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Cover Photo
A biosecurity poster greets attendees at a producer PEDv information session in Lethbridge on March 18. Alberta Pork hosted several sessions across the province throughout February and March to provide producers with the most recent information on the outbreak. *Photo by Sheri Monk*

PED Coverage – Biosecurity

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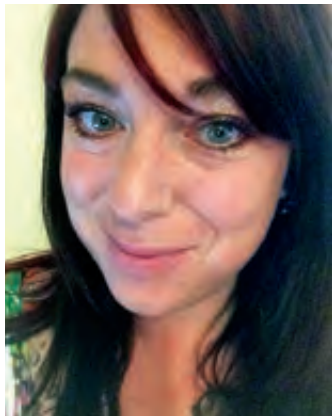

Western Hog Journal

Message from the editor

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

CONTINUED ON PAGE 6

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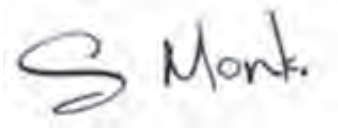
be a really worthwhile endeavour to call your local group and touch base to see how they are working on your behalf. It's also a wonderful opportunity to give them new ideas, or to let them know of challenges or issues that may be on the horizon.

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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Western Hog Journal

News and Views from Far and Near

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 Genesus," said Mike Van Schepdael, vice-president of Genesus.

New territory manager at 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.

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

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 polisher 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

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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% Tylvalosin 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% Tylvalosin 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 annnoyed 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

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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

CONTINUED ON PAGE 16

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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

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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

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 entertis-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."

Outside shoes must be removed before entering a secure zone.

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.

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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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Boots are donned in a Danish entrance to a pork facility.

Clean coveralls are an important biosecurity measure.

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

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.

A shower in a Danish entry.

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

All photos courtesy Alberta Pork

Porcine Epidemic Diarrhea has been described by epidimiologists 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 to comes to PED's hardiness, it's all in the genes.

"The genetic make-up of the virus is what makes to 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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Using the proper cleaning agents is key to getting a truck clean.

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 (32°C 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.

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.

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 65°C 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." ■