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TRAIT	GENESUS 49 FARMS AVERAGE ALL	SMS 585 FARMS AVERAGE ALL	DIFFERENCE
Pigs weaned / Mated female / Year	26.78	23.30	3.48
Litters / mated female / year	2.45	2.36	0.09
Wean 1st Service Interval	6.45	7.01	-0.56
Female Death Loss	5.7	7.7	-2.0
Farrowing rate (%)	87.8	82.8	5.0
Weaned / female farrowed	11.06	9.95	1.11
Total born / female	13.56	12.59	0.97
Born live / female	12.25	11.42	0.83

Of the entire SMS database of 585 farms with 1,175,053 sows Genesus was the #1 herd and the only herd with over 30 p/s/y. Genesus also held 8 of the top 9, 12 of the top 15, and 15 of the top 20 spots for p/s/y.

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Western Hog Journal

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Gilts receiving boar stimulation at the University of Alberta Swine Research and Technology Unit

WEBSITES OF INTEREST

PROVINCIAL ASSOCIATIONS

Alberta Pork	www.albertapork.com
Saskatchewan Pork	www.saskpork.com
Manitoba Pork Council	www.manitobapork.com
Nova Scotia Pork	www.pork.ns.ca
Ontario Pork	www.ontariopork.on.ca
PEI Pork	www.peipork.pe.ca

NATIONAL ASSOCIATIONS

Canadian Pork Council	www.cpc-ccp.com
Canada Pork International	www.canadapork.com
National Pork Producers	www.nppc.org

MARKETING ASSOCIATIONS

Manitoba Pork Marketing Co-op Inc.	www.mpmc.mb.ca
SPI Marketing Group Inc.	www.spimg.ca
Western Hog Exchange	www.westernhogexchange.com

OTHER SITES OF INTEREST

Banff Pork Seminar	www.banffpork.ca
Lacombe Research Centre	http://res2.agr.ca/lacombe/
Prairie Swine Centre	www.prairieswine.com
U of A	www.afns.ualberta.ca
VIDO	www.usask.ca/vido

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• Editor's Notes

After an epic three-year battle against adverse economic conditions, COOL and the unexpected impact of H1N1 on pork demand, the Canadian pork industry is at long last entering a more favourable business environment. This year, producers could even make modest profits. But the damage to the industry has been catastrophic. The latest statistics show that, over the last five years, the total number of pigs in Canada has fallen by 21.5%, while the number of farms with pigs has dropped by a massive 41.7%, down to only 7,360 farms. Not only that, but those producers who survived the carnage have suffered a huge loss of equity that has weakened their businesses.

At its completion, The Hog Farm Transition Program will have removed 137,000 more sows and the effect of that on number of market hogs has still to be seen. Sow numbers are the same as in 2000 and still declining. Further significant reductions in the national herd could threaten the viability of some processors. The industry now needs to stabilize and recover its prosperity. Individual producers must restore their equity position and work on reducing production costs. Producers and processors need to work together more closely to add value to our end products. Industry organizations must be more creative and effective in promoting our product in the home market, where 25% of pork is now supplied by the USA, and in export markets.

There are some encouraging signs for the future. Export markets shut down by H1N1 have re-opened and there are new potential markets such as the EU for our pork. With lower pig numbers in North America, supply and demand is becoming more balanced, which could result in improved prices for an extended period. US producers are chastened after two years of losses and there is unlikely to be significant expansion there in the short term. The only negative factor is that improvements in productivity by US producers result in growing volumes of pork from less sows.

Despite the improving environment for the Canadian industry, it will take many years for sufficient confidence to return for producers to think about major investment or expansion. The next 5 years at least are going to be about restoring the industry's health and putting it on a better footing to face future challenges.

Barrie Peet

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

11-11-0218-01212009

New executive director appointed by Alberta Pork

Alberta pork producers have a new executive director for their provincial organization. Darcy Fitzgerald, who is well known in livestock circles in the province, assumes his new position May 1, 2010.

Darcy Fitzgerald, recently appointed Executive Director of Alberta Pork

Fitzgerald has spent his career in the agricultural industry. Most recently he has been director of industry investments with the Alberta Livestock and Meat Agency Ltd. Prior to that he served as the general manager of the Alberta Livestock Industry Development Fund. He has also served as an agrologist and manager with Alberta Agriculture and Rural Development, as well as holding positions in industry.

"We are very pleased to have Darcy accept this position," says Jim Haggins, Alberta Pork Chairman. "Darcy has broad experience in many aspects of our industry. He understands the business culture in which we operate, and he has worked closely with pork producers in many capacities."

"Perhaps most important," says Haggins, "he has a firm understanding of the challenges our pork industry faces today and the approaches being considered through the Alberta Pork Revitalization Strategy. He has the experience and management training to be part of the transition to a new era."

Fitzgerald replaces Paul Hodgman, who announced last fall that he intended to retire from his position in 2010, so that the organization had adequate time to find a replacement. Hodgman, who has spent his career in agriculture, has been executive director of Alberta Pork for the past three years.

Hypor doubles boar testing to meet demand

Hypor Inc has doubled sire line testing capacity for the Shade Oak Duroc at the Ontario based nucleus unit following its acquisition of the Shade Oak line in July 2009. Growing demand by North American producers has accelerated the implementation of additional Feed Intake Recording Equipment System (FIRE) capacity. Within months of the acquisition, sales exceeded projections, making it necessary to double the testing capacity at the unit ensuring the integrity of the Hypor genetic program was behind every animal delivered to the growing customer base, says the company.

"This significant investment is an acknowledgement that Hypor's strategic acquisition and product development strategies are being recognized through increased demand by the industry for our breeding stock," said Gerjan van Alst, General Manager, Hypor North America. "The increased return on investment that our customers are seeing with our dam line and sire line performance has contributed to growing interest in our genetics. Hypor will not take shortcuts to meet the demand. We will continue to invest in and follow the advanced testing and breeding evaluation programs that have been the foundation of our success to this point," he said.

Increased numbers of tested animals will be available by the end of April, alleviating the pent up demand for both natural breeding animals and AI sires for studs across North America.

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No benefit of using analgesic for castration

Castration is coming under increasing public scrutiny and a number of European countries have either banned the practice outright or only allow castration with the use of anaesthesia or analgesia (pain control). Other alternatives, such as immunocastration, are not yet available in North America, while the rearing of entire boars is seen as unacceptable due to the incidence of tainted meat.

It has been reported that castration without anaesthesia may result in reduced piglet growth rates, which may impact post-weaning performance. Piglets experience pain following castration and this is not relieved by using local anaesthetics such as lidocaine hydrochloride. Analgesia, or pain relief, may help piglets to resume normal activity after castration; however, the use of this technique has not been studied in Canada.

Recent research at the Department of Population Medicine at the University of Guelph has assessed whether providing an analgesic at the time of castration results in an observable difference in behaviour and/or a measurable difference in piglet performance parameters such as growth rate and pre-weaning mortality.

The trial was carried out in a commercial herd where 1440 male piglets were castrated at 5-7 days of age and either injected with a saline solution (control) or with ketoprofen (Anafen® Injection 100mg/ml). Ketoprofen provides pain relief for approximately 24 hours. Piglets were castrated 30 minutes after the injections and observed for 15 minutes after castration. All piglets were weighed again at 21 days to determine average daily gain.

The researchers found that there were no apparent differences in growth rate or pre-weaning mortality between the control and treatment groups. The cost of the protocol was $0.22 per male piglet, assuming 5 males per litter and a new needle and syringe used for each litter. In addition, injecting the piglets almost doubled the time taken to castrate each piglet (32 seconds with injection vs. 17 seconds without). Subjectively, there did not appear to be any difference in behaviour between control and treated pigs.

The researchers concluded that there was no obvious benefit to using an analgesic in terms of piglet behaviour or performance. They also suggested that further work is required to determine protocols that will be effective in these respects, noting that increasing public pressure may force a change to current practices.

DDGS demand increasing in Canada

Demand from Canada for distiller's dried grains with solubles (DDGS) is growing, according to the US Grains Council. Last year, Canada imported approximately 804,000 metric tons of US DDGS and was the second largest export market for the product. Industry experts anticipate more volumes to be traded in 2010 with much of this growth attributed to greater awareness about the product.

"The Canadian livestock producer has more information today on the chemistry, use and economics of DDGS," said Ryan Slozka of Rycom Trading Ltd., a US Grains Council member.

Three to four years ago, Canadian livestock producers were feeding a maximum of 10 percent DDGS in their rations before gradually moving to 15 percent and now 20 percent and 30 percent inclusion. "15 percent and 20 percent inclusion is the average," said Neil Campbell, USGC consultant in Canada, "but nutritionists are using results from trials and on-farm experiences to demonstrate that DDGS inclusion rates at higher levels will lower their feed costs."

In addition to the lower feed costs, the price of DDGS is also attracting converts. Slozka predicts 2010 will bring more US

Demand for DDGS from Canada is growing, says the US Grains Council

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Setting the genetics standard

A commitment to genetic improvement forged more than 40 years ago continues to drive PIC's pursuit of better swine genetics for producers in Canada and around the world.

PIC traces its roots to the 1960s when a small group of pig farmers in Oxfordshire, England asked a group of scientists to help them develop a better hybrid pig. Today, that commitment to genetic improvement has grown to include offices in 30 countries and a genetic research and development program that has no rivals.

"We're very proud to be leaders in swine genetics," says PIC's Account Manager Steffen Klenk. "We're also proud to be able to bring leading PIC genetics to a broad range of pork producers in Western Canada – whether they operate a 50-sow herd or a 5,000-sow unit.

The foundation of PIC's success is genetic research. PIC has implemented more than 140 DNA genetic markers in pure lines to improve mortality, production, reproduction, defects and meat quality traits. These traits are put to the test in PIC's genetic nucleus (GN) herd and on customer farms where real-world data is collected to improve how PIC genetics will perform on-farm, as part of the GN crossbred program. The information collected from the genetic nucleus and GN crossbred projects is input in PIC's PICTraq database, which grows more powerful with each passing day. Klenk notes that "right now we have 150,000 females that we index twice a day, every day."

Klenk also explains that a range of programs and strong relationships with independent multipliers allow PIC to work with both big and small pork producers.

Colony success built on good management practices, sound genetics

Thirteen years ago, Sam Waldner began working in the farrow-to-finish operation at the Kyle, SK Hutterite colony. Since then, the genetic improvement of the herd has jumped 14% to take production from 26.4 to 30.3 pigs per sow per year.

Waldner, who manages the barn with Peter Hofer, believes that success begins in the farrowing barn where individual pig care is essential. "The farrowing barn is a very critical stage of the operation," according to Waldner. "Weaning quality pigs allows producers to market at least 10 to 15 days sooner than substandard pigs. Time and effort in the farrowing barn will be awarded with excellent results," he says. "Wean heavy, ship heavy. Wean light, ship light."

Sam Waldner (left) and Peter Hofer

The best results come from paying close attention to detail. "Keeping good records and documentation, and being in the barn all day, means we can quickly correct any irregularities," explains Hofer.

Waldner credits much of the operation's success to the strong working relationship they have with PIC genetics, a partnership that's been built up over the last 24 years. Chesterfield, a PIC gilt multiplier, supplies gilts to Kyle Colony and, according to Waldner, "has been supplying sound quality gilts with excellent feet and legs."

After examining all the factors, including good sow, good sire and feed conversion, they found the PIC Camborough gives the best return for their dollar. The Camborough sow impressed them for a variety of reasons, starting with its docility.

"It's a very easy sow to manage with good 'motherability', and the ability to raise and wean large litters of quality pigs," says Waldner. "With the PIC genetics, we are able to wean more pigs at heavier weights than ever before."

Despite challenging times for the hog industry, Waldner maintains a positive outlook, continually searching for ways to make their operation more successful. "It's imperative to always be open to improving current practices," he says. "Once you stop improving, you are going backwards."

"With PIC genetics, we are able to wean more pigs at heavier weights than ever before."

– Sam Waldner

PIC

exports to Canada with the period of April-May-June being a key time frame. "DDGS is currently trading at 105 percent of Canadian barley whereas in 2009 it was in excess of 120 percent causing it to be pulled out of the ration. It wasn't until July that we saw DDGS values trading this close to barley," he said.

While any growth is welcomed by the industry, Slozka does emphasize caution. "Increased demand invites more players into the market. Producers unfamiliar with DDGS may start with the product but discontinue it following a bad experience. More traders are entering the market and do very little in the way of product awareness and ensuring product quality. It is important that we all continue to further educate ourselves on the variability of DDGS, the logistical constraints and performance benefits in livestock rations."

Slozka said Rycom Trading has responded to Canada's growing demand for DDGS through the acquisition of a transloading facility, Rycom Transload Services, LLC, in Sunburst, Mont., seven miles south of the Alberta border. Situated along the Burlington Northern Santa Fe Railway, the facility gives producers access to more DDGS manufacturers while eliminating total reliance on the Canadian Pacific Railway.

New approvals for Tylan 40 Premix improve treatment options for Ileitis

Elanco brand Tylan 40 Premix has received two new approvals for use as an in-feed product with pigs. With these approvals, Tylan can now be used for the treatment of ileitis and the treatment of persistent or recurring ileitis associated with the bacterium that causes it, Lawsonia intracellularis. Previously, Tylan was approved as an aid in the prevention of ileitis caused by the bacteria.

"Tylan can now be used both for the prevention and treatment of ileitis, including as part of a step-down program in cases of persistent or recurring ileitis infection," says Peter Mumford, Swine Marketing Associate with Elanco Canada. "These new indications increase the effectiveness, convenience and flexibility associated with the use of Tylan as an in-feed product and that is important to Canadian producers dealing with the most common enteric disease in grower-finisher pigs. Estimates suggest that Lawsonia intracellularis is found in more than 90 percent of Canadian farrow to finish herds, with up to 57 percent of finisher pigs directly affected by the disease it causes.

Dr. Isabelle Moreau, Technical Services Consultant with Elanco Canada, says ileitis can significantly affect the performance of growing pigs but is often hard to detect. "Acute ileitis may be characterized by pale anemic pigs, bloody diarrhea and, in the most severe cases, sudden and unexpected death. In cases of sub-clinical ileitis, there are no obvious, visible signs of the disease, however, as with acute cases, affected pigs exhibit reduced average daily gain and reduced feed efficiency." Moreau says ileitis can occur in pigs between 20 and 70 kilograms, pigs at market weight or pigs in the breeding herd. "Ileitis has significant effects on pig performance, individually and collectively. For producers looking to improve overall herd health, reduce group weight variability and days to market, it should not go unchecked."

