

Western Hog JOURNAL

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Publications Mail Agreement
No. 40062769
Return Undeliverable
Canadian Addresses to:
Circulation Department
4828 - 89 Street
Edmonton, Alberta T6E 5K1

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Cover Photo

An Australian group sow housing system with the German FitMix feeding system (photo courtesy John Riley).



Editor's Notes	4
News and Views	6
Industry Viewpoint	15
Manitoba Swine Seminar	
Nutrition and management during lactation: effects on future parity productivity.....	21
Life beyond needles.....	26
Glycerine in swine diets.....	30
Practical nursery management: Doing the basics right.....	32
Special Features	
Behaviour of pigs in large group auto-sort systems.....	36
Don't be a victim of price volatility.....	40
Feeding increasing levels of yellow- vs. dark-seeded canola meal to hogs.....	44
Is potato starch an alternative to antibiotics in weaned pig diets?.....	48
Alberta Hog Price Insurance Program close to launch.....	53
Dietary co-products may enhance pork omega-3 fatty acid and reduce feed costs without affecting carcass quality and growth	56
Health	
Swine health bulletins address potential health threats.....	59
PRRS free herd certification pilot program for western Canada.....	60
International Round-up	61
View from Europe	
Carrying out a stress audit	65
British producers have their backs to the wall again.....	68
Pigs Down Under	
Pig producers battle Nature	71
Ad Index	74



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Editor's Notes

Over the last six months or so, there has been a large increase in the amount of comment and analysis concerning the rapidly rising price of food around the world. Everyone from the UN Food and Agriculture Organization to *The Economist* magazine has been giving their slant on a situation that has been blamed for tensions in the Middle East and food riots in a number of countries. Chief culprit for the crisis is the USA's biofuels policy, which uses up about 38% of the country's corn production. Other countries, notably in Europe, are following down the same path, a direction that is coming under increasing criticism. The Association of American Physicians and Surgeons said recently that instead of helping human health by reducing global warming, biofuels policy has "added to the global burden of death and disease", by diverting crops from feeding people to feeding motor vehicles.

At the same time, the FAO points out that by 2050 there will be 9 billion mouths to feed in the world, compared to 7 billion today. Food production has started to become of political importance and is receiving a lot of attention. It looks like the era of cheap food is over. So, what does all this mean for Canadian pork producers?

First, the informed consensus is that we will only be able to feed the world by continuing along the path of greater efficiency by using science and technology to increase output and utilize resources more efficiently. The intensive livestock production methods that have been so criticized by the general public will be essential in order to make more meat, eggs and milk available at a reasonable price. The difference will be that the "reasonable price" will be considerably higher than it is now. Producers are under considerable economic pressure due to the high cost of feed ingredients and this has already resulted in higher meat prices. In the short term the pressure will continue, until a new equilibrium is reached, hopefully one in which Canadian pork producers are more adequately rewarded for their efforts than they have been over the past 5 years.

On a more global scale, Canada is forecast to be one of only six food exporting countries in the world by 2020. Higher demand for our products, including pork, should result in greater economic sustainability for the industry. Although this process will take several years, we could be about to enter a "golden age" for pork producers. ■

Bonnie Peck

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Liquid feeding boosts growth by 10 percent

Researchers at the University of Guelph have shown that the use of liquid feeding can boost growth rate of finishing pigs by 10% compared to dry feeding.

The recent increase in the use of co-products such as DDGS has made liquid feeding an even more attractive option for producers. The University of Guelph has an active program in place aimed at further developing liquid feeding technology and a review of recent work was provided at the 30th Centralia Research Update held in January.

"Liquid feeding enhances the feeding value of fibrous ingredients such as wheat shorts and DDGS"

Researchers C. de Lange, C. Zhu, D. Wey and M. Rudar carried out a series of laboratory studies to explore adding fibre-degrading

enzymes and microbial inoculants to swine rations to enhance the nutritional value of high-fibre co-products. They then carried out pig performance studies to further explore the application of such additives, while comparing liquid and dry feeding methods. While in both cases growth rates were over 1000 g/day, the liquid fed pigs showed an improvement of 10% for both ADG and Feed:Gain. The researchers noted that liquid feeding enhances the feeding value of fibrous ingredients such as wheat shorts and DDGS. However, they point out, the growth and efficiency benefits were offset by an increase in carcass backfat, a decrease in loin depth, resulting in lower carcass lean yield, which needs to be considered when carrying out a cost-benefit analysis.

The use of enzymes and microbial inoculants increased feed intake and growth rate in pigs fed liquid diets. When both products were used in combination, feed intake and growth rate were increased by as much as 15%. In one of the two studies, the addition of enzymes alone improved feed efficiency by 5%.

The researchers conclude that there is a considerable opportunity to enhance the



The use of liquid feeding can boost growth rate of finishing pigs by 10% compared to dry feeding

feeding value of high fibre co-products through the use of liquid feeding and the addition of enzymes and microbial inoculants.

New oestrus detector could pinpoint insemination time

Researchers at the University of Guelph have been investigating a device that measures the electrical resistance of the sow's vaginal

mucus and which could help to pinpoint the correct time for insemination. Veterinarians G. Cassar, R. Amezcua and RM Friendship looked at how the electrical resistance (ER) changes over the first 7 days after weaning. They conclude that the ER values may be a useful predictor for ovulation and may in future offer the opportunity to carry out a single insemination to achieve pregnancy.

The timing of ovulation relative to the onset of oestrus

CONTINUED ON PAGE 8

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is variable, which means that in practice producers carry out two or even three inseminations over a two-day period in order to ensure that fresh semen is present in the fallopian tubes at the time of ovulation. The new device – the Draminski Oestrus Detector from Poland – can measure the ER and provide a guide to the optimum insemination time. ER is highest during the luteal phase of the oestrus cycle, which is when the sow is not in oestrus, and lowest during the follicular phase when ovulation occurs.

The researchers used real time ultrasound to determine when sows ovulated so this could be compared with measurements taken by the ER device. On days 4 and 5 three measurements were taken and 2 on day 6, otherwise it was once per day. Oestrus started from the time of the second reading on day 4 and last standing oestrus was observed at the second reading on day 6. Oestrus was observed after the lowest ER readings were

recorded. Ovulation occurred between late on day 5 and late on day 6 after weaning, while ER values were still increasing.

The researchers concluded that there was a definite trend observed in the ER readings from days 1 to 7, indicating that they may be useful as a predictor of when ovulation occurs.

Research tackles challenges of group housing

Maintaining sow body condition and controlling



Free access stalls offer a group housing system which ensures individual sow feed intake

aggression are the two main challenges faced when considering group housing for sows, Prairie Swine Centre researcher Dr. Harold Gonyou told producers at a recent series of meetings in Manitoba and Alberta. The solution is to control individual feed intake and develop suitable management systems for this housing method. “We don’t want to let the sow win a competition for access to feed because that results in aggression,” he says. “With electronic feeding systems (ESF), dominant sows get into the feeder earlier in the day,

but don’t get any more feed.” However, he notes that if there are too many sows per feeder, then there will be competition for access that will lead to aggression.

“There is not much difference in performance between static and dynamic groups”

Gonyou and his co-workers have studied an electronic sow feeding and a free access stall system over a number of years. Mixing sows either at weaning or later in gestation can impact both farrowing rate and litter size, he notes. In the large dynamic groups typically used in ESF systems, mixing is more of a challenge. “Mixing a new group of sows into an established group every 4 weeks instead of weekly is preferable to mixing new sows in every week,” Gonyou explains. “By the time the new sows are mixed, the previous group is past the implantation stage.” There is not much difference in performance between static and dynamic groups, but there is a difference between mixing pre- or post- implantation, he adds.

CONTINUED ON PAGE 10

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New Pfizer swine territory manager for Manitoba



Dennis Stevenson has joined Pfizer Animal Health's swine business unit as Territory

Manager for Manitoba and is responsible for the sales and support of the company's extensive line of swine products. He joins a team of six dedicated Pfizer territory managers across Canada, focused entirely on the swine industry.

Dennis brings extensive experience and knowledge of swine production management to his new position with Pfizer, and will work with producers, swine production systems, feed companies and veterinarians in Manitoba. He graduated from the University of Saskatchewan with a diploma in agriculture, and also holds a journeymen in pork production from the Apprenticeship and Trade certification program in Regina, SK.

"Dennis understands the Canadian swine industry,

especially in Manitoba where he has worked with some of the largest systems in the province," says Tom Elskamp, National Sales Manager for Pfizer's Canadian swine business unit. "Dennis is a terrific asset to the Pfizer team and we know he'll be a great dynamic resource for Manitoba hog producers too."

Manitoba producers unveil wide-ranging plans for greener operations

By Myron Love

The plaudits are coming in from all corners of North America for the Manitoba Pork Council's new 82-point sustainable development program which the MPC

unveiled on Wednesday, March 16.

"We have had a very positive response from most people," says Andrew Dickson, the MPC's executive director, "although we know there is no pleasing the anti-hog people. The government has been very supportive." MPC chairman Karl Kynoch adds that the document is an open book that lets the public know the good things that hog producers are doing. "We are being proactive rather than just waiting to react to situations that occur.

Called *Embracing a Sustainable Future*, the 54-page document spells out 82 commitments the council has endorsed on behalf of local producers. The document, Kynoch points out, is divided into a number of different sections including



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Over the past few years, Canada's and Manitoba's hog producers have been hit hard by recession in the United States, the swine flu scare, low hog prices, soaring feed costs, a high-valued Canadian dollar and new product-labelling regulations that have choked off shipments of weanling pigs to the United States. In Manitoba, the provincial government in recent years has also imposed environmental restrictions – such as a ban on new barn building in the Red River valley – that have hurt local producers.

“The issue that is receiving the most attention initially has been the abolition of sow stalls”

“We began discussions on this project three years ago,” says Mike Teillet, the MPC's sustainable development manager and principal researcher and author of the report. “We had numerous discussions with a wide range of people in and around the industry.” He notes that some of the report's recommendations are more quickly implemented than others. “Establishing an agricultural scholarship we may be able to do in time for the next university year, for example,” he says. “And we are already working on making our office greener.”

Teillet says that the issue receiving the most attention initially has been the abolition of sow stalls. “One of our priorities is to phase out sow stalls in Manitoba over the next 15 years,” he explains. “That is where the industry in North America is heading.” He also spoke of a commitment to work more closely with government to make sure government understands industry needs such as reasonable building codes.

“There is a huge educational component to this document,” says Karl Kynoch. “We hope that it will help rebuild bridges between the public and our producers.”

CQA to include Animal Care Assessment

The Canadian Pork Council (CPC) has announced that completion of the Animal Care Assessment (ACA) requirements will become an integral component of the CQA program effective January 1, 2012. This means that as of the first of next year, producers will need to meet the requirements of the ACA to maintain their CQA status.

“Canadian consumers want to know that pork farmers are responsible stewards

of the animals in our care,” says Jurgen Preugschas, Chair of CPC. “Having the ACA tool an integral part of the CQA program strengthens the position of Canadian pork and Canadian pork producers. Linking the two programs will also streamline the documentation, registration and validation process for all stakeholders.”

CONTINUED ON PAGE 12

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Requirements of the ACA program are outlined in the ACA Manual. Producers already on the program have found it easy to complete, says CPC. Production practices currently used on most Canadian hog farms already comply with the guidelines in the ACA. The ACA program

provides a way for producers to document and validate those practices and reassure customers that livestock are being treated humanely and responsibly.

All producers are encouraged to use the remainder of 2011 to familiarize themselves with the ACA program and complete and submit a self declaration. For all farms, the self-declaration done this year will suffice until their 2012 regular CQA validation. At that point, farmers

will complete the ACA documentation as part of their regular CQA renewal process.

Both the self-declaration forms and the ACA manual are available at www.cqa-aqc.ca/aca.

Four-year limit on temporary foreign workers announced

Citizenship and Immigration Canada (CIC) has announced several changes to the Temporary Foreign Worker Program (TFWP) including a four-year 'cumulative duration' limit on the length of time foreign workers may work in Canada. This regulation is not retroactive - the clock starts ticking on April 1, 2011, for all TFWs, regardless of how long they have already been in Canada, says CIC. Certain classes of worker, such as people in managerial or professional occupations or people working under an international agreement such as NAFTA or the Seasonal Agricultural Worker Program are exempt from the regulation. Similarly, workers who have already gained approval under a provincial nominee program are exempt.

After a TFW has reached their four-year cumulative duration limit, they will not be granted another work permit in Canada for an additional four years. After that time has elapsed, the worker will again be permitted to work in Canada.

The earliest date that a foreign worker could reach the four-year cumulative duration limit is April 1, 2015. Work permit applications that propose an end-date beyond April 1, 2015, will be assessed to ensure the foreign worker is eligible to work the full period of time. If an employer has made a job offer to a worker who has reached or is close to reaching the four-year cumulative duration limit, the work permit application may be refused or the duration of the work permit may be limited.

Also coming into effect from April 1 are regulations to further protect the interests of foreign workers, relating to the genuineness of the job offer and the history of the employer in hiring temporary foreign workers over the previous two years.

CONTINUED ON PAGE 14

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Employers who fail to meet the new requirements will be refused work permit applications for any foreign national offered employment by that employer and will be ineligible to hire TFWs for two years.

Using Net Energy system can save \$2-3 per pig

With energy representing by far the most expensive component of pig diets and the price of cereal grains skyrocketing, it is increasingly important to match the energy content of the diet with the pigs' requirements. Using the Net Energy (NE) system to quantify the energy value of feed ingredients can

save \$2-3 per hog, according to Dr. Denis Beaulieu from the Prairie Swine Centre. "The NE system provides a more accurate way of pricing and evaluating ingredients according to the energy content," she said, speaking at a series of recent producer meetings in Manitoba and Alberta. However, she noted, there are several different approaches to measurement, which is why people have been slow to adopt it.

"The difference can be as high as 10 cents per kilo of gain or \$5 per finishing pig"

Using the NE system allows diets to be formulated with lower crude protein levels. This is because the DE system overvalues the energy content of protein sources such as soybeans and canola meal.

"Crystalline amino acids really shine when the NE system is used and their use allows the crude protein content to be reduced considerably," Beaulieu explains.

With the increasing use of by-product ingredients such as DDGS, the NE system is even more advantageous, Beaulieu points out. "The NE in DDGS for finisher pigs is significantly higher than for growers because bigger pigs can digest it better," she explains. "The cost per Mega calorie of energy is much lower using NE and the difference can be as high as 10 cents per kilo of gain or \$5 per finishing pig."

In addition to reducing costs, the NE system allows very accurate prediction of feed intake and gain, although not FCE, Beaulieu notes. "We can predict the composition of weight gain in the pig, that

is, how much protein and fat deposition will occur."

Correction

In the Banff Seminar issue of WHJ, Kevin Grier from the George Morris Centre was misquoted in the report of the breakout session "Building Canada's future in exports". The article said that "the EU protects its pork industry *plus* its consumer."

"I actually said the EU protects its pork industry, 'if **not** its consumers,'" says Kevin Grier. "The EU pork industry is protected by extraordinarily high protective tariffs and exceptionally small access quotas as well as a creative array of non-tariff barriers. Rest assured that consumers are nowhere near the top of the priority pile in Euroland," he comments. ■



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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.

Has the bleeding stopped?

After five continuous years of decline, hog numbers in the January 1 census report appear to have stabilized and in some provinces increased slightly. Total Canadian hog inventory increased by 0.6% compared to the previous year, totalling 11.9 million. However, over the five years to January 1 hog numbers have fallen by a massive 21%. There were 1.3 million sows and gilts reported in January, down 1.1% from one year earlier and down 17.5% from five years ago. "Sow inventories have not been at this level since 1999, which was the start of a five-year industry wide expansion," notes the Statistics Canada report. Domestic hog slaughter for 2010 was 21.3 million, down 2.4% from 2009.

In the east, the decline in sow numbers in Ontario seems to have been arrested, with a 0.9% increase year-on-year. Over the last 5 years the number of sows and gilts has fallen by 18.8%, from 424,000 to 344,500, while total hog numbers have reduced by 26.7%. Neighbouring Quebec has seen a much less dramatic fall, with roughly a 10% fall in both sow and total hog numbers since the January 2006 census.

In the west, Manitoba has fared the best in terms of both sow and gilt and total hog numbers, showing a 3.6% increase in pig numbers over the past year. While sow numbers have fallen by 13.4% over the last 5 years, total hog numbers have fallen only 10.9% reflecting the higher proportion of pigs finished in the province. Saskatchewan showed a slight increase in hog numbers year-on-year, but has seen sow numbers drop by 31.8% over the five-year period and total hog numbers 42.5%. Sow numbers in Alberta fell 3.2% during 2010 and decreased by 23.7% over the previous five years, while total hogs fell

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CONTINUED ON PAGE 16

Industry Viewpoint *continued*

by 26.8% over the same period. British Columbia now only has 9,400 sows compared to 18,100 five years ago, a decline of 48.1%, with both sow and total hog number dropping about 20% in the last year alone.

The number of farms with hogs continues to fall, with 6,985 farms on January 1, down 5.6% in the last year and 41% over the past five years. Once again the Statistics Canada producer numbers appear to be suspect, as they show 810 producers recorded in Alberta, less than half the actual numbers and 655 in BC which has very few pigs left.

"British Columbia now only has 9,400 sows compared to 18,100 five years ago"

Live pig exports in 2010 were down by 10.1% compared to 2009, at 5.7 million head and down by 42.9% from their peak in 2007. However, there are signs that the decline is stabilizing as US packers adjust to complying with COOL requirements for hogs of Canadian origin.

So has the bleeding stopped? Numerically it appears so. The question is whether a combination of high feed prices and only moderate hog prices will put further pressure on producers, most of whom have no AgriStability reference margins left to provide a safety net.

COOL has been disruptive and damaging

Country of Origin Labeling (COOL) has proved a 'disruptive and damaging trade distorting measure', according to Kevin Grier, a senior market analyst at the George Morris Centre. In a paper titled *Country of Origin Labeling: The Damage Done and the Fight Underway*, he notes that country of origin labeling in the US has become a non-tariff barrier example that other countries are now following. If left in place, these measures will have an enormous impact on trading nations.

"During the first year after the introduction of the COOL measure, there was a reduction in the prices for Canadian cattle and hogs relative to the US," Grier points out. "For example, during 2009 the George Morris Centre calculated that weaner and feeder prices were about \$US3-4/head lower relative to the US in the post-COOL period, compared to the pre-COOL period. Canadian market hogs traded into the US were priced more than \$10/head less than in the pre-COOL period."

"The bottom line for COOL is that it has served no commercial interests and provided no benefits to consumers or industry"

The data also show that there has been a reduction in the flow of Canadian livestock into the United States in the pre- and post-COOL measure periods, notes the report. "During the first quarter that COOL was in effect in late 2008, slaughter hog exports declined by more than 60%," Grier explains. "During the first half of 2009, slaughter hog exports were down by nearly 60%. There is no doubt COOL was the cause of both the pricing discounts and the dramatic reductions in trade volumes."

Grier says that one of the most impacted sectors of Canadian livestock was Manitoba weaner producers. "A material number of these farrowing businesses lost their contracts due to the fact that the Iowa finishers no longer had a market for Canadian hogs," he points out. "Livelihoods in this sector have been lost."

