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Western Hog JOURNAL

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SMS Average All	22.58	22.94	23.30	23.80
Genesus Average All	26.41	26.55	26.78	26.82
SMS Bottom 25%	18.98	18.82	19.72	20.16
Genesus Bottom 25%	24.89	25.17	25.19	25.26
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Cover Photo
Grower pigs at Greenwood Colony, Fort Macleod, Alberta

Pigs Down Under

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Western Hog Journal

Editor's Notes

In November, Australian pig producers voluntarily decided to phase out sow stalls completely by 2017, in response to consumer demands, the first time that a producer body has agreed to such a change without legislation. This was swiftly followed by the announcement of new codes of practice in New Zealand that will also phase out sow stalls. The new codes will limit the use of sow stalls to four weeks after mating in 2012 and ban the practice by the end of 2015. Readers will know that producers in the EU are just two years away from their deadline for moving to group housing except for a four-week period during gestation. As our correspondent Stuart Lumb explains in this issue, some countries such as Denmark and the Netherlands are well prepared for the change, but others such as France have barely started to adapt. Other countries such as the UK and Sweden have had a sow stall ban in place for a considerable time.

The phasing out of stalls in both the UK and Sweden led to a severe contraction of their industries and a huge increase in pork imports. Producers in the UK fought back with a campaign based on their high welfare standards compared to competitors and now command a good premium for their pigs compared with most other European countries. They continue to be extremely active in promoting home produced pork in order to maintain demand. As the rest of Europe moves towards group housing, those premiums may be eroded. However, the most important outcome is likely to be that the EU pig industry shrinks significantly because many producers will shut down production or convert their barns to finishing only.

These changes have interesting ramifications for the Canadian industry, which exports a large amount of pork to Australia and New Zealand, although not currently to the EU. Producers and their representative organizations will do everything possible to defend and expand the home market for their products and both Australia and New Zealand have embarked down the route followed by British producers by introducing a rigorous QA program and a quality mark to identify domestic pork in the store. If they are successful, the opportunities for Canada in their markets could be reduced, unless the industry responds by gearing up to produce pork in systems without stalls. ■

Barrie Peet

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[1] Patience, J. et al. 2006. "Effect of Ractopamine in Finishing Swine Diets on Growth Performance, Carcass Measurements and Pork Quality." Prairie Swine Centre Inc. Data on file.

11-11-0218-01212009

Canadian Bio-Systems wins award

Canadian Bio-Systems Inc. has been presented with the 2010 Company of the Year Award by BioAlberta. Company of the Year is awarded to member companies who have shown a commitment to innovation and entrepreneurship, have a science based business foundation and have demonstrated strong sales growth and market share both domestically and internationally.

Headquartered in Calgary and established in 1984, Canadian Bio-Systems develops, manufactures and distributes enzyme, flavour and yeast based supplements for the global livestock and aquaculture markets.

BioAlberta is the central voice and the organizing hub for life sciences in Alberta and advocates for, promotes and proactively facilitates the growth of Alberta's life science sector. For further information, contact Canadian Bio-Systems at info@canadianbio.com.

Mycotoxin menace in this season's grain

Researchers and nutritionists have been warning producers that due to the wet and cold growing season in 2010, mycotoxins are likely to be present in many feed grains. The most common of these is deoxynivalenol (DON), a vomitoxin that results in reduced feed intake and slower growth in nursery and finisher pigs.

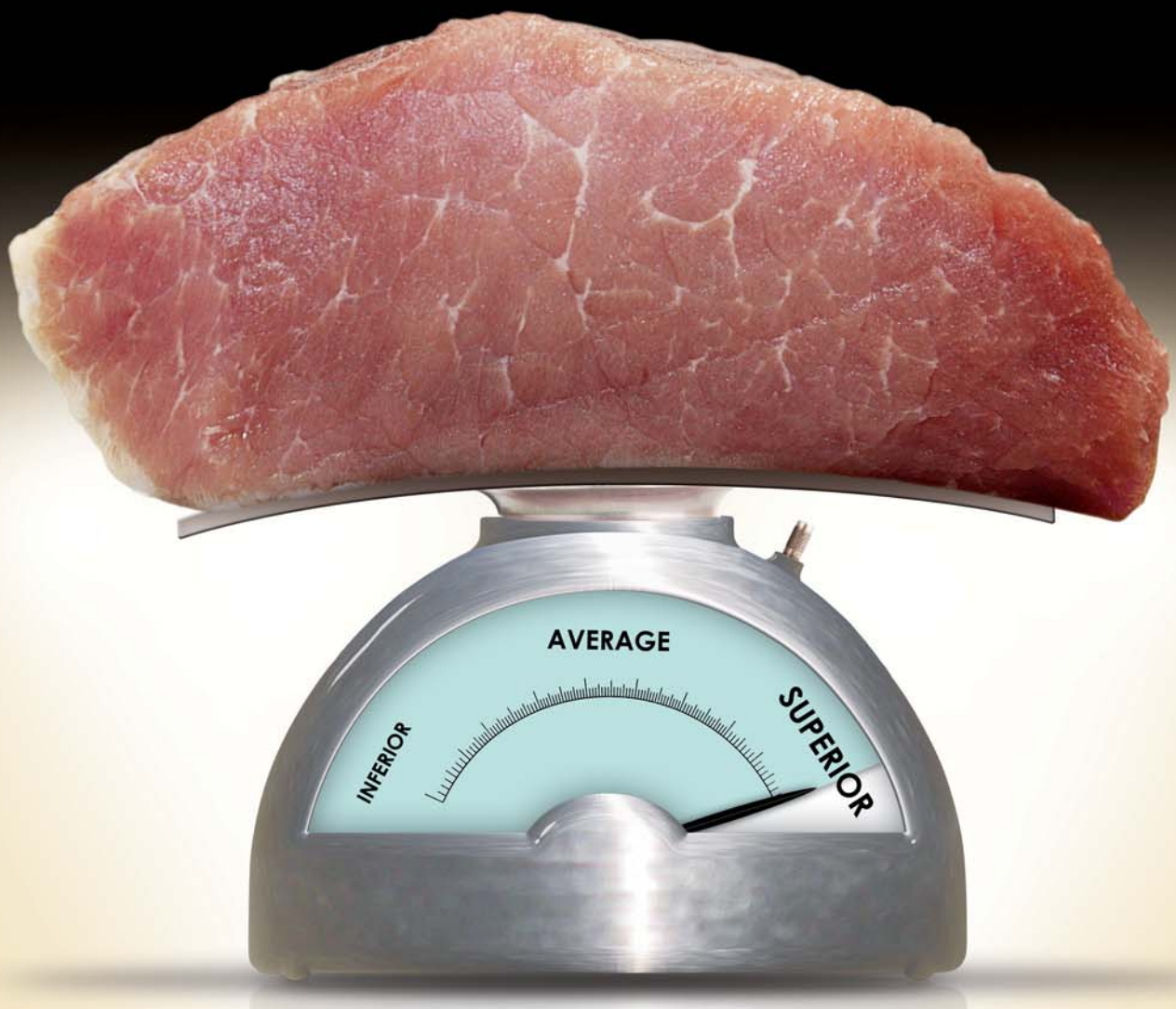
"Some decrease in feed intake will likely be seen if DON contamination exceeds 1 ppm," says a recent factsheet produced by the Prairie Swine Centre (PSC). "In research conducted at the Prairie Swine Centre, feed intake and daily gain of late nursery pigs decreased 9.1 and 5.2% respectively, when pigs were fed diets containing 1.57 ppm DON for 22 days," it comments. "Although pigs may vomit at high levels of DON contamination (~20 ppm) it is more likely that they will refuse feed completely (~12 ppm) before that occurs." Younger animals will be more severely affected than older animals, the factsheet observes. "While the general recommendation for swine is to limit DON in diets for pigs to less than 1 ppm, a maximum of 0.5 is preferable for nursery pigs," it continues. "While there doesn't seem to be direct negative reproductive effects from feeding DON contaminated diets to breeding stock, the reduced feed intake itself may be a problem. Therefore, DON contaminated feeds should be avoided in diets for breeding stock whenever possible."

Testing for mycotoxins is advised because levels of DON as high as 5ppm have been identified in this season's grain. However, sampling needs to be carried out in the correct way to get an accurate result warns PSC. "It is difficult to get a good sample of grain to test for mycotoxin contamination," the factsheet points out. "There is usually a great deal of variation in the amount of mycotoxin present from one area to another within a truck

Moulds on corn and other grains may result in unacceptably high levels of mycotoxins in pig diets

CONTINUED ON PAGE 8

Superior Genetics



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or bin. Therefore, it is easy to get false negatives or lower or higher values than is actually present in the overall grain. Combining small samples from several different areas will help you be sure that a representative sample has been obtained."

Testing allows contaminated grain to be mixed with clean grain so that the level of mycotoxins can be kept within recommended levels. For sensitive stages of production such as nursery pigs and lactating sows, it is best to avoid mycotoxins in the diet. "If possible, feed contaminated grains to less sensitive species and use clean grains in swine diets," advises PSC. "Cleaning grain to decrease dust and small shrivelled kernels helps lower the concentration of DON in the grain," says the factsheet. It notes that there are no feed additives approved in Canada to decrease the impact of DON on swine.

Hypor sow excels over ten parities

A Hypor sow in Big Sky Farms' Last Mountain unit has achieved 170 piglets born alive over 10 parities. Sow A3816 is a member of their 600 sow Large White herd and her stats have been closely monitored through Hypor's Bio-Hypor closed herd sow management program. The "Golden Sow" - as Last Mountain staff affectionately refers to her - has not only delivered large numbers of live piglets, but also had only 4 stillbirths.

Mary McMath, the farrowing technician working at Last Mountain, has taken a keen interest in their Most Outstanding Performer, and has become somewhat of a 'guardian' over her. "I am amazed at her mobility and longevity. She still runs and moves around like an animal half her age. The temperaments of these animals are great. It makes them very easy to work with." When asked how long she thought the Golden Sow would last, Mary said, "We hope we can get her to fifteen parities."

Hypor plans to follow not only the progress of the sow, but also the results of her lineage. A number of the highest ranking performers at the Last Mountain facility are her daughters.

Their performance stats will reinforce the success of Hypor's Bio-Hypor Program. This focuses on the development of a balanced sow that includes not only prolificacy and other accompanying fertility traits, but also selection for physical structure. Physical structure ranks as one of the top three parameters that determine longevity. Last Mountain's Most Outstanding Performer has proven this to be true.

Hypor is capitalizing on the genetic value of their super star. "We will make sure we get a son of hers to perpetuate the superior genes she carries in an already super line," said Patrick Charagu, Hypor Inc. Geneticist.

Bart Kleinlugtenbeld

Schippers appoints new sales person in Alberta

Bart Kleinlugtenbeld has joined Schippers Canada Ltd. as the new sales representative for Alberta, working out of the company's office in Lacombe. He grew up on a farrow to finish farm just west of Lacombe and was educated at Olds College, graduating in Agricultural Business, with a Major in Agricultural Entrepreneurship and Rural Small Business. Bart can be reached at 403-872-6640 or bart@schippers.ca

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New solid manure separation system generates interest in China

From Farmscape.ca files

A new waste management system that separates liquid and solid components is likely to be built in China within the next six months, says ATD Waste Systems, developer of the technology. The Vancouver based Company has spent the past 10 years developing a solid liquid manure separation system which breaks the manure into a solid stream which is used to produce a pelleted dry fertilizer and a liquid stream which can be recycled back to the animals as drinking water.

ATD president Victor Van Slyke says the process dramatically reduces odour, virtually eliminates greenhouse gases and reduces water use by 50 to 70 percent. "From the barns we have two streams, a solid stream of the faeces themselves and a urine stream. They're kept separate," he explains. "After we've cleaned up the urine stream by eliminating the ammonia and the suspended solids, then reducing the total dissolved solids as much as we can, we have a clear liquid that we can irradiate with ultraviolet. At that point the clear water being returned to the pigs has about 13 parts per million of total dissolved solids." Van Slyke says that is about one-eighth or even less than in normal bottled water in Canada.

Victor Van Slyke with Dr. Jianjun Zhang at the site of the new pig farm that will use a new waste management system.

The faeces themselves are dried and then all of the by-products of cleaning up the liquids are added to the faeces, then dried and pelleted. "There's no discharge to the land, there's no discharge to water," he points out. "Everything goes into the pellet or is returned in the water to the pigs."

Van Slyke says ATD is involved in ongoing discussions with several firms in China and that he expects construction of the first plant to begin within the next six months or so.

New label claim extends use of swine antibiotic to "at risk" animals

Draxxin® is now registered for control of swine respiratory disease (SRD) in groups of pigs where SRD has been diagnosed. This additional claim provides Canadian veterinarians with more confidence and flexibility when using the product to control disease in animals that have been in contact with pigs affected by SRD.

Draxxin (tulathromycin) is the first and only injectable antibiotic with a control claim for use in pigs assessed to be at risk of developing SRD because of their proximity to sick animals. With the additional label claim, Draxxin is indicated for the treatment of SRD associated with *Actinobacillus pleuropneumoniae, Pasteurella multocida* and *Mycoplasma hyopneumoniae* and for the control of SRD caused by *Actinobacillus pleuropneumoniae, Pasteurella multocida* and *Mycoplasma hyopneumoniae* in groups of pigs where SRD has been diagnosed.

"This new claim provides Canadian veterinarians with an approved option for the use of Draxxin to control SRD in pigs where disease is expected," says Don McDermid, DVM, Veterinary Operations for Pfizer Animal Health. "And controlling disease early, often before clinical symptoms appear, can be in the best interest of the animal as early treatment leads to better responses."

Draxxin provides full therapy with one injection and has a long duration of activity with an eight-day withdrawal period in swine.

It is available exclusively through veterinarians.

For more information, contact Walter Heuser, DVM, Swine Business Unit Director at Pfizer Animal Health on 514-694-4204 or email walter.heuser@pfizer.com

Canadian producers fight for open border

The WTO Dispute Settlement Panel examining Canadian and Mexican complaints against US Country of Origin Labelling (COOL) requirements completed its second series of meetings on December 2nd.

Canada complained that the inflexible and protectionist nature of the US rules, compounded by interference in implementation, has seriously impacted Canadian exports of feeder and slaughter hogs to the direct benefit of US competitors.

Canadian hog producers were represented by Martin Rice, Executive Director of the Canadian Pork Council; Andrew Dickson, General Manager of Manitoba Pork and Patrick O'Neil, Ontario Pork's Trade Strategist. They were supported by CPC International Trade Counsel, Peter Clark.

"Live exports are essential to the health of the Canadian hog industry"

"Unfortunately, actions taken in both the United States Congress and the administration eliminated the flexibility in the final rule that would have made it less protectionist," Mr. Rice explained.

"On balance, the third country interveners supported the proposition that COOL was not WTO consistent," noted Mr. Dickson. "Live exports are essential to the health of the Canadian hog industry. For Manitoba, they are essential. I am encouraged by the Canadian team's performance. We expect a speedy favourable finding and that we can get the border back to normal soon."

"We should have a decision by summer," says Peter Clark. "This dispute has broad implications - the EU is developing a new very extensive regime. It could seriously erode market access benefits under CETA (Comprehensive Economic and Trade Agreement). If the panel does not clearly condemn the protectionist abuses of the US COOL measures, Country of Origin Labelling could become one of the new non-tariff measures of choice."

CSHB National Biosecurity Survey completed

A National Biosecurity Benchmarking Survey was conducted by the Canadian Swine Health Board (CSHB) in 2010. This landmark exercise assessed measures in place to reduce the spread of disease in all pig-producing areas of the country.

"The Canadian pork industry is already well recognized for its high health status and this project quantifies the biosecurity measures Canadian hog producers have been using," said Florian Possberg, CSHB Chair. "This baseline data is required to demonstrate even further improvements."

The objectives of the survey were:

1. To collect baseline data of biosecurity management practices on Canadian hog farms.
2. To identify areas to strengthen biosecurity on Canadian hog farms.
3. Develop objective methodology to be able to measure the impacts of biosecurity programming.

An in-depth study of this magnitude has never been conducted before in Canada, for any livestock species. Survey sites were selected on a random basis according to farm type and geography.

The knowledge gained from the national swine benchmarking biosecurity survey will drive future programming and facilitate an efficient implementation of the National Swine Farm-Level Biosecurity Standard.

The Canadian Swine Health Board will continue to work with various provincial and national producer groups, industry bodies and professional stakeholders to strengthen biosecurity management on Canadian hog farms.

An information sheet about the national biosecurity benchmarking survey is available on the CSHB website at www.swinehealth.ca

The CSHB was formed to proactively address swine health challenges through leadership, coordination and support in the management of the health of the Canadian swine herd. ■

New Product Showcase

Paradigm Agri-Solutions launches two new products

Paradigm Agri-Solutions announced the launch of two new products at Manitoba Hog and Poultry Days on December 8th and 9th 2010. The first is TEGO™, a new blood collection kit for swine, which is being marketed under an exclusive marketing agreement with ITL Animal Healthcare.

TEGO™ is an easy to use and cost-effective breakthrough innovation for collecting, processing and storing livestock blood samples. It introduces an unprecedented level of safety into the process of drawing blood, while simplifying the collection process without compromising sample integrity, says a company news release. The collected samples can be used for animal identification, genetic/trait selection testing, as well as designated disease tests. TEGO™ is designed to better meet needs of veterinarians, producers and laboratories.

The TEGO blood sampling kit

Also launched at Hog and Poultry Days was the EPI dust removal system developed by American Company Baumgartner Environics Inc. The EPI system creates a healthier environment in livestock and poultry buildings which promotes increased health and performance. EPI is a cost effective way of removing dust and odour particles from the air. This results in improved feed conversion in broiler chickens and improved growth rates in swine nurseries, says the company.

Electrostatic Particle Ionization or EPI creates a huge numbers of negative ions. When concentrations of negative ions are in the air, they will attract to floating particles in large numbers. This causes the particles to act like magnets. As a result, the particles will "stick" to each other and to surfaces creating a cleaner/fresher air environment for the livestock and those working with the livestock.

Paradigm Agri-Solutions, located in Manitoba, Canada, is an animal health and supply company.

For additional information on TEGO™, contact Rick Bergmann at 204-346-9952 or email rbergmann@paradigmag.ca

Ad lib feeder increases lactation feed intake

Feeding sows ad lib during lactation is becoming increasingly popular and experience so far suggests a number of benefits including higher overall feed intake, leading to faster piglet growth and larger weaned piglets. A new ad lib sow feeder – the I-FEED - from Protekta Inc. is designed to allow sows easy access to feed at all times without wastage. It comprises a moulded polypropylene feed hopper with a patented dispenser at the bottom. When the sow pushes up on the dispenser, a small portion of feed drops into the trough. It is easy to install, simple to use and very easy to clean, says Protekta. No adjustment is necessary except when changing feed type, for example from meal to pellets.

"With the I-FEED system fresh feed is always available and the sow can eat when she feels like it," comments

CONTINUED ON PAGE 14

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Morten Jakobsen of Protekta Inc. "This is a great advantage in summer time because sows will eat at night when it is cooler" Also, there is less noise and stress compared to when sows are scale fed twice or three times per day, he says. Higher lactation feed intake not only leads to faster piglet growth, but improved reproductive performance in the next parity, notes Jakobsen. "Producers have also experienced fewer problems with shoulder sores due to the higher feed intake," he claims.