Mumford notes that Tylan has a unique formulation and production process that, among other things, has been shown to deliver high efficacy and consistent results across animals, part of which is attributable to the stability of the active ingredient over time, helping to ensure that the right dose gets to every animal, every time.

Swine Technology Workshop builds on success

Following the success of the event in 2009, the 2010 Red Deer Swine Technology Workshop will be held on Wednesday, November 3rd at the Capri Hotel Exhibition Centre in Red Deer. "Last year, despite the problems facing the industry, well over 200 people attended the workshop and the new venue at the Capri was

very popular with both delegates and exhibitors," says Bernie Peet, the workshop manager.

Once again, the workshop will focus on practical management related topics aimed at increasing productivity and profitability. Topics include "Getting the best from AI", "Feeding sows ad-lib in lactation", "How to be a great team member" and "Troubleshooting problems on the farm".

Registration costs $75, with a special "5 for the price of 4" package available for $300. For further information or to register, contact Bernie Peet at Pork Chain Consulting Ltd. on (403) 782-3776 or (403) 392-3104 or email bjpeet@telusplanet.net

Genesus appoints General Manager

Genesus Genetics has announced the appointment of Brad Cramer as its General Manager, based in Oakville, Manitoba.

For the last ten years Brad has been the Chief Operating Officer of Stomp Pork Farm Ltd. in Leroy, Saskatchewan. He was responsible for the 25,000-sow production system, which had 34 sites and two feed mills. Brad was also responsible for US operations that consisted of 60 production facilities.

"We would like to welcome Brad, said Jim Long, President and CEO of Genesus. "We believe that Brad's personality, business experience and swine production knowledge will augment Genesus as we all work together to build the best swine genetics company in the world."

Leaders in farm animal care honoured at Livestock Care Conference

Susan Church and Pam Miller were recognized with Awards of Distinction at the Livestock Care Conference, held on March 26 in Red Deer, Alta., hosted by Alberta Farm Animal Care (AFAC).

Church, who served for 15 years as the manager of AFAC through to 2009, was honoured with an Award of Distinction for Leadership. This award honours those who set the bar higher for expectations regarding animal welfare, and demonstrate leadership and commitment in doing so.

Church managed AFAC from its inception until last spring. Under her tenure, AFAC members have worked together to build a framework for continual improvements for livestock care. This has included progress in livestock care at the farm level and transport level, along with progress in education, research and more. In accepting the award, she noted that while the Alberta livestock industry has shown leadership and made strong progress, it's critical to ensure that animal care continues to evolve with the livestock industry.

Miller, who for over 14 years has been the voice that answers calls and responds to callers of the ALERT Line, 24 hours a day, was honoured with an Award of Distinction for Communication. The ALERT line is a confidential call line set up by AFAC for anyone to report livestock care concerns, with an aim to assist before animals are in distress. The award for communication honors those who take a strong, active role in 'getting the message out' about livestock care issues in an honest way that builds trust and credibility.

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Olymel "Reach for the Top" Awards

Olymel presented its "Reach for the Top" awards at the Alberta Pork Congress Banquet held on March 17th, recognizing the top suppliers in four categories. Don Brookbank presented $500 to each of four category winners, selected from over 200 qualifying suppliers to the Red Deer plant.

Winner of the Food Safety Award was Livingstone Colony of Lundbreck, Alberta. This award is for low brisket contaminations and also for the producer that has the highest percentage of clear tattoos over the year.

The High Health Award takes into account the number of total demerits, arthritis levels, adhesion levels and abscesses. The winning producer is the one with the lowest score when all these factors are combined and this award was presented to Spring Ridge Colony of Wainright, Alberta.

Suncrest Colony of Castor, Alberta, was the winner of the Core Weight Award, which is given to the producer achieving the highest percentage of hogs hitting the core weight range of 90-100kg.

The fourth category, the Core Lean Award, goes to the producer with the highest number of hogs with a loin measurement in the 62-69mm range. Category winner was Athabasca Colony of Athabasca, Alberta.

The Olymel Grand Champion award was presented to Willow Creek Colony, which also won the same award in 2009 and received a prize of $1000. The winner must score the highest in all of the individual categories based on a weighted point system.

Don Brookbank (left) and Laurie Brandly (right), President of the Alberta Pork Congress board, present Martin Wipf of Willow Creek Colony with the Grand Champion award

Lee Whittington honoured with Industry Leadership Award

Lee Whittington, President and CEO of the Prairie Swine Centre, was presented with the Industry Leadership Award at the Alberta Pork Congress banquet.

Lee is responsible for developing and implementing the centre's strategic plan and overseeing the administration, funding and on-going research, graduate education and technology transfer mandates of the non-profit research centre.

Previously, as Manager of Information Services for Prairie Swine Centre, Lee was responsible for all technical extension programs at the centre as well as demonstration research projects. Areas of research interest have included Segregated Early Weaning, group housing of sows and large group autosort technology for grow-finish pigs.

Lee's primary focus has been developing communications programs that allow the commercial pork industry to adopt new technology and management procedures quickly thus improving their ability to maximize net income and address sustainability issues. He is an active speaker at industry conferences across North America and a regular contributor to several trade publications.

Lee Whittington speaking at the Alberta Pork Congress after receiving the Industry Leadership Award

Lee has been with Prairie Swine Centre since its inception in 1992, developing and implementing the extension program. Mr Whittington was previously employed as a nutritionist and swine product sales manager in Ontario, Canada for a major national feed company for 13 years.

In addition to his contributions to the pork industry, Lee and his wife Grace own and operate Riverbend Plantation Gourmet Foods, a farm and food processing business.

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• Industry Crisis

By Bernie Peet

Is the crisis over?

With hog prices moving upwards, healthy futures prices and less production in North America, will we see the end of the crisis that has battered the Canadian industry for the last three years? In order for the crisis to be considered over, at least by my definition, the attrition in hog numbers must have stopped and producers must be making enough money to eventually recover the massive amount of equity they have lost. On this basis, the crisis is likely to continue for several more years. With the dollar just about at parity, profitability will be considerably lower than in the US, so our producers will remain at a disadvantage. The events of the last five years have proven beyond doubt that the expansion of production that took place between 1995 and 2005 was based purely on a weak Canadian dollar. Economic commentators predict that the US dollar will remain weak for at least several more years, making respite from this challenge improbable. The condition of the industry is therefore likely to remain fragile for some considerable time.

The most worrying thing about the last three years is that, despite the pain, very little has been done to make the industry more competitive. A number of consultants' reports have identified the problems, but due to the lack of cooperation and transparency within the supply chain, progress on changing the industry's business model has been painfully slow. The report prepared for CPC by French food industry consultancy GIRA, says "The only thing that flows along the Canadian pig supply chain is pigs!" The 'brick walls' that separate production from slaughtering and slaughtering from retail are strangling the development of the sector, the report adds. "With very few exceptions, there are no joint producer-packer initiatives to add value to pigmeat," says Cristophe Lafougère, the report's author. "Retailers don't know their pigmeat producers and producers don't know or understand the needs of retailers."

As pork industries around the world move towards on-farm certification of production standards, full farm to fork traceability, dedicated production chains, greater product differentiation and value adding, the Canadian industry is going to get left behind unless the supply chain works together a lot more closely. If our business model remains as a low cost commodity producer, we will continue to receive the lowest prices in the world and the industry will contract still further.

Census numbers highlight continued decline

The January 1 Canadian hog inventory statistics illustrated the continuing decline in hog numbers, with a fall of 4.5% in total hog numbers. Outside of Atlantic Canada and BC, where their small industries have just about disappeared, the biggest reductions were in Ontario (7.6%) and Alberta (5.3%). The magnitude of the impact on the industry of three years of hardship is best illustrated by comparing the January numbers with those of five years ago (Table 1).

Table 1: Canadian pig numbers – January 1st 2005 and 2010 (thousand head)

	January 1st, 2005		*January 1st, 2010*		*Change (%) (Total pigs)*
	Total pigs	Sows and gilts	Total pigs	Sows and gilts	
Quebec	4,280	416.5	3,800	378.4	-11.2
Ontario	3,779	433.2	2,868	341.5	-14.0
Manitoba	2,870	368.0	2,451	322.6	-14.6
Saskatchewan	1,342	129.0	780	87.9	-42.0
Alberta	2,045	198.8	1,505	151.4	-26.4
Canada	14,810	1597.1	11,630	1312.6	-21.5

It can be seen that total pig numbers have fallen by 21.5% during this period. At the same time, the number of farms with pigs reporting for the census fell by a massive 41.7%, from 12,615 to 7,360. In addition, the effects of US Country of Origin Labelling (COOL) legislation have been severe, with exports of live pigs to the USA declining to 6.4 million in 2009 compared to a peak of nearly 10 million in 2007. During 2010, the impact of COOL is expected to moderate as hog supply tightens, although live exports are likely to decline still further.The Canadian breeding herd is now the same size as it was in 2000 and will contract still further as the effects of the Hog Farm Transition Program feed through into the census data.

There was a very positive reaction by industry commentators to the USDA March Hogs and Pigs Report. "USDA's

estimate of the total number of hogs and pigs on US farms at the start of March was down 2.8 per cent compared to 12 months earlier," commented Glenn Grimes and Ron Plain of the University of Missouri. "The average of the trade estimates was for a 1.1 per cent decline. Kept for breeding was down 3.9 per cent according to USDA; the trade estimate was for a 2.6 per cent decline. The market inventory was down 2.7 per cent while the trade estimate was for a 0.9 per cent decline."

The US industry has lost over $6 billion in equity during the last 10 quarters, according to Grimes and Plain. "The March swine breeding herd was 7.6 per cent lower than at the last cycle peak in December 2007 and was the smallest breeding herd since the mid 1800s," they noted.

Transition Program winds up

In the final round of bidding under the Hog Farm Transition Program, 93 bids out of a total of 274 were accepted and the last $14 million of the $75 million fund allocated. The successful bids ranged from a low of $493.80 to a high of $888.97 per Animal Unit Equivalent. A total of 137,000 sows will have been removed by the program since it started, representing about 10% of the national herd. Given the large number of producers that applied for the program but were unsuccessful, there has been some discussion as to whether the government should be approached about a further, similar, program. However, industry leaders have expressed concern about the impact this would have on the processing sector because additional reductions in the national herd could make some plants unviable. With the prospect of increasing prices, the pressure from producers for such a move will inevitably be less.

EU: Danish Crown under pressure, but Brits are optimistic

Producer-owned Danish Crown has been under increasing pressure from its members to improve the price it pays for market hogs. Producers are voting with their feet and sending unprecedented numbers of weaners to Germany for finishing. They exported around 9 million live pigs during 2009, an increase of 1.7 million compared to 2008, and numbers are expected to increase still further in 2010. This reduction in throughput, coupled with much higher wages for its plant workers compared to competitors, is forcing Danish Crown to restructure and reduce the size of its operations. Danish pork exports were down about 12% last year compared to 2008.

Recent discussions with worker unions about implementing a pay freeze collapsed, prompting a strong reaction from Kjeld Johannesen, CEO of Danish Crown. "I am both surprised and

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disappointed that the Food Workers' Union NNF did not listen to its members," he said. In the absence of revised wages, Danish Crown now plans to reduce its number of employees by 600, Johannesen said.

Across the EU, breeding herd numbers were generally down comparing December 2009 with the same time in 2008. As in 2008, the eastern European countries showed the highest declines, with Bulgaria down 7.2% and the Czech Republic down 8.6%. However, Poland, which has suffered a huge decline in numbers in recent years, bounced back by 6.4%. Despite its problems, Denmark experienced growth of 4.4% in contrast to declines in Germany, France, and Italy. Overall, though, the European breeding herd fell by just 0.8% year on year. The UK industry, in positive mood due to continuing high pig prices, saw its breeding herd expand by over 3%, while numbers of in-pig gilts grew by 10.8%. Increased confidence has led to considerable investment and pig housing manufacturers are reported to be swamped with new work.

European producers face a time-bomb in the form of legislation due to come into force in 2013 that will ban sow stalls except for the first 28 days of pregnancy. Apart from countries such as the UK and Sweden, which don't use stalls, there are big differences in the proportion of farms that have converted to group housing. In many countries very little progress has been made and it is likely that, by the deadline, many producers will be in breach of the law.

The lack of progress has prompted the southern Dutch province of North Brabant to propose a financial incentive worth €6.5 million for intensive livestock farmers to leave the industry. The regional farmers' organization believes the industry must shift from mass production to environment and animal welfare-friendly methods if it is to be sustainable in the future.

According to Hans Huijbers, chairman of the Southern Dutch Farmers' Union, ZLTO, some 20 to 40 percent of the pig farms in North Brabant – the country's leading intensive livestock region – are unable to make the necessary investments to comply with animal welfare and ammonia emissions legislation that will come into force in 2013.

Some industry observers in Europe believe that the impending legislation will lead to a massive exodus from the industry creating a huge shortfall in production. US giant Smithfield is rumoured to be eying this prospect with some anticipation and gearing up part of its production systems in the USA to produce pork to certified EU standards.

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Zoonotics – how safe are hog barns?

By Cate Dewey, DVM, MSc, PhD, Population Medicine, Ontario Veterinary College University of Guelph, Guelph, ON

Zoonotics or zoonotic diseases are the terms used to describe human diseases that people get from contact with either animals or food from animals. This paper will cover some of the more commonly found disease agents carried by pigs or pork, the clinical illness expected in people and the ways pork producers and consumers can reduce their risk of infection.

Influenza viruses

Influenza viruses are host adapted. That means they preferentially grow in one type of animal. Viruses such as the classic swine influenza virus grow best in pigs. Negative farms that are infected with these viruses experience widespread infection in the pigs. All of the grower-finisher pigs may become sick at the same time. The pigs have a high fever, stop eating, refuse to get up and cough – a lot! Within a few days, the pigs recover. People working in these barns will be breathing the same air as this barn-full of coughing pigs. There are reports of barn workers and their family members becoming sick with the 'flu' shortly after a barn breaks with influenza. This is rarely reported in the literature. The majority of people working with these sick pigs will not get sick. This virus prefers to live in pigs. These viruses only live in the lungs, nose and throat of pigs. They do not circulate in the blood stream or live in the muscles. If a person becomes ill from this virus, it is because they have breathed the air that is coughed out by the pigs. The virus will live in a pig for approximately 5 – 7 days and then the pig will eliminate the virus. After that, the pig cannot transmit the virus to a person or to another pig.

Novel H1N1 influenza virus

The H1N1 virus is host adapted for people. It grows well in people, spreads well between people and may cause severe illness in people. This virus has been called a 'reverse zoonosis" because it has moved from infected people to pigs, causing the pigs to become ill. The virus does not grow well in pigs. In negative farms, only 10% of the pigs become ill due to this virus if exposed to it.