During 2010, the impact of COOL ameliorated, first because the US industry became more comfortable and proficient at handling meat from Canadian livestock and second because supplies of US livestock continued to decline during 2010. "The US industry's willingness and ability to discount Canadian livestock lessened, comments

CONTINUED ON PAGE 18



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Industry Viewpoint *continued*

Grier. "Price spreads between Canada and the US returned to more 'normal' levels during 2010."

The bottom line for COOL is that it has served no commercial interests and provided no benefits to consumers or industry in either Canada or the US, Grier concludes. "It was always designed as a non-tariff barrier to trade, and it has achieved that goal beyond anyone's wildest expectations." However, while its impact has lessened recently, that situation may not last long, he believes. "When the US industry begins to expand again, US buyers will once again be able to discriminate more aggressively against Canadian livestock," he explains. "This will once again provide an opportunity for discounting or ignoring Canadian suppliers."

Grier says that it is important that the WTO challenge launched by the Canadian government and Mexico succeeds. "The issue has taken on greater importance because other nations are seeing how successful COOL has become as a non-tariff barrier," Grier says. "Korea has adopted a form of COOL as has the EU, of course. If COOL is not defeated, it could become a barrier to trade that impacts many nations."

End of the cheap food era

The recent increases in cereal and protein prices has not only increased livestock production costs significantly but has pushed up the price of consumer staples such as bread, milk and meat. US retail meat prices had risen 9.2% in February, compared to a year earlier, with pork rising 8.9%. Many in the livestock industry point the finger at the US ethanol policy, which swallows up 38% of the country's corn, as the culprit. J. Patrick Boyle, president and CEO of the American Meat Institute, summed up the feelings of many in the industry: "While many variables contribute to the price of any food

item, the soaring cost of corn due to ethanol production is one underlying factor that is driving up not only meat and poultry prices, but other food prices as well. This news is clear evidence that we should not be embracing a policy that burns 40 percent of our corn for fuel – it is burning a hole in Americans' food budgets."

But while this is clearly a factor, increasing demand, notably from China, is also part of the story, according to the American agricultural economist and writer Lester Brown. US consumers face a potential "nightmare" scenario in coming years as China's growth pushes meat and grain prices higher, signalling an end to a cheap food era for Americans, he warns. "While China produces much of the corn and wheat it consumes, the world's most populous nation will increasingly rely on US imports to feed its livestock herds and keep pace with a population that's adding 8 million people a year," Brown believes. "Intensifying food competition from China will eventually hit US consumers in the pocketbooks," he says.

Citing the ethanol industry as one of the main causes of increased corn prices, Jim Lochner, chief operating officer of US Pork and poultry giant Tyson Foods Inc. said recently that livestock producers face a "new norm" for corn prices at around \$7 per bushel. The ethanol industry is projected to use about 40 percent of US corn supplies in the 2010-11 marketing year, compared with 12 percent five years ago, according to US Department of Agriculture data.

"The ethanol industry is projected to use about 40 percent of US corn supplies in the 2010-11 marketing year"

Increased competition for corn from export markets and ethanol makers has resulted in a "new paradigm" for the

CONTINUED ON PAGE 20

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Industry Viewpoint *continued*

livestock industry, with producer profitability determining availability of meat, Lochner suggests. "The drivers of profitability and production have changed," he says. "The old paradigm was that profitability and production are driven by domestic demand. The new paradigm is that they're largely driven by grain costs and exports." Overall US meat supplies have declined for at least three years and probably will shrink again this year, Lochner adds.

Food security is now a hot topic in the media, with countless articles published over the last six months. It is also now on the agenda of the G20 nations and has achieved prominence due to the demonstrations in Middle Eastern countries, which are said to be partly related to higher food prices. There seems no doubt that pig producers, whether in Canada or around the world, are now facing Jim Lochner's new paradigm and will need to adjust to the new economic environment.

European industry shrinking

Most European countries have seen a drop in pig numbers over the past 12 months, with the EU sow herd falling by 3% in the period to December 2010. The Danish January 1, 2011 census showed that there were 4.5% fewer pigs than on the same date in 2010, while the total number of sows

(1.057 million) was 4.6% lower. The industry in neighbouring Sweden, which has the highest animal welfare standards in Europe, is in crisis due to its high production costs and producers are quitting in droves. According to the Swedish Farmers Federation, 20% of producers will have disappeared by the end of 2011.

EU producers are being hammered by high feed costs and the cost of complying with welfare and environmental legislation. The impending ban on sow stalls, which means that sows must be loose-housed for all but 28 days of gestation from January 1, 2013, is expected to result in an exodus from the industry as many producers cannot afford the cost of new buildings or conversion.

A number of countries have called on Brussels to delay the implementation of the partial stalls ban, which has angered countries such as the UK, which is already compliant, and Denmark, which says it will meet the deadline. There seems no doubt that some other countries such as France, Italy and Germany, will be a long way off complying by the end of 2012. This could mean that they are unable to export pork to other countries that are compliant. The result is likely to be an exodus from the industry and a significant shortfall in pork production by the end of 2013. ■



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Nutrition and management during lactation: effects on future parity productivity

Sows have limited feed intake capacity in lactation, such that protein and fat reserves may be severely depleted during the suckling period, notes Dr. Bas Kemp from the Department of Animal Sciences at Wageningen University in the Netherlands. He points out that weight and protein losses exceeding 12% during lactation have been shown to result in reproductive problems such as extended weaning to oestrus intervals, lower conception rates and reduced subsequent litter sizes. First litter sows are especially at risk since they still have significant nutrient needs for growth to maturity, a lower feed intake capacity and lower metabolizable fat and protein reserves, Kemp explains. He discusses the impact of inadequate lactation feed intake and examines feeding and management strategies both during lactation and after weaning that can help to maximize subsequent performance in the sow and gilt.

Effects of limited feed intake on reproduction

The impact of feed restriction has changed considerably over the last 20 years due to genetic selection for a shorter weaning to oestrus interval. “In the seventies and early eighties, feed restriction during lactation resulted in a big increase in weaning to oestrus interval, up to about 10 days, but had hardly any effects on ovulation rate and embryo survival,” Kemp explains. More recent data show that the impact on weaning to oestrus interval is less than one day, while the effects on ovulation rate and embryo survival are much more pronounced.” Feed restriction appears to decrease ovulation rate by about 2 to 4 ova and embryo survival by about 10 to 20%, Kemp says. First litter sows are especially vulnerable, due to their restricted feed intake capacity, he notes. The so-called ‘second litter syndrome’, where litter size is reduced in parity two, typically results in lower litter sizes in subsequent parities and culling one parity earlier compared to sows showing increased litter size in parity two.

Potential ways to optimize post weaning reproductive performance

Gilt development

Gilt development and age/weight at first mating have a large effect on lifetime productivity, Kemp believes. “Although mating gilts at a young age or a relatively low body weight may not have negative consequences for first litter size, second litter size may still be compromised since young sows have the desire to grow and feed intake capacity is limited during first lactation,” he points out. “Experimental data from our research group indicate that sows with a low body weight after first lactation - less than 150 kg - have a reduced second

CONTINUED ON PAGE 23

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litter size.” He notes that current advice is to inseminate gilts at 240-260 days, although he questions whether this is always economically justified.

Feed intake during pregnancy

Kemp stresses that, especially for gilts, excessive feed intake during gestation decreases voluntary feed intake during lactation. “Gilts should be fed according to their requirements for maintenance, reproduction and growth but not be overfed,” he advises. “Some researchers have suggested a target P2 backfat thickness in the region of 17-20mm and a weight of 175-185kg at first farrowing.”

Ambient temperature

As ambient temperature increases, sows will lower their feed intake to prevent overheating. “Research suggests that, for each degree above 16°C, the sow’s daily voluntary feed intake decreases by 2.4 MJ Digestible Energy,” explains Kemp. “At a temperature range of 25-27°C, voluntary feed intake decreases by 214 g per °C. In that same temperature range, when humidity was high (RH 94%), the decrease in feed intake was 492 g/°C/day.” High ambient temperatures can significantly reduce feed intake during lactation. “Skin wetting, drip cooling and snout coolers may increase lactation feed intake of sows at high ambient temperatures,” Kemp

notes. “Research suggests that floor cooling results in higher feed intake (12-18%), increased weaning weight of piglets and reduced weight loss of sows.”

“High ambient temperatures can significantly reduce feed intake during lactation”

“Room temperature in late lactation may be as low as 16°C when a good microclimate is available for piglets,” he continues. “Low ambient temperatures will increase feed intake of sows during lactation and will therefore be helpful in preventing reproductive problems in first litter sows.”

Feed intake pattern

Intake can be increased by feeding sows more than twice a day and feeding ad-lib has been shown to increase feed intake by 10%, Kemp suggests. However, he cautions producers using ad lib feeding to remove feed from the trough once daily to prevent deterioration and mould development.

“Sows showing an increase in feed intake throughout lactation have better subsequent reproductive performance,” explains Kemp. “However, if sows are overfed at the onset of lactation, sometimes a drop in feed intake is seen later in lactation. In those sows, reproductive output is lower. Therefore it is advised to increase feed intake gradually in the first days of lactation, for example from 2 kg at farrowing, increasing by 0.5 kg per day.”

High fat diets during lactation

Another approach that has been followed to reduce mobilization of body reserves is increasing the dietary fat content. “When feeding high fat diets a reduction in feed intake is often observed,” notes Kemp. “However research suggests that in older parity sows total ME intake was still increased by about 3-32%, with a mean of 12%. Fat as an energy source also seems to increase milk fat content and in some cases total milk output, he adds. Fat rich diets may be beneficial in a hot climate since heat production of sows is lower when fat is used for milk production instead of carbohydrates. However, overall Kemp says it is questionable whether high fat diets are beneficial for prevention of reproductive problems.

Optimal water intake

Lactating sows have a very high water requirement and there is a close relationship between water intake and growth and mortality in piglets, Kemp points out. “It is advised to supply water ad libitum during lactation and to regularly check the water output of nipple drinkers, which should be 2 to 4 litres per minute.”

Reduction of the suckling stimulus

Another approach to relieve the sow from the burden of lactation is through reduction of the suckling stimulus.

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“Management techniques like removing the whole litter for part of the day or split weaning, where part of the litter is removed a few days before weaning, can be successful but a drawback of the use of these techniques can be the occurrence of oestrus prior to weaning,” Kemp comments. Also, he adds, with current genetics, litter sizes are so high that there is no opportunity for having lower numbers of suckling piglets on gilts.



Loss of weight during lactation result in problems such as extended weaning to oestrus intervals, lower conception rates and reduced subsequent litter sizes.

Potential for post lactation repair

Although lactation feed intake has the biggest impact on subsequent reproductive performance, there are a number of management techniques that can be used after weaning to ‘repair’ the damage caused by inadequate intake.

Post weaning feeding

“Ad lib feeding after weaning has been shown to increase the percentage of

sows in oestrus within 7 days after weaning to 62% as compared to 52% for restricted feeding,” Kemp notes.

“Feeding carbohydrate rich diets after weaning compared to fat rich diets has resulted in a shorter weaning to oestrus interval.”

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“Ad lib feeding after weaning has been shown to increase the percentage of sows in oestrus within 7 days after weaning”

“Dextrose supplementation between weaning and oestrus does not result in a shortening of the already short weaning-to-oestrus interval, but leads to numerically higher and more uniform birth weights of piglets and increased preweaning survival of small piglets,” he continues. “Also, inclusion of fermentable non-starch polysaccharides such as sugar beet pulp, from weaning until mating, increases the number of total and live-born piglets.”

Boar stimulation

Research has shown that intensive boar contact after weaning improves the percentage of sows showing heat within 9 days post weaning from 30 to 51%. In these studies no effects were found on ovulation rate or embryonic survival.

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Use of PG600

“The use of PG600 directly after weaning results in an improvement of the weaning to oestrus interval in many studies but sometimes it results in lower pregnancy rate or lower litter sizes,” Kemp points out. “The latter may be related to differences in follicle development at the time of PG600 injection, but no data is available to substantiate this.”

Use of progesterone analogues

Ovulation rate and embryo survival may be improved by allowing the first parity sow to recover for a longer period after lactation, Kemp suggests. “One way to do this is to treat sows with altrenogest (Matrix or Regumate TM) for 3-7 days after weaning to artificially extend the weaning to oestrus interval,” he says. “In research trials, this resulted in an increase in pregnancy rate of 5.6 to 15.7% and an increase in subsequent litter size of about 0.2 - 0.8 piglets.” The application of altrenogest for short periods like 7 days is especially effective in sows with depressed follicle development at weaning, which are the sows that lose substantial body reserves during lactation, says Kemp.

“Extending the use of altrenogest to a 14 day treatment seems to result in better and more consistent results,” he points out. “More detailed studies show that application of altrenogest after weaning results in increased ovulation rate, less variation in embryo development and/or a higher embryo survival.”

Skip a heat

Another approach which allows the first litter sow to recover from her previous lactation is to inseminate the sow at the second heat after weaning instead of the first one (skip a heat). “Skipping the first heat can improve pregnancy rates by 15% and subsequent litter sizes by 1.3 to 2.5 piglets,” Kemp explains. “However, whether or not this technique should be used is a matter of economics.”

Feeding levels during early pregnancy

After weaning, sows need to restore body reserves that were lost during lactation, however often feed levels are too low in practice, Kemp believes. “Recently, we studied the effects of feeding 2.5 or 3.25 kg per day from day 3 to 32 of pregnancy on litter size and farrowing rate,” he explains. “The high feeding level increased total born and live born piglets by 2.1 and 1.8 piglets, respectively. Piglet weights were similar at both feeding levels.” However, he notes, farrowing rate was lower for the sows fed at the higher level (77 vs. 90%). “High feeding levels lead to increased litter size but may also result in more sows returning to oestrus after first insemination,” Kemp concludes.

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CONTINUED ON PAGE 26

Life beyond needles

Needleless injectors seem to offer many advantages over conventional injection methods, especially because they completely remove the risk of broken needles. They are easier for staff than using a syringe and are safer because there is no risk of accidental injury from needles, says veterinarian Karine Talbot, with HyLife (formerly Hytek) of La Broquerie, Manitoba. In addition, she points out, they provide improved welfare for the pigs. Although there are some disadvantages such as the high initial cost and the need for a compressor and other additional equipment in the barn, needleless injectors have been working well within the HyLife system and 315,000 injections are now carried out each month. Talbot reviews the needleless injection system, its advantages and disadvantages and how it has been working at HyLife.

Mode of action

“The concept of the needle-free device is to accelerate a jet of fluid, and nowadays even powder, at a speed high enough to give it penetrative power,” explains Talbot. “This power is provided by an energy source such as a spring, gas or a battery and is used to drive a plunger or a piston into the drug, accelerating it through a fine diameter nozzle. The drug then penetrates the skin and reaches various depths of tissue - sub-cutaneous, intra-dermal and/or intramuscular - depending on the pressure applied and the type of device.”

Two types of unit are used in the Canadian pig industry: one is a battery-powered injector (Acushot) and the other one is gas-powered (Pulse). The advantages and disadvantages listed below apply to both types of device.

Advantages

“The reasons to use needle-free injectors in pigs are numerous and the advantages are considerable,” Talbot believes. “First, the risk of having a consumer finding a needle in pork is not acceptable and such a finding would negatively impact the whole industry. The use of a needle-free device eliminates this risk and ensures a safer product to consumers.”

One of the concerns about the needle-free injectors is the increase in neck and head abscesses at the slaughter plant, but studies have shown that the incidence of carcass defects is the same as with conventional needles, Talbot points out.

“Needle-free injectors are also more worker-friendly than needles,” she continues. “Their use eliminates the risk of needle stick injury and also reduces injuries caused by repetitive movements when injecting with a conventional syringe. Their use also eliminates the need for needle disposal.”

Some recent research has also demonstrated a reduction in transmission of some diseases like PRRS, Talbot notes. The conventional needle, when used from pig to pig, has the potential to transfer blood and pathogens. The needleless device, even if it does not eliminate this risk, reduces it greatly.

“Another important advantage of these units is the consistency of the amount of drug delivered,” Talbot adds.

Disadvantages

Talbot believes that the disadvantages of the needle-free injectors could explain its low implementation rate in food animal production, notably in the pig industry. “These include the cost of the injector as well as the cost for maintenance of the unit,” she explains. “In addition to this, some of the devices may require special installation and additional cost for equipment such as a CO2 tank, air compressor or carts.”

“For the needle-free injector to function properly, regular maintenance and cleaning of the unit is required”

“For the needle-free injector to function properly, regular maintenance and cleaning of the unit is required,” Talbot stresses. “Moreover, people performing those tasks need some training in order to use the device safely and efficiently.”

Depending on the amount of drug administered and the way mass vaccination is performed – for example picking up every pig vs. using a board to crowd them - the needleless injector might be slower and increase the time required to perform the task.

“The device and all its components are also heavy if they are worn when injecting,” Talbot notes. “However, alternative methods can be used such as a special cart or a tray that holds

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Table 1: Advantages and disadvantages of needle-free technology

Advantages	Disadvantages
Eliminates the risk of broken needles	Cost (device and maintenance)
Eliminates the risk of needle sticks	May require new equipment (compressed air, CO2)
Eliminates multiple-use injuries (e.g. carpal tunnel)	Higher requirement for maintenance
Reduces the transmission of diseases	Higher requirement for training
Elimination of needle disposal	Slower speed of injection
Easy to use	Weight of the unit
Consistent vaccine delivery	Not practical for individual treatment

everything needed to inject. The user then only needs to hold the handle piece which is very light.”

Needle-free injectors are difficult to use for individual treatment of pigs. “Also, drugs like penicillin cannot be used in some needle-free devices as the components of the drug separate in the injection process under the high pressure required for injecting,” she points out.

Even if some of these disadvantages are significant, they can be overcome, Talbot believes. The disadvantages need to be considered when thinking of purchasing a needle-free injector, however, they should not stop anybody from making this change,” she says. “The advantages of the system, mainly the elimination of broken needles, can certainly overcome most of the disadvantages.” Moreover, she notes, the Province of Manitoba has a financial incentive for every producer to buy one of these needle-free devices.

Efficacy

Among the different vaccines tested in pigs are *Mycoplasma hyopneumoniae*, Swine influenza, pseudorabies, APP and PRRS. These studies have shown that needle-free injections are as good as or better than injections with needles.

Needle-free injectors can also be used with other medications in addition to vaccines, for example iron for piglets, Talbot notes. “In one study the growth, performance and haematological values of piglets that received iron through a needle-free injection were the same as those for piglets that were injected with a conventional needle.”

HyLife’s experience

In 2008, HyLife started a trial in a research barn with needle-free injectors to investigate if the use of such a device was practical in a pig barn. “It did not take much time to realize that this technology was really promising and even though we had some small challenges, it was possible to implement it in the entire system,” comments Talbot. “In 2009, when the Federal-Provincial Growing Forward program was announced, this was the final incentive that HyLife needed to make the decision to go ahead and use needle-free injection in all of the barns.”

“As a fully integrated company owning a slaughter plant, HyLife decided to be completely needle-free, from birth to slaughter,” Talbot explains. “This includes the injection of vaccines, iron and any treatment with antibiotics. Needles are still used for sows as the risk of broken needles was judged to be very low and they are not slaughtered at the Springhill plant.”