For further information, contact Morten Jakobsen on 519-528-5888 or by email at protekta@protekta.ca

MasterTech – A new technology for swine starter feeds

Improving post-weaning swine performance is critical in not only maximizing lifetime performance, but also in obtaining a greater return per pig. New research by ABN, swine technology partners of Masterfeeds, has resulted in the new Vigor Blue range. This range uses a new technology - MasterTech - that is a combination of organic minerals, probiotics and enzymes that enables a higher level of vegetable protein to be used immediately post-weaning, at the expense of higher cost milk proteins, enhancing post-weaning pig performance while lowering cost/kg. MasterTech works by focusing on the removal of the anti-nutrient content of vegetable proteins thereby allowing the higher inclusion in starter feeds than are traditionally used without negatively affecting performance.

A recent trial using the Vigor Blue range, fed for 26 days post-weaning, improved ADG by 3.5% when compared to the standard program on-farm while lowering cost/kg by 12%. Improving on-farm pig performance while lowering cost/kg is a win-win for the Canadian swine producer, especially in times when pig prices are low and cost savings are being targeted. Taking the value of the feed saving and extra gain this could equate to an approximate saving of $30,000 per year for a 1000 sow system, says Masterfeeds. MasterTech has been incorporated into other ranges within the Masterfeeds MasterWean Starter product range. Trials have shown that on average MasterTech can deliver an extra 5.84% improvement in ADG and 4.2% in FCR.

For further information, contact Ian Hopfe on (403) 350-0268

Hermitage Genetics available in Canada

Hermitage Roseland Pork has established a production system to deliver Hermitage swine genetics to the western Canadian market. Hermitage was established over 50 years ago in Ireland and has become an internationally recognized company with markets in many parts of the world. A boar nucleus is located at Gwynne, Alberta.

Semen from the MAXGRO™ Terminal Line, a synthetic purebred line comprising Duroc, Large White and Pietrain genes, is available from the Hermitage AI stud in Lanigan, Saskatchewan. This sire is specifically designed to maximize growth, ADG and

The Hermitage MAXGRO™ Terminal Line

feed conversion in the progeny. It consistently produces the top performing slaughter pigs when compared with other terminal sires in independent tests, says the company. The progeny of the MAXGRO™ are renowned for their vigour and viability. The MAXGRO™ is ideal for the production of heavy slaughter weight pigs, with unrivalled growth potential and carcass yields.

Hermitage GGP maternal lines currently average over 13 pigs born alive per litter, providing the potential for 14 plus pigs per litter in the F1 female and 30 pigs weaned per sow per year at the commercial level.

For further information, contact Ken Carlson on (780) 312-6929 or email ken.carlson@hermitagengt.com. ■

Industry Viewpoint

By Bernie Peet

Over the last few years, the Industry Crisis column has looked at what has been going on in the Canadian industry as our producers have battled a series of unprecedented challenges which has seen the industry reduce in size by nearly a quarter. WHJ Editor Bernie Peet continues to review industry events and trends that will shape the industry in future, both in North America and around the world. He will comment on industry developments and how they impact Canadian producers, providing his unique perspective and personal viewpoint on the important issues.

Decline slows but storm clouds gather

While the October 1 data on hog numbers showed a slowing decline in the number of hogs and pork producers in Canada, recent events suggest that renewed economic pressures will result in further contraction of the industry. Although total hog numbers were down only 0.9% over the 12-month period, the national sow herd fell by 3.8%. And live exports continued their downwards slide, with 1.3 million pigs shipped south in the third quarter, down 11.6% from the same period in 2009. Despite more pigs being retained for finishing, notably in Manitoba, domestic slaughter fell by 5.7% to 5.2 million head compared to the third quarter last year.

Over the 5-year period to October 1, 2010, total pig numbers have fallen by 22% and sows and bred gilts by 19.3%. Both total numbers and sow numbers have fallen every year for the past six years, leaving the national breeding herd at 1.28 million, compared to a peak of 1.597 million in January 2005, a loss of 317,000 sows. The percentage differences between provinces is huge, with hog numbers in Quebec and Manitoba falling by only around 10% in the five-year period, while those in British Columbia and Saskatchewan reduced by 50% and 47% respectively. Ontario has seen its total hog numbers contract by nearly 30% and sow numbers shrink by 23%, while Alberta has experienced a 25% reduction in both sow numbers and total pigs.

According to Statistics Canada, there are now just over 7,000 hog producers in Canada, compared with 12,000 five years ago, a drop of 42%. However, the numbers given are considerably higher than those reported by provincial pork

> **"Over the 5-year period to October 1, 2010, total pig numbers have fallen by 22%"**

organizations, with Alberta Pork estimating less than 400 producers, half the 820 quoted by Statistics Canada. The numbers for BC are even more bizarre, with census data indicating 660 farms with pigs when there are only about 30 meaningful pig producers in the province.

Total hog slaughter numbers for Canada peaked at just under 23 million in 2004, compared with 21.8 million in 2009. However, an increase in carcass weight of nearly 4kg has meant that the total cold trimmed carcass weight remains roughly the same at just under 2 million tonnes. Domestic consumption peaked at 30kg/capita in 1999, but is now around 23kg/capita on a carcass weight basis.

CONTINUED ON PAGE 18

IT'S STILL THE ONE

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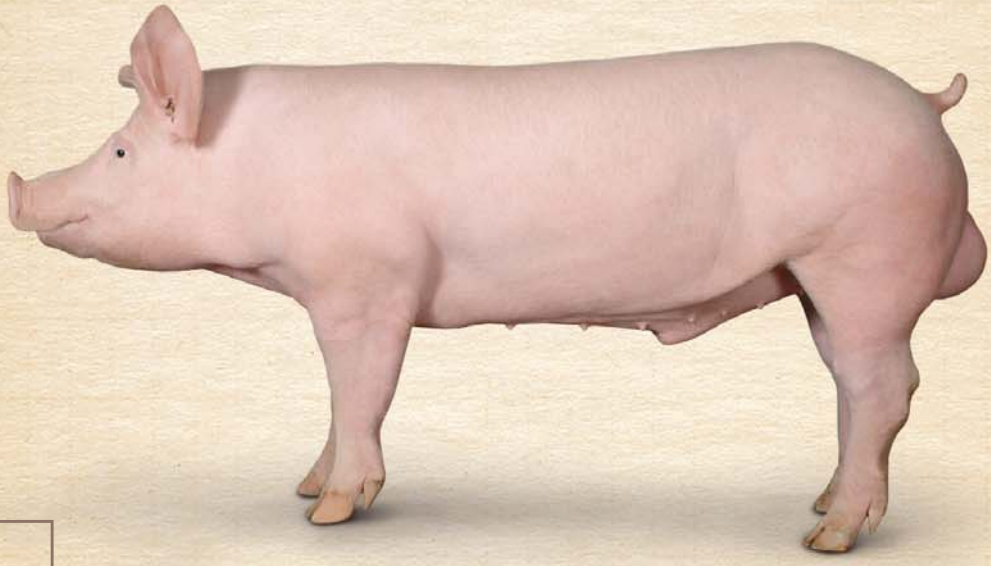

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Industry Viewpoint Continued

Another perfect storm?

The 3-year pork industry crisis from 2007 until the spring of 2010 severely depleted producer equity. As prices rose in the spring and summer of last year, producers started to make modest profits and were hopeful of improved fortunes. But a sharp increase in feed prices and a dramatic drop in the hog price during the fall resulted in severe losses of around $40 per hog during October 2010. That month saw the dollar at par with the greenback, which combined with higher hog supplies in the USA, drove prices down into the $1.00 - $1.10/kg range. While there had been a slight improvement at the time of writing this, producers are still sustaining big losses and are very vulnerable.

Canadian producers are having their piggy banks emptied due to the weakness of the US dollar

Jim Haggins, Chairman of Alberta Pork, told producers at a series of regional producer meetings held in November, that producers were losing $37 per hog, assuming a production cost of $1.45. "That translates into a loss of equity, in Alberta alone, of $1.7 million every week," he says. Producers are increasingly questioning the prices they receive relative to their counterparts in the USA and around the world. "Canada has the lowest prices in the world and Alberta has the lowest price in Canada," Haggins points out. "Pricing formulas must be adjusted if we are to survive. There is no future for the industry if we keep losing money; we must get more for our pigs." Haggins believes that Alberta producers are receiving 10-15% below what they should get relative to US prices. "The formula favours the packer," he believes. "The industry needs to reduce its debt burden, maintain its current production base, generate recapitalization and encourage new investment. The future has to be based on profit!"

"Canada has the lowest prices in the world and Alberta has the lowest price in Canada"

These impassioned words reflect a growing frustration and even anger amongst hog producers as they see their equity continue to be eroded. After three years of losses, most producers have no AgriStability margins left, leaving them vulnerable to sustained losses, while banks are running out of patience. Direct government bail-outs seem unlikely, so

the end result could be another sharp decline in the size of the industry unless the US industry contracts more than it has done thus far.

Feed price hike adds to producer woes

Soaring feed prices, which have increased production costs significantly, are exacerbating the impact of low hog prices. In the USA, corn increased from less than $4/bushel to nearly $6 in just a few weeks, while in Europe, the price of wheat shot up by 30% virtually overnight. The decision by the US Environmental Protection Agency (EPA) to allow blends of ethanol up to 15% in cars and lightweight trucks for model year 2007 and newer increases the likelihood of higher and more volatile corn prices in future.

In Europe, as in North America, producers are being squeezed by falling hog prices and rapidly rising feed costs. Pig numbers are predicted to fall in the EU as a whole, in part due to economic pressures but also due to an exodus from the industry by those producers who are not prepared to modify their sow housing to group systems, a legal requirement by the end of 2012 (see later in this column). The fallout is most likely to be smaller producers. As a result, EU hog prices should increase in 2012-2013.

Whereas the only option for producers in many countries is to tough it out until prices improve, the British industry is calling on retailers and others in the supply chain to increase prices in order to secure future production. "The only sustainable solution is for farmers to obtain a higher price for their pigs and as the vast majority of British pork, bacon, ham and pork products are sold through retailers this means securing higher prices from supermarkets," says a report on the feed price situation by the British Pig Executive (BPEX). "The whole supply chain needs to pull together to ensure a profitable production sector and that the industry continues to meet demand for quality, farm assured product," continues the report. "Retailers and processors alike need to ensure this rise in retail prices is passed down the supply chain, to the producers themselves." With its strong brand and excellent consumer recognition for home produced products, the British industry could score some success with this approach, although the retail industry is notorious for its price competitiveness.

Canada benefits from Mexican trucking dispute

The impact of Country of Origin Labelling (COOL) legislation on the Canadian pork industry has been huge, as witnessed by the huge drop in live pig exports to the USA. However, a dispute over the same legislation between Mexico and the US has resulted in significant increase in Canadian pork exports to Mexico.

US pork exports to Mexico have fallen by a massive 20 percent since the Mexican government added pork to the list of US products against which it is retaliating for the failure of the United States to live up to a trade obligation.

Industry Viewpoint Continued

In August, Mexico put a 5 percent tariff on most US pork imports, as well as tariffs on other US products, in reprisal for the United States not complying with a provision of the 1994 North American Free Trade Agreement (NAFTA) that allows Mexican trucks to haul goods into America. The provision was supposed to become effective in December 1995.

"US pork exports to Mexico have fallen by a massive 20 percent"

The National Pork Producers Council has been urging the Obama administration to resolve the trucking dispute as quickly as possible. The situation first erupted in March 2009 when Mexico placed higher tariffs on an estimated $2.4 billion of US goods after the US Congress failed to renew a pilot program that allowed a limited number of Mexican trucking companies to haul freight beyond a 25-mile US commercial zone.

In August 2010, Mexico added products, including pork, dairy and apples, to its initial retaliation list of 89 products after the Obama administration failed to present a proposal for resolving the trucking issue.

According to recent data from the US Department of Commerce and the Canadian government, US pork exports to Mexico dropped by nearly 5,000 metric tons from August to September – a loss of about $9 million – while Canadian pork exports increased by almost 2,000 metric tonnes.

Mexico is the second largest market for the US pork industry, which shipped $762 million of pork south of the border in 2009. Since 1993 – the year before NAFTA was implemented – US pork exports to Mexico have increased by 580 percent.

Maple Leaf Foods aims to enhance margins

Maple Leaf Foods announced a strategy plan in October that it says will deliver substantial earnings growth in the next five years. The company expects its plan will increase EBITDA margin by more than 75% over the next four to five years - from a current level of 7% to 9.5% in 2012, and 12.5% in 2015.

The plan also contemplates a series of plant consolidations, coupled with strategic capital investments in new manufacturing capacity and technology. This will include construction of two large scale facilities: a bakery in Hamilton, Ontario that is planned to be commissioned in mid-2011 and a new prepared meats facility, with construction planned to commence in 2012, says the company. Capital spending is estimated to be $1.3 billion.

But these ambitious restructuring plans could be put in doubt by disagreements in the boardroom, following the abrupt resignation last October of two directors from the Ontario Teachers' Pension Plan, one of the biggest shareholders, along with the McCain family. Teachers is reported to be increasingly uncomfortable about the company's direction and sold one-third of its 36% stake in MLF to West Face Capital in 2010, an activist hedge fund that is said to oppose the spending plan. There is speculation that West Face could push for the breakup of the company. Teachers sold the remainder of its holding in a public offering at the end of November, a move that sent the share price tumbling by about 10%.

Maple Leaf Foods announced at the beginning of November that it has closed the sale of its pork processing operation, located in Burlington, Ontario, to Fearmans Pork, Inc., an affiliate of Sun Capital Partners Inc. for approximately $20 million. "This sale completes the transformation of our protein operations that we began in late 2006 to support our value-added meats and meals business with our highly efficient, scale fresh pork processing facility in Brandon, Manitoba, commented Michael Vels, MLF's Executive Vice-President and Chief Financial Officer.

In November, Maple Leaf announced plans to close its prepared meats facility in Berwick, Nova Scotia. The facility, which employs approximately 280 people, produces bacon, ham, sliced meats, sausage and deli products primarily under the Larsen and private label brands.

The company will gradually wind-down operations starting in February 2011 and will close the facility at the end of April. Production will be consolidated at Maple Leaf's prepared meats facilities in New Brunswick and Ontario.

CONTINUED ON PAGE 22

Why Try to Predict Which Strain of Influenza Will Strike Next?

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1. Fleck, R. *et. al.* Performance of MaxiVac Excell 3, a trivalent swine influenza virus vaccine, after challenge with a genetically diverse H3N2 swine influenza virus. *Proceedings of the 18th IPVS Congress,* Vol.1, p.130

Intervet

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The Danish Crown processing plant at Horsens in Jutland is the largest and most modern in Europe

Danish Crown moves to improve efficiency

A number of recent changes at giant European processor Danish Crown are aimed at improving its competiveness and reducing its very high cost structure. The company is increasingly moving its operations to regions where labour costs are lower than in Denmark.

In October, Danish Crown's Board of Representatives voted to convert the cooperative into a limited company. "In practice, the decision made today does not entail any changes for the company's owners. What it means is simply that the cooperative will establish a limited company which will be wholly owned by the cooperative. The limited company will thus not replace the cooperative in any way," explained Niels Mikkelsen, Chairman of the Board of Directors. The $1 billion capital Danish Crown expects to attract from investors by trading as a limited company rather than a cooperative will be used to finance acquisitions, mergers and investments, mainly in Germany and Poland.

"It is in Germany and Poland that we will see the most significant growth over the next years," says Mikkelsen.

Wasting no time, Danish Crown announced the purchase of D&S Fleisch, the fourth-biggest slaughterhouse in Germany, with a throughput of 3.5 million animals a year.

"Today we have a successful business with fresh meat in Sweden, the UK and Poland, and Germany is the next obvious step," said Kjeld Johannesen, CEO of Danish Crown. "As in the other countries where we have slaughterhouse activities, the idea is to slaughter local, German pigs. This also means that the acquisition will not have any immediate impact on Danish workplaces."

In November, Danish Crown announced record profits for the year of around $300 million and paid its pig producers a bonus of 17 cents/kg. COE Johannesen noted that now only 35% of the company's employees are in Denmark and 84% of its processing activities are outside the country.

European Union faces pork shortfall

European Union pork production could fall by nearly 3 million tonnes over the next three years, according to Britain's National Pig Association. Following a survey of producers and producer representatives in member countries, it forecasts production will be:

- -4% in 2011, down approx. 880,000 tonnes
- -5% in 2012, down approx. 1,060,000 tonnes
- -5% in 2013, down approx 1,007,000 tonnes

The falls will mean higher prices for consumers, particularly for countries that are net importers of pork, so British retailers and processors should start working more closely with British producers to improve supply chains, NPA told Pig World magazine.

NPA's forecast is the first serious attempt in Europe to analyze the effect of a number of bearish influences on pig production, which will come to a head over the next three years, says Pig World. These include low prices, high feed costs, the European stalls ban (due to come fully into force in January 2013), currency volatility, and nervousness among banks about the sustainability of continental pig production.

NPA has sought the views of pig farmers and industry representatives in a number of countries, particularly Denmark, Germany, France, the Netherlands and Poland, which combined produce more than two-thirds of European Union pigmeat.

Many continental pig-keepers have been producing at a loss for nearly half a decade and are poorly placed to survive the next three years. At least a third of them will have difficulty converting from stalls to loose-housing by 2012, in compliance with European Union law. It costs about $650 per sow place to convert to loose-housing and the 1999 stalls ban in the United Kingdom caused the national herd to almost halve during the following ten years, notes Pig World. ■

Swine Technology Workshop

The Swine Technology Workshop, held in Red Deer on November 3rd, attracted an audience of around 220 people, with more than 80% of them directly involved in pig production. Since its inception 12 years ago by nutritionist Jim Gowans and the late Dr. Frank Aherne, the workshop has built a reputation for bringing practical hands-on speakers to share their knowledge and information. The 2010 workshop was no exception, with topics ranging from "Getting the best from AI" to "How to be a great team member" and from "What does your production manager look for?" to "Setting up an effective farm trial". We bring you three of the presentations from the workshop.

Feeding sows ad-lib during lactation

Feeding the lactating sow is perhaps the most challenging goal of the breeding herd. Though most producers agree that maximal intake throughout lactation is the correct goal, considerable debate exists on the best method to achieve this. Feeding strategies play an important role in maximizing voluntary feed intake. Feeding sows to a predetermined scale is the most common method, but feeding ad-lib is becoming more popular. Nutritionist Dr. Malachy Young, with Gowans Feed Consulting, looks at the rationale for ad-lib feeding and the benefits if it is carried out correctly. He notes that the goals of a lactation feeding program are not only to maximize feed intake and consequently litter weaning weights, but also to optimize subsequent farrowing rate and litter size. Marieke Klok, manager of an 850-sow barn in southern Alberta, looks at how ad-lib feeding works in practice and what factors to consider when implementing this technique.

Feeding patterns

The difference in lactation feed intake among farms is most obvious in the first week of lactation. This is because many farms adopt a feeding program that gradually increases sow feed allowance over the first 5 to 10 days of lactation. In many such cases this pattern of feeding will reduce sow feed intake in the first week of lactation by 15% or more compared with a more aggressive system of feeding. Restricting feed intake throughout or during any week of lactation will result in a higher risk of sows being culled for anestrus than sows having a rapid increase in lactation feed intake. In addition, sows which have an earlier peak in feed intakes have higher overall lactation feed intake. This extra feed intake, achieved with a more aggressive feeding strategy, will increase milk yield, piglet growth rate and reduce weight loss in lactation.