People are most likely to get infected by H1N1 through contact with other people infected by the virus or by touching surfaces (like door knobs) that have been infected by these people. Should you get the H1N1 vaccine? I think it is important for those of us working with pigs to be vaccinated so that we can keep the pigs healthy. We do not want to carry the virus into the pig barn.

This H1N1 virus never should have been called 'swine flu'! It is a virus that is made of component parts of a virus from birds, pigs and people – all three. But it was made in a person, is host adapted to people, is transmitted between people and grows well in people. That means the virus grows best in the cells of the respiratory tract of people rather than the cells of pigs or birds.

Salmonella, Yersinia and Campylobacter

These bacteria can cause diarrhea and vomiting in people. Most people exposed to these bacteria do not develop illness or develop only mild symptoms. A few people may become sick enough to be hospitalized. Although most pigs carry Campylobacter organisms, it is not the type that usually causes illness in people. People are much more likely to get campylobacter from poultry. Pigs and pork are the most common source of Yersinia for people. Salmonella can come from pork, poultry, eggs or beef.

These bacteria are found in the intestine of some pigs. We are not going to eliminate the bacteria from our barns but we can reduce the numbers of bacteria and the proportion of pigs that are infected. These bacteria follow a fecal-oral transmission route. What can you do? First, have good rodent control programs and second, clean and disinfect the pens/barn to reduce the environmental contamination. Be aware of the antimicrobial use on the farm. Every time the pigs are exposed to an antibiotic in the feed, water or by injection, the bacteria can develop a resistance. The pigs may carry Salmonella, but you do not want the bacteria to be multi-drug resistant. Source your breeding stock from only one farm. Each farm carries its own Salmonella organisms. Buying breeding stock from multiple farms increases the numbers of types of Salmonella on your farm.

What can people do to maintain their own safety? Wash your hands before you eat and after you handle meat. In the kitchen, cut meat on a surface that can be cleaned such as a cutting board that can go in the dishwasher. Wash the knife used for raw meat before it is used to cut other foods. Wear a mask when you are using the high pressure washer.

Leptospirosis

This bacteria (Leptospira) typically causes reproductive problems and kidney infections in sows. The bacteria are in the urine and reproductive tract of infected pigs. Leptospira bacteria can cause a wide variety of problems in people. Wear protective gloves when assisting a sow during farrowing to reduce the chance of becoming infected.

Toxoplasma

This parasite causes problems for pregnant women (abortion /blindness) and also for people with compromised immune systems. The disease is rare in pigs and pig barns today. The parasite requires cats to complete the life cycle. When possible, keep cats out of pig barns. If you must have cats in the barn, have only spayed and neutered cats. It is the kittens that are most likely to keep the numbers of parasite organisms high. ≡WHJ≡

Alternative feed ingredients in swine diets

With hog producers now in competition with ethanol producers for the traditional grains used in pig diets, it's time to look at the wide range of alternative ingredients that are now available, says Dr. Martin Nyachoti from the University of Manitoba. Key alternative ingredients in Western Canada include: biofuel co-products (distillers dried grains with solubles, DDGS; wheat with or without corn, triticale and crude glycerol), expeller canola cake, co-extruded oilseeds-pulses mixtures, lentils, zero tannin faba beans and hulless oats. The first critical step to introducing new feedstuffs into swine diets is the characterization of their available energy (NE), standardized ileal digestibility (SID) amino acids and digestible phosphorous; the most expensive components in a swine ration, Nyachoti believes. Continued use of digestible (DE) and metabolizable (ME) systems for ingredients rich in protein, fibre and fat misrepresent their energy value, he points out. Determining the NE of many of the available alternative ingredients in Western Canada will be pivotal for predictable growth performance of pigs fed these ingredients. Nyachoti discusses the ingredients that are available and how they should best be used in swine diets.

Biofuel co-products

The rapid expansion of biofuel production has created a boom with far-reaching effects on the global demand for grains and oilseeds. A consequence of increased production of biofuel is the availability of co-products such as crude glycerol and distiller grains, which can play an important role in meeting the energy and nutrient needs of pigs.

DDGS

The nutritive value of corn-based DDGS to swine has been widely researched and reported. In this section, more emphasis will be placed on triticale, wheat and wheat/corn mixture DDGS, which arguably represents the feedstock grains for Western Canadian biofuel industry. "Generally, the nutrient composition of the DDGS is dependent on the composition of the feedstock grain matrix used in the fermentation process; however, variability has been reported for DDGS from different plants and the same plant using the same feedstock grain," Nyachoti explains. "Nonetheless, there is a general agreement that the process results in co-product (DDGS) whose chemical contents (except starch) are 2 to 3 times greater than in the parent grain. However, he notes, a range of processing procedures has an impact on the feeding value of DDGS.

"The primary issue with DDGS is the available energy and this will be, to a large extent, impacted by the grain stock used in the fermentation, as shown in Table 1." The main energy yielding substrates in the DDGS are the fat and protein, and to a small extent the fibre via hind gut

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fermentation. "The high fibre and protein content in the DDGS makes the energy less available than that in the parent grains therefore net energy is the best energy system to express the energy value of DDGS," Nyachoti notes. "Unfortunately, as shown in Table 1 the NE values for DDGS are yet to be determined."

Table 1: Energy and digestible nutrients (DM basis) content of corn, wheat, wheat/corn mixture and triticale grains and their DDGS

Item	*Corn*		*Wheat*		*Triticale*		*Wheat/corn*
	Grain	DDGS	Grain*	DDGS	Grain	DDGS	
Energy kcal/kg DM							
DE, kcal/kg	3,955	4,140	3,814	3,690	3,689	3,820	4,038
ME, kcal/kg	3,838	3,897	3,638	–	3,533	–	–
NE, kcal/kg	3,074	–	2,794	–	2,770	–	–
Digestible Nutrients, g/kg DM							
P	0.43	4.13	2.10	5.90	1.69	–	5.60
Lysine	2.38	4.60	3.13	4.63	3.51	–	5.95
Methionine	1.72	4.42	2.04	5.51	1.98	–	6.37
Threonine	2.67	7.32	3.53	9.25	3.04	–	5.36
Tryptophan	0.57	1.46	1.53	3.22	1.37	–	3.20

Grains: NRC, 1998, Corn DDGS: Stein and Shurson, 2009, wheat DDGS: Widyaratne and Zijlstra 2007, Lan et al., 2008; Yang et al., 2009, triticale: Beltranena and Zijlstra, 2008, wheat/corn: Widyaratne and Zijlstra 2007; Yang et al., 2009, NE: Sauvant et al., 2004

Research on the NE values of DDGS is warranted as DE and ME systems over-estimate its 'true' energy value, Nyachoti believes. "Our research has demonstrated that a multi-enzyme supplementation in a 30% wheat DDGS-based diet resulted in growth performance and apparent total tract digestibility of DM, energy, and crude fibre in growing pigs commensurate to that of the control without DDGS," he says. "Furthermore, high unsaturated fat is a concern in corn DDGS with respect to pork quality." For wheat and triticale, which have less fat, high fibre may stimulate gut growth, which in turn would reduce the carcass weight. Consequently, there is need to investigate the potential of the fibre degrading enzymes in mitigating the negative impact of DDGS fibre on energy availability and determine the NE value of DDGS with enzyme supplementation, Nyachoti concludes.

It is likely that mycotoxins in DDGS are concentrated three times compared to that of the parent grain, but limited information is available. "An interesting question is whether the fermentation process alters mycotoxin toxicity and if so, what metabolites result and what implication such metabolites may have on the feeding value of DDGS," Nyachoti says. "Such knowledge may be pivotal in providing hints to a potential means of detoxifying mycotoxins in feedstuffs."

Crude glycerol

Crude glycerol is a co-product of biodiesel production, with 79 g of crude glycerol generated for every 1 L of biodiesel produced. "While biodiesel can be made from a variety of feed stocks, biodiesel producers are seeking to include high levels of canola," Nyachoti points out. "With the bulk of canola production being in Western Canada, it's likely that supply of glycerol may, in the future, outstrip the demand for glycerol in the pharmaceutical industry. This will present the hog industry with an opportunity ingredient."

Crude glycerol is absorbed by the gastrointestinal tract of non-ruminants and is utilized as an energy source, containing 3,021 kcal/kg of ME. "Recent studies have demonstrated that it can be used in nursery pig diets. However, a key concern with crude glycerol is that it is not an approved feedstuff in Canada," Nyachoti explains. "Further concerns are related to the chemical composition because it contains methanol, which is poisonous at low concentrations and may cause metabolic disorders and blindness." Furthermore, there is variability in the ash content of 6% to 10% and future research is required to address these concerns and facilitate approval of crude glycerol as a feedstuff, he adds.

Expeller canola cake

Solvent extracted canola meal is an important protein source for the livestock and poultry industry in Canada, but its energy value is low, partly due to efficient (>95%) oil extraction at the crushing plants and high fibre content. Canola oil can also be extracted using an expeller press without solvents, but oil removal is less efficient. Hence, expeller-pressed canola cake contains 10 to 15% oil that may provide additional energy in swine diets. However, limited information exists about the nutritional value of expeller canola cake. "Recent studies at our laboratory and at the University of Alberta evaluated the energy and ileal digestible nutrient contents of the expeller canola cake," Nyachoti explains. "Compared to NRC values for solvent extracted canola meal, the average available energy (NE) content of expeller canola cake is 40% higher than solvent extracted canola meal. The digestible contents of the most limiting amino acids are fairly close between the two meals. As such

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expeller canola cake should essentially be a good source of energy and amino acids."

Recent research at the University of Alberta indicated that up to 23% of expeller canola can be fed up to market weight without detrimental effects on carcass quality. However, the results also showed a strong linear decline in performance (feed intake and body weight gain) in the entire experiment as the level of the expeller canola cake increased. "The same laboratory, also fed weanling pigs (~6.5 kg BW) 15% of either solvent extracted or expeller extracted canola cake in a wheat-soybean meal diet," Nyachoti notes. "The results indicated that the expeller cake depressed feed intake by 10% relative to solvent extracted meal in the first 10 days post-weaning, which was linked to high levels of glucosinolates in the expeller canola meal."

Co-extruded oilseeds

Mixture of oilseeds and pulses presents an economical opportunity to fortify energy in swine diets, to compliment other protein sources, and to enhance pork quality, e.g. omega-3 pork. Moreover, the use of co-extruded oilseeds-peas mixture overcomes the challenges of grinding and handling oilseeds (canola and flax), with their high oil content, in the feed mill because starch in the pulses absorbs most of the oil.

The nutritive value of various mixtures has been investigated, Nyachoti points out. "Our studies showed that

Zero-tannin faba beans can substitute for soybeans in nursery and finishing diets

amino acid digestibilities were intermediate of the peas and canola meal," he says. However, he notes, the key concerns with these products include, heating conditions (during extrusion) on their nutritive value (including the impact on the anti-nutritional factors), keeping quality and effect on growth performance and pork quality among others. "Instructively, growing pig data in our laboratory shows similar energy value of co-extruded canola seed-pea-navy bean mixture and raw canola seed-pea-navy bean mixture supplemented with a multi-carbohydrase enzyme targeting the fibrous canola seed," he explains. 'Such data serve to indicate that enzyme technology may also play a role in solving the concerns of overheated products."

Hulless oats

Conventional oats (Avena sativa L) are not commonly used in pig diets, mainly due to high fibre content. Oats with reduced fibre content, which may be used in large amounts in diets for non-ruminant animals, have now been developed. In addition to the lower fibre content, hulless oats have a higher content of fat, crude protein (CP) and amino acids (AA) compared to hulled oats and other cereals. Studies with pigs have shown that hulless oats have higher nutritive values compared with hulled oat varieties.

The utilization of energy in hulless oats must be known to fully evaluate the significance of oil concentration and reduced fibre content. However, the apparent ileal digestibility of amino acids has only been determined in limited studies and there is a dearth of information on energy metabolizability in the hulless oat. "To address this gap in knowledge we recently conducted a trial to determine the digestibility of amino acids and metabolizable energy in four varieties of hulless oat (grown in Manitoba) fed to growing pigs," Nyachoti explains. "Results indicated that hulless oats have high apparent digestible amino acids and metabolizable

energy compared to hulled oats, as shown in Table 2. However, standardized ileal digestible amino acids and net energy value of the hulless oats are yet to be determined."

Table 2: Apparent digestible amino acids (g/kg) and energy metabolizability (DM basis) in four hulless oats grown in Manitoba

	Hulless oats[1]				Hulled oat[2]
Item	*Paul*	*Gehl VAO-02*	*AC Gwen*	*Lee Williams*	
DE, kcal/kg	4,283	4,168	4,209	3,982	3,112
ME, kcal/kg	4,278	4,166	4,202	3,979	3,045
Lysine	5.33	5.21	6.00	4.25	3.08
Methionine	2.61	2.60	2.97	2.48	1.95
Threonine	3.91	3.61	4.38	2.88	2.91

[1] Nyachoti et al. (2009); 2NRC (1998).

Dry extruded soybean meal

Extrusion processing followed by expelling is a relatively recent technology developed for soybean meal processing. The process results in a product (DESBM) that has a higher fat content compared to solvent-extracted soybean meal. "Our data comparing the standardized ileal amino acid digestibility of regular, solvent extracted soybean meal vs. DESBM indicated that the values for regular soybean meal were higher than for DESBM," Nyachoti explains. "Furthermore, there was variability between the DESBM samples suggesting the need to optimize the manufacturing process of DESBM." Since DESBM has high oil, future study should focus on the available energy (NE) to fully understand its nutritive value, he adds.

Lentils

Lentils are grown primarily in Western Canada for export and for human consumption. However, the feed industry has access to those quantities which do not meet the specifications for human market. Lentils may have a chemical composition quite similar to that of peas. Research at the Prairie Swine Centre indicates 27% crude protein, 6.2% lysine and 40% of starch in lentils, implying that the crude protein content is higher than (22%) whereas lysine (7.3%) and starch contents were lower (50%) than for peas. Consequently, the digestible energy was 3,715 kcal DE/kg DM, which is slightly lower than the value for peas (3,850 kcal/kg DM). Thus, lentils constitute an appreciable ingredient for the pig, with a nutritional value slightly lower than that of peas.

Zero tannin faba beans

Traditionally the use of faba bean in swine rations has been limited by tannins. However, advancements in crop breeding in Europe have resulted in the creation of zero-tannin faba beans (<1% tannins). Extensive research on the nutritive value of zero-tannin faba bean has been conducted at the University of Alberta and Prairie Swine Centre. "Overall, results indicate that zero-tannin faba bean may be included in late nursery diets up to a level of 40% without detrimental effects on weaned pig performance," Nyachoti says. "In growing-finishing pigs, zero tannin faba beans can fully or partially replace locally-grown pea or imported soybean meal as a dietary supplemental protein source without negative effects on growth performance, carcass characteristics and pork quality."