“A person was hired as a full time needle-less injection technician and trained to use and repair the injectors,” continues Talbot. “His job was to implement the technology in



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all the barns, starting in June 2010. As of November 2010, all nurseries and sow barns were using the needle-less injector and the last needles were removed from the barns in December.”

“The transition to this new technology went much better than expected and was well accepted by the employees”

The transition to this new technology went much better than expected and was well accepted by the employees, Talbot says. She notes that some modifications were made to the barns; pipes for compressed air with many drops throughout the barns were installed, special carts were designed so the user did not have to bear the weight of the unit and special trays were designed to hold small air tanks for individual treatments.

“The devices are working well and as long as the basic maintenance is done regularly almost no problems have been experienced,” Talbot notes. “Except for some damage caused by human error, the units have been very resilient considering the number of injections and the environment in which they are used: some barns inject up to 5000-6000 pigs a week and in the whole HyLife system about 315,000 needle-free injections are done monthly. This represents a huge number of needles that HyLife does not need to buy anymore, and also a huge number of needles that do not have to be disposed of.”

Up to now, most of the small technical problems have been fixed in the barn by the employees themselves, Talbot explains. “If ever they have questions, or if they encounter a bigger problem, the needle-less technician or a maintenance employee that has also been trained to repair the device can always help, and the needle-less company itself offers a very good service,” she says.

Since the needle-free injectors are very expensive, it was not economically

feasible to have a unit at every finishing site, Talbot points out. The solution to giving individual treatments was to use a drench gun similar to the one used in sows or cattle and administer medication orally.

Conclusion

Overall, the transition to the needle-free injectors within the HyLife system has

gone very well, indeed much better than expected, according to Talbot. “The risk of broken needles in the pigs from birth to slaughter is eliminated, the injection seems less painful and less stressful on pigs and, most of all, staff like this new technology,” she concludes. “One would now have a hard time to convince an employee to go back to using needles!”

CONTINUED ON PAGE 30

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Glycerine in swine diets

An increase in biodiesel production in North America has led to the availability of glycerine – a by-product from the process – as a possible energy source in pig diets. Up to 15% crude glycerine can be fed to pigs without negative consequences, according to Dr. LeAnn Johnston, technical services manager with Amlan International. However, she points out, crude glycerol contains varying concentrations of methanol, which is potentially toxic to swine. Because crude glycerine is a liquid it can cause problems with feed manufacturing and feed flowability but has been shown to improve pelleting, notes Johnston. Although glycerine is not currently approved for use in swine diets, there is a considerable amount of interest in its potential and recent research has been evaluating its use. Johnston looks at the factors that need to be considered when using glycerine in pig diets.

What is glycerine?

“Glycerine, which is also called glycerol, is traditionally used in the making of soaps, cosmetics, and lotions,” explains Johnston. “It has a sweet taste and can be used as a sweetener in human foods or animal feeds.” When fats and oils are made into biodiesel, crude glycerine is a by-product; 79 g of crude glycerine is produced per litre of biodiesel. “In the body it can be broken down by the liver and converted to glucose to be used by the body as an energy source,” Johnston continues. “Energy cost is sixty percent of the total cost of swine diets. Therefore, because of the increase in biodiesel production there has been increased interest in using glycerine as an energy source in animal feeds.”

Glycerine and pig performance

Energy calculations

To use glycerine as an energy source it is important to determine the amount of energy available to the pig, says Johnston. However, she notes, there can be tremendous variability between sources of glycerine. “Kerr et al. evaluated the digestible and metabolizable energy values from several sources of crude glycerine for nursery pigs and reported a range of gross energy (GE) from 3,173 to 6,021 kcal/kg; of digestible energy (DE) of 3,022 to 5,228 kcal/kg; and of metabolizable energy (ME) from 2,535 to 5,206 kcal/kg,” Johnston informs.

A number of formulae have been developed to predict the energy content of glycerine from its composition. These can be used when formulating diets.

Nursery pigs

Work by Zijlstra et al. at The University of Alberta, showed increased body weight when 4 or 8% glycerol replaced wheat (with the appropriate additions of crystalline amino acids) in diets for nursery pigs. “Feed intake also tended to increase, which resulted in no change in feed efficiency during the twenty-one day experiment,” comments Johnston. “In a similar trial, ADG improved linearly in nursery pigs when fed 3 or 6% glycerine replacing corn.”

Grow-finish pigs

Lammers et al. added 5 or 10% glycerine to diets for pigs starting one week after weaning (from a weight of 7.9 kg) and continuing through the finishing period. “The addition of glycerine did not have any effect on animal performance in any stage of the trial or overall,” Johnston explains. “There were also no effects on carcass characteristics except for the fatty acid profile.” Diets in this experiment did not simply replace corn or wheat with glycerine but were formulated to have the same ME, lysine, sulphur amino acids, threonine, tryptophan, available phosphorus, sodium and chlorine content as the control diets. “When 5% glycerol was added to the diet it replaced 6% of the corn and 50% of the sodium chloride while soybean meal increased by 5% in the formulation,” Johnston points out. “In the diets with 10% added crude

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Table 1: Summary of results for trials using glycerine in swine diets

Reference	Age	Crude glycerine in diet, %	Effect on growth performance	Effects on meat quality	Comments
Groesbeck et al., 2008	Nursery pigs	0, 3, 6, 9, 12, & 15	Increased ADG, tended to increase ADFI, no difference on G:F		Adding up to 9% glycerin increased pellet durability and decreased delta temperature, amperage, motor load, and improved production efficiency.
Lammers et al., 2008a	Growing pigs	0, 5, & 10	No treatment difference on ADG, ADFI or G:F	No effect any carcass characteristic except fatty acid profile	Diets formulated on an equal energy basis
Zijlstra et al., 2009	Weaned pigs	0, 4, & 8	Weight increased with increasing glycerol, quadratic increase in ADFI, no difference on G:F		Energy digestibility increased linearly with increasing glycerin
Mendoza et al., 2010	Finishing pigs	0, 5, 10, & 15	No effect on growth performance	No effect of glycerin on carcass characteristics or meat quality	No effect of different pre-slaughter handling techniques on pork quality
Schieck, et al., 2010	Finishing Pigs	8	3 % increase in gain, 2% decrease in G:F when fed from 31.3 kg of body wt	Increased belly firmness when fed the last 8 wks of the finishing period	No change in drip loss

glycerol 16% corn and 90% sodium chloride were replaced and soybean meal increased by approximately 9%.

“Up to 15% refined glycerine was fed with no effect on growth performance, carcass or pork quality measurements”

In one trial, up to 15% refined glycerine was fed with no effect on growth performance, carcass or pork quality measurements when diets were formulated to the same ME, Johnston notes. However, she says, another trial saw increased ADG and ADFI and decreased Gain:Feed ratio when 8% crude glycerine was fed for 12 weeks in the grow-finish period. “Adding glycerine in this experiment improved belly firmness but had no other effect on carcass quality, water-holding capacity, or taste,” she adds.

Concerns with the use of glycerine in swine diets

Approval

Crude glycerine is not currently listed in Schedule IV for swine in Canada. It is, however, listed in Schedule IV for use in beef cattle feeds up to 5% of the total diet. “CFIA requires that glycerine contains not more than 0.1% (1000 ppm) residual methanol,” explains Johnston. “They also require that it is labelled with guarantees for minimum percent glycerol, maximum percent moisture and maximum percent methanol.”

Impurities

Methanol is used during the biodiesel manufacturing process and some methanol will remain in the crude glycerine by-product. “Sodium and chloride can also be found in crude glycerine in relatively high concentrations,” notes Johnston. “It may be advantageous to adjust the amount of salt in the diet based on the amount of Na and Cl in the glycerine. Adding glycerine to the diet has been shown to increase water intake and urinary output.”

Form

Glycerine is typically a liquid at room temperature. This means that it needs to be stored in a tank at the feed mill and added as a liquid. “Adding more than 6% glycerine to a mash diet can result in feed with flowability problems,” Johnston comments. “However, research suggests that adding up to 9% glycerine increased pellet durability and decreased friction at the pellet mill, improving production efficiency.”

Conclusions

While not currently approved for use in swine in Canada crude glycerine is a good energy source for swine, Johnston concludes. “There is variability in the energy available from crude glycerine, but the energy content can be estimated by the composition,” she says. “When diets are formulated with crude glycerine they will have lower amounts of energy sources such as wheat and higher levels of protein sources, also salt may need to be decreased.”

CONTINUED ON PAGE 32

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Practical nursery management: Doing the basics right

The day of weaning and the subsequent period in the nursery are life-changing and incredibly stressful events for the pig, according to Blaine Tully, a veterinarian with Swine Health Professionals Ltd., Steinbach, Manitoba. A weaned pig's needs are quite basic, and non-negotiable, in that if we want the pig to perform well, we need to provide food, water and a dry place to lie, he believes. Assuming that good quality pigs are weaned into the nursery, it is in our control as stockpersons to facilitate a smooth transition for the weaned pig and ensure good performance, Tully says. He reviews current nursery pig management practises and explores some practical approaches to easing life for the weaned pig.

Food

"Starting on feed immediately after weaning is crucial not only to provide nutrition for growth, but also for heat," Tully points out. "The weaned pig will generate heat as it digests feed, thereby reducing the potential for additional chilling."

The transition period (first 72 hours) will be more successful if the pig has had an opportunity to try chewing some dry, pelleted feed already, Tully stresses. "By providing a small amount of creep feed for 3-6 days prior to weaning, we

can 'train' the pig to chew solid food," he explains. "Once weaned, the type of feed will be one less novel experience the pig will need to deal with." Ideally the pre-weaning creep diet should be the same as the first diet used in the nursery pen, Tully advises. "Creep feed should be provided on mats or in trays to the weaned pigs to increase access opportunities to the piglets," he says. "Remember, the weaned pig was used to eating 20 or more times per day on the sow and therefore if we can hand feed the creep feed - in small amounts to limit wastage - we can also increase the likelihood of a pig eating."

Another consideration with respect to feeding is the nursery feeder design, spacing and setting. "When considering the amount of time spent at the feeder, a dry multi-space feeder appears superior to the wet/dry type feeders in a nursery setting and does not appear to impact growth performance," Tully notes. "This could imply that there is less opportunity for aggressive behaviour and competition at the feeder."

"Newly weaned piglets must find and begin drinking from the water source in the pen as soon as possible"

Correct feeder setting will minimize feed wastage while providing adequate access to feed, preventing competition at the feeder and not reducing feed intake, Tully says. "Feeders should be set to allow 25-60% of the feeder bottom to be covered by feed. For the 72-hour period following weaning, the entire feeder bottom should be covered



to ensure adequate and instant access to creep feed, however for the remaining nursery period, target to have 40% of the bottom covered by feed." He suggests that feeders should be assessed daily to ensure feed stage changes have not altered the feeder pan coverage and adjustments made accordingly. Also, dirty feeders reduce access to feed and feed intake.

Water

Often overlooked as the most important nutritional requirement affecting piglet health, adequate access to clean fresh water cannot be underestimated, Tully believes. "Newly weaned piglets must

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find and begin drinking from the water source in the pen as soon as possible,” he explains. “Piglets prefer a drinker that is easy to find and simple to access water from. A nipple type drinker may take advantage of the normal suckling behaviour of a piglet; however it will not increase water intake or impact piglet performance relative to a push-lever bowl type drinker.” Nipple drinkers also dramatically increase water (and water medication) wastage in nursery pens, he adds.

The number of piglets per drinker, water pressure and flow rate will affect water access and intake. “Generally, the literature suggests 1 drinker/10 pigs, a flow rate of 250-500 ml per minute, with a water pressure of 20 psi,” Tully points out. “Most nursery facilities in Manitoba will perform well with 20 pigs per drinker. With adjustable height type drinkers, ensure the nipple is adjusted to the top of the shoulder of the smallest pig in the pen.”

Water samples should be analysed for bacterial contamination and quality annually or more frequently depending on source, he advises.

Dry place to sleep

The weaned pig has a large surface area to body mass ratio, and therefore is at real risk of losing a lot of body heat. “As discussed earlier, if a weaned piglet does not begin eating and drinking immediately after weaning, the lack of metabolic heat

production from the digestion of feed will begin adversely affecting normal body functions and health,” Tully notes. “For this reason, the nursery room must be preheated to 28-32°C for the first 36-72 hours as the pig transitions onto feed. A weaned piglet prefers a warm environment, even if air quality (increased ammonia level) is reduced in the short term.”

“Air current within a pen can reduce growth rates and impact the health of a weaned pig”

We must also consider the difference between ambient room temperature and the effective temperature - the temperature the piglet actually feels, Tully believes. “The effective temperature is changed by air speed, flooring type, and insulation of walls. For example, if the room air temperature is 24°C, but we have plastic flooring and a moderate draft, the effective temperature, or what the room feels like to the pig, is actually 13°C,” he explains. “This phenomenon explains why we often see weaned piglets huddling in the corner of a pen, despite the thermometer in the room indicating an appropriate temperature.”

Farms that have heated floor pads in each pen can afford to have ambient temperature 2-3°C lower than those without, however stocking density must allow all piglets within the pen to lay flat on the pad without piling, Tully adds. “Any draft in the pen will still affect these piglets, despite having a heated pad to lie on. Air current within a pen can reduce growth rates and impact the health of a weaned pig including increased coughing, sneezing, diarrhoea, and skin lesions.” Another consideration is usable space within a pen, he notes. “If part of a pen is soiled due to poor dunging patterns, or wet from leaking water lines or drinkers, the usable space of the pen is reduced.”

The stockperson

The final ingredient in sound nursery management is an engaged stockperson. “The stockperson must be able to ‘bring their A-game’ each and every day,” Tully stresses. “The first 72 hours post-weaning will set the course for the remaining nursery stay.” Every pig will need to be observed and assessed daily to determine which pigs need more attention to begin eating, drinking and fitting into the new social order, he says. “This means that the stockperson is actually in the pen (crouching down with the pigs, to get a close look at all of the pigs), with marker and syringe in hand and ready to sort and treat at-risk pigs.”

Tully notes that many pigs are weaned on Thursday, which makes the management of the early weaned pig extremely challenging, having the 36-hour mark fall on Friday afternoon. “Many of us are already thinking of the weekend, not identifying at-risk pigs,” he points out. “Getting the right person in place for addressing these early challenges can make the difference between average and superior performance.” ■

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Feed, water and a dry place to sleep: Checklist

Before pigs arrive:

- Apply appropriate sanitation and disinfection program to all nursery rooms, hallways and loading ramps
- Pre-heat pig space, reset ventilation controller for newly weaned pigs
- Check all drinkers are functioning properly and at the appropriate height
- Reset all feeder settings to allow 40% pan coverage with creep feed (For the first 72 hours, cover the feeder pan entirely)
- Ensure appropriate fan covers are in place for the season
- Place creep feed into feeders
- Plan out how to manage pig numbers depending on pen sizes and #pens

After pigs arrive, first 72 hours:

- Sort pigs into pens (ensure all small pigs are placed together). Sort into groups that you plan to manage as distinct groups. i.e. tailored feed budget, etc.
- Keep up to 10% of the pens empty to allow space for picking up fallouts. This means overstocking the rest of the pens for up to 2 weeks and they should be thinned out to appropriate numbers/pen by the third week.
- Keep 1-2 pens empty for treatment pens
- Place a small amount of creep feed into floor tray or on pad or mat 4 times daily (if pigs have had to be transported to the nursery, delay by 2 hours)
- Ensure every pig gets up and moves around 4 times daily
- Identify pigs that are not adjusting to solid feed (see below) or need treating
- Pull out and treat pigs according to medication protocols for the farm

Every day:

- Walk each pen (get right into the pen) in youngest 3 rooms/barns daily (there are 7 days in a week!)
- Walk each pen in the older rooms minimum 2 times/week
- Check feeder settings/feed stage
- Check drinkers
- Check ventilation/temperature - are pigs comfortable?
- Air quality?
- Pit levels?

How to ID non-competitors or sick pigs (make sure to mark these):

- Not staying with group (off in corner on their own)
- Slow to get up
- Fuzzy haircoat (hair standing up)
- Gaunt looking
- Reddened skin
- Glazed eyes
- Scour stained hind quarters
- Abnormal breathing (panting/pumping)
- Limping or favouring leg

Managing the fall-back pig:

- Identify these pigs as early as possible - gaunt, often hairy, (not always the small pig)
- These pigs need to be sorted to less competitive pens
- Gently pick up pig, place a handful of creep feed into mouth to allow it to chew, and gently place down into the "treatment pen" beside the feeder. Do this 3-4 times daily.
- Place a gruel tray into this pen to encourage eating
- Place a creep cover and heat source (lamp or pad) to keep these non-eating piglets warm and comfortable
- Treat as per veterinary protocols

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Behaviour of pigs in large group auto-sort systems

Large group auto-sort (LGAS) systems require considerably more effort on the pigs' part to access feed than in small pens, according to Drs. Harold Gonyou and Jennifer Brown from the Prairie Swine Centre. They recently studied the pigs' behaviour in two LGAS systems to determine what adaptations they made. Pigs were able to maintain their typical diurnal eating pattern, with peaks at 'lights-on and lights-off' as seen in small pens, the researchers found. However, they add, the pigs modified their eating by having fewer (5 vs 10-15) but longer meals than in small pens. Pigs made use of all of the available feeder spaces within the food court, visiting several each day, Gonyou and Brown note. Although able to adapt their eating behaviour to the large group system, some had difficulty learning to enter and leave the food court several times a day, they observe. Management should ensure an adequate number of feeder spaces, sufficient room to move in the food court and training methods to facilitate use of the auto-sort scale, Gonyou and Brown conclude. They describe the studies they carried out and discuss the results and their implications for commercial producers.

Introduction

The use of large groups for grow/finish pigs makes it economically feasible to introduce new technology, such as auto-sort scales, into pig production. One of the initial fears concerning large groups of pigs was that they would fight longer after being put together. Our

earlier research refuted these concerns as aggression per pig at group formation was similar in small and large groups, and in fact, pigs from large groups proved easier to combine with other pigs when marketed. However, early attempts to use auto-sort technology encountered problems with variable feed intake among the pigs. We continued our studies with a focus on eating behaviour.

The commercial farm maintained groups of 650 pigs with 60 feeder spaces. At the Elstow facility we studied the diurnal pattern of scale use, the use of individual feeder spaces within the food court and the eating patterns of individual pigs. Movement through the scale ('hits') were studied using automated output from the auto-sort scale. We photographed all of the feeder spaces at 5 minute intervals using a time lapse camera. To identify individual pigs, 10 pigs in each study group were paint-marked. At the commercial farm, we again used output from the auto-sort scale, and supplemented this with live observations of four rooms of pigs for a 24-hr period.

Experimental procedures

Studies were carried out at two locations; the PSC Elstow Research Farm and a commercial grow/finish operation. The Elstow facility housed approximately 250 pigs in its LGAS (with 1 feeder space per nine pigs).