A recent large scale study by Young et al., (Table 1) showed that in excess of 4% of all sows ate less than 4 kg/day and 17.5% ate less than 5 kg/day over a 19.5 day lactation. There is evidence to show that although short-term under-nutrition may not affect milk yield, it can cause acute and chronic changes in the reproductive hormone system, in the absence of noticeable changes in body composition, and these negative

Table 1: Effect of lactation feed intake on performance

Feed intake group	< 4	4-5	5-6	6-7	7+
ADFI, kg	3.35[a]	4.55[b]	5.52[c]	6.47[d]	7.47[e]
% of sows	4.2	13.2	25.8	35.5	21.4
Lactation length, days	19.2[a]	19.5[a]	19.7[ab]	19.6[a]	20.0[b]
Weaning to estrus interval, days	5.1	5.3	4.8	4.8	5.2
Number weaned	9.5	9.8	9.6	9.7	9.9
Removed, %	45.5	21.4	21.2	19.7	19.6
Subsequent total born	10.8	11.3	11.9	11.9	11.2

Young et al., unpublished

CONTINUED ON PAGE 26


It's time for a gut check.
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effects can reduce ovulation rate and embryo survival. Also, such under-nutrition in any week of lactation can reduce subsequent litter size. Data from a large survey investigating the effects of lactation feed intake on various reproductive

"For each additional kilogram increase in feed intake in lactation, 0.11 pigs were born at the subsequent farrowing"

parameters showed that for each additional kilogram increase in feed intake in lactation, 0.11 pigs were born at the subsequent farrowing. It has been proposed that the final growth of follicles in the pig to ovulatory size covers a period of about 19 days, thus this highlights the importance to maximize feed intake during each week of lactation to optimize subsequent reproductive performance.

Feeding sows ad lib during lactation can improve weaning weights and subsequent reproductive performance

Feed delivery method

The most important aspect of all feeding methods is to provide the sow with access to feed at all times. Restrict feeding in early lactation is commonly adopted because of the belief that over-feeding sows in early lactation may cause udder congestion and hypogalactia, piglet scours, sow constipation, and may lead to sows "going-off" feed in mid-to-late lactation. However, there are many farms feeding lactating sows ad libitum soon after farrowing and showing no detrimental effects on sow performance. Method of delivering feed and whether water is offered to sows during lactation can have a significant impact on feed disappearance and weaning weight. An experiment was conducted to compare the performance of lactating sows, including feed and water disappearance, when fed and watered using a self-fed wet/dry (SFWD) feeding system compared with using a conventional hand-fed (HF) dry feeding system. Sow feed disappearance and weaning weight was greater for the SFWD sows (Table 2), and sows on the SFWD feeding system gained more weight during lactation. The improvement in feed disappearance observed with the SFWD system was likely a consequence of sows having the choice of when to eat and the choice of how wet the feed should be when eaten. Peterson et al. (2004) reported a 7% improvement in the total lactation feed disappearance when lactating sows were given ad libitum access to dry feed using a self feeder.

Some farms are implementing mechanized systems that allow for continuous access to lactation feed. A number of feeding systems are available from manufacturers, but some producers have made simple mechanisms that involve a wide diameter pipe clamped so that the bottom of the pipe is about one inch from the bottom of the trough. Field observations indicate that average daily feed intake often increases 0.5 to 1 kg/day after implementation of this system. It is important to remember that a mechanized system of feeding during lactation does not omit the need for sows to be individually checked, got up, the feed drop checked to ensure feed is freely accessible, and water nipples checked for water flow rate each day. The automated feed system used to fill the drop tubes should be turned off in the evening before leaving the barn. This allows feed drops to be checked first thing in the morning to identify sows that have not eaten the day before and avoid

Table 2: Effect of feed and water system on sow and piglet performance

Feeding-water system	HF	SFWD	P <	Diff., %
# sows	57	57	-	-
Average parity	2.7	2.7	0.83	-
Lactation, days	19.8	20.0	0.58	-
Feed disappearance kg, d				
0 to 6	3.85	3.95	0.62	+2.6
7 to 13	6.23	6.64	0.18	+6.6
14 to weaning	6.83	7.45	0.01	+9.1
Total day 9 to weaning	110	120	0.01	+9.1
Sow weight change, kg	0.6	6.2	0.01	-
Backfat change, mm	-1.7	-1.2	0.37	-
Weaning to estrus, d	5.7	6.0	0.35	-
% estrus by d 11	93.0	89.5	0.51	-
# pigs weaned	10.1	9.9	0.34	2.0
Piglet weaning weight, kg	6.12	6.63	0.01	+8.3
Feed intake, kg/day	5.4	5.9	0.03	+7.4
Litres water per kg feed	3.22	2.92	-	-

Peng et al., 2007.

feed spills in the event of a feed tube/sock comes apart from the PVC pipe. Farms that currently use lactation feeders with a storage hopper on top and allow sows free access to feed from the hopper (example Crystal Springs feeder) will work equally effectively as an ad lib feeder if the storage hopper has feed in it at all times. Typically with an ad lib feeding system sows are gradually increased onto feed during the first 4 days of lactation and on day 5 the mechanized system is turned on and they are given ad lib access to feed through to weaning.

In addition to the benefits to weaning weights and subsequent reproductive performance, staff has more time to focus on early piglet care rather than manually feeding sows multiple times per day, providing the potential to reduce labour costs.

Feeding ad-lib at Sinke Farms Ltd.

Sinke Farms is an 850-sow farrow to finish barn located near Picture Butte, Alberta. Manager Marieke Klok describes how the lactation feeding system works and the advantages and disadvantages of using this method.

The amount of feed sows get in gestation is determined by their body score. An average sow, with a condition score of 3, gets 2.2 kg of feed per day. The condition score is recorded at breeding time, day 35, and day 56. The feeders get adjusted again according to the body score on day 35, and day 56. From day 90, until the sows get brought into the farrowing barn, the feeders get turned up. The skinny sows get 1 kg more feed, and the rest of the sows get 0.5 kg more feed.

In the farrowing barn, we have the Intak™ Ad-Lib feeding system. A chain-disk feed system fills up the Ultra Drop feeders, and the drops are emptied 4 times per day with an actuator. The drops are connected to the Intak™ feeder with flex hose and plastic downspout. The Intak™ Feeder itself bolts into the stainless steel feed trough.

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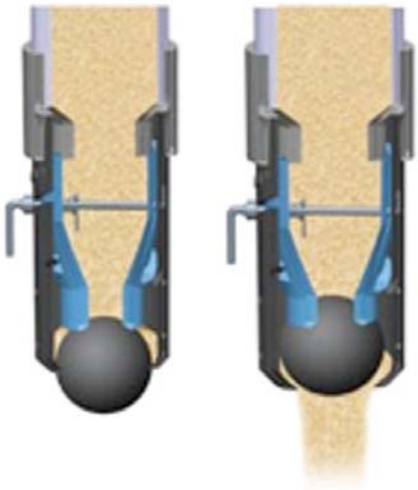

Figure 1: The Intak™ sow feeder mechanism

Sows push up the ball in the Intak™ feeder to get feed. To adjust the flow of feed coming out of the Intak™ feeder, the handle on the front of the feeder is moved up or down.

The sows in the farrowing barn get fed according to their farrowing date:

Table 3: Feeding curve for farrowing barn

Before farrowing & day of farrowing	Setting 1.5 (2 kg/day)
Day 2	Setting 2 (2.75 kg/day)
Day 3	Setting 2.5 (3.6 kg/day)
Day 4	Setting 8 (open all the way) 11.5 kg/day

*If the litter has scours, we do not turn the feeder up all the way on day 4, but continue with the ½ setting increase per day, until the scours are over.

*A water nipple above the feed trough enables the sows to make their feed wet.

Advantages of the Intak™ feeder:

- Sows have access to clean, fresh feed 24 hours a day
- Easy to adjust the flow of feed
- Access to more feed than the sow will probably eat
- Sow can empty the feed trough, so there is no wasted feed there
- Better sow condition
- Less culling sows because of poor body condition
- Saves time and labour
- Increase in sow feed intake
- Decrease in feed waste
- No over or under feeding by different employees

Disadvantages of the Intak™ feeder:

- The ball in the Intak feeder needs to be checked daily to make sure it still rolls and dispenses an adequate amount of feed
- Sometimes feed builds up on the ball and it then needs to be scraped off
- The feeder needs to be taken apart all the way when washing the farrowing crate

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What you should know about decreasing heating and ventilation costs

Studies by the Prairie Swine Centre have shown that the average cost of electricity and natural gas ranged from $5 to $12 per pig produced in commercial barns, with heating and ventilation costs representing a significant portion of the overall total utility cost. For a typical 600-sow farrow-to-finish unit, the annual electricity bill amounted to more than $55,000/yr while natural gas cost was about $53,000/yr, based on 2008 energy prices, notes research scientist Dr. Bernardo Predicala. Consequently, there is a need to look more closely into the energy components of the overall cost of hog production to be able to identify possible areas for cost savings, he says. He examines the most common reasons for excess energy use and suggests ways of keeping energy costs under control.

Take home messages

- Know the operation and functions of heating and ventilation system components
- Avoid common heating and ventilation mistakes
- Monitor ventilation settings regularly and implement a maintenance checklist
- Reduce energy consumption if possible, or maximize efficiency of use of required energy.

Determining the correct ventilation settings

In cold-climate production locations such as Canada, typical components of the heating and ventilation system include air inlets, fans, ducts, controllers, and heaters to provide supplemental heat, Predicala explains. "To be able to run the entire system at optimum performance without wasting energy, the operator has to know each component very well, in addition to understanding the related factors that affect the operation of the system," he comments.

Observation of pig behaviour and comfort is the first step in determining whether ventilation settings are correct. "Even if the controller shows that the air temperature is right on the recommended set-point, the pigs may still show signs of discomfort if other environmental factors are not right, for example if there is a cold draft, floor slats are too cold, or humidity is too high," Predicala continues. "If any of these factors are incorrect, it indicates the need for adjustment of the appropriate ventilation system components."

Over-ventilation is the most common reason for excessive energy costs, says the Prairie Swine Centre's Dr. Bernardo Predicala

Common ventilation mistakes

Even if the system maintains good pig comfort it does not mean it is optimizing energy use, stresses Predicala. Over-ventilation is one of the most common problems and is not always easy to identify. Exceeding the required minimum ventilation rate by just 10% in a grower barn results in a 27% increase in propane consumption, he notes (Table 1). "As barn operators can see only the air temperature from their controller display and not the airflow rate, they may not be aware that they are over-ventilating their barn, particularly if there are no apparent adverse effects on the pigs," Predicala says. "To determine if a barn is being over-ventilated requires a good understanding of the target set-points, the required ventilation rates for various growth stages of the pigs, the operation of the controllers, as well as the response curves of the installed fans."

"Over-ventilation is one of the most common problems and is not always easy to identify"

A detailed analysis of the controller settings, coupled with observations and measurements of fan and controller operations will yield an estimate of the actual ventilation rates relative to the required values, he notes. "The bottom line is that over-ventilation can be resolved by fine-tuning the ventilation settings carefully, which requires virtually no monetary investment to realize savings."

Another cause of over-ventilation is improper sizing of minimum ventilation fans, Predicala adds. "A common

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Table 1: Over-ventilation and its consequences for a 1,000 head barn with 50-lb pigs

% over-ventilation relative to baseline case (proper ventilation settings)	Increase in cost of Liquid Propane (LP) over baseline case	% increase in LP cost (over baseline case)
10% over	$1,049 LP increase	27%
20% over	$1,960 LP increase	51%
30% over	$2,970 LP increase	77%
40% over	$4,060 LP increase	105%
50% over	$5,130 LP increase	132%
59% over	$6,030 LP increase	156%

Source: Sorensen, 2009.

mistake is installing a variable-speed fan with too large a capacity so that it cannot be slowed down sufficiently to meet the required minimum ventilation rate level. For example, a typical fan with 2,500 cubic feet per minute (CFM) rated capacity is not designed to be operated below its lower operating range limit of about 25% of its capacity to meet a 500 CFM minimum ventilation requirement. In this situation, the end result is either the operator will force the fan to operate inefficiently below its lowest operating limit (with the motor growling or the fan stalling at times), or the fan would be set to run at its lowest capacity (25% = 625 CFM) which is above the 500 CFM minimum ventilation rate, both of which would result in significant wasted energy."

Static pressure, which is a measure of the resistance to air movement through the ventilated airspace, is often a neglected parameter that is not given due consideration in running the ventilation system, Predicala believes. "As the air moves through the air intake, ducts, inlets, shutters, and hoods, these structures inevitably present a resistance to air movement. The higher the static pressure, the harder the fans need to work to overcome this resistance, therefore requiring more energy," he explains. "Static pressure levels can be managed by setting openings properly, specifically the inlets through which air enters the ventilated room. The size of inlet openings should be adjusted such that the speed of the jet of air coming out of the inlet opening is between 3.6 to 5.1 m/sec (700-1,000 feet per minute) and overall static pressure is between 10 - 25 Pa (0.04 - 0.10 inches of water) as measured by a manometer." Exceeding these static pressure levels causes a significant reduction in fan airflow rates, requiring more fan energy to pull the required volume of air through the barn, Predicala notes. "The recommended static pressure settings will ensure that incoming fresh air is well-distributed inside the room, drafts directly blowing on the pigs are avoided and flushing of stale air from the room is achieved," he continues. "Too small inlet openings, blocked air intakes (eaves screen, attic openings), and dirty shutters, all contribute to static pressures higher than desired."

Incorrect "staging", or synchronization, of fans and heaters can result in excessive exhausting of heat from the room. "A common mistake is improper setting of the Heater OFF such that the heater continues to add heat to the room up to a point that it triggers an increase in the operation of the ventilation fans," Predicala says. "Understanding that sensors have a lag period when sensing the actual room air temperature, the sensor would register a continued increase in room air temperature even after the heater had already turned off, thus, it is recommended to have the Heater OFF at 1.0 - 1.5 °C below the room temperature set-point to avoid over-shooting the set-point and triggering an increase in the speed of the ventilation fans."

Understanding the heating and ventilation system

Similar to most other aspects of pork production, in order to be able to make changes to the barn and make the operation energy and cost-efficient, an evaluation of how, where, when, and how much energy is being used in different areas of the barn is essential, Predicala stresses. "An energy audit will yield detailed information on energy usage as well as identify target areas in the barn and the appropriate measures that can be applied to either reduce energy use or improve efficiencies," he says. "Also, having baseline information on past and current energy use in the barn will serve as reference for determining

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the potential savings from energy conservation measures being considered for the barn, as well as in figuring out the actual savings if you do decide to implement these measures."

"The key to optimizing energy use is to understand the operation of the heating and ventilation system"

Above all, the key to optimizing energy use is to understand the operation of the heating and ventilation system, Predicala believes. "Most of the common heating and ventilation mistakes can be either avoided or resolved by having sufficient knowledge of the operation of the system," he suggests. Modern ventilation controllers are very sophisticated in their capabilities but may be intimidating to the operator, he adds. "While proper operation of these modern systems yields greater benefits in terms of better efficiencies, not being able to operate the system correctly could result in really poor conditions and significant energy wastage. Hence, it has become more imperative for the barn operator to have a detailed understanding of all the features and functions of the various heating and ventilation system components, particularly the controller equipment."

Modern ventilation controllers are very sophisticated, but can be intimidating

Predicala recommends keeping a list of all ventilation equipment specifications and updating it whenever a component is replaced.

As barns get older, it is inevitable that a mix of different equipment is in use, therefore knowing how both new and old components operate becomes essential if the system is to be kept working efficiently. "Servicing and maintenance of the various equipment in the barn will be greatly facilitated by creating an updated document detailing the model, specifications, manufacturer, location in the barn, supplier, date of installation, date of last and next service, for each equipment installed in the barn," Predicala explains. "Service calls by technicians could then be substantially reduced to just the actual servicing of the equipment."

The settings of the heating and ventilation system should be regularly monitored and adjusted accordingly as ambient conditions, animal growth stage, and husbandry practices change throughout the production cycle, Predicala advises. "Additionally, periodic changes and maintenance activities are required as the season changes in order to maintain peak operation of the different components," he recommends. "For this, it is strongly recommended to have a checklist of all the ventilation-related items that need to be checked regularly as well as the maintenance procedures that need to be performed over the course of a year. Among the important aspects that should be included in the checklist are: checking and verification of temperature set-points, regular monitoring and periodic calibration of controllers and sensors, seasonal tasks in preparation for winter and summer, and keeping fan blades and intakes clean."

Heating and ventilating a pig barn is costly but it is necessary to provide the optimum environment for maximum pig performance, concludes Predicala. "Common mistakes that result in significant energy wastage can often be resolved by having a good understanding of the various components of the heating and ventilation system to be able to fine-tune its operation and run it at peak performance without using more energy than it has to."

Setting up an effective farm trial

All pig farms participate to a greater or lesser extent in experimenting to improve productivity, reduce costs, or make management easier, says Lee Whittington, President and CEO of the Prairie Swine Centre. While sometimes the results of such experimentation are as expected, all too often the time and effort and money required to innovate and experiment results in more questions than answers and does not lead to an innovation being adopted on the farm as part of a new long-term management strategy. He explains why results are not always what we expect and how to improve the odds of success in on-farm trials.

Why you should do an on-farm trial

Many new technologies come with all the work completed, including the change we can expect, the confidence in the statistical approach used to analyze the test, the economic benefit of implementation under a standard set of economic assumptions, Whittington notes. Yet, he says, producers want to test new technology or techniques under their own conditions and "see for themselves'. And, occasionally, they may want to try out an idea they have had under controlled conditions. "No two barns are exactly alike, even though they may be designed to operate the same; the people factor adds a unique component that makes a significant difference on the outcome of many practices or products used," he explains.

Most on-farm trials have at their heart an economic decision they are trying to address, Whittington continues. What is the benefit we are hoping to achieve and what is the cost to achieve it? "The cost is often easy to find (example, feed cost per kg, or drug cost per dose) but the performance result in the barn, the statistically tested part, is much more difficult", he believes. "A review of any scientific publication will focus on the significant p value. That is, the results are not random and there is a 95% probability that the effect seen from the intervention is from the treatment given ($p < 0.05$)."

In practice, the result of a trial may be inconclusive, because the experimental test was not sensitive enough to detect a small difference and so other information is required in order

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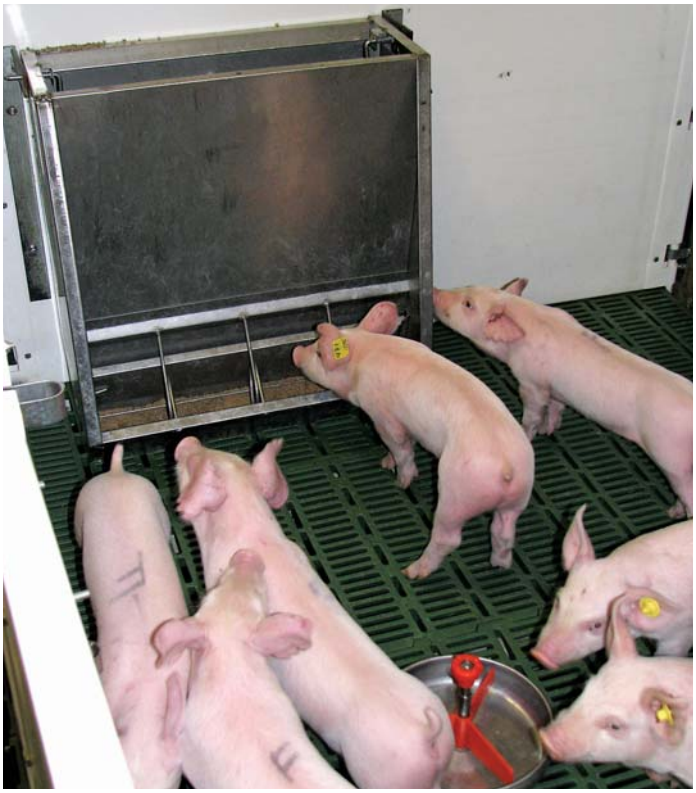

Careful thought and planning will increase the chances of success when carrying out on-farm trials, says Lee Whittington

to make a decision. Sometimes the trial may not have been designed properly and cannot answer the question posed.