Conclusions

"For any feed ingredient, it is important to understand its contents of nutrients, in particular the digestible/available content. Only then is precise diet formulation possible," Nyachoti stresses. North American nutritionists continue to use the DE and ME system to formulate their rations, but these energy systems are not appropriate in describing the available energy, especially in alternative ingredients with high protein and fibre. "Future research should focus on establishing NE values for most of the ingredients available in Western Canada," Nyachoti concludes. "The University of Manitoba has installed an indirect calorimeter which will be pivotal in not only determining the net energy of ingredients available in Western Canada but also in understanding energy metabolism in swine."

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Novel tools for selection – The future of swine genetics

Compared to the pigs of 1970, contemporary pigs perform at levels that were not really imaginable back then. Pigs now produce many more piglets, grow faster, convert feed much more efficiently, and also have carcasses more superior to those from pigs of the early 70s. While part of these improvements could be attributable to advancing knowledge in management and feeding, genetic selection has been instrumental, says Patrick Charagu, of Hypor Inc. The art and science of animal breeding and selection itself continues to evolve, from the traditional farmer's eye to the current use of complex statistical models and computers, on to gene markers and currently, on the threshold of using genomic genetic values. These new technologies promise to speed up genetic progress dramatically, says Charagu, bringing not only huge benefits for producers, but leading to a shakeout in the swine breeding industry, because only large and specialized companies will be able to exploit this advantage. He looks at the background to today's pig breeding techniques and describes the new technology that could revolutionize swine genetics.

Past to present

The oldest practice of animal selection was based on single trait selection. Even when more than one trait was to be selected for, the approach was still the same where each trait was considered individually, such that those individuals qualifying for one trait are then considered for the next trait. This is referred to as truncation selection and it is essentially the precursor to the selection index.

In pigs, and indeed all livestock species, all contemporary genetic improvement programs are based on the BLUP-based selection index. This entails assessing the breeding value of individual animals for as many different traits of economic importance as possible at the same time. In the index each trait is given a weighting, referred to as economic weight, based on its influence on the final economic outcome. The most important thing with this is that the underlying genetic relationships (correlations) between the different traits are taken into account. This is one of the strengths of the selection index.

The use of Animal Model BLUP has the underlying assumption that every continuous (quantitative) trait is determined or coded for by many genes. This is referred to as the infinitesimal model. The science of BLUP hinges on mathematical and statistical calculations with that underlying assumption, meaning geneticists have no idea which genes are important for a trait. The only thing we are sure of is that every continuous trait has a genetic determination and that there are many genes involved. This model has been working very well as evidenced by the ability to improve even those traits of low heritability, such as litter size.

Thus quantitative geneticists work genes in a black box, metaphorically speaking. Hence the move, as technology and knowledge advanced, to try and shed light into that black box. The earlier attempts in working directly with DNA were to discover single genes that coded for given traits (gene discovery). It was this that led to the use of single gene diagnostic tests, such as for the stress susceptibility (Halothane) gene, in the 1990's. This gene was "discovered" because by then a good candidate gene was available from human studies and the trait was already known to be attributable to a single gene. Later, other single gene tests were developed, among them the RN gene - on pale soft and exudative (PSE) meat, and IGF2 gene – on muscle and fat deposition.

Gene discovery, however, is only useful for traits that are coded for by single genes and is of limited practical importance in the improvement of most performance traits. That old underlying assumption that most production traits are determined by very many genes has been proven to be accurate. In fact we can now confirm this assumption with the newest genotyping tools available. At Hypor we have analyzed some of our genetic lines with a DNA chip that contains the sequences of 60,000 well distributed SNP markers. The results show that there are numerous SNPs that can be associated with most of the traits of interest and that none of these SNPs alone explains a large share of the variance of the trait. It is therefore not surprising that, with the few exceptions mentioned above, single gene markers at best have limited usability in swine breeding programs.

SNPs and high throughput genotyping

SNPs, an abbreviation for Single Nucleotide Polymorphisms, are genetic markers based on single point

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mutations: A SNP is a location on a chromosome where a single DNA base (A, C, G or T) can be found in different variants in different homologous chromosomes. The genome of the pig has millions of such SNP locations. SNPs are therefore a rich resource for use as genetic markers. Alternatively a SNP may merely be located close to, and inherited together with, another DNA sequence (gene) that is responsible for a difference in performance (functional genetic variant). In both cases the SNP variants (different DNA bases) are reflecting differences in the performances we observe or measure in individual pigs - functional genetic variation. Since there are so many SNPs one can then hope that a very large proportion of all genetic variability may, in one way or another, be captured by the SNPs.

Over the past several years new technologies have been developed that are particularly suitable for testing large numbers of SNPs in very dense formats, so-called high throughput genotyping technologies. Thousands and indeed up to a million SNPs can be analyzed in a single DNA sample by a single lab procedure. And, what is even more important, the cost of high throughput genotyping using so called DNA chips has come down to a fraction of a cent per SNP. Today it is possible to obtain the genotype of an animal for 60,000 SNPs at a cost of around 150 dollars.

Genome Wide Selection

Genome Wide Marker Assisted Selection (GWMAS) is a concept that hypothesizes that if one had sufficient genetic markers to cover the entire genome (all DNA) of the breeding animal, it should be possible to explain all genetic variation for a trait (and indeed for all measured traits) by the variability of those genetic markers. In 2001, when this hypothesis was put forth by Goddard and Meuwissen, it was impossible to prove since we did not have sufficient genetic markers or the technology to screen individual animals for so many markers at affordable cost. Today we have both for a few livestock species including the pig.

Thus, the perspective of GWMAS in breeding programs is that it provides a - more or less affordable - tool to accurately estimate the breeding value of an animal for any trait at any age. If the accuracy of such a SNP based breeding value is higher than the accuracy of the BLUP breeding value that we have today at a given age of the candidate breeder, we can use this to increase genetic progress in the swine breeding programs. Such improvements may well be very significant for some traits, since the accuracy of the currently available BLUP breeding value at the time of selection is well under 50%. If this can be increased to 70% by using a SNP based breeding value, genetic progress for such traits can be improved by 20/50 = 40%. Such improvements of genetic progress have not been seen since the introduction of BLUP in the 1980s and 90s.

Moreover, GWMAS offers the opportunity to much more easily select for traits that are too costly or impractical to measure. All one needs to do is estimate the effects of all available SNPs on the trait in a reference population where one has made a single effort to measure such traits. The SNP estimates can then be used in breeding populations where these traits do not need to be measured at all.

The future

Evidence in several species is showing that the high hopes for the effectiveness of GWMAS are coming true. Indeed we have shown in poultry that we can estimate the breeding values of animals with as few as 20,000 SNPs to an accuracy of more than 80%. Huge investments by dairy cattle breeding companies worldwide show their belief in this new breeding technology.

Our results in Hypor pigs are convincing us that we can significantly increase genetic progress in the Hypor programs by the use of this novel technology. We expect to select our breeding candidates in the future using this new method.

How will this revolutionary development affect the future of swine breeding? First of all, the rate of genetic improvement will increase for all traits where traditional - BLUP based - accuracies of breeding values used in current programs are lower than what can be achieved with SNP based breeding values. This applies to almost all traits except the ones that can be easily measured on the selection candidates themselves before the time of selection (weight gain, feed intake, back fat thickness), i.e. all reproduction and carcass quality traits. Furthermore, many more complicated traits can be added to the selection program once these have been assessed in an appropriate reference population, i.e. many quality traits, disease resistance traits, etc.

So genetic progress will be increased, but it will be at a cost. After all, the cost of genotyping and additional phenotyping is high. Besides, the expertise of the "breeding team" and its support group will need to be much higher than in the past. Undoubtedly, this technological development will therefore cause an(other) shake out in the swine breeding industry since only large and specialized companies will be able to exploit this advantage.

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Hog price insurance closer to reality for Alberta producers

By Marvin Salomons

Hog producers in Alberta have seen their counterparts in the cattle business get a new tool for their risk management toolbox. In September 2009, Alberta launched a Cattle Price Insurance Program (commonly referred to as CPIP) for the cattle feeding industry. The new price insurance product, sold and administered by AFSC, allows cattle feeders to insure against unexpected low prices for their fed cattle. Launched in September 2009, CPIP has seen good uptake by the Alberta cattle feeding industry.

Price insurance for the pork industry is not a new phenomenon. Alberta Pork studied the feasibility of a hog price insurance concept over three years ago where a commissioned report recommended it had merit and was worth pursuing. With some obstacles to overcome, Alberta producers, industry and government built on the 2006 report and are currently working towards emulating the Alberta's cattle industry price insurance success.

Alberta Pork, in partnership with Alberta Agriculture and Rural Development, set out to undertake a pre-feasibility examination of a Hog Price Insurance Program (HPIP). In December 2009, Gibson Capital of Calgary was contracted to do a limited study to see whether the CPIP concept could be applied to Alberta market hogs. Gibson Capital, no stranger to price insurance, had worked on various risk management concepts over the past several years. The company was the logical choice as they had put together CPIP and was in the midst of developing the companion product for yearlings. For HPIP, Gibson Capital set out to examine several key components of a potential price insurance model: the basic policy design, establish what forward prices and coverage levels would look like, and show what settlement prices and indicative premiums could be in a typical market scenario.

The HPIP Concept

Nothing more than a concept at this stage, a proposed HPIP is simply a market-oriented risk management tool that could provide producers with a convenient and cost-effective means of managing price risk. HPIP would not change the way hog producers market hogs. Producers would continue to market their pigs to the processor of choice. It is also important to know that HPIP is not a price support program like those producers have seen in many past programs. Producers will simply buy insurance on a certain amount / weight of hogs. Coverage levels and premiums paid for that designated market price are market driven and change from day to day – sometimes significantly. To gain more understanding producers are encouraged to look at the CPIP on the "risk management" drop-down menu on the AFSC website (http://www.afsc.ca/). The current live "on-line" workings of CPIP can be compared to how HPIP may operate.

The guiding principle behind developing the HPIP concept was to keep it SIMPLE. Also HPIP had to:

- be a voluntary program,
- reflect the Alberta price in settlements paid,
- be timely and transparent,

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- be flexible, allowing producers to match coverage levels to business operations and allow them to insure any portion of production,
- be offered at the lowest possible cost to producers.

HPIP - How will it work?

It is proposed that HPIP will be packaged as an insurance product. Simply put, producers will select a hog market price on a future date for which they can purchase insurance against. The insurance coverage only provides coverage against a decline in that price. It does not cover other perils such as mortality, disease, etc. and does not affect current contracts with marketing agencies such as the Western Hog Exchange or with pork processors. Producers will be able to insure all (100%) or a portion of their production (such as 20%). In an insurance product there are no margin calls and the "up-side" on price remains open. If the price is higher upon delivery the producer still pays the premium upfront but benefits from the higher market price. If the settlement price falls below the coverage level, a payout is automatic regardless what causes the drop.

In developing the prototype Gibson Capital recommended policies be up to one year in length, be offered year-round, coverage increments be set at $2.00 per 100kg, and the range of coverage be up to 100% of the expected forward price. The settlement price for hogs would reflect Alberta hog pricing. Gibson Capital worked with the WHE to input past price data and arrive at a scenario of what premiums might look like on a certain day. Basing the settlement price on (1) Iowa / southern Minnesota hog prices, (2) accounting for currency exchange and (3) adjusted for yield, metric conversion, etc, the estimated example insurance premiums producers would pay appear to be very reasonable. Producers indicated that settlements based on monthly average forward pricing is likely the best starting point in developing this program.

Premiums would be set daily and also vary according to coverage levels, days or expiration, and market volatility. It is anticipated that over time premiums and payouts will balance out. This market hog model is the first product to be assessed and hopefully developed. A Government-Industry Steering Committee is working towards implementing the HPIP and it is hoped it can be offered through similar partners as is with CPIP. If successful it may open the door to companion products such as price insurance for feeder pigs or even perhaps a feeding margin insurance program. ≡WHJ≡

Euthanasia - When, where and how?

By Jeff Hill, Alberta Agriculture and Rural Development

In the winter issue of WHJ, Jeff Hill described the situations where euthanasia is required and some of the most common methods of carrying it out. In this continuation of his article, first presented at the 2009 Red Deer Swine Technology Workshop, he looks at some other methods for euthanasia including the use of carbon dioxide, electrocution and firearms.

Carbon Dioxide (CO_2)

The use of carbon dioxide (CO_2) for euthanasia is a controversial issue, as exposure to CO_2 has profound physiological effects on a multitude of systems within the body; including respiratory, nervous, endocrine and cardiovascular. Carbon dioxide has been demonstrated as an aversive gas that can induce breathlessness and avoidance behaviors in swine. However inhalation of CO_2 at levels of 30-40 percent induces inhibition of the nervous system and anesthetic effects on the body that minimize the negative impact to the animal.

During CO_2 exposure, the body proceeds through a progressive loss of consciousness, anesthesia and ultimately death. The time of exposure and concentration level of CO_2 determine its effectiveness as a euthanasia procedure. There are currently two primary CO_2 techniques used in the livestock industries: high-level pre-charge and gradual fill systems. Each technique must be designed and managed properly to ensure a humane death and minimize stress to the animal.

It is recommended that for on-farm euthanasia the animal be exposed to the target level of greater than 80 percent for at least 5 minutes, and all animals evaluated for indicators of death upon removal from the euthanasia container. However, the use of CO_2 euthanasia for newborns requires specialized systems with increased exposure levels and times.

Pre-charged systems

Pre-charged systems use a container in which a high level of CO_2 (greater than 80 percent) is injected prior to the animal being placed in the container. The animal should be fully immersed within the gas as quickly as possible, in order to minimize the opportunity for aversive reaction to the gas prior to the animal losing consciousness. The CO_2 must then be maintained at the target level until the animal is confirmed dead.

Gradual fill systems

Gradual fill systems use a low level injection rate of CO_2 gas to slowly replace the atmospheric air in which the animal resides. Current recommendations by the AVMA are that approximately 20 percent of the volume be replaced per minute until 80 percent of the container volume is reached to which the animal should be immersed until death is confirmed. Based on the concept of gas exchange it will require approximately 9 minutes to obtain the target level of CO_2 at a 20% exchange rate. Higher rates of injection can lead to animal distress from gas noise, significant drop in temperature within the container and problems with freeze-up of gas regulators and valves.

