) and if all protocols are met, authorizes the pigs to be loaded. The driver is restricted to the loading area and is never permitted to enter the pig gallery. The loading area should also act as a grey buffer zone between the unclean outdoors and the biologically secure interior.

A one-way movement of both animals and air is required to ensure biosecurity. To that end, the loading room should be installed with a positive pressure ventilation system so outside air cannot enter the facility.

Ensuring this space barrier between the truck and producer ensures that the risk of spreading pathogens is kept at a minimum.

When PED was first identified in the U.S., Canadian authorities knew it was just a matter of time before the virus travelled north. While the Canadian Border Services Agency is responsible for enforcing sanitation regulations on trucks returning from production facilities in the U.S., Dr. Byra states that having adequate wash facilities available for every truck
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crossing the border is a challenge.
While Canada was able to hold PED at bay for nearly eight months, Dr. Byra says that important lessons can be learned from our industry’s response to the crisis.

“We could have been more aggressive with early testing of vehicles from the U.S.,” he suggests, saying that while some tabletop simulations were performed, a stronger approach to testing scenarios could have kept the disease out for longer. He also said that committing money to producers before the outbreak could have helped with disease containment, to ensure an infected farm doesn’t end up affecting its neighbours.

“Many of these were done after the fact,” he said. “In general, the co-operation of affected producers was excellent. As well, making the disease notifiable in the provinces would also trigger the input of provinces at an earlier stage.”

The issue of funding biosecurity, especially in the wake of the PED outbreak, has many producers weighing financial viability with maintaining biosecurity. Funding is available at both the federal and provincial level to assist producers with developing biologically secure operations.

The Growing Forward 2 program is a joint federal and provincial program that provides a specific funding formula for producers to develop sound security and risk management procedures through its Animal Health Biosecurity program.

Shortly after PED was identified in Canada, the Ontario Government pledged $2 million to assist hog farmers tighten biosecurity procedures. Ontario Premier Kathleen Wynne also announced the establishment of specific biosecurity streams in Ontario’s Growing Forward 2 program that will further assist the industry to fortify their biosecurity procedures.

Ontario Pork Chairperson Amy Cronin said the funds will go a long way in containing the disease.

“It speaks to the provincial government’s ongoing commitment to our industry,” she said. “They will most certainly help us with some of the initiatives we’ve already started to help manage this disease.”

While the deadline for Ontario producers passed on March 13, nearly 1000 applications for funding were received by the provincial government.

While possible vaccines and medical breakthroughs are certainly something the industry is looking forward to, many experts believe that the solution to Canada’s growing PED outbreak isn’t going to be found in a laboratory or a veterinarian’s office, but at the farm’s gates.

Effective washing must always be mandatory.
Transportation – getting where we have to go safely

It can be challenging to move just the pigs without the contaminants

By Bryan Passifiume

Porcine Epidemic Diarrhea has been described by epidemiologists as an incredibly ‘sneaky’ disease. PED, as evidenced by the swath it cut across the US pork industry, presents many challenges for stakeholders -- challenges that require transporters, producers and processors to remain vigilant to ensure PED runs its course and wreaks as little financial havoc as possible.

The virus’ ease of transmission and its hardiness have, if anything, highlighted the need for stringent biosecurity in the Canadian pork industry -- in particular the vast network of trucks that transport over five million market hogs annually, amounting to 65 truckloads of animals moved 365 days per year on Canadian roads.

While no cause for the disease's initial appearance in Canada has been confirmed, many researchers believe the virus travelled into Canada in an empty pig transport trailer – possibly surviving in a manure-infected boot print on an insufficiently sanitized trailer.

So, what makes this virus such a challenge? Dr. Julia Keenliside, a veterinary epidemiologist with Alberta Agriculture, explains that when it comes to PED’s hardiness, it’s all in the genes.

“The genetic make-up of the virus is what makes it so virulent,” she says. “It is only deadly for nursing piglets as it destroys the lining of the gut preventing them from absorbing food and water. Older pigs can handle it and survive it quite well.”

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While PED is indeed a challenge for the industry, Keenliside asserts that its deadliness and hardiness certainly isn’t unique among agricultural pathogens.

“It really isn’t unique,” she said. “There are other livestock diseases that are just as virulent and as easily transmitted.”

Maintaining proper sanitation in hog transport isn’t a new idea. Contaminated transports have been blamed for the spread of many agricultural diseases since the beginning of the transportation age.

While specific standards vary from jurisdiction to jurisdiction, all swine health organizations have best practice protocols that require trucks to undergo a stringent cleaning and sanitation regimen. These protocols also require a certain period of downtime between loads in order to facilitate natural degradation of infectious pathogens – 12 hours is the standard.

The challenge facing transportation companies is maintaining consistent and effective sanitation procedures between each load.

While properly disinfecting a truck is the only way to ensure pathogens aren’t spread from one load to another, it’s admittedly a very time and labour intensive process. Human factors weigh heavily into if biosecurity protocols are effective or not. Animals may be accidentally and unknowingly loaded into an infected truck, either by way of negligent cleaning crews or an unscrupulous transportation company recklessly cutting corners on established protocol. The logistics of this become even more frightening when the sheer volume of hogs transported by truck in Canada every day is taken into consideration. To err, as they say, is human.

While the protocols currently in place are sound, Canadian Swine Health Intelligence Network (CSHIN) Manager Dr. Chris Byra, says that ensuring protocol compliance is the biggest variable in keeping infection rates down – especially during the winter.

“Having adequate facilities to wash and disinfect trucks quickly enough during the winter has proven to be a limitation,” Dr. Byra said. “We know the procedure works, but only if it’s done correctly.”

Sanitation and cleaning protocols are a greater challenge in the winter, as allowing water or the sanitizing agents to freeze greatly reduces the efficacy of the process.

What goes into turning a truck over between shipments? The Canadian Swine Health Board (CSHB) mandates a seven-part protocol to ensure trucks are properly cleaned and don’t become a route to spread pathogens.

**This little piggy went to market, this little piggy stayed home. This little piggy had roast beef, this little piggy had none. And this little piggy brought PED all the way home...**

**Step one** involves cleaning all debris from inside and outside of both the tractor and trailer. This involves removing all soiled bedding, all outside dirt, mud and snow from the body, undercarriage and wheel wells. All removable panels, objects, tools, ramps and even clothing should be cleaned and disinfected separately before being replaced onto a clean truck.

The exterior, including exterior mounted equipment lockers, should be rinsed with water first. Next, workers should rinse the trailer’s interior, its loading ramps and then removable panels.
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Workers should clean the truck from top to bottom to reduce the risk of cross-contamination.

After the vehicle has been cleaned of debris, it should be moved to a separate area for washing and sanitation in order to avoid cross-contamination.

The second, third and fourth steps consist of a pre-rinse, shampoo and scrub and final rinse. Especially in the summer, workers should ensure the truck is kept wet between the cleaning and the washing stages. Extra water should be applied if necessary. While the truck is still wet, workers should apply an approved foam detergent to the entire vehicle. While a neutral or alkaline soap is best at removing oil and grease, it’s important to choose a soap that is compatible with the sanitizing solution used in later steps.

After the foam is applied, workers scrub all surfaces with a stiff brush. Not only does scrubbing ensure that all dirt, grime and organic matter is removed, it prevents the formation of biofilm, a difficult to remove build-up of microorganisms that can not only lead to corrosion of metal surfaces but can shield dangerous pathogens from sanitation. Organisms produce this biofilm in order to create a more hospitable environment to grow in – that’s why it’s so important this film is removed.

Once all surfaces have been foamed and brushed, the next step is to rinse the entire surface of the vehicle, following the same order as the initial cleaning. Using pressure washers, workers should take care not to splash contaminated water onto rinsed surfaces. The trailer should also be completely drained with no water allowed to accumulate before moving on to the sanitation step.

Step five involves applying a disinfectant to kill any pathogens that may have survived the previous steps. Workers should not only ensure that they spray the disinfectant everywhere, they should also be mindful of the ambient temperature during the application process as colder temperatures reduce the efficacy of the solution. Workers should also ensure that boots, clothing or hoses don’t come into contact with sanitized work areas – cross contamination at this point is a prime vector for reintroducing pathogens.

Step six is allowing the vehicle to dry completely, either by letting it air dry on a grade (minimum two per cent) or by moving warm air (32ºC or higher) through the open spaces. Drying vehicles outdoors on warm days is another option as direct sunlight can aid in destroying pathogens, but should be avoided in the winter to prevent wash water from freezing.

If vehicles are dried outside, workers should pay attention to where they park the vehicle. Strong winds can carry pathogens from infected vehicles onto clean ones. Workers should also be careful to maintain the integrity of vehicle routes, as a clean truck can become contaminated if driven in the same route as contaminated vehicles.

A PED-specific alternative to drying is being explored. Researchers at the Iowa Centre for Pork Excellence have determined that ‘baking’ the trailer at 65ºC for a minimum of 10 minutes is effective in killing any lingering PED virus.

The seventh and final step involves cleaning the truck’s cab. Using household disinfectants, workers should sanitize all
surfaces of the truck, paying special attention to the steering wheel, pedals, gearshift and floor mats.

With this in mind, the importance of maintaining best practises for vehicle contamination becomes clear.

“Truck cleaning and disinfection works, but only if you do it!” says Dr. Byra.

Byra says that even in areas hardest hit by PED, good transportation biosecurity practices can go a long way towards preventing further infections. He cites an example of a Canadian company that sources their pigs from a farm in Iowa, a state hard-hit by PED. Even though the company finished more than 200,000 hogs since the outbreak began, only 10 per cent of their herd was diagnosed with PED – thanks primarily to clean trucks. This, he says, highlights how important transportation biosecurity is in the pork production chain.

Maintaining a biosecure supply chain starts when the truck first arrives at the farm to take pigs to processors. Once given permission to cross the facility’s controlled access zone, the CSHB endorses a strict series of best practice protocols to ensure trucks don’t become avenues to introduce disease to producers.

Once backed up to the loading dock, the driver exits the vehicle and dons protective coveralls, sanitized boots and gloves before entering the building. The driver is provided a mat to stand on, as touching the ground while putting on the protective clothing and entering the facility is considered a breach of contamination protocols.

Eliminating direct contact between the driver/truck and anything associated with the facility (including employees) is part of maintaining a clean environment. A facility employee should ensure that the trailer is clean before pigs are loaded, but must not enter the trailer nor have direct contact with its surfaces.

Much like the ‘grey room’ in Danish Entrance-type decontamination setups, the driver should remain in the load-out area at all times and never enter the facility itself.