Why on-farm tests often fail

The reasons are many but break down into five main categories:

1. The trial design would not provide the answer you seek. "This sounds very basic and avoidable but likely accounts for a majority of the on-farm test failures," Whittington comments. "What happens if the intervention has multiple outcomes? For example, a small improvement in average daily gain, feed efficiency and improvement in one or two carcass features. Do the combined improvements in each of these areas justify the intervention?" When the improvement in feed efficiency alone is enough to justify the intervention the clear answer is to adopt the new technology, he says. But if only small gains are made in each area, the likelihood is that the study needs to be redesigned to include many more pigs to identify small gains.

2. Consideration of prior knowledge of the item to be tested and the pig barn we are testing in. "If the item we are testing has a history of performance under other circumstances (even in species other than pigs) that gives us a clue as to how big a difference we are seeking to measure," Whittington explains. He also suggests that understanding the degree of variation in key factors such as daily gain within a barn, due to factors such as health, is essential to interpreting trial results.

3. Danger of believing your test analysis when actually it is worthless. "Statistically a negative result of a single study cannot be interpreted as supporting a negative conclusion,"

> **"Statistically a negative result of a single study cannot be interpreted as a supporting a negative conclusion"**

Whittington says. "This really only means that we are not satisfied 'beyond a doubt' ($p<0.05\%$ probability) that the product performed as expected."

4. A micrometer question is often measured with a yard-stick. "Sometimes the scale of the economic benefit required to justify an intervention is much smaller than the capability of the statistical test created," comments Whittington. "If there is so much variation already within the population, it would take a large number of data points (pens of pigs) to sort out the effect of the smaller wave."

5. Data collection or the 'people factor'. Any distractions that will occur during the course of the test need to be dealt with in advance. for example, getting stockpeople on side, arranging additional help to collect information, not fudging data when it is lost, having a backup plan when people unexpectedly leave and having the right measurement tools (is the scale accurate enough to pick up the difference anticipated?)

"There are a whole list of other factors such as ventilation error or power failure, out of water events, feeders adjustable to provide uniform access in all pens and avoid waste, what to do if there is a disease outbreak during the test period, effect of weather and changing seasons on feed intake or dunging patterns, stable parity distribution within the breeding herd, pigs jumping from one pen to another, and so on," he notes.

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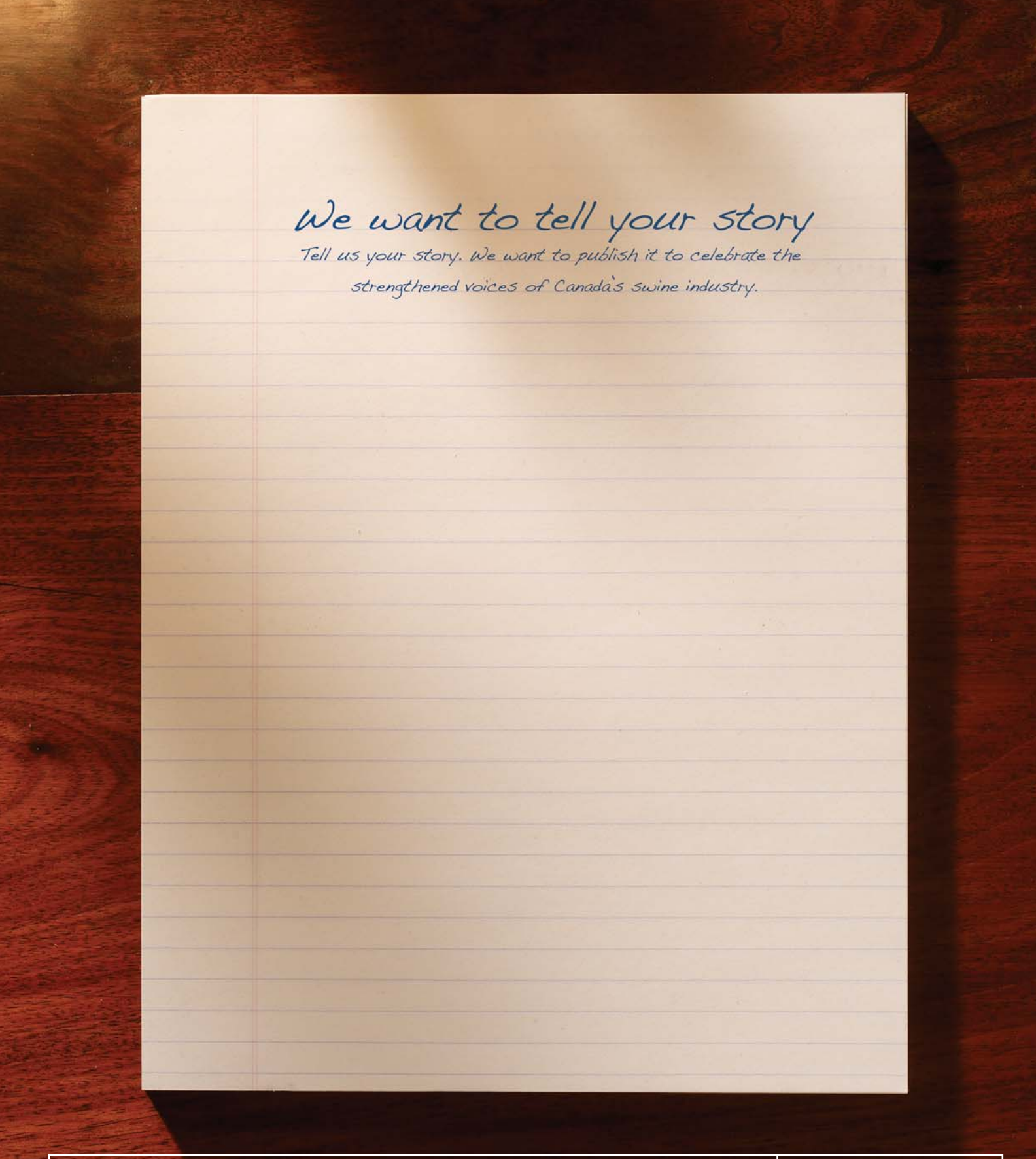

Only you know what it took to stay in business as a Canadian swine producer. We want to hear your story, and share the strategies that helped you weather the storm that has battered the industry. *Was there one important business decision that made the difference for you? What is the main thing you learned through it all? Where do you see the opportunities for your operation in the future?*

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"One sidebar to the people factor is that when you start to measure something, it generally begins to improve," he adds. "For example, when daily feeder and waterer checks are consistently made and acted on, the results of all groups will likely improve because the 'normal' out-of-feed events (typically 10% of all feeders in the barn) do not occur during the test period."

How to avoid common pitfalls when setting up your on-farm trial

1) Do the math first. How many groups of pigs will it take to have confidence (sufficient power in the statistical test) that the difference I am trying to measure can be assessed from my trial design?

2) Calculate the likely financial benefit of a successful trial. Will it be sufficient to justify the work and cost of conducting the trial? Most businesses will want a 3:1 return on new investment because they realize that biological systems don't always behave as predicted all the time, so can I expect a $3 return from a $1 intervention?

3) Get the people involved. Everyone that plays a role needs to be aware of the cost and the large risk of failure to complete the trial as designed.

4) Use a checklist like the one provided to plan your successful trial implementation.

Conclusions

"There are many sources of new ideas and technologies awaiting pork producers" believes Whittington. "Assessing their economic value and appropriateness for your farm should begin with taking the easy route first and looking for third-party verifiable test results that give you confidence the results are repeatable and sufficient to provide a positive economic return under current economic circumstances." However, he says, if reliable information does not exist but you believe the potential economic benefit is too great to ignore, and you have adequate resources to design and implement an on-farm test then the following checklist may be used to increase the chances of success. ■

Designing Your On-Farm Trial

A Checklist For Successful Trials

Prairie Swine Centre 2010

Objective

- Is there a clear question to be answered (objective)?
- Is the experiment designed to answer the question?
- With different outcomes what is the plan-of-action?
- Is the technology being tested applicable to the farm?

Timing

- Is the season appropriate for the outcome to be applicable?
- Do you have a calendar listing the dates that important tasks will be performed?
- Do you avoid major holidays, maternity leave, family births, or other planned events that may disrupt the normal management of the farm or leave labour too short to properly conduct the experiment?

Labour

- Is there sufficient farm labour available to perform extra duties during the planned time of the experiment?
- Have you clearly outlined the extra duties and talked through the requirements with each person involved?
- Pigs and pens will be checked daily for feed and water availability and for signs of illness. Feed and water outages, treatments etc. will be put in the notes of the experiment.

Treatment preparation

- Go to where the treatments will be prepared and be sure that they understand what is to be done and when and have the proper paperwork (ex. Diet formulation) and ingredients to prepare the treatments.
- Confirm that treatments have been correctly made and delivered to the correct bins on the correct farm.
- Be sure that there is sufficient storage on farm for treatments either in bags or in bulk and that bins are emptied before feed delivery.

Animals

- Are enough pigs of similar age, weight, and background (ex. parity distribution, creep or no creep, etc) available to be on each treatment at the beginning of the trial?
- Will the supply of pigs be representative of normal production (eg. weaned at normal age, from normal parity distribution, not during PRRS season, etc)?

Equipment

- Are scales available and checked for accuracy and of the correct precision? Are check weights available?
- Are feeders set similarly?
- Are treatments and pens clearly marked to minimize mistakes?
- Is the correct feed ordered (and delivered)?
- Prepare data collection sheets with spaces for all important information (eg. pen, treatment, date, weight, feed weight in, feeder weight, etc).
- Is each treatment represented in each area of the barn (i.e. not all of one treatment in a drafty corner while all pens on another treatment are near the heater)?

During the trial

- Talk to the people conducting the trial to ensure that the protocol is being followed and that no unexpected things (eg. water outages, disease outbreak) have happened that will affect the outcome of the trial.

After the trial

- Check the data for accuracy.
- Talk to the people that conducted the trial again to be sure that the protocol was followed and to see if unexpected things might have influenced the outcome of the trial.

Feeding increasing levels of canola meal with distillers dried grains and solubles to hogs

By Ruwani Seneviratne[1,3], Malachy Young[2], Gregorio Lanz[2], Neil Campbell[2], Ruurd Zijlstra[3], and Eduardo Beltranena[1,3]
[1]Alberta Agriculture and Rural Development, [2]Gowans Feed Consulting, [3]The University of Alberta

Take home message

Up to 24% solvent-extracted canola meal can be included into hog diets containing 15% distillers dried grains with solubles (DDGS). A recent commercial-scale feeding trial conducted in Alberta showed minimal impact on hog growth performance and no effect on dressing percentage or carcass traits. Therefore, when feedstuff prices permit, inclusion of these two Prairie protein meals with relative high fibre content can be combined and scaled up to reduce feed cost, increasing producer profitability.

Solvent extracted canola meal can be included in finishing diets at levels up to 24% when combined with 15% DDGS

Introduction

Global supply and demand of protein meals affect the price of pig feed, impacting producer profitability. Prices fluctuate regularly, so what applies today, won't necessarily be the case next week. Soybean meal is the most available protein meal worldwide. Thus the price of imported soybean meal is the main factor affecting Prairie pricing of canola meal, field pea, meat and bone meal, and even distillers dried grains with solubles (DDGS). Pricing of these locally produced protein meals is roughly set based on their protein content relative to soybean meal (47%). However, the regional dynamics of protein meal pricing are changing due to recently added canola crushing capacity in Saskatchewan and the rapid growth of the bio-fuel industry in western Canada.

"There was a need to revaluate canola meal inclusion rates while feeding relatively high levels of DDGS"

Increased availability and therefore lower protein meal prices are projected. Pig producers will have the opportunity to aggressively contract and maximize feed inclusion rates when downwards price opportunities exist. But how high can you push feeding combinations of Prairie protein meals to hogs without impacting hog performance or carcass traits? Canola meal and wheat DDGS are not only high in protein, but also relatively high in fibre.

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Table 1a: Ingredient composition and calculated nutrient content of the grower diets

	Grower 1					Grower 2 Canola meal inclusion level					Grower 3				
	0%	6%	12%	18%	24%	0%	6%	12%	18%	24%	0%	6%	12%	18%	24%
Ingredient, %															
Wheat, ground	47.01	58.02	58.91	55.46	51.29	40.19	51.81	62.14	61.95	56.62	37.11	48.49	59.55	64.42	57.41
Barley, ground	19.30	4.52	-	-	-	24.50	10.06	-	-	-	39.62	25.16	11.18	-	-
Canola meal, SE	-	6.00	12.00	18.00	24.00	-	6.00	12.00	18.00	24.00	-	6.00	12.00	18.00	24.00
DDGS[1]	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Field pea, ground	7.25	8.41	8.47	7.67	4.89	15.20	14.75	8.30	1.67	-	-	-	-	-	-
Soybean meal	8.83	5.50	2.58	-	-	2.66	-	-	-	-	5.88	3.02	-	-	-
Tallow	-	-	0.56	1.39	2.43	-	-	0.27	1.11	2.19	-	-	-	0.52	1.68
Limestone	1.34	1.28	1.24	1.25	1.27	1.29	1.23	1.18	1.19	1.21	1.21	1.17	1.11	1.04	1.04
Salt	0.46	0.47	0.48	0.48	0.48	0.45	0.46	0.47	0.48	0.48	0.51	0.52	0.53	0.54	0.55
Lysine HCl	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40	0.40	0.34	0.40	0.40	0.41	0.32	0.24
L-threonine	0.11	0.10	0.09	0.08	0.04	0.11	0.10	0.08	0.05	0.01	0.11	0.10	0.09	0.05	-
Feeder premix	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
DL-methionine	0.10	0.09	0.08	0.06	0.04	0.05	0.03	0.01	-	-	0.05	0.04	0.02	-	-
Copper sulphate	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-	-	-	-	-
Phytase 750 units	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calculated nutrients															
NE, Mcal/kg	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.30	2.30	2.30	2.30	2.30
SID lys:NE, g/Mcal	4.07	4.07	4.07	4.07	4.07	3.64	3.64	3.64	3.64	3.64	3.30	3.30	3.30	3.30	3.30
Calcium, %	0.70	0.70	0.71	0.74	0.77	0.65	0.65	0.65	0.68	0.71	0.60	0.60	0.60	0.60	0.63
Phosphorus, %	0.56	0.57	0.59	0.62	0.64	0.52	0.53	0.54	0.56	0.59	0.50	0.50	0.52	0.54	0.57
Av. phosphorus, %	0.32	0.32	0.32	0.32	0.32	0.28	0.28	0.28	0.28	0.28	0.27	0.26	0.26	0.26	0.26

[1]70% wheat, 30% corn co-fermented; Husky Energy, Lloydminster, SK

We have reported feeding increasing dietary levels of wheat or corn DDGS up to 30% on growth performance, carcass traits, and pork quality. However, the feed inclusion of canola meal in hog diets was arrived at as a safety margin beyond which performance might be compromised rather than to minimize feed cost. Titration of canola meal inclusions in hog diets was also conducted prior to the expansion of the bio-fuel industry, when DDGS was not a relevant feed commodity in western Canada. Therefore, there was a need to revaluate canola meal inclusion rates while feeding relatively high levels of DDGS.

The feeding trial

A feeding trial was therefore conducted to evaluate the effect of feeding increasing levels of solvent-extracted canola meal

(0, 6, 12, 18 and 24%) in diets containing 15% DDGS on hog growth performance, dressing percentage, and carcass traits. This commercial feeding trial was conducted at the Drumloche test barn in Lougheed, Alberta. In total, 550 barrows and 550 gilts initially of 30 kg body weight were housed in 50 pens of different gender, 22 pigs per pen. Pigs in each pen were fed one of the 5 randomly-assigned dietary regimens shown in Table 1 over 5 growth phases until slaughter weight.

Within growth phase, the 5 treatment diets were formulated to provide identical energy (net energy, NE), lysine as a ratio to energy, and a proper ratio of other amino acids to lysine. All diets contained 15% DDGS (70% wheat, 30% corn co-fermented; Husky Energy, Lloydminster, SK). Increasing canola meal level in the diets replaced soybean meal and field pea in grower diets, and barley in finisher diets. Supplemental inorganic phosphorus was not added due to the high content and availability of phosphorus in DDGS and added phytase enzyme.

Pigs were group-weighed on Day 0, 21, 43, 68, 77, 83, 90, 97, 104, and prior to shipping for slaughter to establish pen average weight on weigh days, calculate daily weight gain, days on trial, and dressing percentage. Feed added to each pen feeder over each period was electronically delivered and tracked. Feed remaining at the end of each period was subtracted to calculate pen feed disappearance. Feed conversion was calculated by dividing pen feed disappearance by weight gain.

Results

Increasing the level of canola meal inclusion in hog diets with 15% DDGS did not affect body weight on trial weigh days except on Day 90 (Figure 1). At the end of the trial, hogs fed 18% canola meal were 3.3 kg lighter than hogs fed 0 or 6% canola meal.