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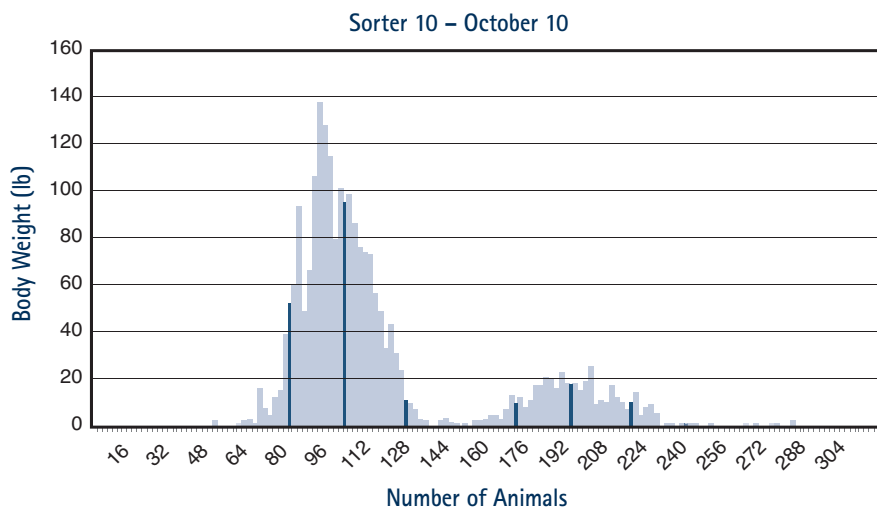


Figure 1: Distribution of weights recorded by sorter during period when pigs averaged approximately 45 kg (98 lbs). Second cluster to right represents times when two pigs were in the scale. Weights in lbs.

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Figure 2: Example of photo used to assess eating patterns and feeder use

Results and discussion

Pigs normally have a diurnal eating pattern with most of the feeding taking place during the 'day'. When we first examined the pattern of 'hits' through

the auto-sort scale the entry pattern was poorly defined. However, we determined that during the daytime, and when pigs were less than 75 kg, two pigs would often enter the scale at the same time (Figure 1). After adjusting

the data for the number of pigs that entered the food court each hour, a more distinct diurnal pattern was found.

The analysis of photos of the feeder spaces (Figure 2) showed a clear diurnal pattern with an 8-fold increase in eating during the daytime peaks compared to the midnight low. The pattern showed

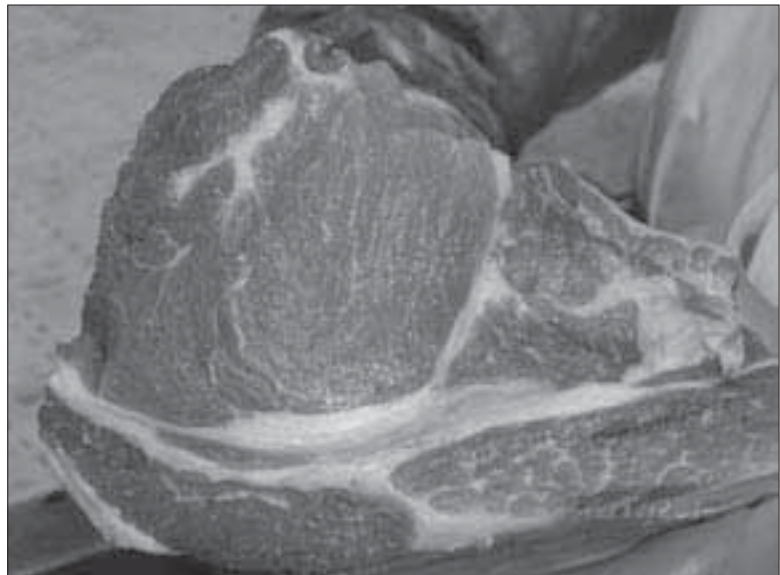
"Large group auto-sort systems pose some significant challenges to pigs in terms of eating behaviour"

typical peaks at 'lights-on' and 'lights-off'. The pigs used each of the feeder spaces fairly uniformly, something we had observed in previous studies. Pigs in small groups typically have 10 – 15 well defined 'meals' in a day. Pigs in the LGAS had approximately 5 meals per day, but they were longer in duration than in small group pens. This adaptation was successful as the pigs in LGAS performed as well as those in small groups.



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The study at the commercial farm allowed us to examine the change in eating behaviour as pigs aged. Our study rooms varied in age by six weeks. We determined that the average number of entrances into the food court each day decreased as the size (age) of the pigs increased, from nearly 4 entries per day at 40 kg to approximately 2.5 per day at 90 kg. The pattern of eating showed the typical diurnal, two-peaked pattern described earlier (Figure 3). Of interest in this pattern was that younger pigs had less of a 'drop-off' in the middle of the day. Comparing these results with other studies suggests that the younger pigs were limited in the number of feeder spaces, and had to shift eating from the normal peak periods to the less intensive mid-day period.

The bottom line

Large group auto-sort systems pose some significant challenges to pigs in terms of eating behaviour. The feeders are all located in a food court which can only be accessed through a single sorter scale. The cost of moving to the feeders is greater than in a small pen, where pigs may only have to move a metre or so to find feed. Despite these restrictions, pigs pass through the sorter and eat in a typical diurnal pattern similar to that seen in small pens. However, pigs in large group auto-sort pens only enter the food court 2-4 times each day, and have fewer meals (5 vs 10-15) than in small pens. They compensate by eating longer during each meal. They also move freely about the food court, eating from several feeder spaces every day. Young pigs, who require more time to eat, may display a higher mid-day rate of eating indicative of restricted feeder space. We believe a key to making food courts work is to make sure the pigs know that food is present by introducing them to the food court rather than the loafing area. The food court should be spacious

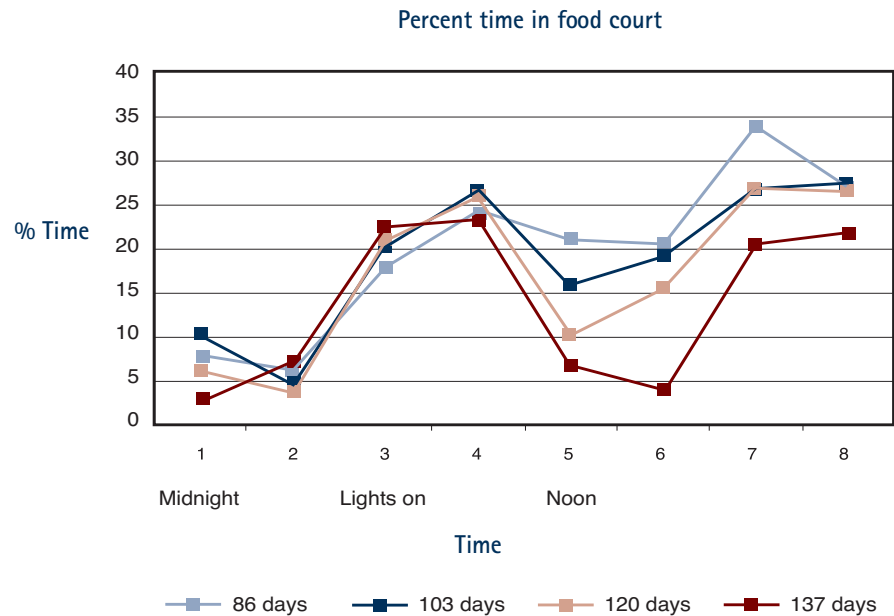


Figure 3: Diurnal pattern of eating by pigs within the food court in auto-sort rooms with different aged pigs. The day was divided into eight 3-hour periods, starting at midnight

so that pigs have access to all of the feeders, and a feeder space should be provided for every 10-12 pigs.

Acknowledgements: Project funding provided by the Agricultural Development Fund of Saskatchewan. Collaboration of Sierens Equipment as well as that of the commercial farm

was greatly appreciated. Strategic funding was provided by Sask Pork, Alberta Pork, Manitoba Pork Council and Saskatchewan Agriculture to the research programs at PSCI.

CONTINUED ON PAGE 40

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Don't be a victim of price volatility

By Gwendolyn Jones, *Global Technical Services Manager, Danisco Animal Nutrition, UK*

The swine industry carries more uncertainty than in previous years, with higher volatility particularly in relation to inputs. Risk management is becoming a hot topic and the ability to make smart decisions about which tools and technologies best support risk management efforts could be what separates high performers from the rest. Enzymes offer an effective tool to counter feed raw material price volatility. With the increasing price of feed phosphates and other key raw materials, producers should consider increasing the inclusion rate of phytase in their feed, as well as maximizing nutrient availability via the use of carbohydrase enzymes to match the increase in complexity of diets.

Price of major raw materials is rising

Feed cost is the major component of producing pork, so the price of feed ingredients is a key element of profitability. In the current economic climate it is hard to be optimistic about prices for the major raw materials used in feed for pork production. Corn prices have approximately doubled over the past ten years and current prices for corn (Feb., 2011) have risen to around \$7 per bushel for pig producers in the US. In Europe the price of wheat has jumped from €120 to €258/t over the last 12 months. Recent press releases indicate world grain prices for wheat, corn and soybeans are to rise due to record short supplies and feed phosphate price is also expected to increase in 2011.

Risk mitigation of price volatility

The question is whether pork producers want to play victim to the increasing volatility and rise in raw material prices, or become more proactive in looking for alternatives. Risk management, which counters the risk of price volatility in feed raw materials, is a proactive approach to minimize the negative bottom-line impact of price volatility. The key for producers and feed companies is to increase flexibility in feed formulations, allowing companies to switch to alternative, but cheaper raw materials. It's a matter of being able to spread

the risk of any particular feed ingredient becoming overly expensive, while being able to take advantage of alternative feedstuffs when they become available. All of these decisions have to be made without any negative impact on animal performance.

Price of alternative raw materials

The result of including alternative, but cheaper, raw materials in pig diets is an increased complexity of diets. Increased complexity means diets can contain more anti-nutritive factors, become more fibrous, less digestible and more variable in nutrient value. This can have a negative impact on feeding value to the animal and ultimately performance.

For example, corn DDGS used as an alternative raw material is potentially a good source of energy, protein and phosphorus. However DDGS is a highly fibrous raw material, containing around 3 times more fibre than corn grain. When screening US-origin DDGS from modern ethanol plants for non-starch polysaccharide (NSP), which is the major part of dietary fibre, it was found that arabinoxylans and cellulose were the predominant NSPs with a value of 11.4% (on a dry matter basis). Also metabolizable energy in DDGS can be highly variable, much higher than that reported for corn and other grains. Therefore adding DDGS to pig diets can reduce the

CONTINUED ON PAGE 42



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A HEALTHY START FOR A STRONG FINISH

Giving pigs a strong, healthy start is the key to a successful finish at market. For producers this means understanding the impact of nursery exit weights, the significance of respiratory diseases and working with their veterinarian to set an excellent foundation for pig health.



Nursery Exit Weight Linked to Finishing Weight

In recent years, a number of studies have demonstrated the importance of nursery exit weight as a clear predictor of whether a pig ends up lightweight at market.¹ “We know that pigs that leave the nursery phase lighter than we would like are at increased risk of also going to market at a lighter weight,” explains Dr. Peter Provis, a partner in Swine Health Professionals, a swine-exclusive veterinary practice based in Manitoba, and consultant to ELANCO Canada. “And, ultimately it is the producer who pays a financial penalty for this.” Don Down, a pork value chain specialist with ELANCO, has crunched the numbers with his customers. “Experience has shown that increased nursery exit weight reduces days to market and your market hogs will be at the plant sooner,” Down says. In addition to freeing up space in the finishing barn, healthier, heavier pigs also contribute to reduced input costs and maximized revenue potential. The message to producers – be vigilant about anything that threatens nursery weight.

“Respiratory disease in pigs is by far the biggest health threat and has the most significant impact on nursery health and performance, relative to other concerns in the nursery;” says Dr. Provis.

“It affects the vast majority of nursery pigs and is the main concern facing veterinarians and producers.” In fact, most herds test positive for bacterial infection in the early stages (i.e. weeks one to three). Respiratory disease negatively affects average daily gain (ADG) by as much as 35%, feed conversion by up to 30% and growth rate by as much as 10 to 20%² – all important predictors of health, performance and profitability.

“We used to just look at the impact of clinical diseases in the nursery. Now we examine for earlier signs of nursery respiratory problems too,” says Provis. “Once we recognize the problem and treat it with a medicated feed like Pulmotil[®] Premix we get a very clear picture of the cost that these conditions have on ADG, feed conversion and growth rates.”

Pulmotil Premix: Leading Respiratory Disease Treatment

For this reason, Dr. Provis suggests Pulmotil as a good early intervention strategy. “Pulmotil is effective against the most common diseases³ that cause respiratory problems in the nursery. Increasingly, it is being used within the first three weeks post-weaning to address those diseases before they have a chance to cause problems.” Respiratory disease is difficult and costly to treat. A proactive approach with Pulmotil helps to prevent it and sets the foundation for nursery-to-finish health management. The easy-to-use premix formulation is appropriate at all stages of production and approved at a treatment rate of 200 or 400 parts per million (1-2 kg/t) for 21 days, beginning approximately seven days before an anticipated disease outbreak, followed by a withdrawal of 14 days. According to Dr. Provis, Pulmotil is unique because of its mode of action, which allows it to concentrate 10 times higher in lungs than in serum, ensuring high levels of activity where bacteria accumulate⁴. In other words, Pulmotil goes to work where pigs need it most. Doing so prepares the pigs’ immune system to combat secondary bacterial infections such as *APP*, *P. multocida* and *H. parasuis*, that are often seen in pigs with Porcine Reproductive Respiratory Syndrome (PRRS).⁵

Setting the Foundation for Full Value Pigs
“Pulmotil really helps to increase the number of Full Value Pigs™,” says Down, referring to healthy, high-quality pigs that reach their

optimum weight in a desired time period to achieve maximum market price and income. In his role, Down works closely with producers and helps them understand that addressing health and management issues in the nursery can improve animal profitability at the end of the line. “We get inside and work with the producer. We help them weigh pigs and record and analyze data right through to the plant. Even though Pulmotil is fed starting in the nursery, the data clearly demonstrates that the money is made when the hog is marketed,” he says⁵. “It is becoming increasingly important for producers to optimize the way they use feed ingredients and, in turn, the growth of pigs in the nursery,” says Dr. Provis. “Pulmotil Premix provides them with that opportunity.”

PULMOTIL PREMIX PRICE REDUCED

Pulmotil Premix is now available at a lower price, offering producers even more economical control of swine respiratory diseases. A price reduction of 20% was announced in Fall 2009 as a result of advancements in product manufacturing. The price reduction applies to 10 kilogram bags of Pulmotil Premix and is based on a treatment rate of 200 or 400 parts per million (ppm) for 21 days, followed by a withdrawal of 14 days.

¹Wolff, T., Lehe, K. et al. 2006. Producer Tool: Measuring Attrition in Wean-to-Finish Swine Operations. Proceedings of the 11th International Symposium on Veterinary Epidemiology and Economics.

²Tubbs, R. and Deen, J. 1997. Economics of respiratory and enteric diseases. Proc. AASP. 361-364.

³Zeman D.H. 1996. Concurrent respiratory infections in 221 cases of PRRS virus pneumonia: 1992-1994. J Swine Health and Production. Vol. 4 No.3. 143-145.

⁴Someaux, B. and Shryock, T. 1998. Intracellular accumulation, subcellular distribution and efflux of tilimicosin in swine phagocytes. J. Vet. Pharm. Ther. 21:257-268.

⁵Harker J.W., Keffaber K. 2006. The impact of Pulmotil feeding in the nursery on finishing performance of at-risk pigs. Proc. AASV 127-130.



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11-17-0274-02032010

digestibility of energy and increase the variability in that energy value.

Other alternative raw materials used in pig diets, such as canola meal and wheat shorts often contain higher phytate levels. As a result of the anti-nutrient effects of phytate in the gut of the animal, increasing dietary phytate has a large negative impact on the solubility and digestibility of dietary nutrients.

Enzymes as tools in risk management

Fortunately, many of the factors which affect digestibility and variability in nutrient availability can be targeted by appropriate enzyme supplementation. This allows producers and feed companies to switch to alternative and cheaper energy sources, without compromising animal performance.

"Extra savings can be made by replacing dicalcium phosphate with higher levels of phytase in the diet"

The most common feed enzyme used in animal diets is phytase. Phytase releases the phosphorus bound to phytate present in raw materials. This can help to reduce dependence on supplementary inorganic phosphorus that, especially in

Table 1: Enzyme solutions improve nutrient value of pig diets containing 20% DDGS

	Control	Phyzyme XP (Phytase) + Porzyme 9300 (xylanase)*
Digestible energy (kcal/kg)	3102 a	3277 b
Phosphorus digestibility (%)	21.6 a	50.7 b
Ileal protein digestibility (%)	67.9 a	73.5

*to supply 500 FTU Phyzyme/kg feed and 500g Porzyme 9300/t feed
a, b= P<0.05 University of Illinois, USA, 2008

recent years, has been highly variable in price. With current increases in feed phosphate prices, extra savings can be made by replacing dicalcium phosphate with higher levels of

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phytase in the diet, while maintaining animal performance. However, increasing levels of a highly bio-effective phytase in the diet can also help to reduce the anti-nutrient effect of phytate, releasing extra energy, amino acids and calcium. This offers the opportunity to switch to alternative raw materials with higher phytate levels.

There is increasing independent evidence to show that carbohydrase enzymes can also offer an advantage when used in addition to phytase in animal diets. This is because these enzymes are able to release extra energy and amino acids. For example xylanase breaks down arabinoxylan in plant cell walls to expose starch and other nutrients for digestion. Table 1 demonstrates the positive effect of adding both xylanase and phytase to pig diets containing 20% DDGS on nutrient digestibility, showing the enhanced flexibility with enzymes to switch to alternative, cheaper raw materials.

Proven enzyme solutions

Enzymes offer an effective tool in risk management strategies for producers and animal feed companies to counter raw material price volatility. However, feed formulators have to be confident that an additive will consistently deliver what it promises in terms of nutrient release, otherwise they could be left making one assumption too many – and animal performance will suffer. Denmark is a country that fully supports the difficult decisions pig producers have to make on feed additives by providing an independent testing service via its organization ‘Danish Pig Production’. This service evaluates many feed additives to ensure that Danish pig producers get value for money when using various products. Results of these feeding tests are published and include a production value index, giving feed and pig producers a benchmark tool for impartially evaluating feed additives. The results for xylanases tested for use in grower-finisher pig feeds, and published by Danish Pig Production, are summarized in Table 2. This demonstrates that there are differences between xylanases in the value they provide to pig producers.

Table 2: Xylanases tested by Danish Pig Production for use in grower-finisher pig feeds

Year	Trial report	Product	Production Value Index ¹
1998	No. 403 (Pelleted feed)	Porzyme 9300	107
2002	No. 558 (Pelleted feed)	Porzyme 9300	106
2002	No 558 (Mash feed)	Porzyme 9300	109
2008	No. 826 (Pelleted feed)	Bergazym P	100
2009	No. 848 (Pelleted feed)	Ronozyme WX	102

¹Gross margins per pen place per year based on the same feed price and an average 5 year pig price (i.e. excludes xylanase cost). All data expressed relative to the corresponding control diet (100)

Increasing uncertainty is a fact of life for pig producers. Proven enzyme solutions can help pig producers to cope effectively with increased volatility in raw material prices and can be assured of reducing the cost of their feed.