Buildings should also be designed with a positive pressure ventilation system, which keeps the building’s internal air pressure greater than the outdoors. This ensures that when the load-out and exterior bay doors are opened, the natural equalization of the building’s air pressure will prevent contaminated air, straw, shavings or bedding from being sucked into the facility from the trailer.

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While being loaded onto the truck animals should move in one direction only. Safeguards should be in place to prevent animals from re-entering the facility once they’ve entered the load-out area.

As mentioned previously, one of the prime suspects in the spread of PED into Canada was a truck returning home after off-loading pigs at a facility south of the border. If this is the case, it clearly demonstrates the need for strict biosecurity protocols and separation between facility and truck.

While transportation companies, producers and processors have their role in ensuring biosecurity between facilities, whose responsibility is it to ensure trucks returning from the U.S. are free of contamination?

While transportation companies should keep to best practices when it comes to cleaning their trucks, Dr. Byra says that government does indeed play a role.

“There already is a regulation with the Canadian Border Services Agency (CBSA) in place for trucks visiting facilities other than slaughterhouses in the U.S.,” he said. “Enforcing this regulation is within the federal government mandate.”

Byra added that expanding this requirement to include trucks returning from American slaughterhouses – an idea currently being considered by the Canadian government – would go even further in keeping our borders secure from pathogens.

Another challenge, says Dr. Julia Keenliside, lie in the inspectors’ ability to ensure a truck actually is clean. She explains that even though a truck may appear clean to the naked eye, it still can still be dangerously infectious.

“Research has shown that trucks that are visibly clean could still be contaminated by the virus,” she said. “This is a hard virus to get rid of on trucks. Having inspectors visually certify that a truck is clean at the border, while reducing the risk, is not feasible as it cannot guarantee that the truck is indeed virus-free.”

She says that visual inspection of trucks at the border can lead to a dangerous false sense of security.
“The responsibility for clean trucks should be a shared one at every step of the chain – from the trucker to the truck wash and to the producers.”

To that end, Dr. Byra recommends producers be especially careful about whom they permit to transport their animals.

If purchasing and using their own trailers isn’t an option, he suggests that farmers inspect the trailer themselves before allowing it near their animals, and demand proof that the trailer was washed by an accredited cleaner.

Transportation companies themselves should work closely with producers and their local pork boards to ensure they’re keeping up on acceptable standards of practice. They should take an active role in ensuring their trucks are being cleaned properly, avoid truck washes that recycle water, and use proper detergent and disinfectant combinations.

While cleaning and sanitizing trucks is indeed cost and time intensive, it doesn’t take an enormous lapse in judgement to render an otherwise clean truck contaminated.

Remaining vigilant, say the experts, is the very best defence Canada’s pork industry has to weather the PED storm.

“Strict biosecurity continues to be the best defence we have to keep animal diseases such as PED off the farm,” said Dr. Julia Keenliside. “Programs that provide funding to help producers, truckers and other organizations provide services to help the farm assess, determine and reduce risks through the implementation of robust biosecurity practices.”
Alberta Pork’s fight to keep PED out of the province

Submitted by Geoff Geddes, Alberta Pork

Every industry has its share of jargon and acronyms. But in reflecting on the tumultuous two months since the first case of PED was reported in Canada, I was struck by two thoughts:

1. Has it only been two months?!
2. It’s all about the letters.

PED

A year ago, it was less prominent here than TGE or PRRS. When it began appearing in the United States last May, Alberta Pork wasted no time advising producers through our website, E-Newsletter and Industry Review. But with Canada PED-free at the time, many seemed to think of the virus as mainly a U.S. issue.

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That all changed on January 23 of this year at the Banff Pork Seminar. During the Boar Pit session that afternoon, it was announced to a packed house that the first case of PED in Canada had been reported in Ontario. You could actually hear the clinking of ice cubes at nearby tables as people stopped mid-drink and absorbed the news. Many then proceeded to polish off those drinks and order another one. Who could blame them? I remember thinking that I was seeing history in the making that day, and not in a good way.

CBC, CTV, etc.

I’m told that the drive home was scenic, with towering mountains on all sides capped by snow and low hanging clouds. But I wouldn’t know. I was too busy fielding inquiries from television, radio, newspapers and online media (my co-worker was driving!). It seemed all the people who never got around to returning my calls on “lesser issues” suddenly found my number and felt compelled to “reconnect”. But cynicism aside, it was a great opportunity to arrange interviews for our executive director and chairman and spread the word that PED, while not a threat to humans or the food supply, had found its way to Canada and posed a serious threat to our animals and our industry.

DR.

They say a crisis is a great time to learn who your friends are, and we quickly realized how lucky we are to have some of the most skilled and dedicated swine veterinarians in our own backyard. Alberta Pork immediately reached out to the veterinary community to help inform producers and industry partners on PED – What it is, how it spreads and the best methods for keeping it off your farm. Veterinarians throughout the province responded rapidly, doing media interviews, working with us at our telephone and in-person meetings and making themselves available day and night when we had questions or concerns.

TTH

Given the need to get as much information on PED out to as many people as possible in short order, Alberta Pork organized bi-weekly telephone town hall meetings led by industry experts from across the country. We’re encouraged by the excellent attendance and feedback for these meetings, with over 1,000 producers and industry partners taking part to date.

FYI

We wanted to take a multi-pronged approach to helping producers protect their farms, so we conducted nine in-person meetings across the province in January, February and March. Over 500 attendees heard the latest updates from PED experts, saw videos on proper biosecurity protocols and received handouts on every aspect of the disease.

URL

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Canada and the U.S. along with a wide range of documents and videos on truck wash protocols, cold weather disinfection, proper detergent use and on-farm biosecurity procedures, to name a few. To ensure that everyone gets the information they need to fight the disease, we fax and email producers and industry on a regular basis with the latest news and resources.

**ARD**

No discussion of PED would be complete without tipping our hats to Alberta Agriculture and Rural Development. They have worked tirelessly to provide funding and expertise in support of our efforts at PED prevention, including the early re-opening of Growing Forward 2 to help with biosecurity projects and a significant investment in our prevention work on behalf of producers and industry.

There's much more to be done, and with cases of PED now reported in Manitoba and Montana, the threat is ever-present. We will need to stay vigilant to keep our farms clean and PED free.

But since Ben Wooley, Vice President of Sunterra Farms, stood up in Banff on January 23 and said, “The world will be watching how we respond to this crisis,” I’d like to think we’ve given them an eyeful and that, for the most part, they like watching how we respond to this crisis.

**Saskatchewan’s Pork Sector Vigilant in PED Prevention**

Submitted by Sask Pork

With confirmations of clinical cases of Porcine Epidemic Disease (PEDv) in Ontario, the Maritimes prevention and mitigation in Saskatchewan herds has taken on a far more urgent tone.

Our discussions with the Chief Veterinary Officer for Saskatchewan, Dr. Betty Althouse, began last July to develop a Saskatchewan response template. In early January, we brought together 20 representatives from a wide cross section of the pork value chain to review all the current information available on this disease and to mobilize key personnel immediately. We owe a debt of gratitude to Saskatchewan’s herd veterinarians, stakeholders and the Ministry of Agriculture who have provided immeasurable support to the industry in their dedication and willingness to assist us in getting ahead of this disease.

Two PED working groups were struck at the January meeting: Transport, Sanitation and Testing, and Contingency Planning. The Transport, Sanitation & Testing group met via conference call January 29 to identify areas of immediate focus and action including a review of truck washing protocols in Saskatchewan; development of needed changes to the protocols in place and identifying personnel and timelines for conducting plant surveillance testing. The Saskatchewan Ministry of Agriculture began environmental sampling at select Saskatchewan packing plants, assembly yards and rendering facilities in March.

The Contingency Planning group (CPG) met in early February. Our contingency plan has been developed which incorporates increased communications with industry leaders and veterinarians in the event of a clinical case in Saskatchewan, plans for bio-containment of the affected farm with increased monitoring and suggested methods to see the farm revert to a non-infectious status. The plan was completed by Warman Veterinary Services and Dr. Al Theede using the U.S. and Ontario experiences to guide our response to the situation.

In the case of a PEDv clinically positive herd in Saskatchewan, the Contingency Planning Group and the Ministry of Agriculture will work with the producer and herd health veterinarian to implement the plan in order to limit the spread of the virus. Costing scenarios to implement the plan in the case of a clinical positive response for a 2,700 sow farrow-to-wean farm, 600 sow farrow-to-finish and an 8,000 sow finisher unit have been developed. Sask Pork is working with the Ministry of Agriculture in determining how the response will be best funded.

The Ministry of Agriculture and Sask Pork initially developed an early cost estimate for an infection in a farrow-to-finish operation at $278/sow based on 5-year average prices. (Given current record breaking prices in the industry, this will be higher if a positive occurred now. This estimate does not include ongoing reproductive costs or cleanup costs.)

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**Western Hog Journal**

Spring 2014

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The two PED producer information meetings Sask Pork hosted February 13 in Swift Current and February 14 in Saskatoon attracted nearly 100 producers/stakeholders who fully supported enhanced industry and producer biosecurity protocols to prevent a break and spread of PED. Additional important information has been sent directly to producers to keep them up to date with the current situation including notices of Alberta Pork’s Town Hall conference calls and in-person meetings. The excellent flow of communication between the provinces has greatly strengthened the overall efforts of the industry as a whole.

Support from the Government of Saskatchewan came swiftly with confirmation of funding of $150,000 for the Saskatchewan Swine On-Farm Biosecurity Program 2014 (SOFBP) under Growing Forward 2, allowing eligible farms to claim $1,000 for biosecurity related equipment and $300 for a veterinarian farm visit. The program will run between February 1 and June 30, 2014, with an application deadline of July 15, 2014. Sask Pork has also committed funds to cover $300 for the cost of a second veterinarian farm visit with a biosecurity focus to be done by December 31, 2014.

Dr. Althouse also confirmed Ministry of Agriculture support for PEDv related funding to cover:

1. $5,000 matching funding to Sask Pork’s contingency planning funding;
2. $50,000 for site surveillance at plants, assembly yards and renderers;
3. $20,000 for transport surveillance;
4. $15,000 for a first case response to match Sask Pork funding allocated for a first case response.

Important Information for Transporters brochure adapted for Saskatchewan is being distributed to truckers at U.S. border crossings in Saskatchewan by the Canadian Food Inspection Agency via the Canadian Border Services Agency. A second publication, Porcine Epidemic Diarrhea Virus developed by the Ministry of Agriculture and Sask Pork, has been widely distributed throughout the province. Our website includes a click-thru on the homepage to PED information from trusted sources and is updated as new information becomes available.