For the entire trial, increasing the level of canola meal inclusion in hog diets containing 15% DDGS linearly reduced daily feed intake, but only by 16 g for every 5% increase in canola meal inclusion (ADF, Figure 2). Daily feed intake was also slightly and linearly reduced for the

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Figure 1: The effect of increasing dietary canola meal inclusion level in hog diets containing 15% distillers grains on body weight on trial weigh days

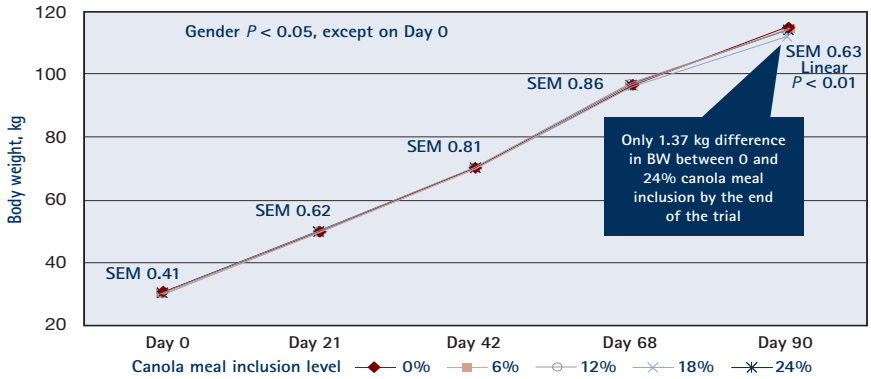


Table 1b: Ingredient composition and calculated nutrient content of the finisher diets

	Finisher 1						Finisher 2				
	Canola meal inclusion level										
	0%	6%	12%	18%	24%		0%	6%	12%	18%	24%
Ingredient, %											
Wheat, ground	12.65	25.11	40.07	55.11	58.59		10.23	25.25	40.07	54.92	58.72
Barley, ground	68.08	51.69	30.92	10.00	-		72.52	51.71	31.06	10.31	-
Canola meal, SE	-	6.00	12.00	18.00	24.00		-	6.00	12.00	18.00	24.00
DDGS[1]	15.00	15.00	15.00	15.00	15.00		15.00	15.00	15.00	15.00	15.00
Soybean meal	1.96	-	-	-	-		-	-	-	-	-
Tallow	-	-	-	-	0.61		-	-	-	-	0.59
Limestone	1.17	1.12	1.06	1.03	1.02		1.16	1.10	1.04	1.00	1.00
Salt	0.54	0.55	0.57	0.58	0.59		0.53	0.55	0.57	0.58	0.59
Lysine HCl	0.39	0.36	0.28	0.20	0.12		0.38	0.30	0.22	0.14	0.05
L-threonine	0.10	0.08	0.04	-	-		0.09	0.04	-	-	-
Feeder premix	0.07	0.07	0.07	0.07	0.07		0.05	0.05	0.05	0.05	0.05
DL-methionine	0.04	0.02	-	-	-		0.03	-	-	-	-
Phytase 750 units	0.01	0.01	0.01	-	-		0.01	0.01	-	-	-
Calculated nutrients											
NE, Mcal/kg	2.25	2.25	2.25	2.25	2.25		2.25	2.25	2.25	2.25	2.25
SID lys:NE, g/Mcal	2.98	2.98	2.98	2.98	2.98		2.76	2.76	2.76	2.76	2.76
Calcium, %	0.57	0.57	0.57	0.58	0.61		0.54	0.54	0.54	0.55	0.58
Phosphorus, %	0.49	0.50	0.52	0.53	0.55		0.46	0.47	0.48	0.50	0.52
Av. phosphorus, %	0.24	0.24	0.24	0.24	0.24		0.21	0.21	0.21	0.21	0.21

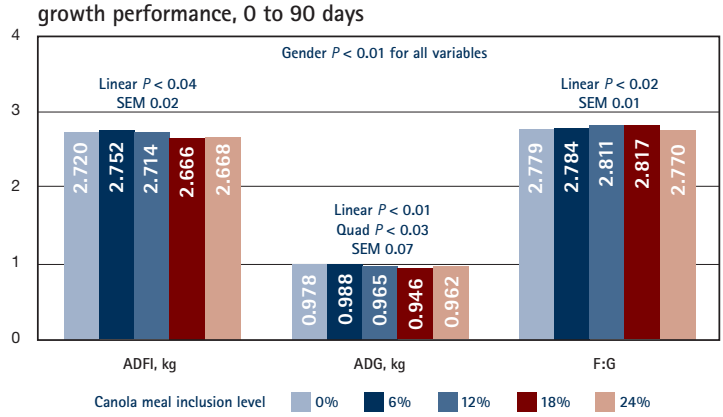
[1]70% wheat, 30% corn co-fermented; Husky Energy, Lloydminster, SK

finisher, but not the 3 grower phases by increasing the level of canola meal in the diets. Overall, barrows averaged 293 g/d higher feed intake than gilts.

> **Increasing the level of canola meal inclusion in hog diets containing 15% DDGS did not affect feed conversion"**

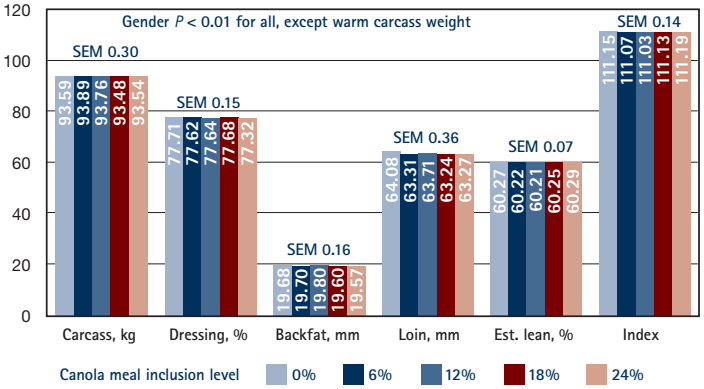
For the entire trial, increasing the level of canola meal inclusion in hog diets containing 15% DDGS linearly reduced daily weight gain by a mere 6 g for every 5% increase in canola meal inclusion (ADG, Figure 2). However, hogs fed 18% canola meal grew slower; 32 g/d lower than controls.

Figure 2: The effect of increasing dietary canola meal inclusions level in hog diets containing 15% distillers dried grains and soluble on hog growth performance, 0 to 90 days



The cause for the reduced weight gain of hogs fed 18% canola meal could not be established from the current data set. The daily weight gain of hogs fed the canola meal regimens was not different from that of controls for the first 2 grower phases. Barrows averaged 46 g/d higher weight gain and took 4 days less to attain slaughter weight than gilts.

Figure 3: The effect of increasing dietary canola meal inclusion level in hog diets containing 15% distillers dried grains and solubles on carcass traits



For the entire trial, increasing the level of canola meal inclusion in hog diets containing 15% DDGS did not affect feed conversion (F:G, Figure 2). Pigs fed 24% canola meal consumed 2.77 kg of feed per kg gained compared with 2.78 for hogs fed no canola meal.

Overall barrows consumed 17 g more feed per kg gained than gilts.

Increasing the level of canola meal inclusion in hog diets containing 15% DDGS did not affect warm carcass weight, dressing percentage, backfat thickness, loin depth, estimated lean yield and index (Figure 3). Barrows had slightly reduced dressing percentage (0.5 % units), thicker backfat (1.9 mm), reduced loin depth (2.1 mm), estimated lean yield (0.9% units) and index (2 units) compared with gilts.

Conclusions

The results of this commercial scale feeding trial indicate that increasing the dietary inclusion of solvent-extracted canola meal from 0 to 24% in hog diets containing 15% wheat DDGS had only minor impact on overall growth performance and did not affect carcass traits. Dressing percentage, which was likely already reduced somewhat by the fibre content of DDGS, was not reduced further by increasing canola meal inclusion. These high fibre protein meals can therefore be fed together at relatively high levels providing that the diets are formulated on a net energy basis and standardized ileal digestible amino acids. Thus, when economically feasible, inclusion of these Prairie co-products can be combined and scaled up to reduce feed cost, increasing producer profitability. Inclusion of DDGS and phytase enzyme eliminated the need to supplement inorganic phosphorus in the diets reducing manure excretion of this mineral and its environmental impact. Feeding Prairie produced co-products enhances our global feed competitiveness, provides flexibility in feed formulation, and reduces dependency on imported feedstuffs like soybean meal.

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Swine barn dust: What's in it? What are the health risks?

By Philip J. Willson, Canadian Centre for Health and Safety in Agriculture

Scientists from the Canadian Centre for Health and Safety in Agriculture, together with other researchers from the University of Saskatchewan, have studied the effects of repeated exposure to a range of doses of swine barn dust (SBD) on airway disease and inflammation using a mouse model system. First, a number of components, including endotoxin and a number of feed proteins, were identified in SBD. This helped to identify some of the potential health hazards in swine barn dust. Some of those components are potent causes of inflammation even though they have very little endotoxin. Second, mice were exposed to a series of doses of SBD mist for 20 min/day, every day for 14 days. The middle dose of SBD was chosen to represent the amount of dust exposure in a typical modern swine barn. Asthma-like response in the mice was measured. At the end of the 14-day exposure period, lung response was measured by counting cells that were washed out of the lung and measuring cytokines.

The asthma-like response was significantly higher in the group of mice that were exposed to the highest concentration of SBD. Likewise, the group that was exposed to the highest level of SBD had significantly greater inflammation than controls and some other groups. Also, there were substantially more immune-response cells washed from the lungs of mice that were exposed to the higher levels of SBD for the 14-day period. The SBD exposures used in these experiments caused chronic-type lung disease responses. The association between the asthma-like response and dose of SBD suggests that a threshold of disease risk occurs after a relatively low, chronic exposure to SBD.

In order to safeguard lung health, ensure that people who are allergic to feed proteins (corn, soy, canola, barley) are not exposed to any swine barn dust, and minimize the exposure of other people to swine barn dust.

For further information and details of the studies and findings, see: Cleave, Jayda , Willson, Philip J. , Town, Jennifer and Gordon, John R.(2010) 'Fractionation of Swine Barn Dust and Assessment of Its Impact on the Respiratory Tract Following Repeated Airway Exposure', Journal of Toxicology and Environmental Health, Part A, 73: 16, 1090 – 1101.

Breeding gilts at an average of 227 days of age resulted in an increase in revenue of $170 compared with breeding at 264 days

How breeding age impacts sow performance and longevity

By Dan Bussières, Groupe Cérès Inc., St-Nicolas, Québec

Recommendations for gilt breeding age have been debated for years and some inconsistency seems to exist within the industry. Fast Genetics and Hytek have carried out an evaluation of the performance and longevity of the Fast Genetics female according to age at first breeding.

From October 2006 to September 2007, 13,000 gilt farrowings were compiled within the Hytek production system. The 13,000 gilts that farrowed during that 12 month period were followed until parity 6. Both the litter size and % of females retained for each parity were recorded, with the data analyzed in September 2009.

Gilts were divided into 11 groups with 10 day breeding age intervals for each group. All gilts were managed according to standard gilt management protocols in place at Hytek.

The first aspect that most people look at with gilts is their first litter performance. Figure 1 shows the total born for each breeding age group for gilts at their first farrowing.

This clearly shows the benefit of breeding gilts at an older age in order to improve first litter size performance. The question then becomes: is this optimal in term of longevity and lifetime performance?

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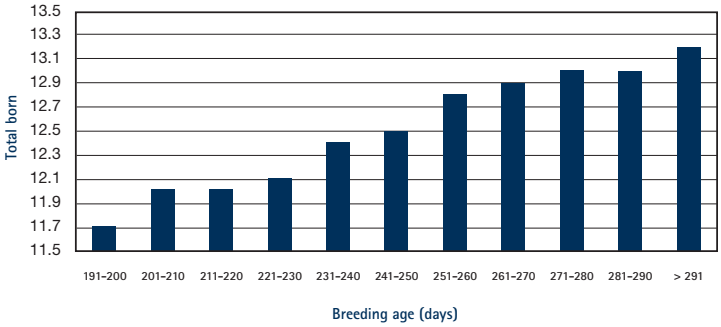
Figure 1: Total born at first farrowing versus breeding age



The second analysis we conducted was to look at the percentage of female retention after the first farrowing. For this we looked at the percentage of females that had a parity 2, 3, 4, 5 and 6 event out of the 13,000 females that farrowed a first litter. Figure 2 shows the percentage of females that farrowed a sixth litter according to their initial breeding age group.

Looking at this data we can see that longevity (percentage of sows farrowing at P6) is optimized when gilts are bred between 201 and 250 days of age, with the maximum percentage achieved by the 221-230 day age group.

Finally we looked at the combined factors of litter size and longevity in order to assess potential lifetime litter size in relation to gilt breeding age. Figure 3 shows the total number of pigs born over 6 parities, taking into account the percentage of female retention at each parity.

"Sow longevity is optimized when gilts are bred between 201 and 250 days of age"

The curve on this graph looks very close the one observed in Figure 2. Over 6 parities, the best total born performance was achieved with gilts bred in the age range 201 to 250 days, with the highest performance in the 211-220 day age group. We can clearly see that either a very young age at breeding (<200 days) or breeding above 250 days of age will limit litter size performance over a 6 parity period.

In order to better understand what could be the main factor that influences lifetime performance over 6 parities, we looked at litter size and percentage retention at each parity for each breeding age group. For litter size, although there was a trend towards better litter size in parities 2-6 with older age at breeding, the differences were much smaller and more variable than the one observed at the first litter. For percentage retention, we saw the same pattern in parities 2-6 as for the parity 6 retention in Figure 3. From parity 2 onwards, we observed a better retention percentage for the younger age groups (201-250 days).

Economics

In terms of performance it seems clear that an older breeding age (>250 days) or a very young age at breeding (< 200 days) will have a detrimental impact on lifetime performance over 6 parities.

Figure 2: Percentage of females having a P6 farrowing event versus breeding age

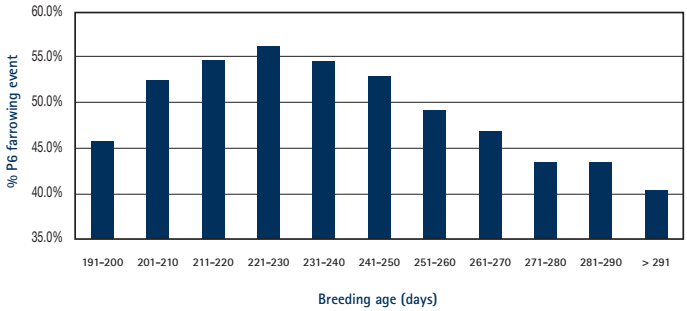
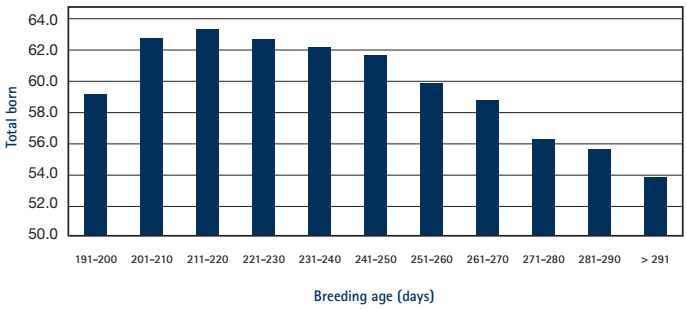


Figure 3: Lifetime litter size over 6 parities relative to breeding age group



In order to better assess the impact of these differences, we need to have a close look at the economic impact. For this we divided our total gilt group into two breeding age groups; 201-250 days and 251-290 days. We removed the two extreme age groups. If we look at the result for those two groups, we can summarize them as follows:

- Better Parity 1 litter size for the older breeding age group
  - 201-250 days : 12.20 TB
  - 251-290 days : 12.93 TB
- Better percentage retention through parity 6 for the younger breeding age group
  - 201-250 days : 54.19 %
  - 251-290 days : 45.36 %
- Better lifetime litter size through 6 parity for the younger breeding age group
  - 201-250 days : 62.65 TB
  - 251-290 days : 57.67 TB

Based on these findings, we can then estimate the economic impact of breeding gilts in the 'young' category (201-250 days) or in the 'old' category (251-290 days). Also, based on the Hytek data, we calculated that the weighed average age for the younger group was 227 days and for the older group average was 264 days.

Cost of raising the gilt until 227 versus 264 days of age
37 days @ 0.14 $/day fixed cost = $5.18/head
37 days x 3.25 kg/day of feed x $0.25/kg = $30.06/head feed cost
Total extra cost of raising the gilt to 264 days = $35.24/head

Difference in revenue from weaned pig produced over 6 parities
Total born difference of 4.98 pigs over 6 parities
4.98 pigs TB x 0.83% survival until weaning = 4.13 pigs extra weaned
4.13 pigs x $32.5/pig (value of weaned pig) = $134.23/female
The total difference in revenue when gilts are bred at 227 days compared with 264 days of age is around $170 per gilt.

The economic calculation may differ from farm to farm, but this information shows that there is a significant opportunity to revisit our objectives for breeding age. We also understand that other factors such as oestrus number at first mating, weight and body condition can influence lifetime performance. Based on this data and our overall experience with the Fast Genetics gilt, here are some general recommendations for gilt breeding:

Age – 200-250 days, with a targeted average at 220-240 days.

Weight –135 kg and over (300 lbs+)

Oestrus – Ideally breed gilts at their second or third oestrus

Back fat – Target back fat of 14-17 mm, avoiding the extremes (<12 and > 19 mm of back fat).

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Performance of weaned pigs is equal across wheat classes

By Rajesh Jha and Ruurd Zijlstra, University of Alberta

Performance of weaned pigs was equal irrespective of wheat class used in their feed

Questions are asked about the differences in nutritional quality of wheat among different classes. The nutritional quality for Canada Prairie Spring (CPS) and Durum wheat has traditionally been expected to be lower than for Hard Red Spring (HRS), without any evidence for these concerns. Growth performance and energy digestibility for weaned pigs was thus compared among six wheat classes, whilst considering particle size and diet pellet quality. Results indicated that growth performance and feed processing quality did not differ among wheat classes, although some variation was found for crude protein (CP) and non-starch polysaccharides (NSP) content. In conclusion, despite minor variations in chemical characteristics and DE content among wheat classes, young pigs fed all classes of wheat including CPS and Durum may perform effectively.

Wheat in pig diets

Wheat is commonly fed to swine as a main source of energy and can be efficiently utilized by swine of all ages. However, the range in chemical characteristics of Canadian wheat, especially CP, starch and NSP, causes variation in nutritional value of wheat for swine.

Among the Canadian wheat classes, HRS wheat is considered the standard for use in feed; however, wheat from all classes may be used, including off-grade wheat. Concerns exist about the nutritional and feed processing quality of CPS and Durum wheat. These classes are therefore separated out and discounted in the market place. However, CPS and Durum wheat is produced on a large scale in western Canada. Characterization of the nutritional quality of CPS and Durum wheat might assure its use in pig diets to reduce feed costs, the largest single cost of swine production.

The weaned pig trial

Twelve wheat samples representing two important cultivars for each of six wheat classes (Table 1) that are grown foremost in Western Canada were collected and characterized for their nutritional and feed milling properties. A 21-day growth performance and digestibility study was conducted at Prairie Swine Centre with 12 kg weaned pigs (PIC; 39-day-old; 4 pigs/pen, 12 pens per cultivar), which were fed pelleted 65%-wheat diets (3.5 Mcal DE/kg; 3.4 g digestible lysine/Mcal).

Pigs were weighed weekly and feed consumption was measured to calculate growth performance variables: average daily gain (ADG), average daily feed intake (ADFI) and feed conversion.

Table 1: Canadian wheat classes

Canadian Wheat Board Classes	Common name
Canadian Prairie Spring White	CPS White
Canadian Prairie Spring Red	CPS Red
Canadian Western Amber Durum	Durum
Canadian Western Red Spring	Hard Red Spring (HRS)
Canadian Western Red Winter	Hard Red Winter (HRW)
Canadian Western Hard White	Hard White (HW)

Nutritional and feed processing characteristics of wheat samples

Density among the wheat cultivars ranged from 76.7 kg/hL to 84.0 kg/hL, and did not vary widely among cultivars (Table 2). The protein ranged from 12.4 to 17.4% and total NSP from 9.0 to 11.5%. The DM, GE, starch, total carbohydrate, and crude fat content did not vary widely among the cultivars. Wheat particle size ranged from 536 to 734 µm (10/64" screen). The pellet durability index was 96 for all diets. Feed processing quality was thus excellent for all wheat classes.