The designs of the primary components (gas delivery and animal container) of any CO_2 system are critical to success and for ensuring the safety of the operator. Primary design factors include:

- Handling systems, if at all possible, should allow animals to be euthanized in groups as this reduces the stress of isolation.
- The container must not be overloaded with animals as all animals must be provided adequate space to stand and lie down. It is unacceptable to pile animals into the container as this will jeopardize their welfare and may cause animals to die of suffocation.
- The euthanasia container should be designed to minimize the level of stress to the animal by accommodating their basic behavioral and physical attributes.

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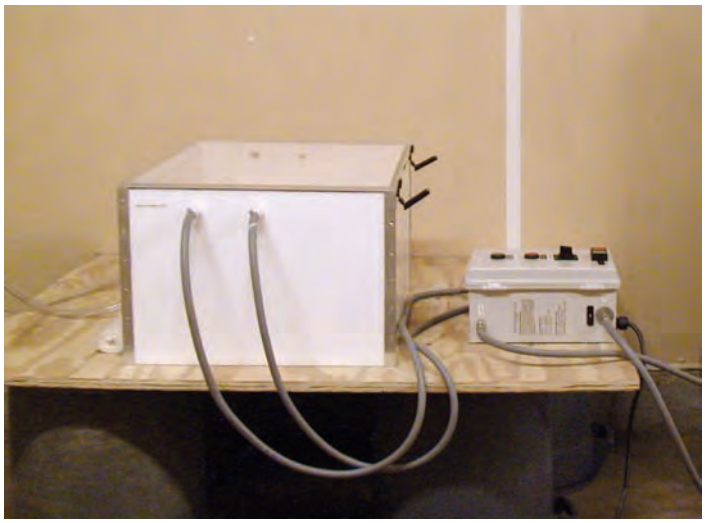

The Euthanex gradual fill CO_2 system

- As CO_2 is heavier than air and will stratify within the euthanasia container, a multiple port injection system should be used to ensure even levels of CO_2 within the container.
- Gas flow rates must be regulated and monitored to ensure proper flow. At best, uncontrolled and unregulated CO_2 systems are an efficient killing method, but are not an acceptable form of euthanasia.
- Exhaust valves must be designed to avoid pressurizing the system during gas injection.
- The system should be routinely assessed for gas flow parameters, and if possible equipped with a CO_2 monitor or at minimum an alarm that indicates an unacceptably low CO_2 level within the container.

Continued utilization by the industry of unregulated, poorly designed, home built CO_2 euthanasia systems will ultimately result in CO_2 being delisted as an approved method of euthanasia.

Inert gases

Inert gas exposure (argon, nitrogen, etc.) does not induce signs of respiratory distress prior to the loss of consciousness as indicated with CO_2. However, time to loss of consciousness and death is significantly longer than for CO_2 systems. Due to the aversiveness of CO_2, differing inert gases and CO_2/inert gas combinations at differing concentrations, exposure levels and times are being developed for the euthanasia of livestock.

Controlled system electrocution

Electrocution causes euthanasia when adequate current passes through the brain to induce a grand mal seizure and fibrillation of the heart which leads to cardiac arrest and ultimately death. The animal is either euthanized by an initial passage of current through the brain followed by the redirection of current through the heart of the unconscious animal or through simultaneous induction of unconsciousness and cardiac fibrillation leading to death.

The critical factor in ensuring a humane death is the amount of current delivered through the pig, which is determined by the voltage and total resistance in the pathway. Primary determinant factors include the physiological state of the animal (i.e. dehydration), distance between electrodes (i.e. size of animal), phase of respiration during application, design of the electrodes, applied pressure, proper placement of the electrodes, etc.

There are a multitude of combinations of voltage, current, frequency, length of application and method of application that have been used successfully as a euthanasia technique. However, the selection of these factors should be based on scientific evidence and verified in commercial conditions.

In order for electrocution to be considered humane, it must be performed with appropriate equipment. There are 4 basic models of electrical systems currently available in North America:

- ***Fixed Wall Voltage output:*** This stunner uses a standard 110VAC wall outlet wired directly to prods attached to the animal. This method provides no means of adjustment or compensation for animal size, percent lean, hair type, environmental conditions, etc. As such this system is NOT acceptable for on farm euthanasia since it is impossible to ensure the necessary current flow through the animal and provides NO control of electrical

parameters (i.e. frequency, wave function, etc) to ensure a humane death to the animal.

- ***User fixed voltage output:*** This unit outputs a user fixed voltage, therefore based on Ohm's law the current applied will vary based on the individual animal and environmental conditions. Leaner animals will get less current, wet animals more, etc.
- ***Passive fixed current:*** These units have a circuit that limits current deviation to +/- 10% of a series (3-4) of fixed current settings. These current settings have been developed to accommodate different size animals and environmental conditions.
- ***Active fixed current:*** These units monitor the voltage and current flowing through the system and adjust parameters throughout the euthanasia process to maintain the target setpoints, thereby ensuring a humane death regardless of conditions.

Ever-increasing concern for animal welfare, aesthetics and human safety has fostered the development and availability of a multitude of commercial electrical systems. However many of the electrical controller units designed for stunning in the processing facility cannot provide adequate current nor operate for the extended cycle periods required to ensure a humane death, especially with large, mature cull animals. Therefore ONLY electrical systems designed for on-farm euthanasia should be utilized.

Firearms

In North America, gunshot is still the most popular method of euthanasia on livestock facilities. However the use of firearms requires extensive training (including firearms, ballistics, anatomy, animal behavior, regulations, safety and first aid), has many legal restrictions, poses significant risk to human safety, and creates potential impacts to normal business operations (i.e. loss of insurance protection, inability to use restricted employees, etc).

Gunshot euthanizes by mass destruction of the brain, with the degree of brain damage inflicted by the bullet dependent upon the firearm, nature of the bullet (or shotshell) and accuracy of the shot.

Table 1: Average muzzle energies for common shotguns

Bore	Muzzle Velocity (ft/sec)	Muzzle Energy (ft lbs)
12 bore	1424	2084
16 bore	1381	1717
20 bore	1381	1503
28 bore	1348	996
0.41	1328	544

(HSA, 2005)

Shotgun

Shotguns are very effective for euthanasia of pigs and are best used at a distance less than 6 feet. Shotshells are recommended at very close range, with slugs recommended as distance to the target increases. Shotshells are not recommended at longer distances as the shot begins to disperse immediately upon exiting the barrel thereby lessening the destruction force and impact damage as the distance to the animal increases.

The 20, 16 and 12 gauge can be used on all weight classes of swine whereas the smaller 28 and .410 gauge shotguns should only be used on small immature piglets.

Rifles

Due to the physiological changes that occur as a pig matures (i.e. brain depth, development of sinus cavity, skull hardness, etc.) there is a considerable range in the firearm requirements and cartridge selection necessary to ensure a humane death.

The Humane Slaughter Association (2005) has a minimum recommendation of 148 ft lbs muzzle energy for short distance euthanasia of pigs, whereas the USDA has outlined two categories of minimum muzzle energies based on livestock weight. USDA recommends a minimum of 300 ft lbs of muzzle energy delivered to the target for firearms used in the euthanasia of livestock up to 400 lbs, and 1000 ft lbs of muzzle energy for animals greater than 400 pounds (Table 2).

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Table 2: Average muzzle energies for common rifles

Cartridge	Muzzle energy (ft/ lbs)	Muzzle energy at 275 yards (ft/lbs)
.357 Magnum	1175	337
.223 Remington	1296	574
30-30 Winchester	1902	651
0.308	2648	1193
30-06 Springfield	2841	1455

(USDA, 2004)

However, it has been demonstrated that 75 ft lbs of muzzle energy is acceptable for the euthanasia of isowean piglets (Whiting et al, 2010), and that utilizing the HSA and USDA minimum standards may result in high levels of pass through creating an unacceptable human safety risk.

While the .22 caliber long rifle is one of the most popular firearms on farms today, with average muzzle energy of only approximately 100 ft lbs, these do not meet the recommended minimum muzzle energies for euthanasia of swine, except for small immature piglets.

Handguns

Handguns can be used for close range euthanasia (2 – 10 inches) of young lightweight swine, provided an appropriate handgun and ammunition combination is utilized that delivers the minimum energy requirements. However, as handguns are considerably more difficult to target properly and are coming under ever increasing legal restrictions, their use as a method of euthanasia has decreased significantly in recent times.

Animal welfare assurance

It is the responsibility of all involved in the euthanasia of animals that applicable equipment is selected, staff is properly trained and expectations for the humane treatment of animals is understood. However every system should be assessed utilizing a standard audit program or third party verification process.

Conclusions

All of those involved in the swine industry share a moral obligation to protect the welfare of the animals under their care. This obligation extends far beyond providing basic care (feed, water, etc) during the production cycle to ensuring no animal suffers unnecessary pain and distress, even in death. This can be done by developing a progressive euthanasia program, utilizing only systems designed for the euthanasia of animals on the farm and verifying performance through a standard assessment program. ≡WHJ≡

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 diseases[3] 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 accumulate[4]. 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).[3]

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 says[5]. "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.

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Elanco Pulmotil

Group sow housing system does not determine success

The success of group housing for sows is not determined by the type of system used, but is mainly related to the quality of management, say researchers from Wageningen University and Research Centre in the Netherlands.

"The type of system of group housing does not determine the success of group housing for sows from four days post-insemination, because no effect could be seen of group housing during gestation on reproduction, welfare and condition parameters," says their report.

The issue of group housing for sows is extremely important for EU pig producers because from 2013 the use of conventional sow stalls will be forbidden by law. For that reason alternative housing systems have to be implemented and ways have to be found to make these successful.

Researchers at the university, together with a task force from the Dutch pig industry, and supported by the Dutch Ministry of Agriculture carried out research into what creates success, starting out by conducting a telephone interview with 900 producers.

The last phase of the research included on-site observation of 70 pig farms, in 2008, that had already made the switch to group housing for sows. The farms were different in size and used a variety of sow housing systems, from floor feeding to free access stalls and electronic sow feeding.

The following factors were found to be important in making group housing a success:

Management

- Producers with good work organization, for example having a clear work plan and achieving good implementation had a higher farrowing rate, more piglets weaned per sow, fewer foot problems in sows and better sow condition.
- Farms with animal-directed management – good attention to the needs of the individual animal - have fewer skin lesions and foot problems and improved sow reproduction.

Rearing gilts

- On farms with more living area for gilts, the removal rate of cycle 1+2 sows was lower and sows had fewer skin lesions during gestation.

Management influences the success of group housing for sows, not the type of system, say Dutch researchers

- Farms that limit feed gilts and/or give them dry feed had a higher farrowing rate, a lower removal rate and a higher number of weaned piglets.
- Familiarizing gilts with the feeding system during gestation (particularly familiarization prior to service) was positively related to reproduction and condition of the sows.

Gestation

- Too low a feed intake during early gestation can negatively affect reproduction results. Also, sows on farms with a lower feed ration during the entire gestation had a worse condition at entry to the farrowing crate.
- On farms with more living area per sow, the farrowing rate was higher and the removal rate of cycle 1+2 sows lower. Provision of more living area may result in higher profit.
- Using straw can positively affect welfare, because it can reduce foot problems in situations where aggression occurs. Straw also offers animals the possibility of exerting explorative behaviour, which prevents the development of stereotypic behaviour.
- On farms using feeding stalls with an indoor exercise area, those with a wider indoor exercise area had a higher farrowing rate, lower sow removal rate and better sow condition when placed in the farrowing crate. Farms where sows are locked up during feeding had a higher farrowing rate in parity 1 and fewer claw problems.
- In designing housing with electronic feeding stations, sows that have already eaten should not be able to go immediately back to the entrance of the feeding station. Farms where this is possible had more skin lesions in sows. For farms that use straw, farrowing rate was improved when straw was renewed more than once a year. It was also shown that farms with wider and/or deeper bedded areas experienced fewer foot problems in sows.

WHJ

Benchmarking identifies opportunities

By Dr. Tom Riek

Today's hog industry has a great reputation for benchmarking production performance, and while great production numbers like pigs weaned per sow per year or days to market are good for bragging rights, they don't necessarily reflect profitability. Effective financial benchmarking can help improve profitability by identifying opportunities for lowering costs or improving returns. For best results, producers should compare both production and financial performance against peer groups or industry leaders.

By the book numbers

Financial benchmarking evaluates the cost of production, addressing the question "at what cost am I achieving production numbers?" and "How do I compare to other producers?" Cost of production – the investment required to produce the end unit – has a direct impact on the profitability of an operation making benchmarking an important process for ongoing improvements.

There are many aspects within a hog operation that can be measured to evaluate and determine financial benchmarks. Some common benchmarks are cost per kilogram of gain, carcass value of a finished hog, the salvage value of mature animals (impacts replacement costs of gilts or boars), feed and genetic costs.

By the barn numbers

Production benchmarking is more common than financial benchmarking, and it's important to consider both for a complete assessment of your operation. Traditional production parameters include things like pigs weaned per sow per year, pigs weaned per litter, average daily gain, mortality and pigs sold per sow per year. Other non-traditional benchmarks such as feed usage (kilograms of feed used per sow per year), caloric conversion (calories of feed used to wean a hog), labour utilization (piglets or finished hogs weaned/produced per worker per year), and facility utilization (weaned or finished hogs per farrowing crate or pen) can also be considered.

Dr. Tom Riek, Health Assurance and Multiplication Manager, PIC Canada

Evaluating production and financial performance and comparing to industry benchmarks is a good management practice, but can be a very daunting task. Approach benchmarking as an audit of your operation and consider all aspects from housing to accounting. Make a list of the areas you would most like to improve – both financial and production areas. And remember the end goal is producing pigs as efficiently as possible for increased profitability – financial numbers tend to improve along with production. Approach experts – ask professionals like accountants, nutritionists, genetics suppliers or production specialists for information and benchmarking equations. Once you have determined the benchmarks for your operation, compare the results with other operations to determine how competitive you are in the industry. Benchmarking studies are often published and are a good resource for comparing; producer groups and neighbours are also a good source to consult and discuss benchmark results, but be sure you are using the same measurements – compare apples to apples.

Applying the results

Benchmarking identifies opportunities within a hog operation for lowering costs and improving efficiencies. A recent benchmarking study in North America identified the top four opportunities for increased profitability among participants as percent market culls (the percentage of animals that don't reach full value market), nursery and finishing mortality, pre-weaning mortality and finishing feed cost. Combining production and financial information, these parameters have been identified in herds across Canada and the US as key profit opportunities; make sure they are considerations in your benchmarking and develop an action plan for improvements.

You need to know the strengths and weaknesses within your operation. Benchmarking helps properly understand your operation's strengths and where to allocate efforts for improvement. Begin financial and production benchmarking as an evaluation exercise, enlist a team to assist you and compare your results with other producers and operations. The benchmarking process is best measured and evaluated on an on-going basis as part of a continuous improvement process toward increased profitability.