Media interest in the potential threat to Saskatchewan’s pork industry was brisk during the initial news of outbreaks in Ontario, the Maritimes and Manitoba. Chairman Florian Possberg and directors and staff continue to respond to interview requests with local TV/Radio and weekly rural newspapers. CTV News conducted two separate in-depth interviews with Dr. Henry Gauvreau, Harvey Wagner and Steve Balzer of Transall Express. Interestingly, no questions have arisen about the safety of pork products though there is interest in potential supply disruptions given the effect PED has had on the U.S. pork industry.

Our producers continue to demonstrate the strength of the Saskatchewan pork sector and its resiliency by once again
ranging to the challenge to ensure their farms are protected. Sask Pork Chairman Florian Possberg credits the vigilance of the province’s pork industry for keeping Saskatchewan free of PED adding that “our producers have been very responsive in stepping up biosecurity and feeding programs to accommodate the reduction of risk.”

**Manitoba Pork tackling PED head-on**

Submitted by the Manitoba Pork Council

Manitoba Pork communicated with assembly yards and transporters in the summer of 2013 about the risk of PEDv transmission. As well, a presentation on PEDv and the U.S. experience was made by Manitoba Pork staff at the Manitoba Pork Fall Producer Meetings, October 29 and 30, 2013.

Manitoba Pork prepared and distributed PEDv pamphlets and Canadian Swine Health Board Wash/Disinfect/Dry protocols in December of 2013 to producers, veterinarians, feed companies, packing plants, assembly yards, and wash facilities. The aim was to further educate these groups on the disease and encourage them to distribute the materials to transporters. The package was also given to Canadian Border Services Agency (CBSA) to hand to livestock transporters returning from the U.S. The materials emphasize the need to wash and disinfect trailers returning from the U.S. and from assembly yards.

In January of 2014, Manitoba Pork allocated $100,000 for a provincial PEDv surveillance program, which is being managed by Manitoba Agriculture, Food and Rural Development and consists of swabbing for PEDv at high pig-traffic sites, such as assembly yards, provincial abattoirs, and federal packing plants. Manitoba Pork applied for and received funding from Growing Forward 2 for up to $67,875 for the Surveillance Program.

A PEDv presentation was prepared and veterinarians were funded to deliver it to their clients. Manitoba Pork applied and received funding from Growing Forward 2 for up to $10,500 for these PEDv Vet-Producer Meetings.

Manitoba Pork has also hosted PEDv Town Hall phone-in meetings (January 31, February 19, and March 21) to update Manitoba producers on current activities and information. Manitoba Pork applied and received funding from Growing Forward 2 for up to $4,500 for these PEDv Vet-Producer Meetings.

We worked closely with the Chief Veterinary Office in Manitoba to perform trace-outs from the one infected premise. We continue to work with the affected producer to maintain biocontainment on his farm and arrange for the orderly marketing of his pigs. Manitoba Pork provided some financial assistance to the producer to offset the extra costs arising from improvements made to his biosecurity and from production problems as a result of the quarantine restrictions. We worked closely with the producer and others to develop a marketing strategy to minimize the potential of spreading the disease.

Manitoba Pork encouraged CFIA and CBSA to seal unwashed trailers at the border returning to Manitoba from the U.S. The exemptions to this are direct-to-slaughter movements (including a direct return) from Canada to the U.S., which only require a scrape-out, and trailers that have been washed and disinfected in the U.S. (provided they have proof of wash). We are working with the federal government to get the regulation changed to close this loophole.

Manitoba Pork established procedures for unwashed trailers to be sealed at the border until they are washed at an accredited wash facility in Manitoba. A veterinary consultant was hired to audit and certify wash facilities. Manitoba Pork purchased tag-seals with unique numbers for transporters to use. We have tags available to transporters free-of-charge at the Manitoba Pork office and we have also sent 1,000 seals to CBSA. Transporters can pick up seals at the Manitoba Pork office or at the CBSA controlled border points such as the Emerson border crossing. Manitoba Pork is assisting with the establishment of some new washing/drying facilities.

We are also continually liaising with other organizations and individuals to enhance biosecurity protocols in their everyday practices.

Manitoba Pork has also recently produced a “Prevent PEDv” series of stickers and posters to be put up in-barn and at other pig sites in order to maintain awareness and vigilance for the disease. The stickers and posters are available free-of-charge to Manitoba pork producers and other industry stakeholders, and can be ordered or picked up from the Manitoba Pork office.

We continue to deliver pertinent updates to producers through our e-newsletter, Chop Talk, our website (www.manitobapork.com/pedv), numerous direct phone calls and meetings, Farmscape articles and radio broadcasts.

We are in continuous dialogue with provincial government officials and CV0 staff, other provinces and national pork organizations.
Manitoba-based company developing PED vaccine

By Myron Love

Over the past year, Porcine Epidemic Diarrhea Virus (PEDv) has wreaked havoc with America’s hog industry. The industry in the United States has suffered over $1 billion in losses and now the virus is showing up in Canadian herds.

In January the virus was diagnosed in 23 barns in Ontario and in Prince Edward Island, and the first case has showed up in southeastern Manitoba.

Terence Sellen however may have the silver bullet that stops PEDv dead in its tracks. Sellen is the president of Manitoba-based company Zyme Fast Inc., which is developing a vaccine that promises to inoculate hogs against the PEDv strain currently affecting North American herds.

Zyme Fast Inc. is a 12-year-old biotech company that focuses on developing antibodies for diseases affecting livestock. “We work from the genome of the virus,” Sellen explains. “Working with live viruses is old technology which we moved away from eight years ago. It is also more dangerous (working with live viruses). If the genome is available, we can create a vaccine.”

Zyme Fast technicians integrate antibodies into egg yolks that they have dried into powder. The powder is incorporated into feed, (one kilo of powdered egg yolk for every tonne of feed) or put it in the water system for piglets to ingest.

The people at the Canadian Food Inspection Agency (CFIA) are aware of the work we do. When they approached us to ask if we would be doing something about PEDv, we were ready. ~ Terence Sellen, president, Zyme Fast Inc.

Sellen explains that the advantage to inoculating herds by means of introducing antibodies into their feed through egg yolk powder is threefold. The method used is quite inexpensive compared to other methods. Egg yolks are easily assimilated. And, if you vaccinate the sow, the sow will pass on the antibodies to the piglets thereby neutralizing PEDv within four days. Because the piglets’ digestive tracks take time to mature, it would take three or four weeks to kill the virus if the inoculant is given directly to the piglets.
Dr. Lin Fang as he works in the Zyme Fast Inc. laboratory.

Sellen reports that his company has thus far developed 55 different egg yolk structures for various diseases. Zyme Fast’s ace-in-the-hole, Sellen notes, is Dr. Lin Fang, the company’s chief research scientist. Fang was an established veterinary researcher in his native Shanghai who came to Winnipeg to study biotechnology under the mentorship of Professor Ron Marquardt at the University of Manitoba.

Marquardt is vice President of Zyme Fast Inc., as well as a professor emeritus at the University of Manitoba. His research on egg yolk antibodies and enzymes has been ongoing for 40 years. He originally approached Sellen, who has a long history working in the private and public sectors of science and technology development, about commercializing Marquardt’s research.

“Dr. Fang is very good at what he does,” says Sellen, adding that Marquardt and Fang are internationally renowned scientists with many breakthroughs and technical innovations recognized in Asia, Europe and North America.

“The people at the Canadian Food Inspection Agency (CFIA) are aware of the work we do,” Sellen notes. “When they approached us to ask if we would be doing something about PEDv, we were ready. We had already developed a vaccine against PEDv for China four years ago.”

Sellen explains that PEDv has been active in Europe and Asia for 20 years or more. “The European strain isn’t virulent, so there hasn’t been that much damage,” he notes.

He reports that the Asian and American strains are very similar, although not entirely the same.

He notes that an American company has developed a PEDv vaccine, but that it has not been very successful. He adds that Merck has announced that they are on track to develop a vaccine some time over the next year.

“Our vaccine will be ready for testing by the beginning of April,” he says.

He reports that on average, it takes Zyme Fast six to nine months working from the genome to develop a vaccine. It took the company six months to develop its vaccine for the Asian PEDv strain.

While regulatory approval can often be a cumbersome process, Sellen is optimistic that Zyme Fast’s PEDv vaccine will receive approval fairly quickly. “The CFIA is focused on this disease,” he notes. “We expect that our vaccine could be fast tracked for approval.”

The situation is becoming more urgent, he points out, because the geese will soon be returning to Canadian wetlands and marshes after stopping en route in American fields, some of which have been sprinkled with hog manure, which may have been contaminated with PEDv.

Sellen reports that Zyme Fast is also beginning to turn its attention to combating human viruses and bacteria as well as animal diseases. “We are researching treatments for antibiotic-resistant superbugs,” he says. “We are in discussion with the University of Calgary about starting human trials.

“We have entered the age of the small protein. The body does not recognize chemicals, but it does recognize biology. If we can figure out what the body needs at the genetic level - to combat superbugs, for example - we can provide biological antibodies that the body will be able to use properly to fight infections.”

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You find PED – what now?

By Bryan Passifiume

With PED claiming upwards of five million hogs in the U.S. in a little under a year, producers can be forgiven if they’re nervous about the future of their herds.

Even though Canadian cases have been – for now – contained to farms in southern Ontario, pig farmers across Canada are rightfully concerned about the disease spreading to their herd.

With stories about PED’s almost indestructible virility, what happens when a producer finds himself facing an infected herd?

While the virus affects hogs of all ages, unweaned piglets are the most susceptible to the disease, with mortality rates between 90 - 100 per cent in infected animals.

With anxiety among Canada’s pork producers reaching crisis levels, many are left wondering what a PED diagnosis would realistically mean to their business.

Dr. Chris Byra is manager of the Canadian Swine Health Intelligence Network, and says that once a veterinarian makes a positive PED diagnosis, the producer needs to immediately stop the movement of all animals until marketing, quarantine and dead stock plans are in place.

Stopping movement of all animals, people and equipment out of the farm is essential to keep the virus from spreading. He also suggests ceasing all unnecessary farm visits from suppliers, and ensuring that those deemed essential to visit the facility follow proper biosecurity protocols to prevent avenues for the virus to escape.

A diagnosis of PED usually comes from an in situ diagnosis from a vet, or a biological report from a processing plant. In either case, Byra stresses that containing the virus is key.

The age of the infected animal determines the course of the disease, and the actions taken by the farmer. While PED is almost always fatal in suckling piglets, weaned young fare better.

“Weaners get diarrhea and vomiting, they may be sick for a few days and then recover,” Byra said. “Signs in grower and finisher barns range from significant diarrhea to almost no signs at all – these are the difficult ones to diagnose. Sows and boars will have some diarrhea and be off feed for a few days, but fully recover.”