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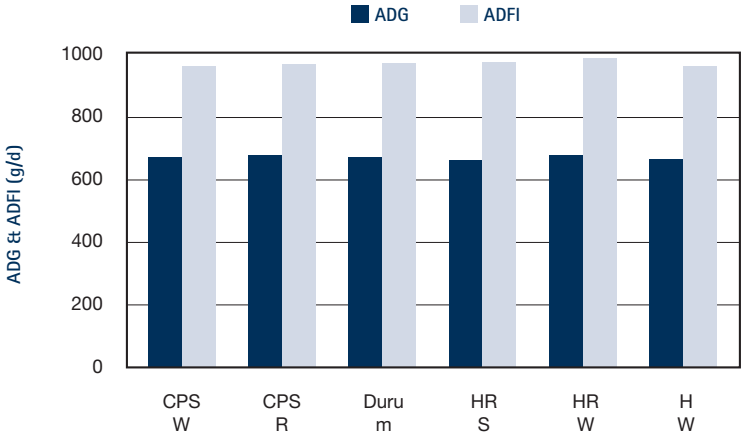
Table 2: Nutritional and processing characteristics of wheat classes (cultivars; 2 samples per class)

Wheat class	Protein (% as is)	NSP (% as is)	Density (kg/hL)	Particle size (µm)
CPSW	16.5, 15.2	11.3, 11.4	77.3, 83.2	591, 700
CPSR	12.7, 16.0	11.0, 11.3	84.0, 83.6	556, 631
Durum	17.0, 16.5	10.1, 9.0	80.7, 82.8	734, 624
HRS	17.3, 15.7	10.8, 11.5	77.3, 83.8	640, 708
HRW	12.4, 13.9	10.9, 9.7	79.3, 83.2	536, 636
HW	17.4, 17.4	10.9, 11.3	84.0, 76.7	724, 629
CV, %	11.4	7.2	3.6	9.9

Results of swine trial

In the growth study, ADG, ADFI (Figure 1), final body weight, and feed conversion did not differ among wheat classes for entire study period. However, some minor differences were observed in the first week. For example, ADG for Durum was 9% lower than for HRW, and similar among other classes;

Figure 1: Effects of wheat class on average daily gain and feed intake feed intake of weaned pigs



ADFI for HW was 7% lower than for HRW and similar among other classes. Finally, diet energy digestibility (and thus DE content) was lowest for CPS Red (86.5%), medium for CPS White, HRS and HW (87.2 to 87.5%) and highest for HRW and Durum (88.6 and 88.9%).

Implications

Protein but not fibre content varied considerably among the 6 classes and 12 wheat cultivars of western Canada. This variation resulted in a 7% range in wheat DE content and DE content was highest for Durum. The cultivars were analyzed in a diet relevant for commercial practice, i.e., without nutrient limitations. Wheat protein content was "corrected for" during diet formulation by balancing for amino acids and did not affect pig performance. Reductions in ADG and ADFI for CPS and Durum wheat were limited to the first two weeks and did not exist after 3 weeks.

Results indicated that energy digestibility is a more sensitive measure of wheat quality than performance measurements, and that the weaned pig might be able to compensate for small differences in wheat DE content. Wheat class did not affect feed processing characteristics. In conclusion, wheat across classes can be used effectively and without limitation for inclusion in diets fed to weaned pigs, provided that wheat fibre content is low and wheat protein content has been corrected for in diet formulation.

Financial implications

Wheat should be considered strictly based on the chemical characteristics and nutrient profile and not based on class. If wheat belonging to other classes is available, perhaps at a discount, producers have one more opportunity to reduce their feed cost per pig without compromising growth performance.

Acknowledgements

The Canadian Wheat Board, Canadian International Grains Institute, FeedRite (Ridley Inc.), Danisco Animal Nutrition and Quality Assured Seeds are acknowledged for funding the project.

Enzyme supplementation improves the gut health of pigs

By Rob Patterson[1], Elijah Kiarie[2], Martin Nyachoti[2] and Bogdan Slominski[2]
[1]*Canadian Bio-Systems Inc.*, [2]*University of Manitoba*

Introduction

It is now accepted that weaning simultaneously subjects piglets to nutritional (e.g. loss of sow's milk), psychological (e.g. mixing and moving) and environmental (e.g. change in ambient temperature) stressors and that these and other stressors contribute to growth depression typically observed immediately after weaning. Reducing this post-weaning growth lag is critical as it not only affects performance in the nursery but right through to marketing. Good barn management is one of the most effective strategies for reducing post-weaning growth lag. However, intestinal disturbances associated with immature gut development or pathogen proliferation can still occur despite our best efforts. Because of this, combining a well designed and implemented nutritional program with good management can be the most effective strategy for maximizing nursery and thus overall performance.

As mentioned above, intestinal disturbances, leading to reduced intake and in some cases scours are known to adversely affect the health status and performance of nursery pigs. The origins of these disturbances are complex and to an extent unknown. However, some research has indicated that indigestible components within the diet can lead to pathogen growth which in turn results in intestinal disturbances. Historically, the risk of these disturbances has been managed by providing in-feed sub-therapeutic antibiotics. Despite this, looking forward, the use of sub-therapeutic antibiotics may not be an option as many parts of the world have banned their use due to concerns that their over use may be contributing to antibiotic resistance. Finding viable alternatives is thus a major challenge for the Canadian (and global) pork industry. One such alternative that has been shown to have the potential to mitigate intestinal disturbance and improve nursery performance is the use of feed enzymes. Although feeding enzymes has been shown to improve digestion and feed efficiency, recent research is showing that enzyme supplementation can also generate prebiotics within the gut which can have positive effects on the health and immune status of the pig.

This article will examine the benefits of feeding enzymes to nursery pigs and will focus on how enzyme supplementation improves digestion and feed efficiency. The beneficial aspects of enzyme addition with respect to prebiotic formation and potential modes of action within the piglet intestine will also be discussed.

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Enzyme supplementation in weaned pig diets leads to improved gut health

Enzymes and pig diets

Before we can understand why enzymes are included into pig diets we must appreciate what enzymes are. Enzymes are biologically active proteins that speed up chemical and/or biological reactions. What this means is that what would normally take an extended period of time (e.g. breaking down dietary fibre) can occur very rapidly in the presence of the correct enzymes. As an example, phytase, which is arguably the most popular and successful enzyme being formulated into pig diets worldwide, selectively breaks down or hydrolyzes the bonds that hold phosphorus to phytate, thus, increasing the digestibility of this nutrient and reducing dietary inclusion levels of inorganic phosphorus sources.

"An inverse relationship exists between a feed ingredient's fibre level and its feeding value"

However, the focus of this article is not phytase but rather enzymes such as xylanase, beta-glucanase, cellulase and others (i.e. carbohydrases) which hydrolyze the indigestible fibre components within pig diets. We now know that pigs lack the necessary enzymes to break down these compounds on their own and as a result an inverse relationship exists between a feed ingredient's fibre level and its feeding value, as measured by digestible energy and outlined in Table 1. Therefore, if the fibre - or more specifically the non-starch polysaccharides (NSP) - present in various feed ingredients can be successfully broken down by the correct carbohydrases then the feeding value of that ingredient can be increased and feeding cost reduced.

Table 1: Energy, NSP content and NSP constituents of common feed stuffs

Ingredient	DE, kcal/kg	NSP, %	Predominant NSP
Corn	3525	8.4	Arabinoxylans
Wheat	3400	11.0	Arabinoxylans
Barley	3050	17.3	Mixed-linked β-glucans
Soybean meal	3450	18.2	Galacturonans, Arabinans, Galactomannans
Canola meal	2900	20.0	Galacturonans, Arabinans, Galactomannans

From: INRA, 2002; Anim. Feed Sci. Technol. 67:319

From an academic standpoint this sounds reasonably simple. But can a real economic benefit be achieved by supplementing carbohydrase enzymes into nursery pig diets? As an example, if the price of enzyme inclusion is $5 per tonne of feed into a typical nursery ration formulated to 3400 kcal/kg DE and costing $550/tonne, then 1% improvement in energy utilization is required to cover the cost of enzyme inclusion. When compared to published reports this is a fairly conservative and realistic expectation. In reality, the correct blend of supplemental enzymes will yield digestible energy improvements in excess of 1%, which in the context of our above example can result in economic savings of $5 - 10 per tonne of complete feed.

Prebiotic formation as a result of enzyme hydrolysis

Recent research is showing that the benefits of enzyme supplementation extend beyond the ability to improve nutrient digestion and reduce feeding costs. Enzyme supplementation also improves the overall health of pigs by improving their intestinal health through the formation of prebiotics. These prebiotics promote the growth of beneficial bacteria within the gut and improve the overall intestinal environment, which in turn can result in reduced incidences of disease and dependence on medications.

To better understand the prebiotic effects of feed enzymes one needs to understand some basics about the carbohydrates or sugars present in pig rations. In simple terms, carbohydrates in pig diets can be broadly divided into two groups, the first being simple sugars and starch, which are readily digested by the pig's own digestive enzymes. The second group is NSPs, which as mentioned above are large compounds composed of many sugar units and for the most part are indigestible to the pig, especially in the small intestine. When NSPs are broken down into low-molecular weight polysaccharides, oligosaccharides and simple sugars by the correct blend of carbohydrase enzymes they acquire the potential to become prebiotics and can in turn exert health benefits by improving the pig's intestinal environment.

"Can prebiotics really be created by supplementing pig diets with enzymes?"

Once again, from an academic standpoint this seems straightforward, but can prebiotics really be created by supplementing pig diets with enzymes? A published study showed that when feed ingredients common to Western Canada are incubated with a broad spectrum (pectinase, cellulase, xylanase and mannanase) of carbohydrase enzymes, a wide range of sugars are in fact released (Table 2).

Table 2: Component sugars of NSP hydrolysis product isolates (mg/g) from common feed stuffs

Sugar Type	Feed Ingredient			
	Soybean Meal	Canola Meal	Wheat Midds	Flaxseed Meal
Arabinose	17.3	80.8	107.8	45.6
Xylose	2.9	39.4	208.2	196.0
Mannose	8.4	nd	7.9	nd
Galactose	128.6	24.8	15.6	69.2
Glucose	32.7	42.5	291.7	113.5
Uronic acids	72.1	33.8	166.4	175.7

From: Anim. Sci. J. 81:63; J. Nutr. 138:502

But will these sugars, once released by enzyme supplementation, act as prebiotics and improve the intestinal environment? Researchers assessed this question by using an advanced "in situ" experimental model. In essence, the researchers directly infused enzyme hydrolysis products into living piglet intestinal segments that were experimentally infected with E. coli K88 and then measured fluid passage and absorption (to estimate diarrhea) through the segments. The researchers found that after an E. coli K88 infection, segments

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that were infused with enzyme hydrolysis products had greater fluid absorption than control segments (Figure 1). This means that the sugars released following NSP hydrolysis exert a beneficial effect on intestinal tissues during an infection which could lead to reduced scours and improved recovery in a commercial operation.

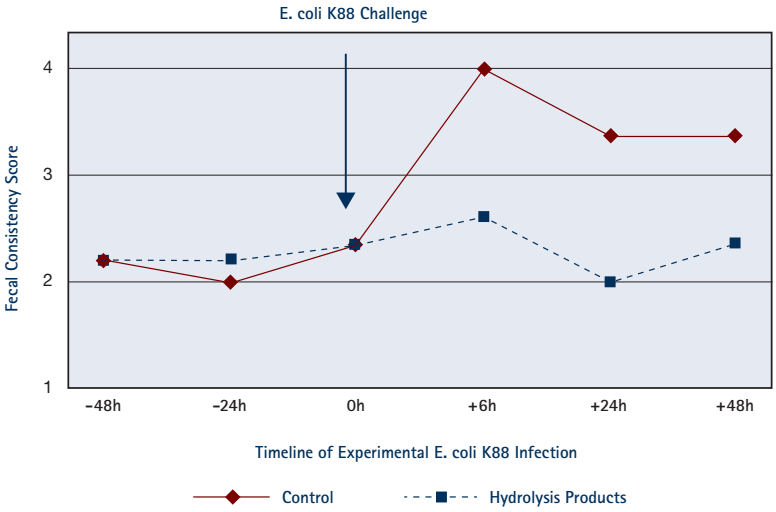
Thus, we can see that under controlled experimental conditions, enzyme hydrolysis products have the potential to reduce the negative effects of an E. coli K88 infection by reducing intestinal fluid loss. However, can the same benefits be achieved in live pigs challenged with E. coli K88? The same authors conducted such trials and found that piglets challenged with E. coli K88 and provided with NSP hydrolysis products from wheat middlings, flax, soybean and canola meal had lower stomach pH and greater levels of intestinal acid compared to control piglets (Table 3). In addition, piglets fed enzyme hydrolysis products consumed more feed, grew better (Table 3) and had lower incidences of diarrhea than control piglets (Figure 2).

Table 3: Effect of enzyme hydrolysis products on the intestinal environment of piglets 24-hours after an E. coli K88 challenge

Parameter	Control	NSP hydrolysis products	P-value
Lactic acid (mmol/L)	44.3	87.9	0.001
Total organic acids (mmol/L)	50.1	95.6	0.001
Stomach pH	3.86	2.62	0.01
Average daily feed intake (g/d)	272	317	0.07
Average daily gain (g/d)	199	267	0.01

From: Can. J. Anim. Sci. 89:341

Figure 2: Development of diarrhea (measured as fecal scores) of piglets fed NSP hydrolysis products and challenged with E. coli K88. Higher fecal scores indicate more severe diarrhea



Conclusions

It has been estimated that worldwide, upwards of 50% of the economic losses seen in weaned pig production can be associated with E. coli infection and that in positive herds 2% mortality can be seen. Reducing this mortality by even a small amount while simultaneously improving feed conversion easily covers the cost of enzyme inclusion given that a 1% reduction in nursery mortality and an FCR improvement of 0.1 can generate savings of approximately $5 - 10 per sow per year in a farrow to finish operation, respectively.

It is evident from the research presented in this article that the benefits to be gained from enzyme supplementation are not only from improved nutrient digestion and feed efficiency. Improved gut health as a result of prebiotics formed from the hydrolysis of common feedstuffs can also benefit the nursery pig by controlling enteric infections such as E. coli. Although this research is still in its infancy, the implications in terms of economic savings and as a potential alternative technology to replace antibiotic growth promoting compounds in pig feeding programs are significant. ■

Coccidiosis treatment now available in Canada

For years veterinarians and producers have been fighting a losing battle against coccidiosis, a disease of young piglets that results in scouring and reduced growth. The only effective treatment is Baycox®, a 5 per cent suspension of toltrazuril, but it has never been licensed and has been unavailable since 1998. However, the product was given market authorization in Canada in October, providing producers with a weapon against this damaging and expensive disease. In this article, we look at what causes the disease, its incidence and how to eliminate it.

Coccidiosis prevalence widespread

Coccidiosis is caused by an internal microscopic protozoan parasite. A coccidial infection is one of several causes of diarrhea in piglets, and is noted in the latter half of the suckling period as a whitish-yellow pasty stool. While the prevalence hasn't been scientifically studied in western Canada, Dr. Mike Sheridan, a veterinarian and partner in Swine Health Professionals at Steinbach, Manitoba says that in the southern Manitoba herds that he personally consults on, "easily 30 per cent of the herds show signs of coccidiosis."

A 2006 research study[1] in eastern Canada lead by Andrew Peregrine of the University of Guelph found that in 50 representative Ontario herds ranging in size from 30 to 1700 sows (average 411 sows), Isospora suis was detected on 70 per cent of farms. This prevalence is similar to a European study of 324 farms in Germany, Austria and Switzerland where 76 per cent of herds were found to have coccidia infections.

In Peregrine's University of Guelph study[1], on 42 of 50 farms, at least one litter out of approximately 10 sampled per farm and aged seven to 21 days was found to be experiencing diarrhea, and 47 per cent of litters experiencing diarrhea were positive for coccidia.

The authors stated in a presentation to the 26th Centralia Swine Research Update in Kirkton, Ontario in January 2007 that: "In summary, this study has indicated that coccidia are commonly found on Ontario farms and are associated with both clinical and subclinical infections. Hopefully this will remind practitioners that coccidiosis is still a problem on many farms and should not be ignored."

Dr. John Harding, Associate Professor, Swine Production Medicine at the Western College of Veterinary Medicine at Saskatoon, Saskatchewan, said that a pasty yellow scour typical of coccidiosis is commonly seen on commercial hog farms in western Canada. "It is seen frequently with generally low percentages of the litters affected, but the incidence can be higher as well."

Understanding coccidiosis

"Coccidiosis occurs when piglets ingest coccidial oocysts - the external stage of the life cycle - from the farrowing pen surroundings," explains Dr. Bruce Kilmer, Director of Veterinary Services and Regulatory Affairs at Bayer HealthCare. "These oocysts are found in faeces and on pen surfaces, usually having been carried over from the previous litter."

"Once ingested, the oocysts begin a maturation process while moving down towards the small intestine, where they enter the intestinal wall and undergo multiple cell divisions and stages of their life cycle," Kilmer continues. "After five to seven days of infection the coccidia re-emerge from the intestinal wall as oocysts and are excreted back into the external environment. This mass emergence of mature coccidia from the intestinal wall causes diarrhea."

Dr. Sheridan notes that the first signs of an infection occur about 8 - 12 days after birth, when a piglet develops diarrhea

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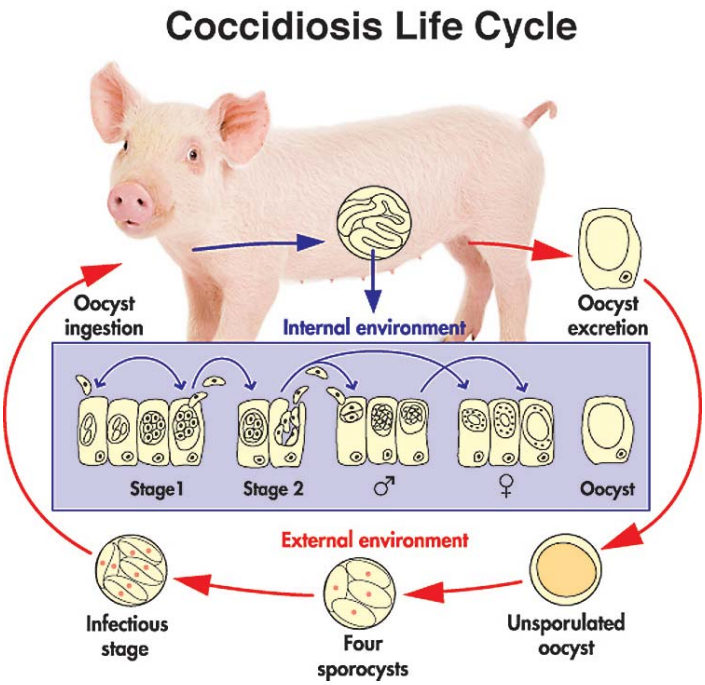
with the faeces changing to a creamy tan colour. "This occurs when the organism is exiting the gut. The damaged intestines can't absorb the fat, which is why the scours are a greasy, creamy consistency." Not all piglets in a litter will necessarily be infected, but quite often, one or two piglets will be smaller, less thrifty, lose weight or gain more slowly, and eventually produce lower weaning weights – all of which can cause economic loss.



"Once coccidiosis is present in a herd, eradication is very difficult, if not impossible," says Dr. Harding. Recommended practices include frequent sanitization of the barn, degreasing pens and farrowing areas, eliminating porous surfaces in the barn by painting plywood and cement floors. Ultimately, though, these practices can only minimize the impact since the oocysts are very difficult to control or eliminate in the barn's environment.

Coccidia control improves piglet growth

The difficulty in controlling the disease means that the availability of Baycox 5% will be a godsend for producers whose herds are affected, because coccidiosis is so costly. Baycox 5% is administered as a prophylactic treatment to piglets, at three days of age, prior to clinical signs of coccidiosis. "This administration controls coccidial infection by halting the single cell development of the protozoa, killing the parasite in the gut before it damages the intestinal walls," explains Dr. Kilmer. "Also, because Baycox 5% does not have any activity against the natural flora in the gut, the prevention of coccidiosis results in improved gut health and better performing piglets."