Dr. Tom Riek is the Health Assurance and Multiplication Manager for PIC Canada.

WHJ

Encapsulated Zinc oxide benefits pigs and the environment

Australia's Pork Cooperative Research Centre (CRC) has found a positive link between feeding encapsulated Zinc oxide and reducing post-weaning diarrhoea (PWD) in piglets.

The results showed the encapsulated product enabled the effective level of Zinc oxide to be reduced 30 fold, offering substantial environmental advantages to Australian pork producers.

To minimize post-weaning growth lag and potential effects of enterotoxigenic E. coli (ETEC), weaner piglets are often treated with high concentrations (3kg/tonne) of Zinc oxide.

Using pharmaceutical levels of Zinc oxide in weaner pig diets is widely accepted as a control measure, due to its proven effects on performance and PWD and its cost-effectiveness, compared to other feed additives and dietary strategies.

However, this option is not a viable long-term solution to the problem of PWD, according to Pork CRC supported researcher Dr Jae Kim of the Department of Agriculture and Food Western Australia (DAFWA). "There's concern at the possible toxic effect on the environment of faeces containing high Zinc concentrations," he said.

The final report of Pork CRC Project 2C-114, prepared by Dr Kim, DAFWA colleague Dr Bruce Mullan and Dr Christian Hansen and Professor John Pluske, both of Murdoch University, states that PWD is a major problem in commercial units and is associated with increased morbidity and mortality and high treatment costs.

Gut health of weaned piglets is known to be influenced by many factors, including nutritional, physiological and psychological stressors, immune functions, hygienic conditions, intestinal barrier functions and diet composition. Importantly, growth check associated with PWD decreases lifetime pig performance.

Despite numerous dietary and management strategies introduced and implemented by research groups around the world, poor gut health of pigs after weaning is still a concern as it compromises their potential growth.

Feeding encapsulated Zinc oxide reduces diarrhoea in newly weaned pigs while reducing environmental impact

Some studies have reported no benefit from feeding Zinc oxide, whereas others concluded that while it was an effective treatment for PWD there were no definite answers as to how excess dietary Zinc oxide exerted its effects.

Dr Kim said that despite ambiguity around the exact mode of action of Zinc oxide, it was likely it would continue to be used and studied because it was a cost-effective nutritional tool.

"However, the high level of Zinc excreted in the faeces is an environmental concern and in Europe high levels of Zinc oxide can now only be used under veterinary prescription. It's possible a similar ruling may apply in Australia at some stage."

Recently, a microencapsulated, lipid-coated Zinc oxide product was released on the market with claims it dramatically decreases inclusion of Zinc oxide (from 2500-3000 ppm to 100 ppm) to achieve the same effect on PWD.

Studies by Pork CRC researchers showed inclusion of 100 ppm microencapsulated Zinc oxide suppressed the expression of PWD in ETEC challenged and non-challenged pigs and kept the plasma and faecal Zinc levels to the same levels found in pigs fed a control diet without supplemental Zinc oxide.

Results from the Pork CRC research suggest expression of PWD can be reduced by supplementing 100 ppm microencapsulated Zinc oxide in the diets for weaner pigs, without compromising fecal Zinc excretion levels. "Therefore, the microencapsulated Zinc oxide was evaluated as a solution for the environmental issue as well as controlling PWD," Dr Kim said.

A large-scale commercial validation study is still required to confirm the current findings, however, if confirmed, these findings could prove to be of significant use and benefit to commercial production operations across Australia. ≡WHJ≡

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Pfizer Animal Health

Feeding wheat distiller's dried grain with solubles to weaned pigs

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Take Home Messages

Increasing cost of feed grains and an ample supply of bio-fuel co-products is changing the landscape for feeding pigs in the Prairies. Producers are now encouraged to include co-products in swine diets. Wheat distiller's dried grain with solubles (DDGS) is a co-product of the ethanol industry for the production of blended gasoline. It can be a cost-effective source of protein in swine feeds replacing imported soybean meal with a locally-produced co-product. We evaluated feeding increasing levels of wheat DDGS (0, 5, 10, 15 or 20%) to weaned pigs for 28 days. Growth performance was not affected by 10% inclusion of wheat DDGS, but 15% reduced weight gain by 3.5%, and reduced feed cost per kilo gained by 11%. Increasing wheat DDGS inclusion to 20% caused body weight to plummet drastically (7%) by the end of trial. Thus, weaned pigs should not be fed more than 15% wheat DDGS of good quality.

Why wheat DDGS?

Bio-fuel production is increasing in western Canada, but lots of wheat grain is being diverted from animal feed to ethanol production. This trend is increasing feed grain prices, but also the availability of the main co-product of ethanol production for blended gasoline. Wheat distiller's dried grain with solubles (DDGS) has a higher protein, fat and fibre content than wheat grain because the starch is fermented to ethanol. Thus wheat DDGS is comparable to canola meal in protein content, but its price can be less than half of that of soybean meal. The nutritional attributes of wheat DDGS as a protein feedstuff in livestock feeding might help to reduce feed costs, the largest single cost of swine production.

Initial results of feeding wheat DDGS to pigs were not positive in Canada. Previous studies found that the growth performance of growing-finishing pigs fed 10% or more wheat DDGS was reduced even when diets were properly formulated. However, wheat DDGS used for previous studies had been overheated during drying, resulting in protein damage evident by a dark colour. Modern ethanol processing plants have novel fermentation and drying technologies producing wheat DDGS of better quality and light colour. Therefore, inclusion of wheat DDGS in pig diets needs to be re-evaluated, so that up-to-date information can be made available to producers to increase their profitability.

Nutrient profile of wheat DDGS

The wheat DDGS used in our weaned pig trial was sourced from Terra Grain Fuels, near Belle Plaine, SK. The sample contained 42.5% crude protein, 5.1% fat, 6.6% crude fibre, 1.1% lysine, 0.89% available lysine, 1.2% threonine, 0.65% methionine, and 1.0% phosphorus.

The weaned pig trial

The weaned pig trial was conducted to evaluate the effects of feeding increasing levels of wheat DDGS (0, 5, 10, 15 or 20%) on growth performance and diet digestibility. The trial was carried out at the piggery of the University of Alberta, the Swine Research and Technology Centre in Edmonton.

The diets fed were formulated to provide 2.4 Mcal/kg net energy (NE) and 4.8 g standardized ileal digestible lysine per Mcal NE. Increasing wheat DDGS level progressively replaced the soybean meal in the diets. In total, 240 weaned pigs of 6.2 ± 1.2 kg in initial weight housed in 60 pens of 4 pigs each had free access to an assigned pellet diet for 4 weeks. Individual pig body weight and pen feed disappearance were measured weekly.

Feeding nursery pigs a diet with up to 15% wheat DDGS is cost effective but 20% DDGS results in reduced feed intake and weight gain.

Trial results

For the 28 day trial, daily weight gain was curvilinearly reduced by increasing wheat DDGS inclusion level (Figure 1). This reduction in growth performance was caused by both a drop in daily feed intake and feed efficiency. Pigs maintained body weight at the 10% inclusion of wheat DDGS. The 15% inclusion caused a 2% drop in body weight, whereas increasing to 20% inclusion of wheat DDGS caused pig weights to plummet 7% by the end of the trial. Pigs fed 10, 15, and 20% wheat DDGS were 0.1, 0.4, and 5.5 kg lighter, respectively, than pigs fed diets without wheat DDGS by the end of the trial.

Because the diets were formulated to similar dietary energy content, the curvilinear drop in feed intake that resulted in poor pig performance with increasing wheat DDGS inclusion, might have been caused by taste and smell factors that affected diet palatability. Increasing dietary wheat DDGS inclusion level linearly decreased the total tract digestibility of crude protein, energy, and dry matter of the diets. So it may also be that increasing wheat DDGS inclusion also increased digesta passage rate in the gut lessening the opportunity for digestive secretions to act on the feed. However, the measured digestible energy content was not different among diets.

Cost vs. benefit

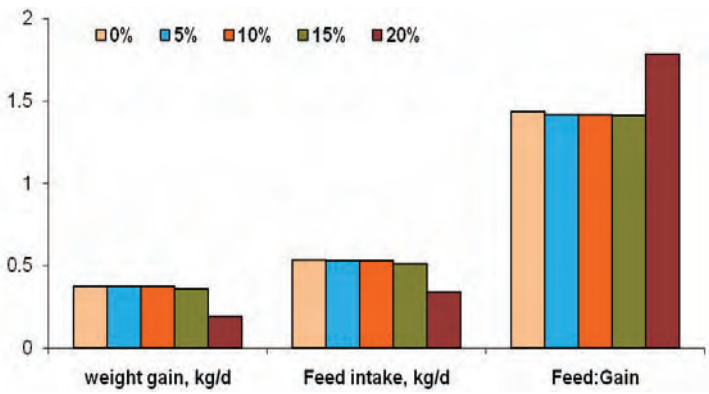
Assuming $150 wheat, $160 wheat DDGS, $350 soybean meal, and $2350 L-lysine, increasing wheat DDGS inclusion from 0 to 5, 10, 15, and 20%, reduced cost of feed by $4.60, $10.10, $14.60, and $19.60 per metric tonne, respectively. For 5, 10, and 15% inclusion, feed costs per unit of gain reduced by $0.65, $1.42, and $2.07 per kilo. However, due to reduced animal performance, increasing wheat DDGS to 20% actually increased feed costs per unit of gain. Therefore it did not pay to feed more than 15% wheat DDGS in the weaned pig diet.

Recommendation

Wheat DDGS is a local co-product of ethanol production and a potential source of supplemental protein in pig diets. Feeding 10% in the nursery diet as a replacement for imported soybean meal did not impact on growth performance of weaned pigs. However, feeding 15% wheat DDGS caused a marginal reduction in growth performance yet showed a continued economic advantage. Thus, weaned pigs should not be fed more than 15% wheat DDGS of good quality.

Acknowledgment: Funding from the Agricultural Bioproducts Innovation Program of Agriculture and Agri-Food Canada is acknowledged.

Figure 1: Performance of piglets fed different level of wheat DDGS diet



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Danes to combine pigs and tomatoes to reduce CO_2 emissions

Danish scientists and architects are developing plans for an environmentally friendly pig production complex combined with greenhouses for tomato production, which is to be near Aarhus in Jutland. The project is one of a number that came out of the Danish financial institution, Realdania's contest for agricultural buildings of the future.

The key objective is to reduce the CO_2 impact of pig production. "By integrating modern technologies it has been possible to create a vision for modern pig farming that not only minimizes environmental impact and improves animal welfare but also paves the way for a greater degree of decoupling pig farming from the agricultural landscape, thus liberating it for other purposes," says Nee Rentz-Petersen, an architect working on the project.

One of the pig farmers behind the idea is Søren Hansen who plans to create Denmark's most modern and energy-efficient food production complex by combining an annual production of around 20,000 finishers with 1,100 tonnes of tomatoes. "The idea is that the greenhouses will benefit from the heat generated from the pigs while the manure will be used as fertilizer. The end result is CO_2-neutral and odour-free pig production," he explains.

Pig production will be operated as a farrow-to-finish system. Animal welfare benefits include larger stalls, straw for sows during the period up to farrowing and a loose housing systems for sows. In addition, because the system also includes a processing plant, there will be minimal stress moving them to slaughter. The greenhouse side of the operation will benefit from lower energy costs for heating and lighting and negligible fertilizer costs.

An artist's impression of the pig production facility combined with greenhouses

A biogas and slurry separation plant will be designed to maximize their financial and environmental impact. The biogas plant will be supplied by slurry and other wastes from the pig production facility and any surplus energy will be used to heat the greenhouses. The purified liquid fraction from the separation plant will be used to water the tomato plants.

Søren Hansen expects construction to start in the near future. "We haven't got the financing in place yet, but we're in the process of drawing up a budget and getting approval from the authorities. If everything falls into place, we hope to get started on the building in the spring of 2010 so the first pigs can be ready in 2012."

Plans are for the facility to be open to the general public so that the many facets of food production can be viewed at close hand. There will also be a farm shop and learning centre.

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Select topics in farrowing room health

By Egan Brockhoff, DVM, Prairie Swine Health Services, Red Deer, Alberta and University of Calgary Faculty of Veterinary Medicine, Calgary, Alberta

Introduction

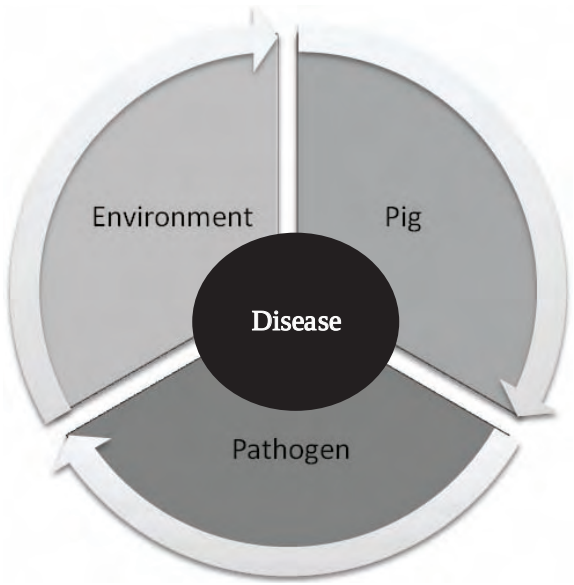
The farrowing room continues to play a pivotal role in the economic fitness and wellbeing of modern pig production. Our ability to influence the health and subsequent performance of both the neonatal piglet and the sow is a key component to fostering the future success of our production enterprises. Pre-weaning mortality continues to be a major cause of wastage in pig production.[1] Through the maintenance of sow and piglet health and by reducing the impact that pre-weaning mortality can have on your barns' performance, positive influences on pig flow and production can be achieved.

It is well accepted that disease of the piglet and sow can have profound effects on neonatal survival. That being said, the routine daily attention, attitude, diligence and training of farrowing room technicians and staff are the primary drivers of a successful versus unsuccessful control program for pre-weaning mortality. As always, good leadership and open communication can facilitate this outcome. As pork production and associated research continues to evolve world-wide, we keep expanding upon those known factors affecting pre-weaning mortality. The importance of birth weight is well established as the single largest predictor of survival in pigs.[2]

Moving forward, as we explore new horizons you will see more work coming forward on prenatal programming, neonatal porcine circovirus type 2, and the challenges of uterine capacity.