CONTINUED ON PAGE 44

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SAVINGS AT 42.25 WATTS PER CRATE			
With TD-34	82.75	132.75	207.75
Cents per KWH	ANNUAL SAVINGS PER CRATE IN U.S. DOLLARS		
4.5	32.62	52.33	81.90
5	36.24	68.14	90.99
5.5	39.87	63.96	100.09
6	43.49	69.77	109.19
6.5	47.12	75.59	118.29
7	50.74	81.40	127.39
7.5	54.37	87.22	136.49
Cents per KWH	RETURN ON INVESTMENT IN MONTHS/YEARS		
4.5	1.7	1.1	0.7
5	1.5	1.0	0.6
5.5	1.4	0.9	0.6
6	1.3	0.8	0.5
6.5	1.2	0.7	0.4
7	1.1	0.7	0.4
7.5	1.0	0.6	0.4

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Feeding increasing levels of yellow- vs. dark-seeded canola meal to hogs

By Ruwani Seneviratne^{1,3}, Malachy Young², Gregorio Lanz², Neil Campbell², Ruurd Zijlstra³, and Eduardo Beltranena^{1,3}

¹Alberta Agriculture and Rural Development, ²Gowans Feed Consulting,

³The University of Alberta

Take home message

Meal from yellow-seeded (*B. juncea*) canola contains less fibre and likely more energy than meal from conventional dark-seeded canola, so it might be fed at higher feed inclusions. We tested feeding these two solvent-extracted canola meals to hogs in a commercial-scale trial in Alberta. Feeding increasing levels (10, 20, 30%) of either meal from 33 to 120 kg live weight slightly reduced feed disappearance, weight gain, carcass weight, dressing percentage, and loin depth. Increasing the dietary inclusion of canola meal improved feed conversion, with this effect being greater for yellow-seeded compared to the dark-seeded canola meal. Thus, up to 30% meal of either yellow- or dark-seeded canola can be fed in diets that also contain wheat DDGS and field pea as long as it is economically feasible.

Introduction

Canola meal is a good feed source of amino acids, vitamins and minerals for livestock, but it also contains relatively high levels of fibre and phytate – a compound that reduces phosphorus availability. Feed energy is the primary driver of pig growth. Fibre in feedstuffs has a diluting effect on feed energy because fibre is poorly digested by single-stomached (monogastric) animals. Reducing the fibre content of canola meal is therefore a priority for monogastric animal feeding. Yellow-seeded canola (*B. juncea*) has a thinner seed coat, which results in meal with reduced fibre content and slightly higher phosphorus availability compared to meal from

conventional dark-seeded canola. Lower fibre in yellow-seeded canola meal would permit higher inclusion levels in practical diets compared to conventional canola meal. Higher inclusions of low-fibre canola meal in pig diets could improve growth performance and further reduce feed cost.

Conventional, solvent-extracted meal from dark-seeded canola has been fed to livestock in Canada for the past 35 years. Compared to dark-seeded meal, yellow-seeded (*B. juncea*) canola meal has tested higher in protein (42% vs. 38%) and phosphorus content (1.4% vs. 1.0%), but lower in crude fibre content (7.7% vs. 12%). Yellow-seeded canola meal does, however, contain higher levels of

a toxic group of compounds called glucosinolates (>10 vs. <5µmol/g in dark-seeded meal), known to alter thyroid function in animals.

To confirm that yellow-seeded canola meal has a higher dietary energy value compared to conventional dark-seeded canola meal, we tested feeding increasing levels of each meal in grower diets and the effect



on hog growth performance, dressing percentage and carcass characteristics. Both canolas were crushed and the oil solvent-extracted at Bunge (Altona, MB) using similar processing parameters to minimize differences in nutritional quality of the resulting meals.

The feeding trial

The feeding trial was conducted under commercial conditions at the Drumloche test barn in Lougheed, AB. Barrows and gilts (550 of each, initial weight of 33 kg) were housed in 48 single-sex pens, 22 pigs per pen. Pigs were then assigned to one of 6 dietary regimens consisting of yellow- or black-seeded canola meal at dietary inclusion levels of 10, 20 or 30% through to market weight (120 kg). Hogs were slaughtered at Britco Pork Inc. (Langley, BC) and the warm carcasses were graded between the last 3rd and 4th rib, 7 cm off the midline using a Destron probe (Anitech, Canada).

The test diets were formulated to provide the same dietary energy (net energy, NE), lysine (as a ratio to NE) and essential amino acid content (in ratios to lysine) within 5 growth phases. The cost of imported soybean meal was so high at the time of this trial that it was excluded from the formulations in favour of wheat DDGS and field pea. In fact, the energy cost of wheat DDGS was lower than that of wheat grain (6.0 vs. 6.4¢/Mcal NE). Wheat DDGS was therefore included at relatively high levels and increasing inclusions

of canola meal were accommodated by adjusting the inclusions of cereal grains and field pea in the formulations. No supplemental inorganic phosphorus was required in any of the diets due to the high content and availability of phosphorus in DDGS and canola meal and the inclusion of phytase enzyme. The diets fed thus reflected typical western Canadian feedstuff composition and commodity pricing at the time.

The pigs were weighed in pen groups on day 0, 23, 44, 60, 72, 84, 91, 98, 105, and prior to shipping to slaughter to establish average pig weight. Pen weights were then used to calculate daily weight gain, days on trial, and

dressing percentage. Feed additions to the two-opposing feeding places wet/dry feeder (Crystal Spring™) in each pen were tracked electronically throughout the trial using a robotic feeding system (Feedlogic™). Feed remaining at the end of each period was subtracted from the amount of feed added to calculate feed disappearance for each pen. Feed conversion was calculated by dividing pen feed disappearance by weight gain.

Results

Feeding increasing levels of both types of canola meal reduced daily feed disappearance by 81 g/d and weight

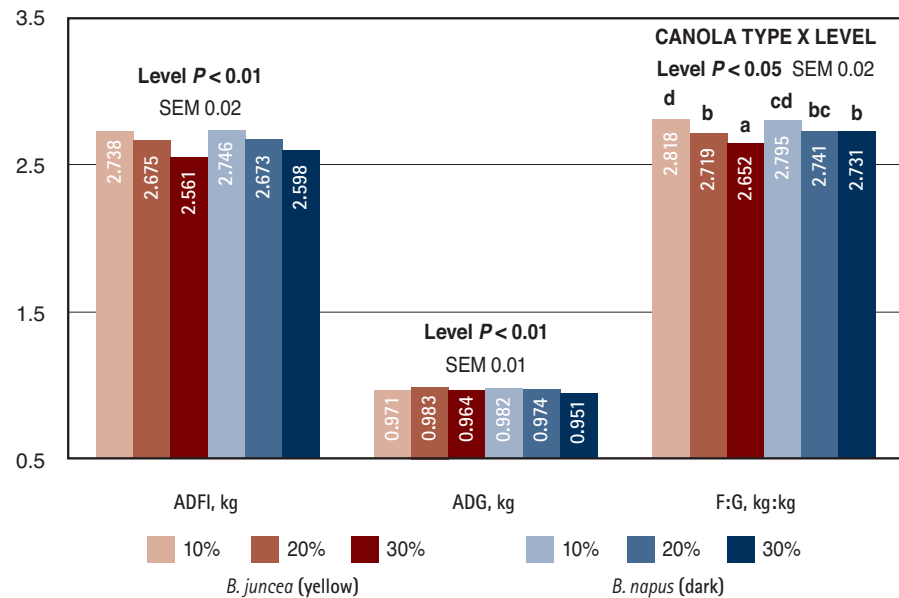


Figure 1: The effect of feeding increasing levels of either yellow- or dark-seeded canola on feed disappearance, weight gain and feed: gain ratio.

CONTINUED ON PAGE 46

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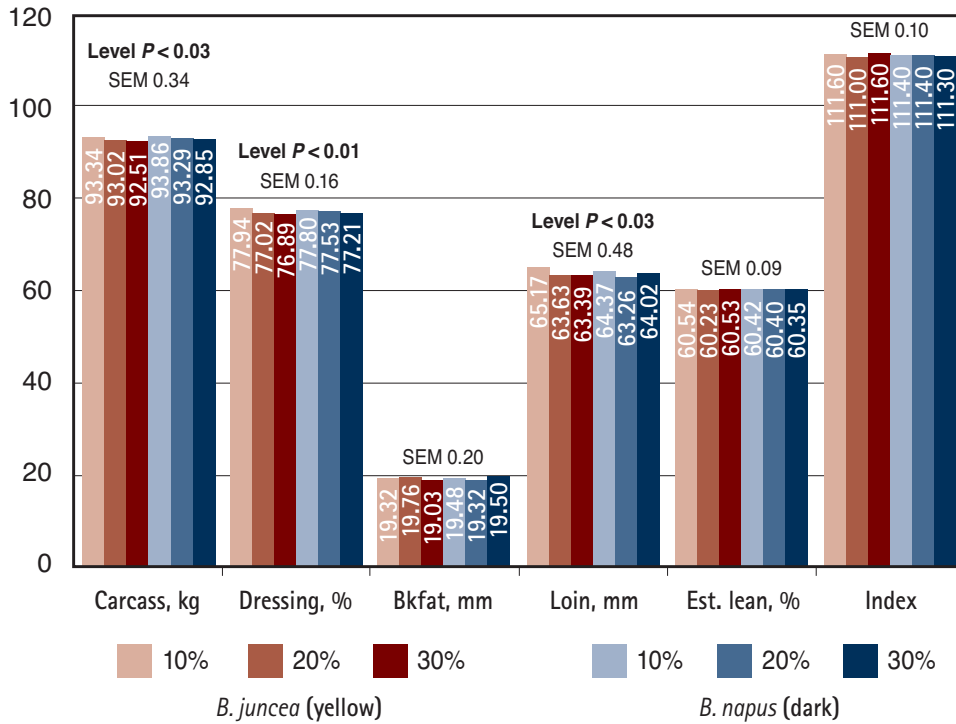


Figure 2: The effect of feeding increasing dietary inclusions of either yellow- or dark-seeded canola meals on carcass weight, dressing percentage, backfat, loin depth and carcass lean content

gain by 9 g/d for each 10% increase in canola meal inclusion (Figure 1). Feeding increasing levels of canola meal, however, reduced the amount of feed required per kg of weight gain. The reduction in feed to gain ratio was more pronounced for hogs fed the yellow-seeded meal compared to the dark-seeded meal (83 g vs. 32 g less feed per kg of gain for each 10% increase in canola meal inclusion).

"Increasing dietary inclusion of both canola meal types increased cost per kg of weight gain"

Final trial body weight was not affected either by canola type or level of dietary inclusion. The number of days on trial, however, increased by 1 day for each 10% increase in canola meal inclusion.

Increasing the dietary inclusion of either canola meal type reduced carcass weight by 0.46 kg, dressing percentage by 0.4 %-points and loin depth by 0.5 mm for each 10% increase in dietary inclusion. Backfat depth, lean yield and carcass index, however, were not affected by either canola meal type or inclusion level (Figure 2).

Increasing dietary inclusion of both canola meal types increased cost per kg of weight gain. This cost increase occurred largely as a result of the lower cost wheat DDGS being displaced in formulations as canola meal inclusion level increased. The increase in cost per kg of weight gain was greater for the dark-seeded compared to the yellow-seeded canola meal (Figure 3).

Expected differences in growth performance and carcass traits were observed between barrows and gilts. There were no interactions among canola meal type, inclusion level, and gender. Barrows consumed 300 g more feed per day, gained 64 g more weight per day and required an additional 136 g of feed per kg of weight gain compared to gilts. Barrows were also 3 kg heavier and took 3 days less to reach market weight compared to gilts. Carcasses from gilts had 0.64%-points higher dressing percentage, 2 mm less backfat, 2 mm greater loin depth, 1 %-point higher lean yield and indexed 2 points higher than carcasses from barrows. Although the cost per kg of weight gain was 3¢/kg higher for barrows than gilts, barrows earned 38¢/head more than gilts, once feed cost was deducted from gross revenue per hog.

In summary, feeding increasing dietary inclusions of either yellow- or dark-seeded canola meals slightly reduced feed

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disappearance, weight gain, carcass weight, dressing percentage and loin depth. Increasing dietary inclusion of canola meal improved feed conversion, with this effect being greater for yellow-seeded compared to dark-seeded canola meal.

Conclusions

Feeding up to 30% of either yellow- or dark-seeded canola meal is feasible in commercial diets with high inclusions of wheat DDGS, provided that the diets are formulated on a net energy and available amino acid basis. Formulating on the basis of net energy accounts for higher heat production and therefore lower efficiency of energy use that result from feeding high-protein, high-fibre feedstuffs such as canola meal and wheat DDGS. Minimizing feed cost was not the main goal of this experiment. Instead, we sought to push the limits in terms of feeding high inclusions of both canola meals. Hog performance and carcass traits were adequate proving evidence that canola meal and wheat DDGS together can make up 50% of hog diets. The slight reduction in dressing percentage observed is consistent with feeding high fibre diets that result in greater gut fill and a heavier, thicker gut. When feeding high fibre diets to hogs, producers should therefore increase target market weight by about 2 kg to achieve the desired carcass weight once the heavier gut is removed. Canola is Canada's leading crop in farm cash receipts, earning \$5.6 billion in

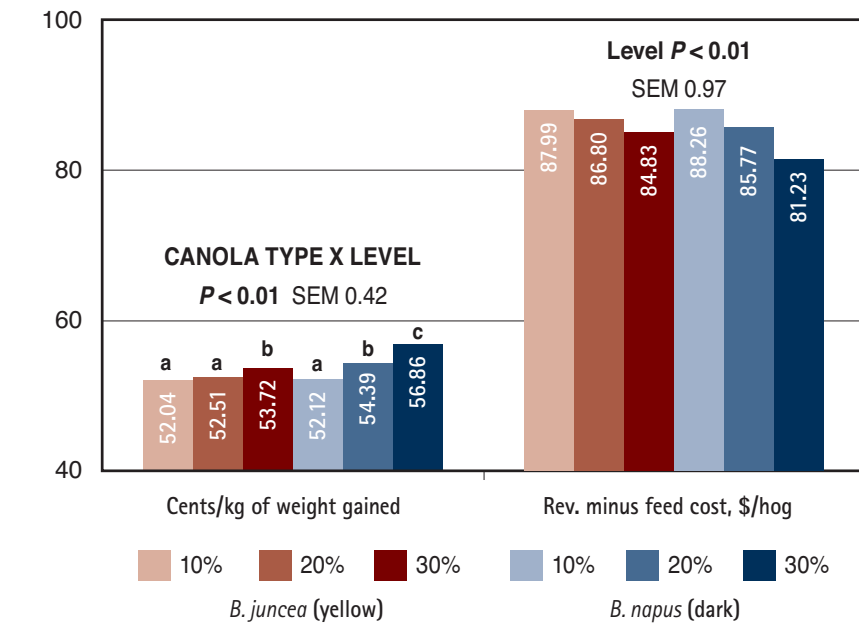


Figure 3: The effect of feeding increasing levels of yellow- or dark-seeded canola meal on cost per kilo of weight gained and margin over feed cost

2010. Conventional black-seeded canola is mainly grown in the fertile Black and Grey soils of the cool northern Prairies. Yellow-seeded canola (*B. juncea*), however, is more heat and drought tolerant, which makes it more suitable for production in the warmer, dryer, Brown and Dark Brown soil zones of the southern Prairies. Increasing canola acreage in these regions would further increase farm cash receipts, as well as the availability of canola oil for both human food and biodiesel applications. A parallel benefit would be an increase in the local supply of lower-fibre, yellow-seeded canola meal, which would help to reduce feed cost for pork

producers. Feeding Prairie grown feedstuffs, their fractions and co-products to livestock enhances our global feed competitiveness, provides flexibility in feed formulation, and reduces our dependency on imported feedstuffs like soybean meal.

Acknowledgements

We would like to acknowledge funding for this research from the Canola/Flax Canadian Agri-Science Cluster Initiative, a partnership between Agriculture and Agri-Food Canada and the Canola Council of Canada.

CONTINUED ON PAGE 48

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Is potato starch an alternative to antibiotics in weaned pig diets?

By Elba Lorenzen, University of Manitoba

Historically, hog producers have used antibiotics in weaned piglet feed to prevent diarrhoea and increase growth performance. However, the pressure to remove in-feed antibiotics from swine diets is increasing because of growing fears and evidence of a link between their use and antibiotic resistance in human medicine. What would be our next option if antibiotics were banned in Canada? Could adding potato starch be an alternative to in-feed antibiotics?



At weaning, a combination of factors such as changes in nutrition, housing conditions and numbers of animals in a group make this period immensely physiologically and psychologically stressful to newly weaned pigs. During this time, piglets must adapt to new nutrients that are offered in solid feed instead of the sow's milk. They are also separated from their sow, moved from the farrowing pen and mixed with unfamiliar pigs. Consequently, they have reduced feed intake, which also reduces intestinal development, particularly of the finger-like projections called villi that are important for nutrient absorption. Consequently this leads to reduced enzyme secretion and absorption of nutrients. These changes can predispose the pigs to postweaning diarrhea (PWD), a disease that is associated with proliferation of *Escherichia coli* (E. coli) in the intestinal tract of affected pigs.

CONTINUED ON PAGE 50



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Although mortality rates are rarely high in uncomplicated cases the subsequent growth check as a result of PWD can have a significant impact on how well affected pigs will do in the nursery.

"In the European Union the use of antibiotics as growth promoters in pig diets was banned in 2006"

Recently, an increase in incidence of outbreaks of severe *E. coli*-associated diarrhoea has been observed worldwide with most such outbreaks occurring in early-weaned piglets¹. The gut of the pig is inhabited by numerous bacteria of different species. These bacteria need nutrients for their growth and normally get them from the food consumed by the piglet. Antibiotics increase the growth performance of pigs because they inhibit the growth of bacteria and therefore decrease the competition for nutrients between the bacteria and the

piglet. Antibiotic use is effective in the prevention of diarrhoea and promotion of growth, but it may be time to consider other options.

Alternatives to antibiotics

In the European Union the use of antibiotics as growth promoters in pig diets was banned in 2006. Other methods that sustain animal health and performance such as probiotics, prebiotics, organic acids and zinc oxide are effective alternatives to antibiotics. Although research studies have shown the merits of using these alternatives to antibiotics, the focus of this article will be on the use of resistance starch from potato starch as a prebiotic. A prebiotic is a non-digestible food ingredient that alters the composition or metabolism of the gut microflora in a beneficial manner. Prebiotics benefit the host in a manner similar to probiotics. In contrast, probiotics are microorganisms

that are directly linked to modulation of either host or bacterial factors in the gastrointestinal tract. When administered in adequate amounts, probiotics confer a health benefit on the host through various mechanisms in the gastrointestinal tract that include; stimulating the growth of beneficial bacteria, preventing enteric pathogens from colonization, increasing digestive capacity and lowering the pH as well as improving mucosal immunity². For newly weaned piglets, the dietary supplementation with fermentable carbohydrates is one way to manipulate the composition of gut microorganisms in both the small and large intestine. Previous studies in which sugar beet pulp, inulin, lactulose and wheat starch were added to the diet to stimulate the fermentation along the entire gut, altered the species composition of bacterial in the gut of newly-weaned piglets³. Prebiotics are generally cheaper, lower risk, and easier to handle and to incorporate into diets than probiotics.

So what about potatoes?