Dr. Julia Keenliside, a veterinary epidemiologist with Alberta Agriculture, stresses the importance of developing a sound plan of action with both animal health providers and processors.

“The herd vet and the producer will work together to reduce the impact of the disease, clean up the site and prevent the

CONTINUED ON PAGE 44
virus from spreading further,” she said. “They both work with
the processor to ensure hogs are shipped to market in a way
that minimizes the risk to other farms.”

When pigs from an infected facility are sent off for slaughter,
the processor will often arrange special transport for the
animals as well as ensure the truck goes through extra
decontamination steps.

Animals that survive a PED infection do not typically lose
their saleability when brought to finish.

“Most of the affected pigs will continue as normal and go to
market,” Dr. Keenliside said. “PED does not affect food safety
or human health.”

For the animals that do succumb to the disease, Dr. Byra
says producers should ensure the dead stock isn’t accessible
by scavengers, especially if the farmer plans to dispose of
the animals on site. For those who dispose of their animals
through a rendering operation, he says it’s vital to let the
renderer know what he’s picking up so they adjust their pick-
up schedule accordingly to avoid cross-contamination and
take proper measures to disinfect their trucks.

Before a facility can be declared PED-free, both Byra and
Keenliside suggest working closely with the farm veterinarian,
especially if they’ve had experience in working with
recovering operations. He says the best way to eliminate the
virus from the farm is through good old-fashioned hard work.

“Begin a repeated process of cleaning and disinfecting,” he
said, adding that doing so after a spell of warm weather is the
standard. “This involves pressure washing the entire facility,
chlorination of the pits and then environmental testing when
this is done before the introduction of naive animals.”

“The best method will vary depending on the size of the
farm,” added Dr. Keenliside. “The producer will need to work
closely with their veterinarian to develop pig flows and
sanitation procedures to shorten the length of the outbreak
that fits the operation.”

An important part of the infection chain is knowing where the
virus came from. Knowing how the infection took root in the
first place is key to preventing future infections. Dr. Keenliside
says that resources are available to assist producers in tracking
down the cause of the infection.

“Alberta Agriculture will assist with communicating in
the industry, providing laboratory testing and follow-up
investigation as needed to trace where the virus came from
and how to prevent it from spreading further,” she said.

“Alberta Pork will provide support to the producer as well.”

The effectiveness of a producer’s cleaning regimen at this
stage is decidedly unscientific. If animals manage to live in
the barn without becoming sick themselves, it can be declared
disease-free.

“You only know that you are negative for sure after the
introduced animals have been in the barn for a couple of
months,” said Dr. Byra.

While PED certainly isn’t a picnic for the unfortunate
producer dealing with an infected herd, sticking to established
biosecurity protocols and keeping in close contact with
processors and animal health practitioners is the best way to
not only ensure a quick and complete recovery, but to prevent
future outbreaks.
PED threat hangs over otherwise buoyant Manitoba Swine Seminar

By Myron Love

The mood was buoyant at this year’s annual Manitoba Swine Seminar February 5-6 at the Victoria Inn Hotel and Convention Centre in Winnipeg.

“Our attendance, (435, including about 100 walk-ins) this year was excellent,” says Robyn Harte, Manitoba Agriculture, Food and Rural Initiatives Swine Specialist and seminar co-chair. “And the discussions among the attendees at lunch and coffee breaks have been very positive.”

Jason McNaughton, the president of Winnipeg-based Standard Nutrition (Canada) Ltd., also remarks on the attendance. “This was the best attended swine seminars in at least the last five years,” he says.

Dave Jolicoeur, who represents Fast Genetics in Manitoba and Minnesota, says that this was the best-attended series of swine seminars here in the last ten years.

Laura Kunzelman, the Manitoba Pork Council’s director of Communications, adds that this was the best turnout that she has seen to date.

Jolicoeur also observes that there was a lot of optimism among the attendees. “With feed prices down and market prices up, producers are feeling more positive than they have in several years,” he notes.

Mark Waldner of the Sturgeon Creek Hutterite Colony near Winnipeg and Travis Hofer from the James Valley Hutterite Colony in Elie (about a half hour west of Winnipeg on the TransCanada Highway) spoke glowingly of the seminar speakers. Waldner singled out for praise Dr. Tim Blackwell from the Ontario Ministry of Agriculture and Rural Development.

CONTINUED ON PAGE 46
Food whose topic was ‘Communicating On-Farm Welfare’. Both Manitoba producers also appreciated the presentation on weaning pigs by Dr. Steve Dritz, a professor at Kansas State University’s College of Veterinary Medicine.

Eric Aubin, national account leader for DNA Genetics in Canada, liked the presentation by Dr. Julie Menard, a swine specialist from Quebec, who also provided tips on weaning.

Although the mood over the two days was generally upbeat, there was a dark cloud hanging over the proceedings in the form of the porcine epidemic diarrhea virus (PEDv) potentially crossing the border and infecting Canadian hogs. The concern was such that conference organizers tacked onto the program a panel discussion on the subject at the end of the first day, and substituted a panel and question and answer session on the subject to the program on the second day in place of a previously scheduled presentation.

Don Bridge (Champion Alstoe Animal Health), from Whitby, Ontario, reports that five PEDv cases have already cropped up in Ontario. “Producers are paying closer attention to biosecurity measures,” he says.

Standard Nutrition’s Jason McNaughton reports that his company is taking a new approach to preventing outbreaks of PEDv in Manitoba. The company has begun testing the preventive power of baking trucks and trailers at its site in Brandon.

“We bake the insides of trucks and trailers in our facility at 160 degrees Fahrenheit for ten minutes,” McNaughton says. “That should destroy any PEDV present.” If our initial tests prove successful, we hope to open this up on a commercial basis some time in March.”

Hutterite Colony members Waldner and Hofer sum it up best. “We will do our best in terms of bio-security and look to God to do the rest.”
**Scenes from the Seminar**

Federal Agriculture Minister Gerry Ritz participates in a media scrum after his funding announcement. Photo by Terry Hockaday

Jurgen Preugschas, an ALMA board member and producer, asks a question at the Boar Pit. Photo by Terry Hockaday

Geoff Geddes (right) chats with Ron Gietz at the Alberta Pork booth on the trade show floor. Photo by Sheri Monk

Dr. William Flowers, (left) and Dr. George Foxcroft after the tradition of the Foxcroft Honourary Lecture. Each year the Banff Pork Seminar pays tribute to swine research pioneer and industry icon, Dr. George Foxcroft with an honorary lectureship.

The 2014 lecture featured a presentation by Dr. William Flowers of North Carolina State University entitled “Gilt and sow management on farm with high sow longevity.” Photo by Terry Hockaday

What would a pork seminar be without ham? Photo by Terry Hockaday

It started with strong energy, delivered in spades with excellent speakers and discussion, and concluded with a call to action on a new threat. The backdrop was great weather and stunning scenery. All in all it was a dynamic opportunity for a broad cross section of the pork sector to talk progress and innovation to build a successful future.

BPS program director Ruurd Zijlstra kept his closing remarks short and simple, since many had stayed overtime for an extended Boar Pit session.

“Obviously the day ended with not the message we wanted to hear on PED, but of course we are very happy with the conference,” says Zijlstra. “The success is largely because of our great sponsors, our advisory board and our conference coordinator. We strive to have a good program with excellent networking opportunities and this is the tradition we plan to continue. Your feedback is important and we welcome it. We look forward to another great event in 2015.” Photo by Terry Hockaday

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Boar pit tackles PED bombshell

Just before the BPS boar pit session kicked off a bombshell had dropped – news of the first case of deadly pig virus “PED” confirmed in Canada. Understandably this topic dominated the session, which is designed as an open-format, no-hold-barred, frank and interactive discussion of the hot issues in pork production.

Leading the session were three panelists, including producer Claude Vielfaure, Dr. Doug MacDougald of SouthWest Ontario Veterinary Services and economist Steve Meyer of Paragon Economics, along with moderator Shannon Meyers of Fast Genetics.

Managing a potential crisis

Porcine epidemic diarrhea (PED) has become a major problem for the U.S. pork industry recently. Dr. Doug MacDougald has been at the forefront of Canada’s effort to understand and rally support for precautions to limit PED risk. He provided an update based on the day’s news.

“There’s a 500 sow farrow-to-finish operation confirmed positive as of today,” says MacDougald. “It’s a closed herd. At this point there is no short-list of probable introductions of the virus. The direction today is containment. The direction is also to follow contacts on where people, supplies and equipment have gone. As of today and tomorrow the focus is marshalling resources and doing extensive investigating. We will know 30 hours from now on at least the initial contacts to this farm if it has spread by those means or not.”

There is no need to raise panic, he says. “There are a lot of misconceptions on the manner and speed of how this has spread in U.S. It may be acting like a super virus, but folks it’s not. It’s a coronavirus, there’s good history and knowledge, and we know if it’s handled right in most situations, the track record is sow herds can eliminate this in 90 to 100 days.”

“The most important thing in a case like we’ve found today is put your arms around and contain it. That’s what’s happening now.”

More cases are likely and the industry is expected to enter a lock-down mentality to limit spread. Several participants noted the risk has been very high given the close interaction between the Canadian and U.S. industries, so while the news is not welcome it is also not surprising. The tone in the room reflected a resolve to make good decisions and work diligently to turn a challenging situation into a speed bump that will not derail a Canadian pork sector that has been looking very strong.
Faces and Places

Optimism and new Code
There was more to the Boar Pit session than PED.

Glass half full
The boar pit blocked time to make sure other topics could be discussed and one of these was the generally encouraging indications of what the future holds for the prospects of pork producers and their industry. Despite the news on PED, the overall outlook for Canadian pork production is very positive, says Steve Meyer of Paragon Economics. “In fact it’s excellent, particularly for the next two years.”

“It’s a very good outlook in terms of reduced costs and profitability,” he says. “We’re looking at profits of $25 per head for most operations and up to $40 per head from some of the top ones.” He noted he doesn’t see any further inroad of PED in Canada affecting price in a negative way.

Dissecting the Code of Practice
Also discussed was how Canada is closing in on a major milestone to complete a new Code of Practice for the care and handling of pigs. There has been a lot of debate around this particularly on the issue of sow housing. Consensus has been reached on the new Code but details will not be officially released until it is finalized in a couple months, likely in March.

Producer Claude Vielfaure has been involved in the Code development process and was asked, “In your mind what’s real in this new Code that will affect producers when it hits the ground?”

“Four things were probably the most contentious around the Code development table,” says Vielfaure. “Group housing. Space requirement for nursery and finishing. Euthanasia and enrichment. These were by far the hottest topics negotiated.”