"If there isn't any damage to the intestinal lining, it acts as a barrier to colonization of bacteria that can cause secondary infections. With a healthy gut, research has shown that piglets have a higher growth rate and improved weaning weights," Dr. Kilmer points out.

Research in many parts of the world backs up the claim. For example, a trial by P. Madsen et al. in 1994[2] looked at the efficacy of Baycox 5% against coccidiosis infection. The untreated group had 8.03 oocysts excreted per gram of faeces compared to 0.3 oocysts per gram for the Baycox 5% treated group measured at Days 11 – 13. At Days 20 – 22, the untreated group's level of oocyst excretion was 4.72 oocysts per gram, compared to none with the Baycox 5% group.

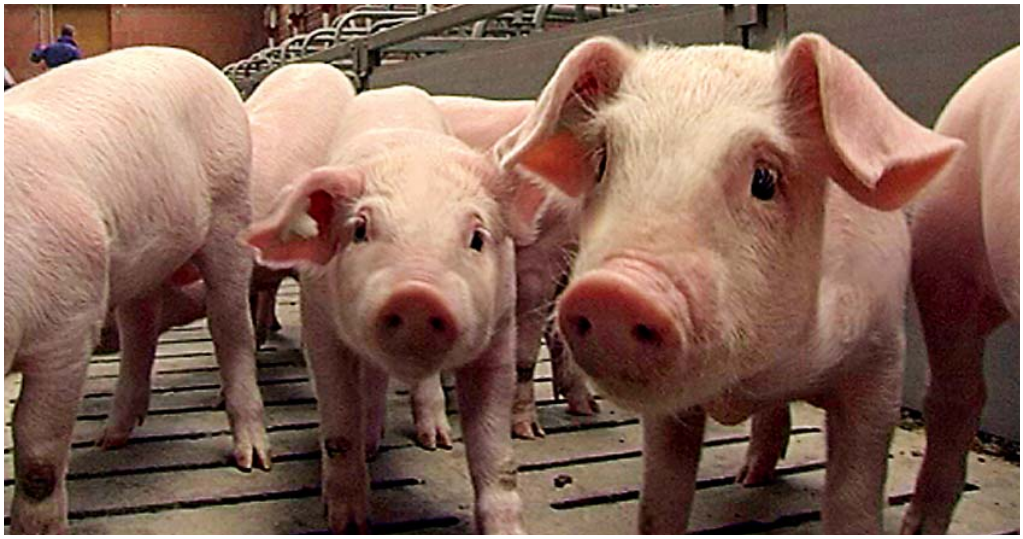
In research presented by Wustenberg[3] et al. at the 18th International Conference of the World Association for the Advancement of Veterinary Parasitology, Stresa, Italy in 2001, the Baycox treated group of piglets was shown to have significantly lower levels of diarrhea than diclazuril and sulphadimidine treated groups, and the weight gain profile from day 7 to day 28 for the Baycox 5% group had consistently higher gains than the other treatments.

Dr. Kilmer also says that the prophylactic treatment of piglets does not impair the piglet's ability to acquire lifelong natural immunity against coccidia, which helps promote resistance to re-infection[2]. This treatment program is termed metaphylactic, meaning that if there is known coccidiosis in the farrowing room, all piglets will benefit from treatment for protection.

A recent study[5] by Dr. Steven McOrist at the University of Nottingham, United Kingdom shows the value in the metaphylactic approach. He evaluated the efficacy of Baycox 5% for the improvement of gut health in a large scale grower-finisher pig herd in Romania. The four day old piglets were treated with Baycox 5%, and performance was measured from Day 21 up to Day 150

in the grower-finisher stage. Baycox 5% treated pigs were consistently and significantly heavier (by as much as 3.6 kg) through Day 150, and feed conversions were also improved, compared to the untreated pigs.

While the western Canadian prevalence of coccidiosis may not be as high as eastern Canada or in Europe, both Dr. Harding and Dr. Sheridan agree that Baycox 5% will be a valuable tool for hog producers. They say that if clinical evidence of coccidiosis has been present in the past, a Baycox 5% treatment should be considered.



Infection with coccidiosis causes scouring and reduced growth in piglets

"Our goal is to get the herd on Baycox 5%, clean up the infection, sanitize and clean up the barns, and then hopefully we will be able to eventually get the herd off the treatments," says Dr. Sheridan. Dr. Harding believes that using any preventive treatment is a balance between benefit and cost. "I would recommend the use of Baycox 5% for a period of time, reduce the burden of oocysts shed into the environment, improve sanitation and then try to pull back and re-evaluate the clinical situation," he advises.

For more information on Baycox® 5%, visit www.BayerPigletHealth.ca, or talk to your veterinarian.

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International Round-up

Selection of pork for increased marbling will ensure that every chop is juicy

Grading based on pork marbling now a reality

Extended on-line tests of a newly developed instrument grading system for pork carcasses have demonstrated its ability to differentiate pork loins based on marbling levels. The new system, called BioQscan®, has now been tested on more than 20,000 pork carcasses and has proven its ability to operate effectively at chain processing speeds exceeding 1,200 carcasses per hour, according to Ames, Iowa based Biotronics, Inc., developer of the equipment.

Doyle Wilson, Biotronics' president, says that within milliseconds of the BioQscan® probe being placed on the skin of a pork carcass, the marbling level is known, allowing each carcass to be differentiated relative to its quality. An added benefit to the technology is its ability to accurately measure backfat depth and loin depth through noninvasive means, two important traits in the determination of pork carcass percent lean. "Pork producers could receive added payment benefits for carcasses meeting minimum marbling specifications while maintaining high per cent lean values," Wilson says.

Researchers have long shown that marbling in the pork loin adds significantly to juiciness and flavour of chops. "The new BioQscan® technology allows the packer to place an instrument-graded marbling level on each loin, guaranteeing that it meets minimum levels of marbling," he continues. The adequate level of marbling almost always guarantees that each and every pork chop will be juicy and have plenty of good old fashioned flavour."

Biotronics, Inc. has spent the last 5 years developing and perfecting this technology and is now gearing up for commercial production.

Isotope testing can identify pork's origin

The British pork industry has a new high-tech weapon in the war against mis-labelling by processors and retailers, a practice which, while not widespread, is still a cause for concern. With home produced pigs receiving a large premium compared with European competitors, there is the temptation to label imported product as British, so industry body the British Pig Executive (BPEX) has been using a novel method to identify the origin of pork in the store. It is based on the principle that four elements - hydrogen, carbon, nitrogen and sulphur - give pork a unique signature which shows precisely where each pig was raised.

"The system is so accurate it can be used to track pork to individual farms anywhere in the world"

"Having completed a trial which showed it could identify the provenance of pigmeat with 98 percent accuracy, BPEX is now poised to start sampling supermarket pigmeat in earnest," says Pig World magazine. "The system is so accurate it can be used to track pork to individual farms anywhere in the world, depending on the comprehensiveness of the signature database that samples are compared against."

BPEX director Mick Sloyan said isotope sampling can only be effective when used in conjunction with the British Quality Assured Pork audit process. Once sampling had identified a problem it would be followed up with a paper trail. "You not only have to prove it happened, you have to prove the intention to mislead was there. Once is a mistake... twice could be a pattern." He said there was a degree of nervousness among processors and that meant isotope testing could be a powerful tool without BPEX having to resort to naming-and-shaming.

BPEX chairman Stewart Houston told Pig World: "We are convinced some imported product is coming in

and being labelled British." BPEX sampling will be able to tell whether pork and processed pork products come from Britain, Spain, Denmark, France, Germany, Holland or Northern Ireland. Trials have shown the test to be extremely accurate. It can identify pigmeat from the United Kingdom with a probability of over 98 percent.

There are over 150 'signatures' in the England and Scotland database, enabling BPEX to say with certainty whether pigmeat really is British, and which part of the country it comes from.

Recent sampling suggests that not all products sold as "British" originated in the country. However, two samples, labelled as being produced in the Netherlands and France, actually originated from Britain, suggesting that mis-labelling may be done as much by error as deliberately.

New Zealand launches welfare accreditation scheme

New Zealand is the latest country to implement an independently audited accreditation system for pig producers. The country's producer organization, New Zealand Pork recently published the audit results and launched the PigCare label, which will be used to identify home produced pork in the supermarket.

The audit of 123 New Zealand farms was in response to pig farmers wanting to provide independent assurance to customers their pigs were well cared for. Certified auditors, with knowledge of the pork industry and pork industry practices, assessed the farms to determine the competency and skill of the farmer in how they handle the pigs, the condition and behaviour of the pigs themselves and the environment in which the pig lives including, feed, water, temperature, space and on outdoor farms shade and shelter. PigCare is administered by an independent audit organization, AsureQuality.

Sam McIvor, CEO of New Zealand Pork, says the 115 farms that passed the audit can have their meat labelled "100% New Zealand Pork, PigCare Accredited". Labelled meat started appearing in retail and wholesale outlets from 1 December. Only farms which have passed the audit are able to use that label.

"It is important to provide consumers with transparency," says McIvor. "By purchasing pork with the PigCare Accreditation, they can be reassured the animals have been well cared for. The same cannot be said for the 700 tonnes of imported product arriving on our shores every week; there's no similar guarantee."

Accreditation of welfare standards is becoming increasingly common in countries that have introduced specific production methods such as group sow housing, such as the UK, and find themselves at a disadvantage in terms of production costs. "The industry has committed to phasing out the use of sow stalls and the first step is ensuring that by the end of 2012, sows will be kept in stalls for no longer than four weeks of their pregnancy," notes McIvor.

PQA Plus program hits 50,000 milestone

The US industry's Pork Quality Assurance Plus® (PQA Plus) program reached a significant milestone in October when the number of producers achieving PQA Plus certification reached 50,000.

Since its introduction in 1989, PQA has been the pork industry's flagship educational and continuous improvement program. Created through the Pork Checkoff to promote food safety and residue avoidance on the farm, the program was expanded in 2007 to include animal handling practices and renamed PQA Plus. To attain certification a producer must meet with a trained Advisor once every three years to review the 10 Good

CONTINUED ON PAGE 60

Production Practices that promote pork safety and animal well-being practices. Additionally, to achieve site status, a pork operation must have an on-farm assessment of its animal handling practices by an assessor trained by the National Pork Board.

The board also has set a goal of having all operations site-assessed by the end of 2010. "Right now, we have assessed operations that represent two-thirds of all the pigs in the country," says Stacy Revels, manager of certification programs for the Pork Checkoff. "We continue to assess new operations each week and are making great progress on our goal.

Fermented soybean meal shows potential

Researchers at North Carolina State University have found that fermented soybean meal has considerable potential in weaner pig feeds.

Formulation of diets for nursery pigs requires a trade-off between utilizing protein sources that are highly palatable and digestible and those that are low cost. While the major concern of the use of animal protein sources in nursery pig diets has been cost, recent concerns over animal health and food safety related to feeding animal products back to food animals have added greater complexity to this issue. These concerns have also spurred research towards improving the quality of plant protein sources for use in diets for newly weaned pigs.

"Fermented soybean meal has the potential to replace skim milk"

Recent work by Drs Sung Woo Kim and Eric van Heugten and colleagues has examined a fermented soybean meal (FSBM) product for use in diets designed for newly weaned pigs. The FSBM tested was produced by Genebiotech Co. Ltd (Seoul, Korea) by fermenting soybean meal with a fungus - *Aspergillus oryzae* - that has been used for human food fermentations for centuries. In addition to partially digesting the proteins in the soybean meal, thereby improving their digestibility, the fermentation process also reduced the concentrations of several anti-nutritional compounds found in soybean meal.

The researchers conducted four separate feeding trials to examine the potential for using FSBM instead of animal protein products such as dried skim milk and plasma protein. From the results of these studies, they concluded that the FSBM was superior to soybean meal for inclusion in weaned pig diets. They also demonstrated that this product has the potential to replace dried skim milk, particularly if lactose and synthetic amino acids are utilized. Overall, this work provides valuable information regarding the suitability of FSBM for use in newly weaned pig diets.

Reference: *Fermented soybean meal as a vegetable protein source for nursery pigs: I. Effects on growth performance of nursery pigs in the Journal of Animal Science, 2010, 88:214-224.*

SowCam alerts producer of farrowing problems

One of the innovations at the EuroTier 2010 show, held in Hanover, Germany was Big Dutchman's new SowCam system for automatic monitoring of sows giving birth in the farrowing pen.

This is made possible by combining a standard webcam installed above the farrowing pen with special PC software: the video material recorded by the standard webcam is continuously checked and intelligently analyzed by the software.

The result is a completely new management tool which not only automatically recognizes the beginning of the farrowing process and counts the number of born piglets, but also records the time span between the individual piglet births and transmits a warning message onto a mobile phone if too much time passes between the births, says Big Dutchman. Via online access, the farm manager is able to watch live pictures directly from the farrowing pen and can thus decide whether his intervention is required, all without having to enter the house.

Danes launch PR offensive

The Danish pig industry has launched a publicity offensive in a bid to beat the bad press and media headlines it has received in the past. The Danish Pig Research Centre is constantly fighting stories from campaign groups about piglet mortality, antibiotic use injuries to pigs and tail docking. The centre has said that to combat the bad publicity the industry must concentrate on the positive aspects of the welfare regimes in production systems.

"Whether we think it is fair or not, we'll get beaten up by the press as long as we do not straighten out unfortunate slants on stories such as on mortality or antibiotics," Lindhart B Nielsen, chairman of the Danish Agriculture and

Food organization told the annual meeting of the Information Centre for Pig Production.

> **"Bad stories are the easiest and quickest way to more and more stringent regulatory action"**

"Bad stories are the easiest and quickest way to more and more stringent regulatory action," he said. "It is difficult to defend the industry against bad stories, but the way forward is to turn the tide on the bad publicity."

"We believe that market driven development is the only right way, for example as we see in the US, where burger chains and supermarkets put increasing pressure on getting loose sows. We'd like to meet market requirements," said Mr. Nielsen

The industry organization has now embarked on a positive action campaign to get better news stories and advertizing in the media about Danish pig industry practices.

Whole Foods launching humane meat rating system

US supermarket Whole Foods, which specializes in 'natural' and organic food, is launching a new humane meat-rating system nationwide this year, according to the Chicago Tribune.

"If the six-step, colour-coded labelling system works as planned, it could allow American consumers at many supermarket chains unprecedented levels of specificity when it comes to choosing meat to match their principles," the Tribune writes.

> **"The rating system aims to address growing consumer concerns over the way animals are raised for food"**

Developed by the Global Animal Partnership, a nonprofit group made up of farmers, scientists, retailers, sustainability experts and animal welfare advocates, the rating system aims to address growing consumer concerns over the way animals are raised for food. Its six-step approach establishes baseline standards for all meat sold in the store, while offering producers an opportunity to achieve higher ratings as their animal welfare standards improve based on the program's benchmarks.

Whole Foods says that about 1,000 farms have been or are going through third-party GAP auditing, and a few hundred are awaiting the process. Most are small, regional producers, but they also include big, national names like Pennsylvania-based chicken producer Bell & Evans and Niman Ranch pork producers, which are still in the auditing process.

Whole Foods has 270 stores, including five in the Vancouver area, two in Ontario and five in London, England.

Genetics can avoid castration, say Danish scientists

Scientists from the Faculty of Agricultural Sciences at Aarhus University in Denmark are investigating if a genetic method can be found to avoid castration of piglets while at the same time avoiding undesirable boar taint in pork. They are trying to develop genetic methods for identifying which piglets are likely to develop boar taint.

"Alternative methods for castration have been investigated for years but they are unfortunately not as efficient and thoroughly tested as castration," says Henrik Hornshøj from the Department of Genetics and Biotechnology. "There is a large variation in boar taint among the animals. Some pigs can have a level that makes the meat inedible," he notes.

The scientists have found the area on the pig chromosomes that is involved in boar taint. Because the development of boar taint is heritable and there is variation between pigs there is reason to hope that something can be done about the problem via breeding, say the scientists.

Boar taint in pork is due to an accumulation of the compounds skatole and androstenone in the fat tissue. The process that regulates this is controlled by certain genes. The scientists want to investigate precisely which genes are involved and how they regulate the process. ■

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How stress affects pig performance and costs

By John Gadd

In his previous article, John Gadd looked at what causes stress in animals and described the difference between acute stress, which triggers the autonomic nervous system and chronic stress, which is generally the reason for a reduction in performance. It is strain within the pig's physiology which does the damage to productivity and also affects behaviour - which also can add to the cost, he explained. In this second article, he describes the situations when stress is most likely to occur and how much the loss of performance could cost the producer.

Overstocking

Pigs are overcrowded on many of the farms that I visit. With the cooperation of three producers, we compared deliberately-overstocked pens of growers by 15% (two pigs in pens of 14 when there should be 12) with the current stocking density advice and recorded performance (Table 1).

The average payback from deliberately destocking to guideline levels on all three farms was well over 3 to 1. Even with healthy pigs, as on these farms, it just does not pay to overstock.

"Even with healthy pigs it just does not pay to overstock"

Overcrowding gilts

The gilt is often overcrowded prior to puberty and before service, made worse by poor matching of animals within the group when bigger, faster-grown gilts bully the more submissive ones. Regrettably, I have no figures to show the impact of this – only some data from 12 farms who were persuaded to reduce overcrowding in their rather narrow gilt pens, each holding about 6 to 8 gilts, from an average of 1.5 to 1.8 m^2 per animal, then changing to gilt pools with a more generous 2.8 to 3.0 m^2/ animal in squarish pens of 10-15's.

Table1: Likely costs incurred by overstocking nursery and finishing pens by 15 per cent

	Pigs 6-35kg		Pigs 36-100 kg	
	Correct density	+15 per cent	Correct density	+15 per cent
Daily gain (g)	518	480	844	848
Days in pen	56	60	77	77
Overhead costs at 24 p/day (£)	13.44	14.40	18.46	18.46
FCR	2.02	2.12	2.42	2.63
Total feed eaten in period (kg)	58.6	61.5	153.7	171.0
Total feed cost, p/kg. (£)	11.13	11.69	27.53	29.93

Extra costs per pig: £1.85 plus £2.40, total £4.20

Savings in 15% less housing costs per pig (at £8.20/pig) was a saving of £1.23/pig.

Thus final cost was £ 4.20 less £1.23 = £2.97/pig, giving an REO of 3.4:1

Returns were down by a mean of 13.6% (range 0-21%), birthweights were up by 200g and, on five units, litter size was better by as much as 1.8 over an original litter size of 10.1.

Mixing pigs

Mixing is very stressful and activates the Autonomic Nervous system (ANS), as described in my last article.

Mixing after weaning

Pigs perform better in litter groups, but this is not practical, so penning according to weight is preferable to random mixing (Tables 2 and 3).

Table 2: Effect on splitting litters after weaning

	Growth (g/day) 20 days after weaning
Litters mixed after weaning	240
Kept together as litter groups	350

From: Varley (2001)

Table 3: Skill in batching and matching at weaning

	Days to slaughter	MTF* kg	(weight range)
Litters mixed randomly at weaning.	150	237	6.1 - 101 kg
Litters carefully batched and matched.	148	248	6.3 – 100 kg

Author's records (2008)

*MTF = Meat per Tonne of Feed

Random mixing didn't seem to affect overall live growth rate much but significantly reduced the amount of lean meat sold. The extra MTF was equivalent to all feed from weaning to slaughter being 10.2% cheaper, indicating that it is worthwhile penning weaned pigs according to size.