Table 1: Constituents of the four diets

Diet	Antibiotic	Raw potato starch (% inclusion in diet)
PC	+	0
NC	-	0
7% RPS	-	7
14% RPS	-	14

A recent study done at the University of Manitoba evaluated the effect of incorporating resistant starch granules from raw potato starch (RPS) on growth performance and postweaning diarrhoea in piglets. In the study, two diets containing different levels of RPS were compared with a diet containing an antibiotic (positive control, PC) or a negative control diet that contained



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Figure 1: *Escherichia coli* bacterial counts from large intestine of early weaned pigs fed different diets. (Bacterial counts were log transformed)

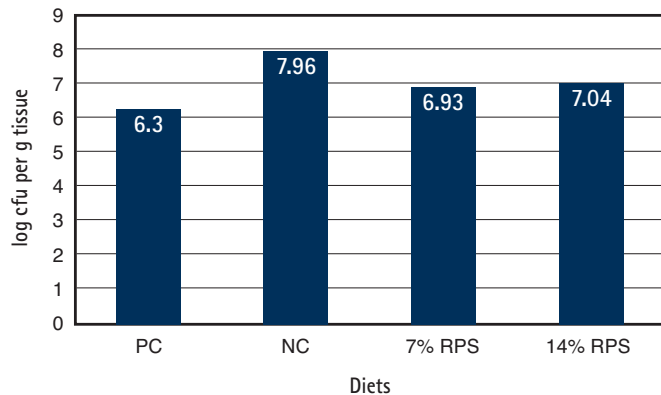
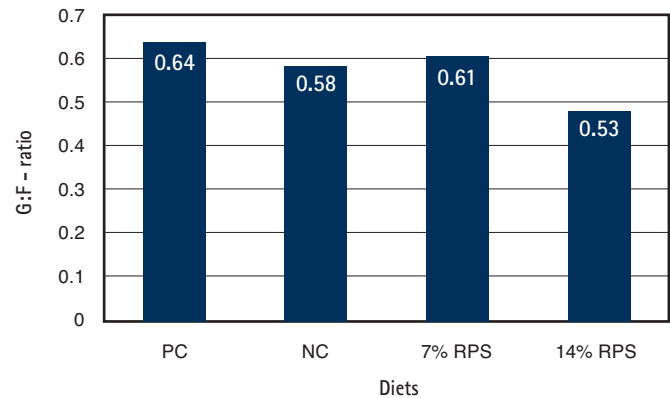


Figure 2: Gain to feed (G:F) ratio (g/g) from day 0 to 21 in early weaned pigs fed different diets



neither RPS nor antibiotics (Table 1). The findings from this study are published in the Journal of Animal Science (volume 87 pages 984 – 993). Some of the findings showed that adding RPS altered the composition of the microorganisms in the gut. For example, the results show that the antibiotic containing diet (PC) and the diet containing 7% raw potato starch (7% RPS) had the lowest *E.coli* counts (Figure 1). Since *E.coli* is the main inducer of postweaning diarrhoea, the 7%

RPS treatment could be a comparable alternative to feeding antibiotics in the diet. As expected, results from the negative control had the highest *E.coli* counts in the intestine.

It is important to to minimize the growth check that results from weaning-associated stress or diseases such as PWD. Additionally pigs must adapt to the new diet in order to reduce the extent of the slowdown in growth associated with

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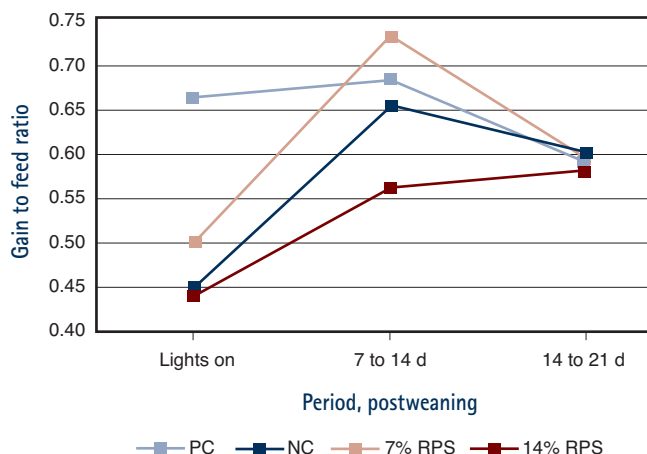
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Figure 3: Gain to feed (G:F) ratio (g/g) calculated over 3 weeks after weaning in early weaned pigs fed different diets



this stage. In the same study at the University of Manitoba pigs fed the RPS diets and the NC diets all had lower average daily gains than the PC diet. Average daily gain was 236, 237, 251 and 289 g for the 7% RPS, 14% RPS, NC and PC diets respectively, which showed that antibiotic treatment had an advantage in getting the piglets started on this phase of their growth. However, the gain to feed ratio (G:F ratio) from day 0 to 21 postweaning was measured (Figure 2) and showed that even though RPS resulted in slower growth, the feed to gain

ratio for the 7% RPS was not different from that of animals on the PC (antibiotic treatment). This implies that the cost producers would pay for not using antibiotics could be slower growth shortly after weaning. Figure 3 shows the G:F ratios for the diets during three 1-week intervals after weaning. Although the G:F ratios were different at weaning, by 3 weeks post weaning G:F ratios were similar which suggests that these effects may be transient and that performance would not suffer in the long term. This study also found that higher levels of resistant starch granules from potato (14% RPS) resulted in scours possibly as a result of a decline in diversity of microbial species in the gut and thus use of levels higher than 7% may not result in performance similar to that reported with the 7% RPS diet.

Therefore the 7% RPS diet can be used as an alternative to antibiotics to prevent post-weaning diarrhoea and based on the G:F ratio, a 7% RPS diet also has a performance comparable with that of an antibiotic diet. Although the growth rate of pigs on RPS diets may be lower, the feed-associated cost may not be higher in these diets assuming that substituting RPS for antibiotics does not increase the cost of the diet.

Conclusions

There are various alternatives to antibiotics, such as probiotics, prebiotics, organic acids and zinc oxide, which can be used to prevent diarrhoea and promote growth in weaned piglets. A combination of these various alternatives may provide an effective alternative to antibiotics.

Incorporation of raw potato starch in the piglet diet can be used as a strategy to effectively reduce diarrhoea and increase feed conversion efficiency. As a swine producer, this is one option to consider, either if in-feed antibiotic use is eventually prohibited or a decision is made to reduce antibiotic use in a swine operation.

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Author's note: All research data presented is based on the author's interpretation of the scientific publication by Bhandari, S.K., C.M. Nyachoti and D.O. Krause 2008. *Journal of Animal Science* volume 87: 984-993. This article is a result of information collected as part of a course (ANSC 3510 Feeds and Feeding) and encouragement and guidance by the courses instructor (Dr G.N. Gozho) is acknowledged.

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Alberta Hog Price Insurance Program close to launch

By Ron Gietz, *Alberta Agriculture and Rural Development* and Emmet Hanrahan, *AFSC*

A year ago the Western Hog Journal reported on hog price insurance for Alberta producers, primarily as an interesting concept which had merit for producers' risk management. That article was based on an initial feasibility study conducted by Gibson Capital and presented in March 2010. The industry, led by Alberta Pork, quickly identified the Hog Price Insurance Program (HPIP) as a priority to develop and implement. The Alberta Ministry of Agriculture and Alberta Pork agreed that the Agriculture Financial Services Corporation (AFSC) was the natural fit to develop and deliver HPIP, given that organization's recent experience in establishing similar insurance programs for Alberta's cattle industry.

AFSC has a targeted delivery date of "spring" 2011. Although the industry would have preferred a more rapid delivery, this is a large and complex project requiring funding, design, development, industry consultation and cabinet level approvals, to name a few hurdles. It might be compared to livestock production itself, with breeding, gestation and feeding all taking time, money, and organization before an end product is seen many months later. Early in the process, funding was secured from the Alberta Livestock and Meat Agency (ALMA) to move the project ahead, and a steering committee including representatives of Alberta Pork, AFSC, Western Hog Exchange and Alberta Agriculture and Rural Development was struck to provide guidance and input to the process.

"Participation will be completely voluntary and the program is designed to be self-sustaining"

Now with "spring" officially here (although hardly evident in the landscape outside as of late March) most of the heavy lifting is behind us and we can look forward to AFSC's pending announcement of a delivery date! As the launch nears, AFSC will be getting the message out to Alberta producers about the new program and encouraging them to set up an HPIP account. Participation will be completely voluntary and the program is designed to be self-sustaining, with AFSC covering the administrative costs once HPIP is up and running.

The following are some of the highlights of HPIP:

Who:

- For all Alberta swine production, regardless of operation type.

What:

- Bought in minimum units of 100 kg dressed (about 1 market hog).
- Coverage offered from 2 to 10 months out in time.

CONTINUED ON PAGE 54

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- Coverage and premiums will change daily to reflect current market conditions and be offered Tuesday, Wednesday, and Thursday afternoons.
- The producer is insuring a specific Alberta price level, based on a formula intended to duplicate the WHE index 100 calculation.
- Settlement is automatic based on the average monthly price compared to the insured price. If the settlement price is less than the insured price for the month of insurance purchased, the insurance program pays the difference.
- Premiums are not subsidized.

Where:

- A one-time sign up application through AFSC District Offices.
- Insurance can be purchased online, via fax or through a District Office.

Why:

- HPIP is a risk management tool tailored specifically to the Alberta market in Canadian currency.
- It protects the downside price risk while leaving the upside open.
- There are likely to be considerable savings compared to using similar options strategies on the CME.
- It is much easier for the producer to use and designed with flexibility in mind.
- It can be combined with other risk management strategies such as forward contracting and feed grain hedging.

Example

The program is designed to be simple to use. An example of a premium and payout calculation illustrates how easy it is.

A producer is marketing 400 hogs weekly and wants to purchase a policy expiring in August.

Insured

$$\begin{aligned} \text{Weight} &= (\# \text{ of head} \times \text{expected sale weight}) / 100 \\ &= (400 \text{ hogs} \times 95 \text{ kg}) / 100 \\ &= (38,000 \text{ kgs}) / 100 \\ &= 380 \text{ ckg} \text{ (ckg} = 100 \text{ kg)} \end{aligned}$$

The premium table on March 9 has a policy expiring in August with an insured price of \$140.

The premium is \$3.01 per ckg.

$$\begin{aligned} \text{Premium cost} &= 380 \text{ ckg} \times \$3.01 \\ &= \$1143.80 \end{aligned}$$

The settlement price published for the month of August is \$125.26.

The settlement price is below the insured price purchased resulting in an indemnity owed to the producer.

$$\begin{aligned} \text{Indemnity owed} &= 380 \text{ ckg} \times (\$140 - \$125.26) \\ &= \$5601.20 \end{aligned}$$

CONTINUED ON PAGE 56

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Don McDermid, DVM

From the Vet

Reproductive vaccines deliver important, inexpensive health insurance

An estimated 80% of Canadian sow and gilt herds regularly receive vaccination against parvovirus, leptospirosis and erysipelas (PLE). A reproductive vaccine covering all three health challenges is a convenient way to protect your breeding herd against these diseases which may have negative effects on the unborn litter and/or the sow herself. The economic impact of any one of these three conditions in a sow herd can be very significant. Let's take a look at each of these diseases.

Parvovirus is a viral disease and the most common cause of stillbirths, mummification, embryonic death and infertility, but the virus does not cause abortions. The virus is widespread in most sow herds. Gilts are the major concern with parvovirus because maternally derived antibodies in gilts may persist for months – preventing natural infection and subsequent immunity from developing before being bred, and putting the developing litter at risk. While older sows have probably been exposed, and are likely immune for life, some larger sow populations may not have uniform parvovirus exposure and parvovirus may be seen in older sows in these situations.

Leptospirosis is a bacterial disease causing abortions and reproductive failure in sows and gilts. While outbreaks are rare since hog operations have moved indoors – eliminating the spread through urine of infected wildlife – protection is really pennies per pig and well worth the investment.

Erysipelas is a bacterial disease affecting pigs of all ages. The bacteria is a common contaminant of the swine environment. This organism can quickly become septicemic – spreading through the bloodstream – and result in high fevers and in the case of pregnant sows, abortions. Sows are more susceptible during the stress of farrowing, which can have a significant negative impact on their wellbeing and on their litters.

Talk to your veterinarian about the best timing for a PLE vaccination protocol in your herd. PLE vaccines such as FarrowSure® Gold B are given to gilts prior to breeding and to sows prior to each farrowing (e.g. mid-gestation 50-80 days) or at weaning time. Vaccination during lactation is generally not recommended as it can cause the sow to go off her feed and reduce milk output. It is important to remember that gilts need two doses of a PLE vaccine prior to breeding to establish an adequate baseline of immunity.

When influenza protection is part of your recommended vaccination program, FluSure® XP/FarrowSure Gold B can be used to deliver maternally derived flu antibodies to piglets.

Best practice PLE vaccination tips

- Store vaccines in the refrigerator at 2° to 7° C, and do not freeze!
- Bring vaccines to room temperature before use.
- Follow CQA® recommendations for hip or neck injections and record keeping.
- Use the bottle size that matches the number of doses required.
- Properly dispose of any unused vaccines.
- Follow the label regarding pre-slaughter withdrawals.



Dietary co-products may enhance pork omega-3 fatty acid and reduce feed costs without affecting carcass quality and growth

By R. Jha, J.K. Htoo, M.G. Young, E. Beltranena, and R.T. Zijlstra

Take home message

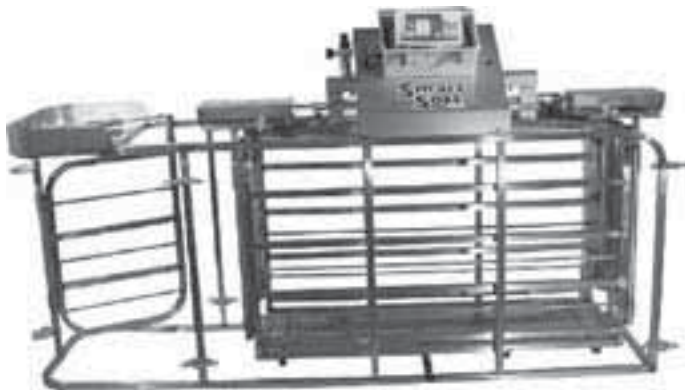
Interest is growing to include co-products in pig diets to reduce dependence on feed grains, to reduce feed cost, and to produce specialty pork products such as omega-3 enriched pork. Co-extrusion of flax seed and field pea and increased availability of co-products such as canola meal, wheat/corn dried distillers grains plus solubles (DDGS) are opportunities in western Canada for use in feed formulations. A commercial scale study with grower-finisher pigs was conducted to evaluate the effect of co-products (Linpro, co-extruded flax and field pea; canola meal, DDGS) inclusion on growth performance and carcass quality and feed costs of grower finisher pigs fed experimental diets from 30 kg to slaughter weight. The results of the study revealed that co-products can be included at up to 50% in diets balanced for net energy (NE) and standardized ileal digestible (SID) amino acids without compromising growth performance and carcass quality. The study also indicated that inclusion of these co-products may enhance pork omega-3 fatty acid content of pork and reduce feed costs.

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Co-products in pig diets

Producers and nutritionists are continuously looking for alternatives to expensive energy and protein sources to combat high feed costs and meet the demand from some consumers for specialty meat products such as Omega-3 enriched pork (due to human health benefits). Production of flax seed and field pea in western Canada has expanded considerably over the past decade. Incorporation of flax seed into pig diets increases the content of omega-3 fatty acids in pork. Thus, flaxseed and its co-products could be of interest to the pork industry to reduce feed costs and potentially enrich pork with omega-3 fatty acids. Availability of other co-products such as canola meal and DDGS, that can potentially be included in pig diets to reduce feed cost, has also increased.

Nutritional profile of Linpro

This study used the commercial product Linpro, which is co-extruded flaxseed and field pea and effectively deals with limitations of grinding and storage of full-fat flaxseed. Linpro contains 21.4% crude protein, 19.2% ether extract and 8.35% acid detergent fibre. Fifty percent of the fatty acids are omega-3 fatty acids. Linpro also contains energy and amino acids, and is thus an alternative ingredient for incorporation in pig diets. Depending on price, Linpro may reduce feed costs.



Flaxseed and its co-products can reduce feed costs and enrich pork with omega-3 fatty acids

The pig trial

The effects of increasing (from 2.0 to 12.5, 25.0, 37.5 and 50.0%) levels of co-products (Linpro, co-extruded flax seed and field pea; canola meal, wheat/corn dried distillers grains plus solubles) on growth performance, carcass quality, and feed cost indices were evaluated in grower-finisher pigs. A treatment with 37.5% co-products + 10% SID amino acids (AA) was introduced to alleviate potential reduction in feed intake. The co-products replaced barley, wheat and soybean meal in the diet.

The growth performance study was conducted at Drumloche Research Farm at Lougheed, Alberta. In total, 1008 pigs (29.5 kg body weight, Duroc sire x Large White / Landrace) were fed one of six isocaloric and iso-lysine diets in 4 phases (2.40, 2.35, 2.30, and 2.30 Mcal NE/kg and 3.96, 3.62, 3.22, and 2.83 g SID lysine/Mcal NE for days 0 to 19, days 20 to 38, days 39 to 60, and days 61 to 97, respectively) with 21 pigs/pens and 8 pen replicates per regimen.

Pigs were weighed at the start and end of each feeding phase. Feed disappearance was measured to calculate growth performance variables: average daily feed intake (ADFI), average daily gain (ADG) and feed conversion. After

Figure 1: Effects of co-products level on average feed intake and daily gain of grower-finisher pig

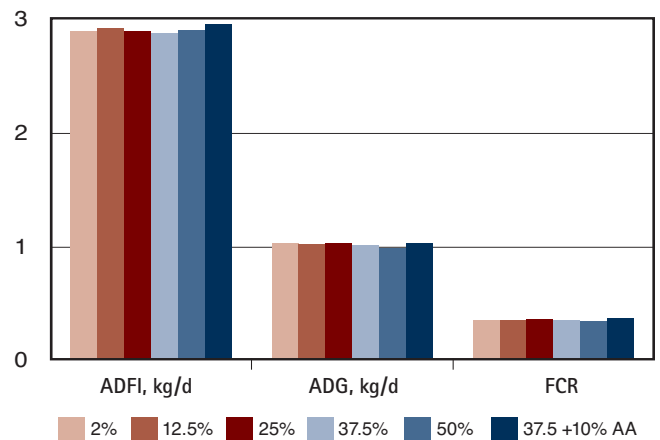
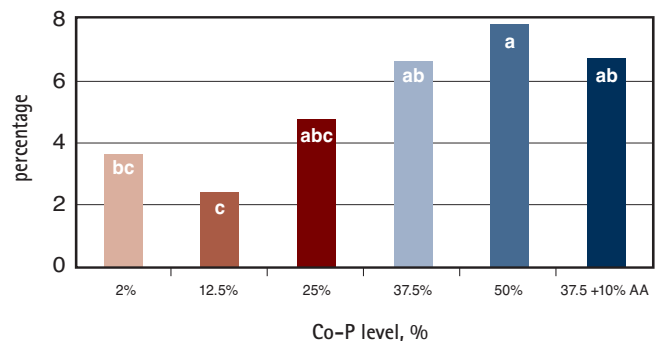


Figure 2: Effect of co-products level on omega-3 fatty acid profile




slaughter at constant body weight (118 kg), warm carcasses were characterized for all pigs; and jowl fat samples (collected from 2 pigs per pen) were analysed for fatty acid profile.