On sow housing the clause in the draft Code has changed significantly based on producer and industry response during a Public Comment Period. “I think with this change the result reached will keep our industry competitive and hopefully most producers will be comfortable with it.”

U.S.-based Steve Meyer was asked his opinion. “We approach this differently in the U.S. The short answer is we see the Code approach as ‘Canada’s PED,’” he quipped, “We’d like it to stay on your side of the border.”

Jim Haggins asks a question about the PED discovery during the Boar Pit session. Photo by Sheri Monk
Jean-Guy Vincent of the Canadian Pork Council asks the panel a question. Photo by Sheri Monk

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With increased production a priority of every industry-minded person, it’s certainly no secret that producers look to take every advantage possible to make sure their herds are returning the biggest bang for their buck.

Brian Melody, technical service manager of PIC spoke during the morning breakout session, speaking about PIC’s ability to maximize returns.

“For over 50 years, PIC’s focus has been on improving the financial competitiveness and profitability of our customers,” Melody said. “This drive has been highlighted throughout the years in the establishment of aggressive goals. The by-product of these goals has been an acceleration of progress by production teams with support from PIC technical services to capture the genetic potential of the females and market pigs in the barns.”

The benchmark for many producers is the elusive “30 Piglets per Sow Year” goal.

“The speed at which 30 PSY has been achieved in multiple farms serves as a recent reminder of the power of people and genetics in reaching a previously unthinkable reality,” he said. “Today’s continuation of the tradition takes the form of the Triple 2s within the wean to finish discipline of our business.”

PIC’s Triple 2 concept is key to ensuring maximum productivity. Triple 2 is a set of performance goals defined as a 2 lb average daily weight gain, a 2.0 feed to weight gain conversion ratio, and a 2 per cent mortality rate.

Based on a 270 lb finishing weight, these numbers translate to 516 pounds of feed required for the animal to gain 258 pounds in 129 days.

Lofty goals, Melody says, considering the current industry averages sit at a 1.48 lb average daily gain, a 2.52 feed conversion ratio and 8 per cent mortality rate.

Melody says that PIC bases strong growth and return on production based on genetic potential.

“PIC leverages multiple practices to accelerate genetic progress, ranging from genomics, Genetic Nucleus Crossbred in formation, extensive performance testing information, and traditional BLUP selection processes,” explains Melody.

PIC bases these goals on a carefully selected breeding stock in order to better leverage genetic potential. However, sometimes the limits of the breeding stock can often affect production on the whole.

Melody explains that Leibig’s Law of Minimum, originally developed in regards to crop production but found to apply to raising animals, states that growth is controlled by the availability of its scarcest resource, rather than the total amount of resources available. Applied to crop growth, the concept states that increasing the amount of plentiful nutrients doesn’t necessarily result in an increased growth.

“Only by increasing the amount of the limiting nutrient, the one scarcest in relation to need, was the growth of a plant or crop improved,” Melody explains. “This can be demonstrated by a barrel with different staves at the length of limitation. The water level within the barrel of performance can only rise as high as the most limiting trait.”

“When we apply this philosophy to understanding constraints within a wean to finish system,” he continues, “we begin with a basic framework of multiple factors contributing to the results reviewed on lot closeouts. These constraints include facility design, water and feed availability, and husbandry practices.”
The amount of available water can have a drastic effect on production yield for pork producers. “Taking a look at one specific factor of production, water, we can find data that indicates that less than ideal water availability can cause production results to change,” Melody says, citing a 2008 study undertaken by the University of Iowa that concluded that 25 pigs per cup see an 11 per cent decrease in daily weight gain compared to eight pigs per cup in the nursery.

A previous 1989 study came to a similar conclusion. “Barber and others in 1989 found that when water flows through the nipple at 175 mL/minute in the nursery vs. 450 mL/minute, the gain is slowed by 20% and the pigs require 7% more feed to a common weight,” Melody said.

What does this mean to the average producer? Melody suggested that producers need take a close look at their facilities to determine what might be limiting their herd’s growth. “We recommend evaluating each facility to understand the most limiting factor relative to ideal production parameters and eliminating the lowest staves on the barrel within your system,” he suggests.

Speaker 2 – Matt Shoonderwoerd, Olymel, Red Deer, Alberta

Optimizing Returns from Slaughter

While the ultimate goal of every producer is to send their finished animal off for slaughter, Dr. Matt Schoonderwoerd of Olymel wants producers to ensure they’re doing everything they can to keep their business operating at peak levels by providing healthy and salable animals to their local packers. “Producers don’t realize what they are leaving on the table when shipping hogs for slaughter,” he explains. “There are numerous areas where one can improve the returns once you are aware of it. These improvements cannot be made overnight; they will take some concentrated efforts over time.”

Correct and legible tattoo placement is critical in ensuring producers get paid for every animal they deliver. Producers, Schoonderwoerd says, need to ensure they’re following correct tattoo requirements provided by the slaughterhouse. Otherwise, animals provided to the processor run the risk of not getting credited to the producer. “When the carcass is hanging on the line, one should be able to read the tattoo on the shoulder from left to right, with all digits completely visible,” he explains, stating that many producers incorrectly assume that slapping a tattoo anywhere on the animal is enough to prove ownership. “If you want to be assured that each hog you deliver is the hog you get paid for, the tattoo requirements must be followed exactly,” he says.

Common tattoo mistakes other than it being in the wrong location include the tattoo being applied upside down or sideways, not using enough ink and not all digits being completely legible.

Dead loss is another issue that producers can actively reduce. Schoonderwoerd says that loading procedures account for a majority of animals that arrive at the packing plant deceased. Situations that can prove fatal for animals include overcrowding on the trailer, loading chute width, presence of feed in the stomach and even how the animals themselves are loaded.

Many producers use electric prods to coax stubborn animals down the chute. Schoonderwoerd advises against this, as this can increase stress levels in the animal to fatal levels and can cause the pig to die during transport. Pigs who have recently eaten are especially vulnerable, as they can be difficult to get moving during loading. Pigs can also resist loading if they encounter a strong wind or a drastic change in lighting levels on the loading chute, such is the case when the animal is suddenly moved from a dark holding area to a bright sunny day outdoors. “The more we use the prod, the higher the dead losses,” he explains. “Yearly dead losses can vary markedly among

CONTINUED ON PAGE 52
producers from 1 to 65 per 10,000. You might say, okay, I have insurance. But is the insurance really necessary? How much do I pay per year for that, and what did I really lose?"

Schoonderwoerd recommends taking animals off feed as a standard practice. This not only makes the pigs easier to move and reduces dead loss during transport, it also reduces feed costs and can reduce carcass contamination at the slaughterhouse.

Currently sitting at about 9.3 per 10,000 animals, the most common reasons for a condemned carcass are abscesses – usually the result of wounds sustained in tussles with other animals. Peritonitis, an inflammation of the lining of the abdomen, is another common reason for carcass rejection.

Feed given to an animal prior to its slaughter usually just ends up on the kill floor along with the rest of the animal’s gut. While the ideal gut weight for an animal is roughly eight kilograms, Schoonderwoerd says that he has seen animals with gut weight in excess of 15 kilograms containing five kilograms of feed, although the average amount of feed found in killed animals is around 3.5 kilograms. Schoonderwoerd says that for producers that ship tens of thousands of hogs per year, that represents a significant amount of waste.

“A standard guideline is to take the hogs off feed 12 hours prior to loading for same-day kill, and six hours prior to loading for next day kill,” he says. “These hours will vary depending on the fibre content of the feed and the setup of the farm facilities.”

He also suggests that animals coming from bioshelters require even more time off of feed. Water, however, should still be offered to the animal.

Merely anticipating the time the animals spend in transit and waiting to be killed is not advisable, he says. Schoonderwoerd stresses that withdrawal from feed needs to begin while the animal is still on the farm.

While the total number of condemned carcasses has been on the decline over the past 15 years, Schoonderwoerd says that it is still a concern. Currently sitting at about 9.3 per 10,000 animals, the most common reasons for a condemned carcass are abscesses – usually the result of wounds sustained in tussles with other animals. Peritonitis, an inflammation of the lining of the abdomen, is another common reason for carcass rejection.

Less-serious abscesses can be trimmed by the processor, but this is still not a desirable trait to commonly find in a producer’s animals. Such penalties are called demerits, and refer to condemned portions of an animal that don’t necessarily result in the rejection of the entire animal. Arthritis, which can occur in one to 35 out of 1,000 animals, is also a common reason for demerits.

Evidence of infection from roundworm larvae can also cause a carcass to be rejected. Evidenced by liver spots on the animal caused by the larvae travelling throughout the body, they aren’t as common as they once were among farm animals. Producers can see a condemn rate of up to 38 per cent, with animals coming from bioshelters especially vulnerable.

Another uncommon, but still prevalent reason for rejection is mycoplasma pneumonia. Producers take various steps to ensure their herds remain free from pneumonia, but still need to monitor their abatement measures to ensure they are addressing the problem efficiently.

More common among producers are high rates of chest adhesions, resulting from systemic infections that can cause the animal’s lungs to adhere to the inside wall of the pleural cavity. Separating the lungs from the abdomen wall is time consuming for workers on the kill floor, and multiple affected animals from the same producer can cause the processing line to quickly grind to a halt.

“As a producer, you need to ask questions,” says Schoonderwoerd. “What is my standing in any one of the above areas? There has to be a valid reason why I am much higher in one or more of the above conditions. Can I really continue to operate like that?”

Producers should contact the packinghouse to get an idea of how their animals fare in these areas, and identify where problems lie, not only to ensure continued productivity for the packing plant, but also to ensure maximum return on their investment.
Sow Lameness, Longevity and Temperament Workshops

Contributed by the Prairie Swine Centre

The lameness, longevity and temperament of sows was the topic up for discussion at the recent set of workshops across Canada. Nearly 100 pig producers and allied industry representatives attended the workshops in Manitoba, Quebec, and Ontario to discuss the latest research in the areas of lameness, longevity and temperament and what we need to consider when selecting a sow for the future.

The agenda covered some recent research outcomes of the Canadian Swine Research and Development Cluster (CSRDC) funded by Swine Innovation Porc. The conclusions of research papers such as the new quantitative lameness assessment options and lameness levels in different sow housing systems were complemented by other up-to-date topics in this area, such as hoof trimming sows and economic analysis of lameness in sow barns.

Dr. Laurie Connor from the University of Manitoba introduced the day by explaining the vision behind the cluster research program. This vision brought together likeminded researchers from across Canada to address the issues surrounding lameness in our sow barns, looking specifically at the welfare and economic analysis of lameness and its impact on longevity. This research used conventional and new technologies to identify and evaluate factors such as social characteristics, sow temperament, lameness, calcium and phosphorus balance and early reproduction management that may impact sow welfare and longevity in the sow herd.