As an introduction I would like to speak about the importance of understanding the environment in which our pig production occurs. Like all environments that pigs or humans inhabit there are a few key principles to focus upon when disease occurrence increases to epidemic or high endemic levels. Veterinarians, like all medical professionals, commonly refer to the disease triad (Figure 1). In swine production this triad is composed of three parts; the pig, the pathogens (bacteria, fungi, parasites, virus), and the environment in which the pigs, barn workers, and pathogens interact. It is that junction where all three pieces of the triad crash into one another that disease expression occurs. Through the understanding and manipulation of this triad we can better position ourselves to prevent disease and thus reduce our reliance on antibiotics as a means to react to disease pressures.[3]

Figure 1: The disease triad



Environmental factors of the farrowing room

Sanitation and colostrum

Farrowing room sanitation is strongly correlated with neonatal pig disease. Enteric diseases such as bacterial scours and septicemic diseases leading to various end points are the common outcome of poor farrowing room hygiene. Sanitation is multi dimensional and describes not just the state of the pig's

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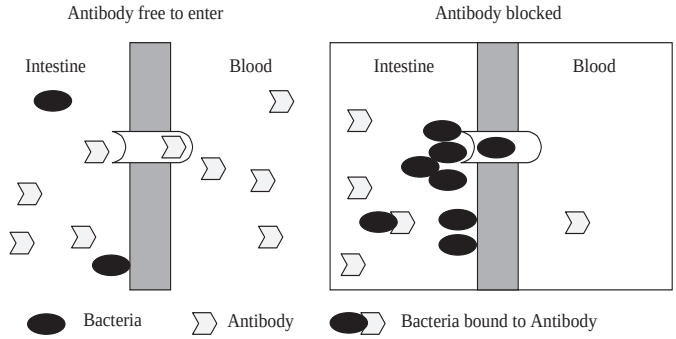
environment but also the cleanliness of your instruments, your boots, and your hands, to name a few. Poor farrowing room sanitation can also have an impact on the new born piglets' ability to absorb antibodies from the sow colostrum.

For sustained good health following birth it is essential that piglets consume adequate amounts of good quality colostrum. Veterinary literature suggests that six feedings should be sufficient to give adequate maternally derived protection.[1] Statistically there is no reported difference in the concentrations of plasma immunoglobulins (immune system agents) if feedings are increased to 12, 18 or 24. The small intestine is the site of immunoglobulin absorption from across the intestinal wall into the piglets' circulatory system. Following birth the small intestine is able to actively absorb immune system agents from the sows' colostrum for approximately 24 hours after first suckle. Absorption is more easily facilitated in the first 6 to 12 hours after birth.

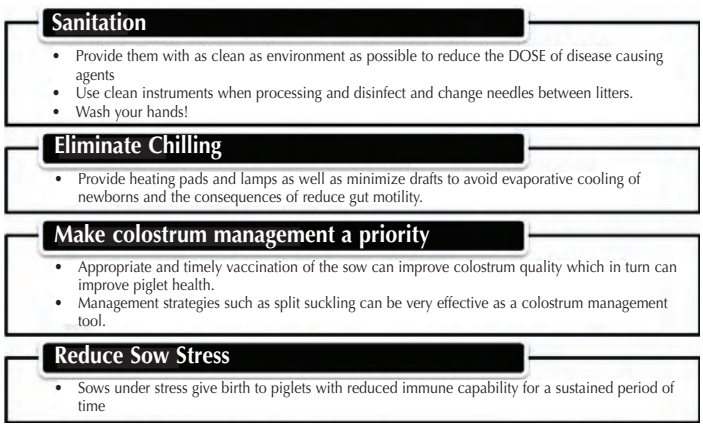
Figure 2: Gut bacteria interference on antibody absorption



Farrowing room hygiene can have strong negative influences on colostral antibody absorption. Upon a 1 square cm surface of the farrowing crate floor or side panel there can be tens of thousands of fecal bacteria such as Escherichia coli or Salmonella typhimurium. When piglets are born into a dirty and contaminated environment, such as immediately behind the sow, they have an increased chance of being exposed to large doses of potentially harmful bacteria. These bacteria that they ingest have the potential to cause trouble in two ways. Firstly, they can lead to disease directly, in the case of bacterial scours. Secondly, they also have the potential to reduce colostral antibody absorption by blocking the pathways across the gut wall into the circulatory system. This reduction in absorption leads to impaired piglet immunity and thus decreased resistance to disease (Figure 2).

Bacterial contamination of the newborn piglets' environment is unavoidable, but it can be reduced to levels that provide a better opportunity for them. The three main sources of contamination are feces from the sow, established biofilms in the farrowing environment that intermittently release disease causing agents and mechanical transfer from sow or human interactions plus that of house flies or pressure washing aerosolization when the room is not all in all out. Proper cleaning and sanitation of the farrowing

Figure 3: Improving piglet immune function



room prior to sow entry is critical. Daily cleaning of the farrowing crate prior to and during the birthing process helps reduce piglet exposure to unwanted risk. The control of biofilms through the proper use and application of detergents is the hallmark to preventing continuous contamination of the crate environment.

Temperature and contaminated colostrum

Farrowing room temperature plays an important role in piglet health and the health of the piglet's gut. Cool temperatures that lead to chilling of the piglet will slow the intestinal contractions and thus slow the transit time of ingesta through the gut before it is expelled. This increased transit time plays an important role in the effects seen in Figure 2. If, for instance, the piglet's gut is loaded with disease causing agents such as Clostridium perfringens, slowing down the transit time allows these bacteria greater time to cause disease within the pig's intestinal tract or body.

Piglet factors of the farrowing room

There are many factors that directly impact the piglet and consequentially pre-weaning mortality rates. As referenced earlier, low birth weight and later birth order are both cornerstones in maternally derived piglet immunoglobulin concentrations.[4] Questions often arise regarding the use of farrowing induction techniques and the consequences thereof. For many barns or large systems induction is an important management tool. However, it is important to remember that with every intervention there is often a corollary consequence. Gunvaldsen et al demonstrated that, regardless of parity, inducing sows led to piglets that were 575 g lighter on average by day 16 than those from non-induced sows and that the odds of a piglet being medically treated by lay staff was 2.0 X higher.[5] They concluded that knowing your herd's average gestation length and understanding the need for improved individual pig care was critical to ensuring that induction would not be a major limiting factor in good pig production.

There are always some key points to remember that will improve your piglets' immune function and ability to resist disease. With these points in mind you and/or your staff can work together to reduce the losses associated with pre-weaning mortality.

An area of increasing interest in understanding piglet health and performance is the area of prenatal programming. Beginning in the early 80's researchers began noting a strong relationship between muscle fibre size and later performance. Recently researchers such as Town and Harding have begun further exploring how the concept of prenatal programming can have long term effects on piglet performance as it is related to muscle development, health and immune function.[6]

Pathogen factors of the farrowing room

There is a multitude of various disease causing agents, be they bacteria or viruses that can impact the health of the new born pig. Traditionally we think of common agents such as certain types of Escherichia coli that can cause neonatal scours early on or edema disease later on. In recent times, experts such as Dr. Tanja Opriessnig have described non-traditional expression of disease such as neonatal porcine circovirus type 2. Regardless of the disease causing agent we can most often follow a very objective line of thought when dealing with our disease triad. Dr. Kent Schwartz from Iowa State University is one of the most recognized swine pathologists in the world. Many years ago he proposed a very simple yet very effective way to show how disease works in the individual or in populations. He did this using a very simple mathematical representation (Figure 4).

When we think of how we can influence this equation from the point of view of reducing the impact of the disease causing agent we must look at dose as we can have little direct impact on virulence. A common response that I receive when I ask the question "Do you use a disinfectant after cleaning" is "no I do not" or "no, I don't want to kill the good bacteria". Of course no one can ever name those good bacteria for me or if they happen to exist in our fecal challenged barns. However, there is a rather simple

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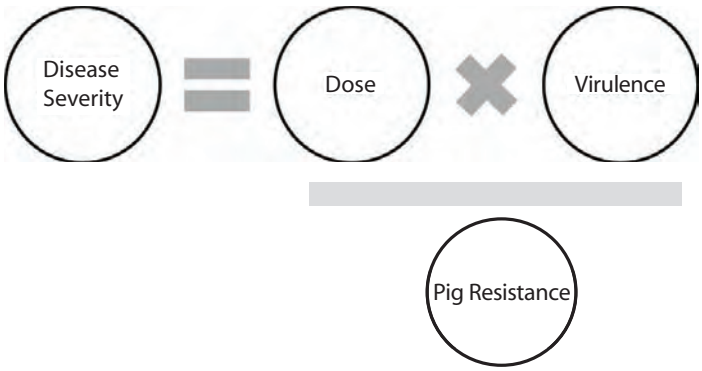
Figure 4: Disease Severity Equation



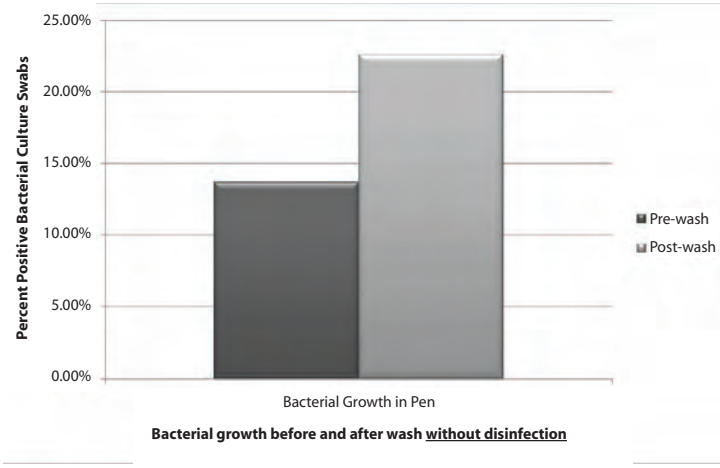
answer to whether or not you should use a disinfectant after proper washing. That answer is a resounding yes.

The use of a disinfectant after washing and drying is a critical factor in reducing bacterial counts in farrowing rooms following washing. Zewde et al demonstrated that washing alone without disinfection actually increased the number of Salmonella positive swabs they were able to collect from the pen.[7] How is this possible given that the floor now "looks" clean? The simple answer is that pressure washing alone can remove organic contamination but because you aerosolize much of the bacteria in water droplets or do not then disinfect the surface or properly remove biofilms your hard work may all be for nothing. Only through the proper application of a disinfectant can you expect to see bacterial counts drop significantly. It is at this point that we begin having an effect on dose.

Conclusions

Understanding farrowing room and piglet health is an ever evolving art and science that should serve to humble even the most experienced farrowing room technician, manager, or health care provider. Every barn and every room can have its own individual challenges and unique set of biofilms and disease causing agents. With you and your staff working with your veterinary health care provider to better understand the importance of sanitation, changes in disease patterns and presentations as well as developing standard measurable protocols that protect both your pigs and by extension the consumer through increased pig health together we should always be seen as moving in a positive and rewarding direction. Management and measurement go hand in hand.

Figure 5: Salmonella growth before and after washing without disinfectant use. Adapted from Zewde et al 2009.



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• International Round-up

Glycerol reduces number of feeder visits

Recent research in Northern Ireland indicates that including glycerol in finishing pig diets increases the number of feeder visits per day. The trials, which were carried out by Dr Elizabeth Ball at the Agri-Food and Biosciences Institute (AFBI), Hillsborough, Northern Ireland, tested the effects of glycerol inclusion in finishing pig diets on performance and meat quality.

Glycerol is a by-product of biofuel production and it may be used as an energy source in diets for pigs, but there is limited research on its optimum level of inclusion or on its effect on performance and meat quality.

Four diets were produced to contain 0, 4, 8 or 12% glycerol and offered to 48 pigs in pens of six. The pigs were housed in the specialized research facility at AFBI Hillsborough which enabled individual feed intake and behaviour to be measured.

There was no difference in feed intake but average daily gain decreased at 4 and 12% glycerol inclusion and feed conversion ratio (FCR) tended to be less efficient as glycerol level increased (Table 1).

Table 1 : The effect of glycerol on pig performance and feeding behaviour

	Level of inclusion			
	0%	4%	8%	12%
Feed intake (g/day)	2,527	2,286	2,528	2,395
Daily gain (g/day)	1,031	927	995	905
Feed Conversion Ratio (FCR)	2.45	2.47	2.55	2.66
Number of feeder visits (pigs/day)	4.9	16.0	14.3	20.9
Drip loss (%)	4.7	3.8	4.9	4.6
Tenderness (kg per cm^2)	3.6	4.1	3.8	3.7

There was an interesting effect on feeding behaviour, with glycerol inclusion significantly increasing the number of feeder visits per day which may be due to reduced palatability of glycerol diets.

Glycerol can be used as an energy source in the diet, but reduces feed palatability

There was no effect of glycerol inclusion on meat quality as assessed by drip loss or tenderness.

Ball concluded: "Glycerol has the potential to be a new feed ingredient in pig diets and can replace a proportion of cereal in the diet but more research is needed to fully understand how glycerol is utilized by pigs."

Early weaning has little effect on lifetime performance

Recent Australian research suggests that pigs weaned at 13 days perform equally well over their lifetime and have very little difference in body composition compared to those weaned at 21 days. A trial involving 240 entire males and gilts showed that while the pigs weaned at 13 days had slower growth in the immediate post-weaning period, they "caught up" to the later weaned pigs and were the same weight at 53 days of age. Daily gain from birth to 146 days was similar for both weaning ages, while the boars grew slightly faster than the gilts.

Pigs weaned at 13 days perform just as well over their lifetime as those weaned at 21 days, say Australian researchers

A type of x-ray scanning was used to measure body composition in the live pigs. Pigs weaned at 13 days had a greater percentage of lean tissue at 119 days of age (78.4 compared with 76.8% for the 21-day weaned pigs) but this difference was not maintained through to slaughter. Also, the percentage of fat tissue was greater at 146 days in the pigs weaned at 21 days (15.2kg compared to 13.8kg for the pigs weaned at 13 days).

The researchers concluded that weaning age predominantly influences growth immediately after weaning and does not have a major influence on lifetime growth performance or body composition at commercial slaughter weights.

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Australia introduces Skills Passport for stockpeople

The Australian pork industry is moving towards a "Skills Passport" system for livestock workers which details and endorses a person's workplace skills and competencies and provides an employer with verification. Launched last year, a training group in Western Australia is now implementing the program prior to a mandatory requirement for staff competency which will soon come into force nationally. The 12-month training scheme began last July and is also being implemented in other livestock sectors.

Frances Gartrell, Training Officer with Pork Industry Training WA (PITWA), says that all pork producers should be aware of the new staff competency requirements, effective from March 2011, in the Model Code of Practice being regulated in each state. "This means producers should start preparing now to ensure they and their staff will meet those competency requirements," Ms Gartrell said.