Mixing just before shipping

We all know this should not be done, but producers succumb when a bulge in production occurs and space is urgently needed for the next batch. However, this is unwise, as a trial on a client's farm revealed.

Pigs varying in weight by 10.8 kg (av. wt. 82.1 kg) and growing at an average of 760 g/day were mixed from 4 pens into one pen of 15 pigs (with adequate stocking density) until an average shipping weight of 92.2 kg was reached. These were compared to pigs of similar weight which remained in their pen groups until shipping (Table 4).

Table 4: Enforced mixing of pigs from 10 days before shipping slows growth rate considerably

	Mixed pens	Unmixed pens
Av daily gain, g/day	696	805 (+ 13.5%)
Av. feed intake per day kg	2.05	2.21 (+ 4.87%)
Av. FCR 25.1 to 92.1 kg)	2.94	2.73 (7.7% better)
MTF (25.1 - 92.2kg)	259	278

Clients records (2003).

This shows how very costly mixing pigs before shipping can be. In this case just 13 days before shipping weight, 19 kg less saleable meat per tonne of feed was forfeited due to the ANS stressors affecting protein formation and water/mineral balance, both major components of lean meat. It is less costly to put up with the lower income from selling surplus pigs as underweights so as to free-up the space; about 2.8 times cheaper in this example at 2010 prices.

"Newly bred gilts are especially vulnerable to stress"

Implantation

The female needs rest and quiet during the period when the fertilized eggs implant in the uterine wall. Newly bred gilts are especially vulnerable to stress, with litter size reduced by 0.2 to 1.8 born alive, birthweights 200g lighter and more uneven litters where stress occurs. This is due to stressors affecting the regeneration of the uterine wall after farrowing – especially in gilts.

If gilts are stressed they will produce fewer piglets and more uneven litters

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Farrowing

We all know that making the sow as comfortable as possible is important at this time and appreciate what is needed, but there are two areas which are not so well-known.

Speeding up farrowing

This has come to the fore with the much larger litters we are getting now. Litters of 13 can take up to 30 minutes longer to deliver than 9s, so the last piglets out can be anoxic (starved of oxygen) and thus moribund and the sow that much more exhausted, which increases weaning to service interval.

There are ways of speeding up the farrowing process. Parturaid seemed an excellent product, reducing time taken by about 20 minutes but has sadly not caught on. Exercise pre-farrowing is worth consideration and we will also need to consider the use of routine assistance in future, not just for slow or difficult farrowings.

Attending farrowings

Attended farrowing, using a night shift, can result in significantly reduced piglet losses. Attended farrowings not only give you more weaners to sell but also reduce stress in those sows experiencing difficulty or just slow to farrow. Trials on three clients' farms showed 108, 185 and 190 extra weaners sold per 100 sows per year

In my next article, I will be explaining how stressed pigs talk to you all the time, and how to do a stress audit. ■

Mixed response to 2013 EU partial sow stall ban

By Stuart Lumb

Welfare features prominently on the EU radar these days and the issue of the partial sow stall ban is now concerning many EU producers. The ban, which comes into force on January 1st 2013, is only a partial one, much to the annoyance of UK producers who had to scrap stalls completely. Other EU producers will be able to keep sows stalled for the first four weeks after service. Many countries have dragged their heels, hoping for an extension to this date, blaming the financial crisis on the lack of available credit. However the EU authorities have stated that there will be no derogation, much to the relief of UK producers, although on the other hand the UK will lose some of its high ground as far as welfare friendly pigmeat is concerned.

A slatted ESF system in Germany

It was very significant that at the recent huge EuroTier show in Hannover, Germany there was a 500m^2 static demonstration of all kinds of equipment for the group housing of sows, most of it made by German, Dutch and Danish companies. This contrasts strikingly with the September 2010 French SPACE show where in the large halls devoted to pigs there were only 4 or 5 companies exhibiting group housing equipment. It's generally recognized that more producers in northern Europe have converted to group housing compared to those in France, Spain and Italy.

According to the Danish Agriculture and Food Council (DAFC) nearly 70% of Danish producers are already compliant. Of the remainder, 50% have already got environmental approval to change their systems. This is significant as it can take up to two years to get planning permission in Denmark. Another factor is that capital is very tight (influenced by declining land prices) with producers simply not being able to get bank loans. Some producers will go out, but the slack will be taken up by producers planning to expand before 2013. With regard to systems, the Danes have gone for Electronic Sow Feeding (ESF) and free access stalls. Danish units rely a lot on foreign labour and free access stall systems are easier to manage. All the free access stalls can be bolted shut for vaccination etc.

Germany currently imports millions of weaners from both Denmark and the Netherlands and so farmers that can't afford

to convert to group housing will just become finishers or in the case of some older farmers – retire. Currently about 50% of German producers have converted, with ESFs and free access stalls being most popular (50:50). The author visited two farms whilst on his Eurotier trip. One had a Schauer ESF system and the other, with 1500 sows, had Big Dutchman ESFs. Incidentally both units had viewing passages to counter biosecurity problems.

"It can take up to two years to get planning permission in Denmark"

After the UK, the Netherlands probably has the next highest welfare standards in Europe. According to pig specialist Rene Stevens, 70% of units have already changed to group systems, with most going for ESF set ups. "Five years ago units went for solid floors and deep straw whereas of late slats and minimal bedding is now the preferred option," he says. Many of the ESF companies such as Nedap are Dutch, having started with transponder feeding systems for cows, so it's hardly surprising that Dutch producers have opted for ESF systems.

French producers are having a tough time currently – with the demonstrations against poor prices at the recent SPACE show turning violent, cumulating in booths getting trashed. Olivier Biannic is European Development Manager for the French based multinational Olmix additives company. According to Biannic only 20% of French producers have changed their systems. Many farmers do have the cash, but are wary of investment and are waiting to the last minute to convert. Planning permission should take 12months, but in reality it takes nearer 16-24 months and the government has recently passed legislation to speed up the planning process. If the future price forecasts are optimistic then producers will change to group housing, but if not, many of these producers who are 45-50 will sell up and invest in property. There is also talk of an outgoers scheme, which would be attractive to many small and older farms.

Manufacturers had various types of systems on display at the SPACE show in September, with several ESFs on display. Wet feeding is very popular in France and some exhibitors were showing systems with full length troughs and stub wall divisions. Some free access stalls were in evidence, plus a trickle feed option was on show. I got the impression that the French are going for the cheapest systems, but these can often be the most expensive in the long run.

"Younger farmers with 2-300 sows will simply just go into contract finishing"

Spain is further south than France and might be expected to be well behind in terms of converting, but seemingly 40% of producers have changed over, although that figure might be somewhat speculative. In Spain it appears that trickle feeding is popular. The stall back gates are removed and the sow stalls are reduced in length to act as dividers when the sows eat. For this system to work it's imperative that sows are grouped by size to minimize aggression and also management has to be very good. Also, because of Spain's economic situation, for the last three years young farmers have been unable to get bank loans to finance conversions. Younger farmers with 2-300 sows will simply just go into contract finishing (as happened in the UK) while the older ones will retire. Spain has too many sows so this may, fortuitously, be a way to cut the national herd.

Trickle feeding systems with short feeding stalls, appear to be popular in France, says Stuart Lumb

According to the UK's National Pig Association (NPA), EU production will drop by 4% in 2011 and 5% in 2012 and 2013, which translates into a drop in pork production of nearly three million tonnes. In 2013 NPA sees two downward pressures on production. Those producers who have converted to loose housing will see a reduction in productivity of up to 0.5 pigs per litter and some thousands of producers in the EU-27 who have not converted to loose housing will be forced to discontinue production by the regulatory authorities in their respective countries. When the ban was implemented in the UK, MLC data showed that productivity did not drop. However, units are on average much larger nowadays compared to 1999. It will be very interesting to see how well producers and their staff in continental Europe can manage group housed gestating sows.

Certainly those producers that have toed the line and spent time and effort to convert to group housing will be extremely angry if the ban is not policed effectively and as yet it seems unclear as to who will actually enforce the ban after January 1st 2013. ■

A momentous decision by Australian producers

By John Riley, IAS Management Services

Australian producers are moving towards group housing and the FITMIX ESF system is in use on some farms

Australian pork producers have set a world first by agreeing to the voluntary phasing out of individual gestation stalls by 2017.

The current Model Code of Practice for the Welfare of animals –Pigs 3rd edition (The Code) states that from 2017 sows could be housed in gestation stalls for up to six weeks during pregnancy. At the AGM of the industry's representative body, Australian Pork Ltd (APL), in Canberra in November, producer representatives voted unanimously to phase out sow stalls from 2017.

The gestation stall decision will result in sows and gilts being loose housed from five days after service up to one week before farrowing. Loose housing is defined as sows or gilts either singularly or in groups where they can turn around and extend their limbs.

A second resolution stated that Australian pork producers recognize the benefits of gestation stalls, the cost of change and the need for research, investment and offsets to support the voluntary commitment to change.

The industry representatives recognized that the commitment to change can only be achieved with the support of key stakeholders, namely government, retailers, animal welfare advocates and the consumer.

The industry will be seeking support of the key stake holders in the following areas

- Financial assistance with barn reconfiguration
- Improved whole-of-government approach to planning

- Labour skills and development and recruitment activities
- Marketing support for PorkMark and country of origin labelling

The industry found itself in an almost impossible situation due to the fact that one of the country's major retailers, Coles, had announced that it would not purchase pigs from producers using gestation stalls after 2014. In addition, politicians in Tasmania, a state with a small pig population, had brought the implementation of the six week rule on gestation stalls forward to 2014.

The industry had to respond and to its credit responded in a responsible and positive manner.

Forward thinking producers had already responded by installing group housing systems.

Several have installed the FITMIX electronic sow feeding system (ESF), several are in the process of installing the Danish Skiold system and there is interest in the Kansas made Osborne TEAM system and the MPS feeder from the United Kingdom.

This ESF system is from Skiold, a Danish manufacturer

The FITMIX system does not have a full feeding stall to isolate the sow from its group mates during feeding whereas the other systems mentioned do have this feature.

One of the advantages of the ESF systems is that they can be fitted into almost any barn configuration and can be economical on the space allowed per sow. The Code states a minimum of 1.4m^2 per sow but the early Australian adopters of the systems are providing at least 2m^2 per sow.

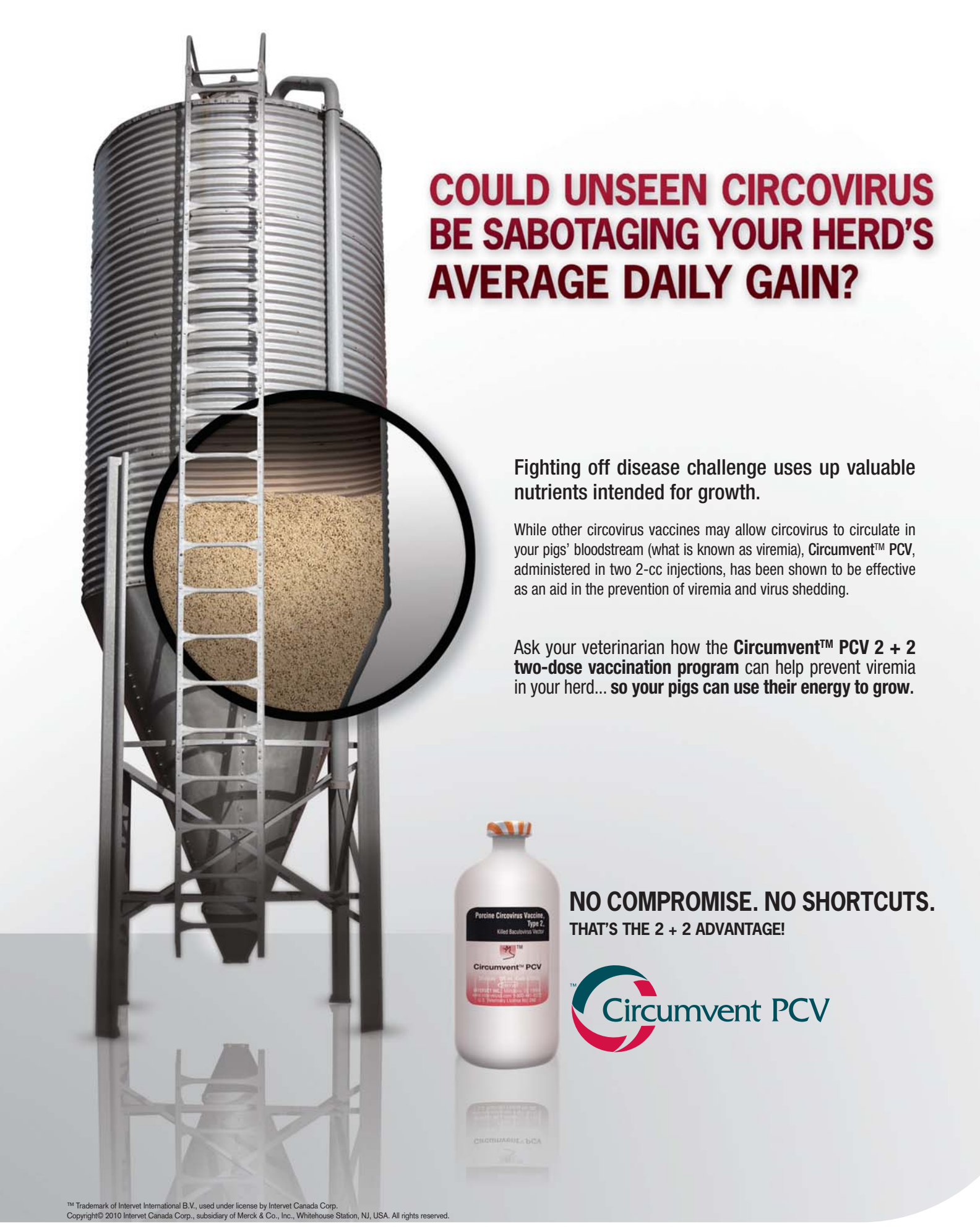
In other instances producers have modified their existing stall facilities to allow sows to run in small groups with shoulder stalls installed to allow some protection from their group mates during feeding. To reduce the activities of the bully sow, in some instances meal feed is dispensed by a down-tube with only 30-40mm clear space between the end of the down pipe and the bottom of the trough dictating that sows eat slowly and gain no advantage from moving to another space. A Down Under variation on the trickle feed system!

There is some interest in free access stalls, often in conjunction with straw bedded systems, in both traditional buildings and plastic shelters. The disadvantage of the free access stall is that more space needs to be allowed compared with an ESF. The advantages of the shoulder stall and the free access stall are that sows can be fed at one time and lethargic sows can be identified by the stockperson immediately.

Uncertainty in the Australian industry due to low priced imports, currency exchange rates and lack of profit margins in recent times has resulted in a lack of capital investment in new technologies. The decision taken in Canberra to pursue the voluntary phasing out of sow stalls, replacing them with loose housing, will have a significant effect on the industry. It will be a case of get on and invest in new systems or get out of the industry.

Australian producers have responded to Australian consumer demands for the removal of gestation stalls. Will Australian retailers respond by only sourcing imported product from producers in the U.S.A, Denmark and Canada who meet the standards adopted by their Australian counterparts? An interesting question! ■

Ad Index



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Fighting off disease challenge uses up valuable nutrients intended for growth.

While other circovirus vaccines may allow circovirus to circulate in your pigs' bloodstream (what is known as viremia), **Circumvent™ PCV**, administered in two 2-cc injections, has been shown to be effective as an aid in the prevention of viremia and virus shedding.

Ask your veterinarian how the **Circumvent™ PCV 2 + 2 two-dose vaccination program** can help prevent viremia in your herd... **so your pigs can use their energy to grow.**

NO COMPROMISE. NO SHORTCUTS.

THAT'S THE 2 + 2 ADVANTAGE!

™ Circumvent PCV

Intervet

Subsidiaries of Merck & Co., Inc., Whitehouse Station, NJ, USA

The First Power In Genetics

GENESUS

2009 GENESUS
25+ AWARD WINNERS

CAMROSE
31.60

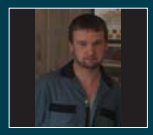
FAIR HAVEN
30.27

EVERGREEN
30.09

RIVERVIEW
30.00

WOODLAND
29.92

MILLTOWN
29.29

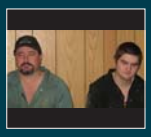


HURON
29.29

CLARK WIKNER
29.20

SUNCREST
29.05

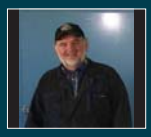
BLUEGRASS
28.73



SHADY LANE
28.61

ROSEDALE
28.50

SUNDALE
28.40



HARTLAND
28.40

BRENTWOOD EAST
28.10

TWIN HILLS
28.10

NEW HAVEN NORTH
28.14

GRAND
28.00

GRASS RIVER
27.98

DECKER NORTH ACRES
27.80

NEW HAVEN SOUTH
27.64

BRENTWOOD WEST
27.50

MILLERDALE WEST
27.50

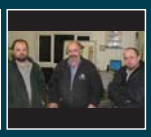
CLEARFIELD
27.50

LITTLE BOW
27.50

SEVILLE
27.46

SAGE CREEK
27.40

MILLERDALE EAST
27.30



PARKVIEW
27.20

HILLSIDE
27.14

SPRINGFIELD MB
27.10

ELMSPRING
26.98

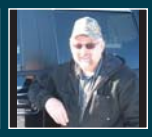
FAIRHOLME
26.97

SPRINGFIELD SK
26.87

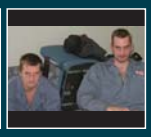
RUSTIC ACRES
26.80

CLEARWATER
26.75

LAKEVIEW
26.70



BRANTWOOD
26.63



CYPRESS
26.60

GADSBY NORTH
26.60

RAINBOW FARMS
26.50

VALLEY CENTER
26.39

BERESFORD
26.27

CLEARVIEW AB
26.20

TOBACCO CREEK FARMS
26.10

DAKOTA 10
26.00

POPLAR POINT
26.00

FAIRVIEW
25.92

SUNNYSITE
25.90

SUNSET
25.80

GOOD HOPE
25.80

SOUTH BEND
25.80

BORDER GENETICS
25.70

OK
25.70

GADSBY SOUTH
25.70

WILLOW CREEK EAST
25.66

OAKRIDGE
25.64

GLENDALE
25.60

MARTIN FARMS
25.40

SIMMIE SASKATCHEWAN
25.40

HANSEN HOG WEST
25.20

CASCADE
25.05

Top 5 herds: 30.38
Top 10 Herds: 29.74

The First Power In Genetics
GENESUS

27.25
AVERAGE TOP 25+ HERD

25+ COULD THIS BE YOU?

GENESUS IS PLEASED TO CONGRATULATE THE 62 GENESUS CUSTOMER HERDS THAT ACHIEVED OVER 25 PIGS WEANED PER YEAR IN 2009. IT TAKES EXTRAORDINARY EFFORT AND MANAGEMENT TO REACH SUCH LOFTY PRODUCTION ACCOMPLISHMENTS.

At Genesus we are proud these award winning producers have made the decision to choose Genesus as their genetic source.

Genesus continues to invest intensively in genetic improvement and testing. Genesus has the world's largest registered Purebred Swine Herd and is the largest producer of Yorkshire-Landrace F1's derived from registered purebreds.

The combination of purebred genetic enhancement which maximizes heterosis and the Genesus customer's superior management leads to production results that are creating new industry benchmarks.

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