Dr. Connor went on to focus the group on what lameness is and where it occurs in the herd. Dr. Connor presented figures to show it is not just an old sow issue – recent Irish work found that 39 per cent of replacement gilts and 48 per cent of pregnant gilts were found to be lame in a study of over 68 sow herds (Quinn & Calderon Diaz. 2010).

One item covered in the workshops was the new options available to the industry that can quantify lameness.

Previously, lameness scoring has been subjective and differences could be found between assessors, and this had led to barns abandoning this practice. Dr. John Deen from the University of Minnesota suggested a simple two-scale scoring system was easiest – “Is she lame or not lame?”

Dr. Sabine Conte and Dr. Nicolas Devillers researched kinematics and force plate analysis as a way of objectively measuring lameness. The force plate takes measurements of pressure from all four feet as the sow stands in the crate. This analysis can therefore look to see if there is any weight differentiation among the four legs and therefore, any lameness. It is likely the force plate system would be the most economical to adopt in genetic company barns, and in the future could also be incorporated into an ESF feeder to provide a time-free lameness analysis for all gilts and sows over a long period of time.

Even within different group sow systems there are options for group sizes, flooring types, partitions, space per sow, dynamic versus static, and for feeder types. All of these factors impact the lameness levels that you will see.

Dr. John Deen discussed why lameness is underestimated in sow barns and how we might be able to learn from the Dairy industry, which continually works on lameness issues. Along with mastitis, dairy cattle lameness is cited as the most prolific production issue facing modern dairy farmers today, so why not also the pig industry? The trend for research in sows however, is increasing. In 2008, only six publications were available on sow lameness, but by 2013 there were already twenty nine.

CONTINUED ON PAGE 54
Longevity of sows is essential for improving costs of production. It is widely regarded that gilts do not pay for themselves until their third parity, therefore drop out prior to this is very costly. Dr. Deen showed that lame sows are less productive (see Table 1). So is it lameness or low productivity that leads to culling decisions? The sows that are being culled out prior to third parity on productivity issues could indeed be lame.

<table>
<thead>
<tr>
<th>Lameness Effects</th>
<th>Non-Lame</th>
<th>Lame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigs born/day</td>
<td>0.049</td>
<td>0.028</td>
</tr>
<tr>
<td>Days to removal</td>
<td>137</td>
<td>90</td>
</tr>
<tr>
<td>Avg days in herd</td>
<td>215</td>
<td>147</td>
</tr>
<tr>
<td>Replacement rate</td>
<td>49%</td>
<td>67%</td>
</tr>
<tr>
<td>Mortality/removals</td>
<td>0.24</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Calculated Productivity

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigs produced by sow</td>
<td>10.5</td>
</tr>
<tr>
<td>Pigs produced by replacement</td>
<td>6.6</td>
</tr>
<tr>
<td>Pigs produced</td>
<td>17.1</td>
</tr>
</tbody>
</table>

The afternoon started with temperament research with Dr. Jennifer Brown from the Prairie Swine Centre. Dr. Brown covered the different temperament types in sows and how they affect productivity in the barn. As the industry thinks about moving forward to group sow housing, the interaction between sows and stock people will grow, and more information will be needed in this area. The diverse range of group housing systems available will only add to the matrix of which sows will “perform” best in which systems. Recent work from the cluster found that sows with more passive and fearful traits had greater numbers of piglets born and born alive in the free access system, and confident sows showed a greater improvement of body condition score in slatted ESF systems. Temperament is heritable and is related to important production traits, so will we have specific sows for specific housing systems?

Dr. Laurie Connor also discussed housing systems and how it impacts lameness. Unfortunately, in this area there is not a one-size-fits-all answer. Even within different group sow systems there are options for group sizes, flooring types, partitions, space per sow, dynamic versus static, and for feeder types. All of these factors impact the lameness levels that you will see. Dr. Connor also reminded us that stock people are still incredibly important, and this echoed a point Dr. Deen made about using our eyes more when it comes to observing problems in pig production.

To finish the session, Dr. Yolande Seddon of the Prairie Swine Centre, presented work carried out outside the cluster on hoof trimming sows. Hoof trimming in other species is very common – cattle, sheep and horses husbandry is synonymous with hoof management, so why not sows? The FeetFirst®Hoof trimming chute developed by Zinpro Corporation allows easy and stress-free immobilization of the sow so trimming can be quick and efficient.

The day ended with general discussion, and many topics were addressed such as what can be done now to look at lameness in barns, and what else do we need to know before the industry can create a blueprint for reducing lameness levels. Areas of research that need to take place in the genetic barns were also discussed, such as the foot and leg which is so important, but currently it has no direct marketing value – unlike the P2 level or ham size. Will the industry need to forgo something to achieve selection for lameness or can we manage our way through it by considering flooring types and stockmanship first?

The bottom line on lameness:

- Lame sows wean on average six per cent fewer pigs per year. This equates to a loss of $5 per market hog sold from lame sows.
- Total costs per head associated with lameness could vary between $161–$447 per lameness diagnosis.
- This does not include the opportunity cost on lost production of an early culled sow.

Archived videos of the presentations can be found on-line at www.prairieswine.com
On-farm trial confirms the impact of overcrowded pens in the grower-finisher barn

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The revised pig Code of Practice released in March 2014 requires more space per grower-finisher pig. What does this mean for the bottom line of pig producers?

Introduction
Crowding pigs during the growing and finishing phases reduces feed intake and weight gain, and negatively affects carcass backfat and loin depth. A trial at a Hutterite colony in Northern Alberta was set up to investigate the effect of stocking density in pigs from ~ 70 kg body weight until slaughter weight on live performance and carcass characteristics. An economic analysis was performed to calculate the cost vs. benefit.

Trial set-up
Six pens measuring 8’ x 17.5’ (2.4 x 5.3 m) were used for the trial. Pigs were randomly allocated to pens with 15, 18 or 24 pigs/pen by sex, at a body weight of 70 kg. Standard stocking density in the barn was 24 pigs/pen. Pigs stayed in their pens until they reached slaughter weight. The trial was repeated three times between December 2012 and August 2013, giving a total of 18 pens, 6 per stocking density. All pigs were fed the same mash feed diet, based on a finisher ration, for the entire trial. Water nipples were located on the opposite wall from the feed trough. Body weight and feed intake were measured throughout the trial. At 118 kg, pigs were shipped for slaughter to Olymel (Red Deer, AB) and were processed following typical commercial procedures. Carcass grading information was obtained for each individual animal.

Crowding
For each pen and each one- or two-week period, it was calculated if the pen was crowded. Crowding was defined as having more pigs in the pen than allowed by the revised pig Code of Practice. The pens at the colony were 12.8 m². Dividing the pen space by the space requirement per pig (calculated as \( k \times BW^{0.667} \) with \( k=0.0335 \) and \( BW=\)body weight) provided the number of pigs that could be housed in the pen without being crowded. Table 1 shows how many of the 6 pens per stocking density were crowded during the trial.

<table>
<thead>
<tr>
<th>Pigs/pen</th>
<th>Days on trial</th>
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<tbody>
<tr>
<td>15</td>
<td>0 14 28 42 49 56 63 70 77 84</td>
</tr>
<tr>
<td>18</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>24</td>
<td>6 6 6 6 6 5 3 1 0 0</td>
</tr>
</tbody>
</table>

Pens with 15 pigs/pen never experienced crowding. Some pens with 18 pigs/pen experienced crowding between d 28 and 49 of the trial, while all pens with 24 pigs/pen experienced crowding until d 49, and some pens until d 70 of the trial.

Live performance
For the first 42 days of the trial, average daily feed intake (Figure 1) and weight gain (Figure 2) were lower for pigs in pens with 24 pigs than for pigs in pens with 15 or 18 pigs. Feed conversion, however, was not affected by stocking density. After the first pigs were sent for slaughter (first pull),
average daily feed intake and weight gain were no longer affected by stocking density. Feed conversion was again similar among pens with 15, 18 and 24 pigs/pen.

Weight gain progressively decreased in the weeks before pigs were sent to slaughter (first pull), but there was an increase in growth rate in the weeks after the first pigs were shipped for slaughter (d 50–56 for pens with 18 pigs/pen, and d 57–63 for pens with 24 pigs/pen; see Figure 2). This increased weight gain coincided with the timing where most pens went from a crowded to a non-crowded situation (see Table 1). For pens with 15 pigs/pen, weight gain did not increase after the first pigs were shipped for slaughter, as these pens were not crowded before the start of shipping for slaughter. After this short weight gain increase in crowded pens, weight gain decreased again until the end of the trial, reflecting that pigs shipped after first pull were not the fastest growing.

These results clearly showed that crowding negatively affects weight gain, but crowding is alleviated immediately after first pull, benefiting the remaining pigs.

Carcass traits

Shipping for slaughter started at d 43 for pens with 15 and 18 pigs/pen, and at d 50 for pens with 24 pigs/pen. The last pigs were shipped for slaughter after 91 days on trial. It took the pigs from pens with 24 pigs 8 days longer to reach slaughter weight than pigs from pens with 18 pigs (Table 2). There was no difference in days to market for pigs from pens with 15 and 18 pigs.

Stocking density did not have an effect on ship weight, carcass weight, dressing percentage, loin depth, lean yield, index and loin bonus. Backfat tended to be 1.4 mm thicker in pigs from pens with 15 pigs compared with pigs from pens with 24 pigs, reflecting a mild feed restriction for pens with 24 pigs/pen (Table 2).

| Table 2. Effect of stocking density on carcass traits of growing-finishing pigs |
|---------------------------------|---|---|---|---|
|                                | Density (pigs/pen) | 15  | 18  | 24  |
| Days to slaughter              | 59.9<sup>a</sup>   | 58.1<sup>b</sup> | 65.9<sup>a</sup> | <0.01 |
| Ship weight (kg)               | 117.7              | 117.9          | 117.2          | 0.15  |
| Carcass wt (kg)                | 95.8               | 95.9           | 95.5           | 0.77  |
| Dressing (%)                   | 81.6               | 81.3           | 81.4           | 0.86  |
| Backfat (mm)                   | 18.5               | 18.3           | 17.1           | 0.08  |
| Loin depth (mm)                | 62.6               | 63.2           | 62.2           | 0.68  |
| Lean yield (%)                 | 60.8               | 61.0           | 61.4           | 0.17  |
| Index                          | 110.8              | 112.5          | 112.4          | 0.27  |
| Loin bonus ($)                 | 2.25               | 2.78           | 2.87           | 0.72  |

<sup>a,b</sup> Within row, means with a different letter differ from each other (P<0.05)

Economics

Feed cost was not affected by stocking density, both when expressed per pig and per kg of body weight gain. The income-over-feed-cost per pig, calculated as the average pen revenue from carcasses minus the feed cost for that pen, was also not different among pigs from pens with 15, 18 or 24 pigs, but was greater on a pen basis for pens with 24 pigs compared with pens with 18 or 15 pigs.