Results of pig trial


Our study shows that increasing co-products did not affect ADFI (2.90 kg), ADG (1.01 kg) and feed conversion (2.88) of pigs during the entire study period (Figure 1). However, some minor differences were observed in the early stage (day 0

CONTINUED ON PAGE 58




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Table 1: Effect of co-products level on carcass characteristics

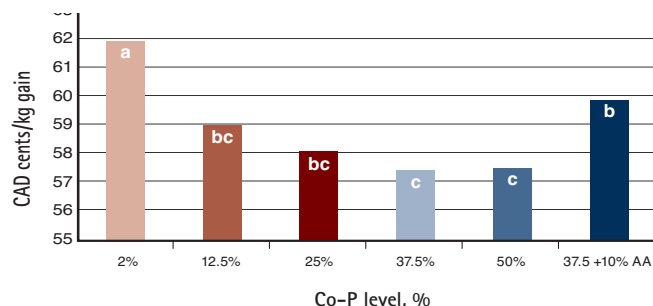
Variable	Co-product level, %						SEM	P-value
	2	12.5	25	37.5	50	37.5 + 10% AA		
Day off test to slaughter	33.8a	33.2a	34.4a	36.8bc	38.2c	35.1ab	1.47	<0.01
Carcass weight, kg	99.8	100.1	100	98.7	100	98.8	0.69	0.34
Dressing, %	78.6a	78.4ab	78.0bc	77.7c	77.0d	77.2d	0.36	<0.01
Backfat, mm	20.9ab	21.3a	20.7ab	20.5b	20.4b	19.8c	0.38	<0.01
Loin depth, mm	65.2a	64.4abc	64.9ac	64.0b	63.5b	64.1bc	0.66	0.02
Estimated lean, %	59.8ab	59.7a	59.9b	60.0b	59.9b	60.2c	0.15	<0.01

to 56); feeding 50% co-products, but not up to 37.5% co-products, did reduce ADG and ADFI, however, feed conversion was not affected.

"Increasing dietary co-products levels decreased dressing percentage and loin depth"

Increasing dietary co-products levels decreased dressing percentage and loin depth, but carcass weight was not affected (Table 1). Increasing co-products from 2 to 50% increased omega-3 fatty acid content by 116% (Figure 2). Adding 10% extra SID AA to 37.5% co-products did not affect growth performance, increased carcass lean, but decreased backfat compared to 37.5% co-products diet, indicating that dietary AA supply did not limit body weight gain.

Figure 3: Effect of co-product level on feed costs



Economics of co-product inclusion

Increasing co-products linearly decreased diet cost, both per tonne of diet and per kg BW gain (Figure 3). Increasing co-products from 2 to 50% decreased feed cost per unit BW gain by 7% and per tonne of diet by 6%. However, the cost of co-products + added AA diets/kg BW gain increased by 4% compared to the 50% co-products diet. Income over feed costs (IOFC) increased 7% by increasing co-product inclusion from 2 to 37.5%, but was only 4% with a 50% inclusion rate.

Conclusions

This study explored the potential of incorporating co-products as an alternative protein source, and its inclusion level in pig diets to reduce the feed cost and produce omega-3 enriched pork. Co-products can be included up to 50% in grower-finisher pig diets balanced for NE and SID AA to enhance pork omega-3 fatty acid content and reduce feed costs without affecting growth performance. However, carcass characteristics must be closely followed to ensure that targets for the packer are met.

Acknowledgments

The Alberta Livestock and Meat Agency, Evonik Degussa GmbH (Hanau, Germany) and Oleet Processing Ltd. (Regina) are acknowledged for funding the project. ■

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Swine health bulletins address potential health threats

The Canadian Swine Health Board (CSHB) is introducing a series of swine health awareness bulletins aimed at keeping the industry informed of emerging or potential health threats.

The first of the series deals with vesicular diseases. Several vesicular disease viruses in hogs cause visually indistinguishable symptoms. The vesicles and blisters caused by these viruses could be a sign of Foot-and-Mouth Disease, a cause for great concern to all stakeholders in the swine and pork value chain in Canada, says CSHB.

“Symptoms include fever, loss of appetite and lameness, which may range from being as mild as an uncomfortable appearance to refusing to move on hard surfaces,” explains the bulletin.

“Fluid-filled blisters on the snout, feet, mouth and teats or ruptured blisters, leaving lesions that continue to erode healthy tissue, are key signs of vesicular disease.” Animals may exhibit loose foot pads or even loss of hooves, it adds.

If a vesicular disease is suspected, no animal should be transported off the farm until the disease has been ruled out by a veterinarian. Also, notes CSHB, these diseases are reportable under the *Health of Animals Act*. “These symptoms must be immediately reported to the Canadian Food Inspection Agency (CFIA) and the farm’s veterinarian can help with the notification,” it says. “Contaminated vehicles or equipment should not be moved to another farm until the disease has been ruled out.”

“It only takes one suspicious incident to shut down a plant or possibly even the border”

Vesicular diseases are not present in Canada but could be introduced through infected animals, meat or contaminated visitors. To prevent entry livestock, semen or embryos should not be sourced from outside the country without CFIA approval. “It is important to prevent illegal entry of meat into Canada and not feed food scraps to livestock,” says CSHB. “Also, producers should

only allow essential visitor access to livestock.” It notes that international travellers should take special biosecurity precautions and avoid contact with Canadian livestock for a period of time.

“Keeping the industry informed of emerging or potential health threats, how to minimize their risk and how to respond to suspicious observations is critical to the health and viability of our industry,” says Florian Possberg, Chair of the Canadian Swine Health Board. “It only takes one suspicious

incident to shut down a plant or possibly even the border.”

The one-page bulletins are being distributed to all pork producers, swine vets and other relevant industry stakeholders. A copy is also available on the CSHB website (www.swinehealth.ca).

For more information, contact Robert Harding, Executive Director CHSB, on 613-230-4445, Ext. 267 or email harding@swinehealth.ca

CONTINUED ON PAGE 60



Pigs don't always tell you the truth about ileitis—and it could cost you big.

This pig may look healthy, but it's lying. It has ileitis. No obvious signs, no subtle hints. In fact, 94% of herds in a recent study¹ had pigs with ileitis and no clinical signs. Do yours? Truth be told, the only way you'll probably find out is at market, when ileitis losses hurt the most. Subclinical ileitis reduces average daily gain by as much as 38% and worsens feed efficiency by up to 27%²—costing you \$2.83³ per head. Use Elanco Tylan, and make honest pigs out of the liars.

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¹ Armbruster, G. et al. Review of *Lawsonia intracellularis* seroprevalence screening in the United States, June 2003 to July 2006. *Proc. AASV*, 2007.

² Paradis, M. et al. Subclinical ileitis produced by sequential dilutions of *Lawsonia intracellularis* in a mucosal homogenate challenge model. *Proc. AASV*, 2005.

³ Data based on ADG and F:G differences over 21 days from treatment A, B, and F; base price of market hog of \$130/100 kg, carcass yield of 79.9%, index of 108, and nursery feed cost of \$250/tonne.

⁴ Guedes, R. Update on epidemiology and diagnosis of porcine proliferative enteropathy. *J. Swine Health Prod.* 12(3), 2004.

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PRRS free herd certification pilot program for western Canada

The Porcine Reproductive and Respiratory Syndrome (PRRS) virus is very widespread around the world and can be very costly to affected herds. In western Canada, because of our separation distance between farms and stringent biosecurity protocols, many farms have never had PRRS or have eliminated it from their herd. To limit the production costs associated with infected pigs and avoid the problem of re-infection with a different strain of the virus, the demand for PRRS negative semen, breeding stock and feeder pigs is growing.

While there is a demand for PRRS free pigs, up to now there have been no readily available standards to define what PRRS free status is. Certification is useful to purchasers of live animals and semen to prevent their herds from becoming infected. The certification should allow PRRS free animals to move freely through regions where PRRS eradication programs are in place.

"Up to now there have been no readily available standards to define what PRRS free status is"

The Canadian Swine Health Board agreed to fund this pilot project as a part of its Long Term Disease Risk Management pillar. The goal is to develop and implement a protocol and to test the concept of disease freedom certification. This project is being piloted in western Canada on about 100 premises. All farms are eligible to participate if they are presumed to be free of PRRS and do not vaccinate for it. The project will be of special interest to farms selling semen, breeding stock or feeder pigs. The certification is premise specific, so if a farm has multiple premises, some premises may be part of the project while others are not. It is hoped that certified farms will find enhanced value for their animals at time of sale.

The protocol was developed over the last few months by a group of experts representing field veterinarians, researchers, epidemiologists and diagnosticians. It has been circulated for review to international PRRS control experts and is generating widespread interest.

Participating farms are required to do a series of initial tests under the supervision of their herd health veterinarian to become certified. They will then need to do additional routine surveillance testing to maintain their status. Each test generates a "point". The points will lose value or "decay" over time, depending on the downstream risk to the purchasing herd. The rate of decay is variable by the type of herd; boar stud points decay more rapidly, commercial herd points the slowest. A premise will achieve certification when it reaches 60 points and maintains points to be over that threshold over time.

Boar studs will need to conduct PCR tests weekly, breeding herds will need ELISA tests at least every six weeks and commercial (feeder or slaughter) herds every 12 weeks. Past tests may be eligible for use in the project. The test results are submitted by the veterinarian to a database operated by the project, under the control of the western pork producer organizations. Individual farm data will only be accessed by the veterinarian, the farm and the project administration.

To assist those farms participating in the project, a portion of the costs of testing will be covered. The project will run until December 31, 2012. It may continue dependent on industry needs.

To find out more or enroll in the project, contact Harvey Wagner at Sask Pork, Murray Roeske at Alberta Pork or Miles Beaudin at the Manitoba Pork Council. For more information on the Canadian Swine Health Board, go to www.swinehealth.ca. ■

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International Round-up

British welfare body recommends reduction in mutilations

Britain's Farm Animal Welfare Council (FAWC), which advises the government on welfare issues, has recommended that the pork industry work toward the goal of a reduction in use - and the eventual abolition - of mutilations such as teeth clipping and tail docking. And, while British producers do not practice castration, it recommends it is banned. "Retailers should require imported produce to come from pigs that have not been castrated, with increased emphasis on prevention and detection of boar taint," says the report.

The report is likely to be seen by British pig farmers as measured and balanced, says Britain's Pig World magazine. "Whilst calling for pig farmers to do their best to reduce surgical interventions, it recognizes the difficulties involved and the extra cost of raising pigs in extensive straw-based systems," it comments.

"EU and UK law prohibits the routine use of teeth clipping and tail docking, except under veterinary advice"

The FAWC report majors on rewarding pig farmers for introducing higher welfare husbandry that might otherwise be unsustainable. It acknowledges the welfare dilemmas facing pig farmers, and majors on incentives to persuade them to seek ways of avoiding interventions such as tail-docking and teeth-clipping. "Where interventions are necessary, then every effort should be made to refine procedures to minimize pain and distress, for example by provision of pain relief," says Professor Christopher Wathes, FAWC chairman.

In its opinion on mutilations and environmental enrichment in pigs, the council says it is pleased very few pigs in the United Kingdom are now castrated and encourages farmers in other countries to copy British pig

farmers' example. However, although EU and UK law prohibits the routine use of teeth clipping and tail docking, except under veterinary advice, a high proportion of producers practice both. The report suggest that a Tail Docking Action Group should be set up by the British pig industry and Government, to put existing initiatives on a formal basis, and to devise and implement a strategy to reduce the need for tail docking while preventing tail biting.

Eliminating the weaning to mating interval

Australian researcher Dr. Jeff Downing has been investigating the possibility of eliminating the weaning to mating interval by inducing oestrus during the suckling period and breeding sows prior to weaning. While the concept is not new, the inconsistency of results from

CONTINUED ON PAGE 62

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Table 1: Performance comparison of sows induced to ovulate and mated during lactation and conventionally weaned sows

Measurement	Induced	Weaned
Mating performance		
Sows mated within 7 days	20	20
Induction to mating interval (days)	4.4 ± 0.1	4.2 ± 0.1
Sows confirmed pregnant after 40 days	19	16
Farrowing performance		
Sows farrowed	16	14
Piglets born alive per sow	11.9 ± 0.7	10.6 ± 0.7

previous research in various parts of the world has meant that the principles have not been developed into commercial production systems. Now Dr. Downing believes his recent research points the way towards achieving fewer non-productive days and more pigs weaned per sow per year.

A study carried out in 2007 had shown that oestrus could be induced during lactation, using an injection of PG 600 (Intervet) at 19 to 24 days after parturition, combined with boar exposure and piglet separation for 16 hours each day until mating. Dr Downing and his colleague Roger Giles recently tested the concept under commercial conditions.

The study was conducted with 46 parity 2+ sows in conventional farrowing crates and housed in the same room. "At 20 days after farrowing the sows were treated with an injection of PG 600, combined with boar exposure and piglet separation from 16:00hr to 08:00hr each day until mating by AI," explains Downing. "Alternatively, sows were weaned conventionally into dry sow stalls and given boar exposure each day until mating by AI." Piglet separation on induced sows ceased after AI and the piglets remained on the sow until weaning at 35 days after farrowing.

The results of the study showed that the technique was repeatable under commercial conditions. "Induction of oestrus at 24 to 25 days after farrowing and postponing weaning age to 35 days had no effect on subsequent mating and farrowing performance," Downing reports. "Of 23 sows allocated to each treatment, 87 per cent of sows were mated within a mean of 4.3 days, resulting in a subsequent farrowing rate of 65 per cent and an average of 11.3 piglets born alive per sow."

However, although postponing weaning to 35 days increased mean piglet weight by 0.9 kg, this weight advantage was not maintained to 70 days of age, he added.

"We are confident oestrus can be induced during lactation at 20-21 days after farrowing"

Downing believes that adoption by the industry is likely to be 60 per cent because of the commercial availability of PG 600, the minor change required to farrowing accommodation to enable piglet separation for four to six days and the application of AI to sows housed in farrowing crates.

An opportunity now exists to see if it is possible to inject PG 600 earlier than 20 days after parturition, Downing says. "We are confident oestrus can be induced during lactation at 20-21 days after farrowing. The outcome will be a reduction in non-productive period by 10 days per reproductive cycle for sows weaned at 26 days and seven days for sows weaned at 23 days after farrowing."

Downing calculates that the potential benefits include an additional two piglets per sow per year. We estimate this benefit alone will increase industry profitability by 10 per cent," he notes.

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Pigs being loaded at a farm in Denmark – note that the top deck lowers so there are no ramps for pigs to climb

Danish scientists answer transport conundrum

Is it best for pigs to be unloaded from the transport vehicle for a break during a long distance journey or should they remain on the vehicle until it reaches its final destination? Danish scientists have recently been trying to find an answer to this question.

According to EU regulations, pigs transported over long distances must be unloaded from the truck and moved into a resting station after no more than 24 hours of transportation. Once unloaded, they must stay in the resting station for another 24 hours before they are permitted to continue their journey. The question is whether or not this is the best solution for the pigs.

Scientists from the Faculty of Agricultural Sciences at Aarhus University have been studying what pigs do during the driving time and during rest periods, using video recordings.

The results of the study show that there are only limited differences between pigs that remained in the vehicle during their break and pigs that were unloaded for their break.

Pigs in the study were split in two groups. One group was transported for more than 4,000 km over a period of almost five days. The transport took place in three stages that were interrupted by two 24-hour breaks. One of the pig groups remained on the upper floor of the transport vehicle during the breaks while the other group was unloaded from the lower floor of the vehicle and moved into pens in a resting station.

The pigs had approximately 0.8m² per pig available in the vehicle and in the resting station. They were mixed at the beginning of their journey but were then kept in stable groups.

Apart from the first couple of hours of the journey the pigs spent most of their time lying down and there was no

CONTINUED ON PAGE 64



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International Round-up *continued*

difference between the groups. During the breaks the pigs were inactive for about nine to twelve hours during the night and they drank almost no water during these periods.

The results indicate that if the transport vehicle is equipped properly, then it is beneficial for the pigs to remain in it during the breaks. Unloading them at a resting station often subjects the pigs to stress factors such as the actual unloading and re-loading process, a new environment, and a new social environment at the resting station, where they are typically mixed with other pigs, say the scientists.

Alltech's International Symposium set to change the game

Alltech's 27th International Animal Health and Nutrition Symposium will provide insights and solutions to the issues that currently face the swine industry. The Symposium, entitled *The Game Changers: Creative Concepts for Agribusiness to Respond to Relentless Commoditization and to Innovate for a Greener Future* will be held at the Lexington Convention Center in Lexington, Ky., USA from May 22-25, 2011.

"Pork meat is consumed in the greatest quantity by today's consumers more than ever before. As the global human

population explodes, meat production needs to double in the next 50 years. Issues of food security and environmental impact of food production are becoming increasingly more critical, hence efforts to increase productivity and efficiency in a sustainable manner need to call upon novel nutritional and management strategies," said Jules Taylor-Pickard, global brand manager for Alltech. "Now is the time to explore novel strategies to achieve efficient pork production in a sustainable and cost-effective manner."

The presentations include *Game Changers: How global meat consumption patterns will affect the role of the nutritionist* by Luciano Roppa, Provimi Brazil; *Sows with 40 piglets? What now for trace mineral nutrition?* by British consultant William Close; *Can we wean 40 pigs per sow? Nutritional implications of recent genetic advances*, by Gunner Sørensen from the Danish Agriculture and Food Council and *Where now for North American Swine Production? The Game changers of how we will feed pigs* by Terry Coffey of Murphy-Brown LLC.

Further information can be found on the company's website www.alltech.com

National Pork Board launches new slogan



The US National Pork Board recently launched a new slogan – "Pork. Be inspired" – which will replace, although not entirely, the 23-year old "Pork. The other white meat" tagline.

The new campaign of: *Pork® Be inspired™* shows pork's place in almost any menu, day part, cuisine and lifestyle, based on its unique combination of flavour and versatility as the source of kitchen inspiration, says the National Pork Board.

There is a new focus on reaching creative, flavour-seeking home cooks who already prepare, eat and love pork, NPB says, announcing a new branding position celebrating pork's ability to offer a wide range of options in the kitchen.

"Our research shows that pork's top consumers are looking for more than basic education; they're looking for inspiration. With its great taste and versatility, pork is the ideal catalyst to inspire great meals," said Ceci Snyder, vice president of domestic marketing for the National Pork Board. "While our new target represents our biggest fans, we believe they have the potential and desire to enjoy pork more often – and to inspire others to do the same."

The Other White Meat campaign will play a role as a heritage brand, with use on the consumer web site and in nutrition communications, says NPB. *The Other White Meat* campaign will not be featured in advertising. ■



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View from Europe

Carrying out a stress audit

Following on from his two previous articles on stress and its effects in pigs, John Gadd looks at how to carry out a stress audit and what benefits it has.

What is a stress audit?