An economic analysis was performed by Prairie Swine Centre to estimate the economic impact of decreasing stocking density from 24 to 18 pigs/pen. Some assumptions for this model were:

- Revenue per pig was the same regardless of stocking density
- Total costs for labour, feed for nursery and grower diets, certain miscellaneous costs and fixed costs were the same regardless of stocking density
- Finisher diet costs depended on feed conversion ratios obtained in the trial
- The number of pigs marketed per year depended on ADG obtained in the trial, and was based on a barn marketing around 17,500 pigs/year when having 24 pigs/pen.
- Certain miscellaneous costs and costs for water and manure handling were fixed per pig, and were therefore higher as stocking density increased

The analysis showed that net earnings per pig were $ 5.75 lower for a stocking density of 18 pigs/pen compared with 24 pigs/pen, which for a barn shipping 17,500 pigs/year meant a loss of net earnings of 223,000 dollars.

Conclusion

Under the conditions in this trial, when pigs were kept in pens of 15 or 18 pigs, pigs performed similarly; their overall weight gain, feed intake and feed conversion were not different, days to market weight was not different and carcasses from pigs of these pens were similar as well. However, when pigs were housed 24 pigs per pen, their feed intake decreased. This decrease in feed intake was likely due to difficulty to get to the feeder, and/or competition for space at the feeder. Therefore, results could be different in barns with other layouts and feeders. In this trial, stocking densities in pens did not influence feed conversion. Therefore, the decreased feed intake in pens with 24 pigs resulted in a lower growth performance. Consequently, it took pigs from these pens longer to reach market weight than pigs kept in pens with 15 or 18 pigs. Stocking density in pens had minimal effects on carcass characteristics and income-over-feed-cost per pig. An economic analysis showed that, although a stocking density of 24 pigs/pen resulted in less barn turns per year, it was economically more beneficial than a stocking density of 15 or 18 pigs/pen.

The revised pig Code of Practice allows a decrease in space of up to 15% for grower-finisher pigs at the end of the production
phase if the higher densities don’t compromise the welfare of the animals as determined by weight gain, mortality, morbidity and treatment records, as well as the absence of or no increase in vices such as tail-biting. Pens with 24 pigs/pen were crowded for the first 56 days of the trial and showed decreased weight gain. Pens with 18 pigs/pen only experienced crowding for about 2 weeks, and did not show decreased overall weight gain compared with pigs housed 15 pigs/pen. Therefore, for this barn a stocking density of 18 pigs/pen would be recommendable under the revised pig Code of Practice.

Acknowledgements
We would like to especially thank the pig barn manager and the members of the colony for their great efforts weighing feed and pigs, and for managing the trial. We also thank Ken Engele for performing the economic analysis.

Figure 1. Average daily feed intake of pigs in pens (8’ x 17.5’, 2.4 x 5.3 m) with different stocking densities (15, 18 or 24 pigs/pen). Means based on 6 pens per stocking density. Within period, columns with different letters (a, b, c) differ (P<0.05).

Figure 2. Average daily weight gain of pigs in pens (8’ x 17.5’, 2.4 x 5.3 m) with different stocking densities (15, 18 or 24 pigs/pen). Means based on 6 pens per stocking density. Within period, columns with different letters (a, b, c) differ (P<0.05).
Research into New Pig Pathogen Looking for Solutions

Contributed by Alberta Livestock and Meat Agency Ltd.

*Brachyspira hampsonii* (*B. hampsonii*) is a newly emerged pathogen that causes diarrhea in grow-finish pigs. This pathogen was originally identified in Alberta, and shortly after in the U.S. mid-west. It is a Western Canadian problem with new cases each year and no effective vaccine. The bacterium targets the large intestine causing inflammation and cellular damage. Unfortunately, how the bacterium causes diarrhea is unknown.

Although it can result in death in the most severe cases, most pigs recover from the diarrhea. However, the disease can cause major economic losses with increased mortality, reduced growth rates and feed efficiency, and added medications.

In partnership with the Alberta Livestock and Meat Agency (ALMA), a team of University of Saskatchewan researchers, led by Dr. John Harding, is studying *B. hampsonii* to discover how it causes diarrhea in affected pigs.

“In order to create an effective vaccine, we need to know how the pathogen causes disease. To do this, we have created a unique multidisciplinary team with experts in physiology, microbiology, pathology and swine medicine”. Dr. Harding explains “Although *B. hyodysenteriae*, the cause of swine dysentery, was discovered about 40 years ago, we know very little about the mechanism by which it causes diarrhea. We know less about *B. hampsonii*, a relative of *B. hyodysenteriae*, discovered in Western Canada in 2010. Clearly, there are large knowledge gaps to be filled.”

To study *B. hampsonii*, Dr. Harding’s team will develop cell lines to better understand the interactions between *B. hampsonii* and other pathogenic *Brachyspira* and the animal’s intestinal cells.

“There are several different ways that bacterial pathogens, such as *Brachyspira*, cause diarrhea. Some release toxins, other directly damage intestinal cells.” Dr. Harding said, “Developing appropriate cell lines to mimic what is happening in a live infected animal will enable our team to precisely identify specific changes in the intestinal cells over time that ultimately lead to the development of severe diarrhea.”

The work being done by Dr. Harding’s team is a necessary step towards creating a novel vaccine to combat *B. hampsonii*. A vaccine, in turn, will help to control the pathogen, thereby reducing the need for antimicrobials, preventing production losses and improving animal welfare.

Clint Dobson, ALMA’s Senior Policy and Research Manager said, “Obviously we never want to see a new pathogen emerge, especially one that can cost the producer $7 a pig. But these pathogens do appear. Dr. Harding’s research is the first step in determining the best approach to treatment, control and ultimately prevention of *B. hampsonii* infections.”

For more information, contact Dr. Harding directly.
Prairie Diagnostic Services Upgrades Testing Technology, Broadens Service Offering

Contributed by Alberta Livestock and Meat Agency Ltd.

Located at the Western College of Veterinary Medicine in Saskatoon, Prairie Diagnostic Services (PDS) provides commercial testing services for animal health. It handles a significant amount of the laboratory diagnostics for large animals in Western Canada, including cattle, pigs, poultry and bison. PDS has the largest capacity and the most diverse test offering of the three publicly-funded veterinary labs in the West. With support from the Alberta Livestock and Meat Agency (ALMA), Western Economic Diversification Canada (WD), the Saskatchewan Ministry of Agriculture’s Agricultural Development Fund (ADF), and the federal-provincial-territorial Growing Forward 2 framework, PDS is looking to broaden the diagnostic services it offers to Western Canada’s meat and livestock industries.

PDS and ALMA are currently involved in two projects that began early in 2013: a research project in partnership with the Saskatchewan ADF and a strategic project in partnership with the federal government through WD.

The research project is aimed at improving the diagnostic significance of testing for enteric and respiratory diseases. Comparing the detection rate of specific microbiological agents from cattle and pigs infected with the disease to those in clinically unaffected animals will help improve current diagnostic methods. The target pathogens selected for this project were chosen because of the challenges that clinicians and laboratory diagnosticians have in providing a definitive diagnosis for these diseases.

The research will increase the collective knowledge of the industry when it comes to enteric and respiratory diseases. The data generated will help develop more comprehensive testing for a growing number of target pathogens, resulting in increasingly accurate and convenient testing. More importantly, increased testing will lead to better disease monitoring, revealing new insights into which pathogens play a role in wider outbreaks. This information will allow industry to prepare for and prevent future outbreaks.

Marilyn Jonas, CEO of PDS, said, “Improving our testing technologies pays off in terms of helping veterinary practitioners in identifying targeted treatment for the specific pathogens that an animal is infected with. As we improve our detection abilities, we, and the veterinarians that we work with, gain a better understanding of which pathogens are most prevalent as the source of these diseases. We also gain a better understanding of how disease evolves and how it presents itself in new ways. That information can then be used by practitioners to work with livestock producers to develop more effective management strategies to prevent and treat disease. Our job is to provide support to veterinarians in the field, and through them, to the industry as a whole.”

In support of the improvement of current testing methods for enteric and respiratory disease in pigs and cattle, ALMA, PDS and WD have partnered on a strategic initiative that is adding new testing capacity to the lab, primarily in molecular diagnostics and toxicology. The test development in molecular diagnostics supports a number of new test methodologies, including those used for the enteric and respiratory project. The addition of Liquid Chromatography–Mass Spectrometry (LCMS) to the lab adds capacity to do organic toxicology, a service new to PDS. This new testing service is one that offers significant opportunity to add value to health management in the livestock sector.

A first area for development was setting up a complete quantitative analysis for ergot and mycotoxins in feed. Currently, if contaminated feed is suspected, samples are most often shipped to the United States for this testing. This new diagnostic capability—a first for Western Canada—is possible with the investment from WD for the equipment and ALMA’s funding for a technologist and laboratory supplies to support test development. Once this capacity is fully developed, the resources will be applied to introduce additional organic tests to support the livestock sector.

Jonas said, “One of our priorities is to consistently increase the range of services available to the livestock industry in Western Canada. The new toxicology service is going to reduce wait times on testing and also reduce our dependence on American labs to support our industry.”

Gordon Cove, ALMA’s president and CEO, said, “PDS handles most of Alberta’s large animal testing, so any increase in their diagnostic abilities has a direct benefit to our industry in terms of more accuracy and quicker results and treatment. What sets these projects apart is that the benefits are shared across Western Canada to improve animal health.”
Of salt and spring…
The battle of the sexes is fought in the kitchen, and the weapons are wine and swine.

By Sheri Monk and Pierre Laberge
I always really look forward to our Swine and Wine Me cook-off, but it seems we have such a hard time making the time for it! Nonetheless, we finally did just before deadline, and it was a fun time as always.

This time I selected back ribs, purchased from Sobeys in Pincher Creek. I’ve started to notice that we have too few cut selections available in most grocery stores. Obviously, this is the result of consumer preference, but it shows that we need to do more as an industry to educate our consumers about the different cuts that can be available, and how to prepare them. (Easier said than done, I know.)

That said, back ribs have long been a favourite of mine, and they are so versatile. Technically, I guess even a large roast can be versatile, but

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Sheri Monk’s Jägermeister back ribs, inspired by Scott Hibb

**Ingredients**
2 baby back rib racks  
Fresh coarse ground black pepper  
1 tablespoon ground red chili powder  
2 1/4 tablespoons vegetable oil  
1/2 cup minced onion  
1 1/2 cups water  
1/2 cup tomato paste  
1/2 cup white vinegar  
1/2 cup brown sugar  
2 1/2 tablespoons prickly pear cactus honey  
2 tablespoons Worcestershire sauce  
2 teaspoons salt  
1/4 teaspoon fresh coarse ground black pepper  
4 ounces of Jägermeister  
2 teaspoons garlic powder  
1/4 teaspoon paprika  
1 tablespoon dark molasses

**Directions**
Preheat oven to 300°F (150°C). Cut each full rack of ribs in half, so that you have 4 half racks.
Sprinkle salt and pepper (more pepper than salt), and one tablespoon chili pepper over meat then wrap each half rack in aluminum foil and bake for 2.5 hours.
While the ribs are baking, heat oil in a medium saucepan over medium heat and cook and stir the onions in oil for five minutes. Stir in water, tomato paste, vinegar, brown sugar, honey, and Worcestershire sauce. Season with 2 teaspoons salt, 1/4 teaspoon black pepper, Jägermeister, garlic powder, paprika, dark molasses, and 1/2 tablespoon ground chili powder.
Bring mixture to a boil, then reduce heat. Simmer for 1 1/4 hours, uncovered or until sauce thickens. Remove from heat, and set sauce aside. Preheat an outdoor grill for high heat.
Remove the ribs from the oven, and let stand 10 minutes.
Remove the racks from the foil, and grill the ribs for three to four minutes on each side. Brush the sauces over the ribs at the last minute otherwise the sauce will burn, which will alter the flavour. Serve leftover sauce in a small dish with the meal.

**Sides:** Bacon-wrapped steamed then grilled asparagus  
**Wine:** Splattered Toad Shiraz, South Africa  
**Dessert:** Carrot cake, gopher style
ribs just seem to naturally fit with so many different flavour variations. Plus, they are perfect for barbecuing and somewhere in the back of my head, I was convinced that spring might actually show up sometime before Christmas.

Pierre turned to mensjournal.com and found a tantalizing formula called Baby Back Pork Ribs with Milanese rub. (It almost sounds like a high-end spa treatment in an upscale hotel). We had two racks of ribs each to work with, so Pierre had to scale his recipe back accordingly. He chose to augment his dish with maple-flavoured beans and steamed sugar snap peas.

After some Googling, I found a recipe on Food.com called Scott Hibb’s Amazing Whisky Grilled Baby Back Ribs. They did look amazing, but I decided to use that recipe as a base, and switch it up a little. (For the record, I have no idea who Scott Hibb is, but I’d like to thank him for his recipe!) For my side dish, I chose asparagus, then decided later to wrap them in bacon when I saw Pierre’s recipe called for pancetta, which is an Italian bacon! I switched out very little from the original recipe. I cut out liquid smoke, replaced the honey with cactus honey, used chilli powder instead of ground chili pepper, eliminated the onion powder, and used Jägermeister instead of the whisky. In fact, I used a lot more of it too. The recipe called for two tablespoons of whisky, but I used four ounces of Jäger.

For the dessert, I made a carrot cake, which is Pierre’s favourite kind. I obtained the recipe from an old neighbour in Winnipeg, and have stood by it ever since. The icing was a cream cheese icing for which the recipe also came from my neighbour... but with a twist. Every year, it has become a tradition to make a carrot cake, decorated with a gopher to herald the coming of spring (and the opening of gopher season!).

He said

Pierre’s Baby Back Pork Ribs with Milanese rub – 4/10

I never follow recipes very well, and this meal was no different. I never cook with kosher salt, and assumed I could use good natural salt as long as I cut the quantity by half. The recipe called for about an hour in the oven, which I tried to follow blindly. It turns out that I should have just followed my heart – or my stomach – this time. My ribs were not as tender as I’m used to, and way, way too salty. The dry rub added a nice texture, which I always like, and the overall taste was good, so I’ll have to try this recipe again, once I tweak it a bit. I used snow peas as a side dish, and steamed them when I should have blanched them. Overall, not very good results.

But really, I should have known. I tried a similar dry rub recipe on one of the first dates Sheri and I had, with similar pitiful results. She kept me around then, I’m hopeful she’ll keep me around now.

Sheri Monk’s Jägermeister back ribs – 7/10

Sheri’s ribs tasted better, even Tanner said so – Sheri’s youngest son. It was sweet and tangy. The meat itself was similar, as she decided to not follow her recipe, and cooked it the same amount of time as mine. Same action, same result. The bacon-wrapped asparagus were not as inspiring-looking as expected, and we both ended up pushing the asparagus aside. When I looked at Sheri eating her bacon, she said, “What? The bacon fell off!”

I love spring, and Sheri believes it’s time to celebrate when the gophers are out. So she used this Wine and Swine as an excuse to make her famous gopher cake – a carrot cake that became a tradition in our family. Just for the cake, that meal was a 7 out of 10.
Our choice of wine brought a nice surprise. My Stoneleigh (Pinot Noir) was drab, but the Splatter Toad was absolutely refreshing! We opened another bottle right after!

She said

**Pierre’s Baby Back Pork Ribs with Milanese rub – 5/10**

This would be an awesome recipe if it weren’t so salty. When I was typing this report up, I realized how much salt it called for, and at 3/4 cup, it seems very excessive regardless of what kind of salt is used. But other than that, the flavour was excellent. As soon as I saw Pierre zesting the lemons, I thought I would be beat... I am a huge citrus fan in cooking and in desserts. And then once I saw the Italian bacon come out, I started to panic, which is when I decided to wrap my asparagus in bacon. I really want to try this again – after cutting down on the salt.

The beans were a nice touch, but I like my peas raw. The Pinot Noir was just rather... bland. It had no life. But huge kudos to Sobeys for their aptly named Lemon Bliss cake. It’s THAT good. In fact, it’s probably the single-best dessert I’ve ever had that came out of a grocery store. And it’s reasonably priced, and in a portion size that makes sense. Too often I skip buying cakes at the grocery store because I really don’t need to eat cake several days in a row, and even if I did, there isn’t usually enough room in my fridge for it.

**Sheri Monk’s Jägermeister back ribs – 9/10**

I’ll be honest – this rating is coming as a direct result of the ribs, because I really, really enjoyed the flavour they had. I’m not much of a vegetable girl, so the failure of the asparagus didn’t bother me in the least. In fact, it was more like, “Free bacon!” I guess if I had to include the asparagus, I would lower it to an eight.

This recipe was super easy to make, and I enjoyed it much more than I thought I would. I suppose, after reading Pierre’s report, that they weren’t as tender as they could have been. The recipe did call for baking them for 2.5 hours, but when I saw Pierre’s called for just one hour, I decided to stray from the recipe to better co-ordinate preparation times. Maybe I shouldn’t. However, the tenderness factor didn’t bother me when I was eating my ribs, or Pierre’s... so maybe I’m just not fussy when it comes to that.

I loved the Splattered Toad wine, and I have since bought two more bottles to keep in-hand. At $16.99, it’s affordably priced, and it’s a peppy, lively enough wine to satisfy veteran wine drinkers, but entry-level enough not to alienate newer drinkers who may not have developed their palate yet. The gopher cake is a fun tradition, but I wish I could make fancier cakes with the amazing three-dimensional decorating that some people are so gifted with. The truth of the matter is that I can hardly draw a stickman, and my lack of artistic skill is clearly demonstrated in my cake. But as always, it tasted great and didn’t last very long in our house.

*If you have a recipe you would like us to try, please send it to sherimonk@gmail.com, and if you’ve tried one of ours, let us know how it turned out! We would love to publish your results and a photo of your dishes.*
Hello there, fellow bacon connoisseurs! It’s time again for Your Daily Bacon!

For this installment we are going to take a look at celebrity bacon. That’s right, pork isn’t limited to memes and extreme recipes! Of course there will be memes in this issue’s offering as well. But first we are going to take a peek at a few of our porcine pals in literature, television and film. Not only that, we are going to decide whether the celebrity porkers should be famous, or just bacon.

First on the agenda we have Napoleon. Not the French military genius, but one of the protagonists from George Orwell’s famous allegorical novel, Animal Farm, in which the animals on a British farm stage an uprising against the farmer when his love for drink causes him to fail to care for and feed his stock. The animals, inspired by an old boar by the name of Major, run the farmer off the farm, and take it over for themselves. Led at first by a pair of boars - Snowball and Napoleon – the newly in charge livestock create their own society, a model of Communism. Napoleon eventually takes all the power for himself, banishing Snowball, thus becoming a dictator of Animal Farm and changing the set of governing rules the animals had set forth for their society. Before it was all over, Napoleon and his pig cronies reduced the rules the animals had established for themselves to one credo, “All animals are created equal, but some animals are created more equal than others.” It ends with the other farm animals realizing that the pigs had become non-discernible - literally and figuratively - from the humans they overthrew.

The charges: backstabbing, political manipulation and corruption, and of course, dictatorship. He’s probably the most deserving of a bacon verdict, if any pig has PED coming to him, it would be Napoleon. But every pig gets their day in court here at “Your Daily Bacon”!

The Verdict: BACON

Next on the docket, Wilbur the Pig, from the charming children’s story, Charlotte’s Web. Wilbur learns of the fate he faces when he reaches adulthood. A compassionate spider devotes herself to saving him from that fate. She spins seemingly miraculous webs extolling Wilbur’s “virtues”. “Seemingly” because she’s just good with words, but the people who come to see Wilbur and the webs Charlotte created for him don’t know that they had been fooled by a spin-doctor.

The charges: Willful self-misrepresentation, fraud, and colluding with another in order to prey on the gullibility of simple farm-folk.

The Verdict: BACON

Okay, now here we have an interesting subject, Porky Pig. This little piggy runs around in a jacket, but with no pants!

The charge: social deviancy and indecent exposure.

The Verdict: Th-th-th-that’s all folks! BACON!
Next we have a plucky little pig who dreamed of being a sheep-dog. We are talking about the movie *Babe.*

**The charge:** Okay, the prosecution does not have much of a case on this one. The pig COULD herd sheep quite well, after all. But it is our considered opinion that any pig with such deep-rooted delusions could only serve to be a danger to himself and others, and should be remanded to a mental institution. Unfortunately, there are no such institutions for pigs, so that’ll do, pig!

**The verdict:** BACON!

We had hoped to place mug shots of the culprits here for all to see, but decided we did not wish to become bacon ourselves by violating copyright laws, so just imagine pictures of them with “BACON!” stamped across their images in big red letters. Instead of mug shots, we chose to bring you some memes that are sure to make you chuckle.
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