A stress audit involves taking time to:

- Look at the pigs carefully, without distractions, to pick up abnormal behaviour.
- Check on thermometers, sensors, controllers, fan speeds, air inlets, fail-safe equipment, feed monitoring and delivery devices, water pressure etc. to ensure the pigs are as comfortable as you can make them.
- Review how well the staff is handling the pigs. For example, the female pig is vulnerable to unsympathetic handling during ovulation, insemination and implantation.

The important thing about a stress audit is to allocate time to do it without the day-to-day distractions of a busy routine.

A stress audit should be carried out 3 or 4 times a year. Much can get out of kilter in 4 months.

Clients tell me that a quarterly stress audit and acting on it has raised labour cost 3 to 5%. But the benefit of one person responsible for shipping 1000 finishers achieving 8% faster throughput, and each sow producing half a piglet more born/alive (which seemed to be achievable by those who tried it) will outstrip this extra cost sevenfold. Good value! You might care to work the figures out under your own conditions from before-and-after records as we did.

Sure, the figures are somewhat subjective. Farm trials often are, but allied to them in this case were the comments from the participants. Almost to a man they thought periodic stress audits were worth the trouble taken as any abnormal behaviour identified in the pigs alerted them to investigate what might be causing it. When this was dealt with, performance improved to the degree described.

Some experiences from doing stress audits

- Do it quietly and unobtrusively, so wear green or blue coveralls, not white
- Observe the pigs so that they are unaware of your presence, under their normal behaviour patterns. Open nursery doors by 3 cm, no more, and listen for relaxed breathing, or coughing, sneezing, teeth grinding and general restlessness.
- If you need to, switch on the light and then through the 3 cm gap, try to observe resting pattern, huddling (piling) and where they are lying relative to air pattern, which you can measure with a smoke candle or a bee-keeper's canister when you enter.
- A good time is last thing at night using a flashlight. Indeed Graeme Pope from Australia has suggested that a useful sign of pigs not getting enough food is to find them feeding in the middle of the night. Hunger stress!
- Next, observe them stirred up (best done during the day as they need a night's rest just as we humans do). Walk down

the building and breathe the atmosphere to check for gases - an indication attention to ventilation is needed.

- At the same time look for stiffness or lameness - just after they all rise will make this much more apparent, as will lung / respiratory trouble - coughing when disturbed.
- In nurseries and farrowing rooms, look for piglets which are lying awkwardly or lifting their bellies off the ground in the semi-sternum position. This can be advance warning of a digestive upset. The slightest sign of looseness must be immediately washed away - and I mean at once; this can stop scour in its tracks.
- Palpate (feel) the sows' udders, using your fingers to reveal unusual conditions or discomfort to the sow.
- Check hoppers and troughs for stale food, contamination, cleanliness, and wastage. Good trough management is one of the major factors revealing the competence of the staff responsible or whether they have enough time to do this important job. Problems are rather too common.
- For stalled sows get as many to stand as you can. Body-condition score those that do. Old-fashioned? No, because it makes you examine them properly. Go on to check legs and check for body sores and think about how they happened.

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View from Europe Continued

- Check urine colour, which should be white / pale yellow, not towards orange, which indicates water shortage. Constipation could be a sign of inadequate water supply too.
- Check for too much queuing at ESF feed stations, which could be causing anxiety or stress.
- Check the quality of flooring surfaces - slipperiness, roughness, gaps, holes.

Do your pigs actually like you?

Workers like Paul Hemsworth in Australia, Harold Gonyou in your own backyard and Temple Grandin down in Colorado have done sterling work on human / pig interrelationships. Hemsworth especially has shown great ingenuity in trying to measure this scientifically and its effect on pig performance. He has quantified how 'Pleasant' treatment (gentle manner, soothing voice, slow approach) contrasts with 'Adverse' handling (noisy, rapid approach, abrupt movements, use of sticks and goads, etc) and how they affect the performance of both growing and breeding pigs.

"In growers the fall-off in daily gain where handling is poor seems to be about 8%"

In growers the fall-off in daily gain where handling is poor seems to be about 8%, an acceptable average from a sequence of trials. Where breeding gilts are concerned the conception rate could be as much as 50% lower.

The 'Approach Test'

Intriguingly, some of Hemsworth's measurements are made from how long it takes a pig to approach a stockperson standing still in a pen with whom they are familiar, or conversely are fearful of, or again is just new to them. The range varies from up to 14 times longer, with some fearful groups not approaching at all

He says "Stockpeople should regularly monitor the level of fear in their animals by individual responses to the approach test. In situations where the level is high or rising, the attendant should reassess his/her behaviour when near to the pigs."

Hemsworth's advice is to handle breeding pigs especially gently at service, farrowing and implantation because these are all times

when delicate hormonal balances can be affected by stressors. He suggests pats, strokes, quiet tone of voice and gentle movement when among them, allowing them to sniff you.

Does playing music help?

Probably. I'm all in favour of anything which encourages the pig to become familiar with its surroundings and the same background noise could be reassuring when there is a change of housing or companions - and maybe even when mixing groups?

But a word of caution! Last year I toured some piggeries where the stockmen were playing very loud rock music throughout their large grower barns - I suspect more for their own benefit than for the pigs. As I walked down the central passages the pigs were far more nervous and flighty than is normal, some even slamming into the far wall in their panic. I remonstrated with the owner who was with me and on a subsequent visit a year later things were much calmer, the loud music having been banned.

Some key stress signals

Newborn piglets: prolonged aggression; excessive 'wandering' for food and comfort; huddling; late to suckle; scuffed knees.

Nursery: Excessive competition; restlessness at night; crowding at the trough (first few days), thirst (pizzle-sucking).

Gilts: Scrapping; protest shrieks (insufficient fleeing space/overstocking); cold at night (huddling); slippery floors.

Farrowing time: Prolonged farrowing; thirst; panting (too hot) or restlessness (too cold); savaging (gilts); irritation/rubbing (parasites); 'lumpy' udders/discomfort/pain.

Weaned sows in stalls: Restlessness; hunger/lack of fibre; cold; legs and bursae; feet; stiffness/lameness; head shaking (parasites); tooth 'chewing' (worms); shoulder sores.

Sows in groups: Aggression; hesitancy; fear; stiffness/awkward gait; cold (on concrete).

Growers/finishers: Restlessness and vices (overstocking/insufficient feeder space/lack of sleep/gases/variability in temperature); disturbed sounds at night (draughts); wrong dunging pattern (heat and misplaced ventilation pattern); lameness (floors); raised water consumption (onset of disease?).

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British producers have their backs to the wall again

By Stuart Lumb

At last year's biennial British Pig & Poultry Fair producers had broad smiles on their faces as they actually had money to spend. The building company sales executives were all boasting of bulging order books as many farmers were finally replacing barns that were past their sell-by date 15 years ago. But how times change - wheat is a major ingredient of UK pig feeds and thanks to the wheat price doubling last autumn (it's still at £200 a tonne) producers went into the red last September and are currently losing around £20 (\$31) per pig.

The UK sow herd is quite small compared to what it was 10-15 years ago and nowadays around 40% of our pigs are outdoors. UK consumers are becoming more welfare conscious and link this with outdoor pig production. The supermarkets have used the "outdoor image" to promote sales, generally of their more expensive sausages / bacon / pork, and often use a picture of the farmer on the packaging along with details of his farming system. Seemingly, affluent consumers like to know precisely where their pork is coming from and are happy to pay a premium in this respect.

Probably because of the diminished number of producers, the British industry is a pretty close knit bunch of guys; hence the National Pig Association is a very proactive



A pig producer's son gives the 'thumbs up' to a banner promoting British pork at a crossroads in southern England.

organization with an excellent website. The UK's premier pig magazine *Pigworld* comes out monthly and works very closely with the NPA, disseminating topical information in hard copy form. Back in 2008 during the last industry crisis the NPA and BPEX (British Pig

Executive) launched the "Pigs Are Worth It" campaign to promote "Buy British" and to make the consumer aware of the high welfare standards pertaining to UK produced pigs as compared to Continental Europe. Consumers were told to identify British pig meat and

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pork products by means of the colourful British Quality Standard Mark (QSM), which incorporated a Union flag.

The QSM mark has now been replaced by the “Red Tractor” logo, which is now a key part of the current “Pigs Are Still Worth It” campaign. Another aim is to persuade supermarket buyers to step up their support for British pork to ensure British producers can stay in business. Given the current state of the UK economy with supermarkets watching every penny, things are not that easy. Back in September 2010 NPA chairman Stewart Houston asked for “a positive response from both retailers and processors alike to help our industry meet this latest price challenge”.

“Another aim is to persuade supermarket buyers to step up their support for British pork”

Anyone travelling along the UK’s highways can’t help but have noticed advertising hoardings perched on trailers or fixed to the sides of old trailer units. Given that many pig farmers have land alongside major roads, why not promote British pigmeat by means of colourful PVC banner adverts? Eureka - the “Banner Blitz” was born - as part of the Pigs Are Still Worth It campaign. By January 2011 over 120 sites had been pledged, mainly in England but also north of the border, to display the 4.6m x 1.2m banners. There is even a 12.3m banner for very high profile sites, like alongside major busy motorways. By mid-March *Pig World*, which is running the banner project, had dispatched over 500 banners and at least half of them have now been erected, promoting Red Tractor pork. It’s amazing how this campaign has taken off but it just goes to show the great camaraderie that exists in the UK industry. The original aim was to produce just 30 banners! To date over £10,000 has been donated by the industry for banners, with the NPA providing considerable funding as well. Not content with static banners, campaign organizers have designed and had manufactured four different

sized stick-on truck and van signs and thousands of stickers to go on car windows. British Pork signs now are on feed trucks, processor’s refrigerated trucks and haulier’s trucks, spreading the message across the length and breadth of the UK.

This message is reaching millions of consumers every day and would have cost £millions had it been in the form of television or newspaper adverts.

BPEX was worried that consumers concerned about the recession might not be as supportive as they had been during the last feed crisis of 2007/8; however it breathed a sigh of relief after the market research data had been analyzed. Seventy-eight per cent of consumers said that they would be prepared to pay a little more for higher welfare pork and pork products compared to 73% in May 2008. Eighty-

CONTINUED ON PAGE 70

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View from Europe Continued

three per cent said they were prepared to do a little more to help farmers through this crisis compared to 72 % in May 2008 and, very significantly, 81% said that welfare standards versus the rest of Europe are something that the UK industry should be proud of, compared to 72% in May 2008.

“Seventy-eight per cent of consumers said that they would be prepared to pay a little more for higher welfare pork”

As in 2008, NPA organized a Downing Street rally, which was held on March 3rd, to draw attention to the plight of the industry. Producers came from all over the country to march and present a petition to the Prime Minister. A hog-roast was organized with pork-filled buns being handed out to the passing public, along with the “buy high welfare

pork” message. It was also a chance for producers to meet up with their own MPs and to drive home to them the problems facing the pig industry. The march attracted a great deal of media coverage, although this year NPA did not record another version of the song “Stand By Your Ham”!

Another point being strongly flagged up by the Pigs Are Still Worth It campaign is that processors and retailers are continuing to make large profits at the expense of producers. NPA has built up a good relationship with the big supermarkets and Stewart Houston talks to them on a regular basis, far better than the confrontational blockading of supermarket distribution centres that took place some years ago. Most retailers help the British industry, but currently Tesco and Asda (Walmart) are engaged in a vicious confrontation

with neither wanting to put its prices up first. Tesco was targeted at the Downing Street rally for not stocking sufficient British product and consequently it will hopefully be substituting some of its imported pigmeat with British. Asda’s buying policies will be the next ones under the microscope.

NPA’s comments that the rally had caused an increase in pig prices were well received by the industry. Since the New Year the EU reference price has climbed quite sharply whilst the UK one has declined, such that the two are now pretty well the same. Because of the UK’s high welfare systems, producers are always looking for a premium, reckoned to be 20p/kg. If this premium can be restored, it will put the British reference price at over 150p/kg, which translates to a producer price of about 155p. This is still well below the 164p/kg (\$2.54) that producers need to stay in business.

Recently concerns were expressed that some continental countries were still hoping for a derogation on the partial stall ban due to kick in on Jan 2013, claiming farmers just didn’t have the funds to build or modify their sow barns and that this would lead to a massive shortage of pork, putting pressure on the EU politicians to consider a derogation to ensure plentiful supplies of pork were maintained. UK producers would fight tooth and nail to block any derogation, given the pain and grief the UK’s unilateral stall ban caused the industry in 1999. Also, losing producers (and their sows) who couldn’t meet the ban would result in pigmeat prices rising and be some small compensation for those efficient producers who had found the finance to convert to loose housing. Another possibility is that if pork was in short supply and got really expensive many consumers would switch to chicken. ■

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Pigs Down Under

Pig producers battle Nature

By John Riley, IAS Management Services

In the early months of 2011, large areas of eastern Australia experienced flooding and cyclone activity resulting in loss of human life, stock losses and damage to transport systems and properties. At the same time, in Western Australia bush fires caused losses and hardship.

In Queensland, it was reported that the flooded area was comparable in size to the total area of France and Germany combined. Graphic pictures of the inland tsunami which hit the writer's local city of Toowoomba and townships of Murphy's Creek, Helidon and Grantham were shown around the world.

However, when compared to the devastation caused by the earthquakes in Christchurch, New Zealand and Japan, pig producers in Australia and in Queensland in particular could count themselves fortunate. No major loss of animals was reported but most producers will be revisiting their contingency plans as a result of their experiences. Problems were experienced in moving pig feed onto properties and pigs from properties due to inaccessible roads to the property or due to the fact that the chillers at Queensland's major abattoirs could not be emptied because roads to the major centres of population were cut.

With many pig units sited away from towns or community developments to comply with environmental legislation, the movement of staff onto piggeries was a logistical nightmare. Helicopters and boats were used in many instances and in some situations staff set up "camp" on the piggery and remained there for several days. The servicing industries also showed ingenuity with one major pig semen processor and veterinary network servicing their client's veterinary needs and semen requirements using helicopters.

The rural industries have suffered serious losses with cattle producers, grain farmers and intensive crop producers facing a battle to survive the financial cost. The adverse weather has had a significant effect on grain production, with the 2011 wheat and barley crop being significantly affected with mycotoxin contamination from fusarium toxins. The early rains after planting suggested a bumper harvest after a decade of drought but the continuous wet weather saw many crops left in the field and the grains that were harvested were of low quality.

The pig producer is currently benefiting from the low export demand for Australian grains due to quality and the strength of the Australian dollar. They are aware however that a poor harvest in the northern hemisphere will result in a rapid increase in domestic feed prices.

The strength of the dollar which limits exports and benefits imports dictates that pig meat prices will remain low at a time when investment is needed to meet the move to group sow housing.

A seminar and trade display organized by the Queensland Pig Consultancy group and supported financially by Australian Pork Ltd in early April addressed the options for group housing, drawing on the experiences of industry identities who had investigated systems in operation at home and overseas.

Exhibitors in the trade display included Mundigo, the Australian agents for the Kansas based Osborne Team system which created interest amongst the larger producers. Canadian representatives Kase van Ittersum from Calgary and Kevin Kurbis from Manitoba were also present representing Cawi Canada and New Standard Ag Inc.

Uppermost in the minds of the delegates was the fact that many of the medium sized producers (300 - 800 sows) are

CONTINUED ON PAGE 73



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A photograph of a large, white, single-story barn with a gabled roof. To the right of the barn is a tall, metal water tower with a tank on top. In front of the barn are several large, white, cylindrical silos. The entire facility is situated in a flat, open landscape under a clear sky.

lacking the confidence to invest in new buildings and conversion of existing sheds. The FitMix ESF system manufactured by Mannebeck in Germany attracted considerable interest since it takes up little space and can be fitted into almost any shed layout. The modification of existing stall systems to groups with shoulder stalls also created interest with several present being in the process of testing the system in part of their operations.

The decision to invest is confused by the fact that the Animal Welfare Code allows for sows to spend six weeks in gestation stalls post 2017. In late 2010 industry delegates voted for the voluntary phasing out of gestation stalls by 2017 except for five days after mating, subject to the support of key stake holders, including government.

The industry representative body Australian Pork Ltd is in discussions with government on issues including financial assistance for barn configuration, assistance with planning and labour skills development and recruitment activities. The industry also wants support for country of origin labelling. In addition the decision made by the major Australian retailer Coles, along with Woolworths to announce that they will work with their producers to phase out stalls by 2014 has added to confusion in the minds of producers.

Adding to the lack of confidence to invest now is the results of research funded by the Pork CRC cooperative research centre at Sydney University which is successfully mating sows during lactation and achieving results comparable with traditional mating systems. If the research results are consistently repeatable on commercial units then the area of accommodation required for gestation will be reduced and will have a different objective that the gestation housing currently being considered.

The Australian industry is committed to a well planned research program. The Australian Pig Science Association Conference which will be held in Adelaide South Australia from 27th-30th November 2011 is an excellent opportunity for Canadian pork producers and industry identities to visit our country and combine a technical conference while enjoying the beautiful sights and warm hospitality of our country. ■

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Ad Index

AFSC.....	14
Agrovision	30
Alberta Swine Genetics.....	58
Barkman.....	71
Bayer Animal Health.....	27
Biovator/Nioex Systems Inc.....	11
Boehringer Ingelheim.....	13/33
Canada Farm Distributors.....	24
Canadian Bio-Systems	67
Canadian Nurs-ette Distributors	68
Canarm BSM.....	12
Carlo Genetics	53
Champion Alstoe.....	62
Crystal Spring Hog Equipment.....	42
Danisco.....	10
DPI Global/MICRO-AID.....	65
Echberg Distribution.....	60
Elanco.....	5/41/59
Fast Genetics.....	9
Gencor IMV	74
Genesis	2/70/76
Glass-Pac.....	18
Halchemix Canada Inc.	4
Hermitage NGT.....	50
Husky Farm Equipment.....	48
Hypor Swine Group	21
Intervet Canada Corp.....	75
ITSI.....	54
J&R Livestock Consultants.....	68
John Guliker	72
Kane Manufacturing.....	44
Kenpal Farm Products/dry START.....	40
L & B Ranch.....	69
Landmark Feeds	29/35

Longarm.....	6
Magnum Swine Genetics	43/45/47
Masterfeeds.....	51
Maximum Swine Marketing.....	28
Merial Canada Inc.....	19
Nuhn Industries.....	66
Parks Livestock.....	8
Parkview Pre-cast	22
Peak Swine Genetics.....	38
Pfizer Animal Health.....	55
PIC.....	17
PigWIN	36
Pork Chain Consulting	24
Prairie Swine Centre.....	26/54
Precision Management.....	50
Pro-Ag Products.....	15/39/57
Protekta Inc.	52
Ralco Nutrition.....	63
Red Deer Swine Technology Workshop	73
Sand Ridge Farm Ltd.....	73
Shac Environmental Products Inc.	32
Sierens Equipment Ltd.	46
SIGA Farm Software.....	61
Signature Genes	25
Smart Sort Innovations.....	56
Standard Nutrition.....	20
Sterling Oats.....	66/74
Sun-North Systems.....	16
Super Sorter / Baer Mfg.....	64
SwineBooks.....	62
Tomco Chemical.....	70
Topigs	31
Vétoquinol	7/23/37/49
Western Hog Journal.....	34/40/73

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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
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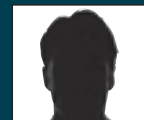


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