The Code requires that pigs must be cared for by personnel skilled in pig husbandry and competent to maintain the health and welfare of the animals in accordance with the Standards listed in the Code, or are under the direct supervision of such personnel.

The pork industry Stockperson Skill Set covers the minimum skills required by a stockperson 'responsible for the day-to-day needs of pigs' or of a person 'under the direct supervision of such personnel.'

The Stockperson Skill Set, as defined by industry, registered training organizations and industry representative body Australian Pork Limited, comprises these units of competence:

- Comply with industry animal welfare requirements.
- Move and handle pigs.
- Care for health and welfare of pigs.
- Implement animal health control programs.
- Administer medication to animals.
- Contribute to occupational health and safety processes.
- Observe enterprise quality assurance procedures.

Ms Gartrell reminded seminar participants that by March 2011 anyone responsible for the care of pigs must be able to demonstrate their competency or must be supervised by a person who can demonstrate their competency as a person skilled in pig husbandry and competent to maintain the health and welfare of pigs in accordance with the Code.

"Although most pork producers and stockpeople are already capable of caring for their pigs, certification of this competency is an important way of proving that animal welfare standards are being met on farm," she said.

Irish research investigates Deep Intrauterine Insemination for sows

The Deep Intrauterine (DUI) catheter delivers the semen into the uterine horn and closer to the egg compared to conventional foam-tip catheters that result in semen being introduced to the lower part of the uterus, just past the cervix. Manufacturers claim that only one insemination is required using DUI in order to achieve conception, compared with the conventional two. However, success will greatly depend on accurate and timely heat detection and subsequent insemination. A recently published trial conducted at the Agri-Food and Biosciences Institute in Northern Ireland compared the use of the DUI catheter with the traditional catheter and insemination regime.

In the trial, a total of 180 sows were used and 3 insemination procedures were compared:

- ***Normal*** - Sows were inseminated twice using a normal catheter. If heat was detected at 8am the first insemination took place 2 – 3 hours later and the second 24 – 26 hours after detection. If sows were detected in heat at 4pm, the insemination took place at 8am the following morning and the second 24 hours later.
- ***DUI + Normal*** - After detection, sows were inseminated in the same pattern as above. In this treatment a DUI catheter was used in the first insemination and a normal catheter was used in the second insemination
- ***DUI Once*** - After detection as described above, sows were inseminated once using a deep intrauterine catheter 24 hours after detection.

The results showed that the lowest conception rate (72%) and lowest number of pigs born alive (11.1) were the result of inseminating sows with the DUI catheter once 24 hours after heat was detected. Under normal commercial management where sows are inspected for heat and inseminated within time blocks, it is difficult to ensure high success rates using a single

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insemination. However, the combination of the DUI catheter with a normal catheter within a double insemination regime optimized conception rates (88%) and the number of pigs born alive (12.1) with little effect on the average birth weight of piglets born.

Specialized training is required in using the intra-uterine catheter because incorrect use can damage the reproductive tract within the sow, note the researchers. A high standard of hygiene should also be in place since the insertion of a dirty catheter would deliver infection deep into the reproductive organs of the sow, they note.

Boar finishing most efficient

Trial results from international animal nutrition company Provimi have confirmed that boars make most efficient use of feed during the finishing period over barrows, vaccinated boars or gilts.

The company has been focusing on this topic because the Netherlands is rapidly moving away from the use of castration in young piglets. The company researched boar finishing on their research farm at De Viersprong in the Netherlands.

In total, four treatments were compared: boars with and without vaccination (Improvac, Pfizer), barrows and gilts. Feed conversion ratio was highest for barrows due to their greater feed intake and higher carcass fat content. Boars proved to be the most efficient and had the best FCR.

Table1 : Performance results of swine finishing trials, 0-123 days

Sex	Daily gain (g/day)	Feed intake (g/day)	FCR
Barrow	867	2302	2.66
Boar	837	1891	2.26
Vaccinated	867	2039	2.34
Gilts	795	1939	2.44

"The vaccination of boars on day 80 led to a strong increase in both feed intake and daily growth: boars start to act as barrows after the second vaccination," said Pieter Wolleswinkel, product manager for swine at Provimi.

From a financial point of view, the margin on feed costs is highest for non-vaccinated boars. Yet this does not include any additional costs or reduced revenues due to boar taint problems. Vaccination of the boars also proves to be economically beneficial over finishing barrows (vaccination costs not included).

Table 2: Financial results of swine finishing trial

Sex	Barrows	Non-vaccinated boars	Vaccinated boars	Gilts
Hot carcass weight, kg	129.90	125.80	128.5	121.6
Corrected carcass price, €	124.54	127.64	125.60	26.12
Feed costs per pig, €	76.60	62.80	66.82	64.90
Margin over feed costs, €	47.94	64.84	58.78	61.22

Lupin inclusion reduces feed intake and growth

Research at the Agri-Food and Biosciences Institute in Northern Ireland suggests that including lupins in pig diets reduces feed intake and growth rate, limiting its potential as an alternative to soybeans in pig diets.

"Soyabean meal is the main source of protein in diets for pigs and poultry due to its high crude protein content and its good profile of amino acids," says Dr. Elizabeth Ball, one of the researchers. "However, as soybean meal must be imported, home-grown protein sources such as lupins have been considered as alternatives."

Lupins can contain up to 44 percent crude protein and previous research elsewhere has shown they can be included in pig and poultry diets with no adverse effects on performance provided the diets are supplemented with synthetic amino acids.

There is a lack of information on the use of low levels of lupins in pig and poultry diets as a direct substitution for soybean meal, without additional amino acid supplementation. The aims of the research were to investigate the effect of substitution of a proportion of soybean meal with lupins on pig and poultry performance. Four diets were produced to contain 0, 4, 8 and 12 percent lupins and offered to a total of 240 pigs in pens of 10 from 10 to 15 weeks of age.

Feed intake and average daily gain decreased with increasing lupin inclusion (Table 1) with the result that pigs offered the 12 percent lupin diet were 4.7 kg lighter at 15 weeks of age. Feed conversion ratio tended to increase as the level of lupin inclusion increased, although the differences were not significant.

The reduction in daily gain and live weight at 15 weeks with increasing lupin inclusion may be attributed to reduced feed intake, most likely caused by low levels of alkaloids in the lupins which impacted palatability.

Table 1: The effect of lupin inclusion on pig performance

	Inclusion rate			
	0%	4%	8%	12%
Feed intake (g/d)	1412	1380	1323	1203
Daily gain (g/d)	614	568	547	477
Feed conversion efficiency	2.31	2.43	2.42	2.52
15-week weight (kg)	51.8	50.2	49.5	47.1

British consumers to get better COOL information

British pork producers and consumers will both benefit from a new labelling code of practice for the country of origin for pork and pork products. Major supermarkets have endorsed the voluntary code which aims to give clear and unambiguous information about country of origin on packs of pork, bacon and ham.

The final code, launched in February by Environment Secretary Hilary Benn, has come about as a result of the Pig Meat Supply Chain Task Force which represents a broad range of stakeholders including retailers, food service companies, consumers, processors, industry organizations, government and its agencies.

Mr Benn said: "A year ago I said that I wanted to end the nonsense of unclear country of origin labelling on pig meat products – and through the Task Force bringing together farmers, processors and retailers, we now have a code of practice that will do this.

"I expect all major retailers to sign up and join those who have already decided to end the confusion for shoppers. If they don't, their customers should ask them why they're not in favour of clear, honest labelling."

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The key aim of the code will be to ensure that the country of origin of the pork used in processed products will be clearly displayed on the pack. For example, the code says that terms such as 'Produced in the UK' can be ambiguous if origin is not qualified. Companies adhering to the new code have committed to providing clear information such as 'Produced in the UK using pork from country X.'

Production definitions for 'outdoor bred' and 'outdoor reared' pigs are being finalized and an announcement on how these could be incorporated into labelling is expected in the near future.

The code of practice also covers the use of single country of origin descriptions and where pork from a number of different countries may be used.

Task Force member and chairman of BPEX and the NPA Stewart Houston said: "Clear labelling is great news for everyone in the supply chain, easier choice for consumers, more sales of British pork products for the retailer, benefiting both the producer and the processor."

The Task Force will now seek to encourage more retailers and food service companies to sign up to the code before it goes live for consumers in April. A planned website will give consumers a list of those businesses who have signed up to the code.

New website showcases US pork production

A new Internet resource is now available to support US pork producers as well as address consumers' questions about modern pork production. The new Web site, www.PorkCares.com, highlights the industry's 'We Care' initiative, a comprehensive effort dedicated to informing the public about pork producers' strong record of responsible farming and their commitment to continuously improve production practices. The site will offer testimonials and interviews with pork producers as well as video clips of modern pork production.

"PorkCares.com provides a great resource for the consuming public as well as packers, retailers and food service organizations," says Dallas Hockman, vice president, industry relations, National Pork Producers Council. "The site will tell the story of the pork industry first-hand from the actual producers."

Hockman goes on to explain that the new Web site provides an excellent reference on today's modern pork production systems. "The site helps put a face on pork production in the United States."

The PorkCares Web site is a joint effort of the National Pork Board's pork checkoff and the National Pork Producers Council, to help demonstrate that US pork producers are accountable to established ethical principles and animal well-being practices.

Tryptophan enriched diet reduces pig aggression

Feeding the amino acid tryptophan to young female pigs as part of their regular diet makes them less aggressive and easier to manage, according to a recent study by Agricultural Research Service (ARS) scientists and cooperators.

The tryptophan-enhanced diet reduced aggression and overall behavioural activity among young female pigs during the 8-month study. Tryptophan, which is only acquired through diet, is the precursor for the calming cerebral neurotransmitter serotonin. Keeping swine calm is important, because aggressive behaviour can harm them and increase feed and medical costs for producers.

The supplemented diet raised blood concentrations of tryptophan in 3-month-old females by 180 percent, and by 85 percent in 6-month-old females, resulting in calmer animals, mainly at the younger age. Persistent aggression in pigs can cause chronic stress, leading to poorer welfare, increased disease susceptibility and reduced growth and efficiency, note the researchers.

In the study, a diet with 2.5 times the normal amount of tryptophan was fed for one week to grower pigs (3 months old) and finisher pigs (6 months old). Another group of pigs received a normal diet. Behavioural activity and aggressiveness were measured before and after the seven days of diet supplementation.

To test aggression, researchers put an "intruder" pig in the pen until an aggressive interaction was triggered or for a maximum of five minutes. Pigs receiving the high-tryptophan diet showed less aggression - fewer attacked the intruder, and those that did attack were slower to do so - compared with the animals that didn't get the supplement.

Pigs form social groups that, over time, form stable hierarchies or "pecking orders". However, when new individuals are introduced, aggression is used to re-establish a new hierarchical order. If repeated changes in group composition occur, persistent aggression may arise, sometimes leading to physical injury and acute stress. A tryptophan-enriched diet may help producers avoid these problems, especially when groups of pigs are mixed together.

The research was published in the journal Applied Animal Behaviour Science.

WHJ

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Gilts – Are we up with the times? Part 2: Catching up with recent genetic progress

By John Gadd

From the farms I am visiting and the articles we are all reading it is becoming increasingly apparent that the area of gilt management and feeding has fallen behind. This is reflected in terms of weaners produced per sow productive lifetime (SPL).

Potential productivity from the replacement gilt has shot ahead - much more so than in the baby pig, AI, and growing pig performance areas which also have improved well over the past ten years, but nothing like as far forward as that of the gilt and young sow which can be summed up in one word - 'hyperprolificacy'.

I calculate from the performance records of my average clients compared to my best, that they produce 44% (about 221kg) less weaner weight at 26 days across their sow's productive lifetime - what the breeding companies call 'weaning capacity.' I agree with Hypor's claim that any producer with the new genetics should try to attain 500kg weaner capacity per SPL. This target seems practical because my best clients are indeed reaching this level with gilts from a variety of breeding companies. But that's not all, because as any successful businessman knows, the euphoria from excellent sales per unit of investment can be eroded by higher costs, so the average producer is not only producing less for his investment in genetically-sophisticated gilts than is possible today, but he is having to turn over his breeding animals unnecessarily quickly and thus increasing his replacement costs by around 22% at least.

So what has gone wrong?

Why isn't everyone managing 500kg weaner capacity per SPL? There are several primary reasons for this, some of which are not being addressed at all or insufficiently well.

1. Not everyone is buying these top gilt genetics

For a variety of reasons - some are not aware of the new potential of these new hyperprolific females. Some choose not to use them on cost grounds, others because they think they can do as well by breeding their own (a belief - mistaken in my opinion - which seems prevalent in the less-sophisticated pig industries).

2. Gilts are being bred too soon

The penny is beginning to drop now, if too slowly. Age, fleshing (rather than fat cover) and weight targets are being adopted but these are changing. Becoming simpler, too, which is good and as I show in this article, the position has changed quite dramatically recently, but the current advice needs some qualification before we all rush gladly into just basing first service on age alone! Age needs an adequate induction/natural-immunity period for the young sow to acquire sufficiently strong immune threshold which then 'sets up' the breeding sow for life.

3. Feeding the gilt and young sow has fallen behind

These hyperprolific gilts have different nutritional intakes from those advised up to now. They need special diets which, in certain conditions, may need to be fed in a second pregnancy, and even on into a second lactation, before reverting to the current conventional pregnancy and lactation diets for the older sow. The sow feeds we have now, which are adequate for older sows providing enough is eaten at the right time, are not good enough for hyperprolific young females! My third article covers this, with the evidence to support it.

4. There is not enough attention paid to immunity

My fourth article deals with this and suggests the gilt is actually a dangerous animal to the rest of the breeding herd from an immunity standpoint. We must think about this whole area more seriously from now on in terms of how we design and stock our breeding units.

Breeding the hyperprolific gilt and young sow

Experience from those experts who manage to hit the 500kg weaning capacity target suggests that the nutrition of the second parity sow is as important as in the gilt parity. Some tell me - from taking a year or two to get it right - that this has been the case.

Part of this advance in dietary adequacy is bound up with the timing of the first service. As I said this is getting better, if too slowly and is based on the existing advice of:

Breed at -

- 220-230 days of age
- 130- 140 kg bodyweight
- 18-20mm p2 fat cover
- 2nd or 3rd estrus

Age at first service now dominant

One major breeding company (JSR) now recommends, from their own extensive trials, that age is the predominant factor to

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Breed gilts at around 240 days of age, advises John Gadd

minimize returns from first service and maximize numbers born alive and takes precedence over weight and fat cover at first service. 240 days of age is now recommended.

JSR also shows that the proportion of returns to service to successful conception varies little at first service between 120-170 kg, and similarly between fat cover of 12 and 18 mm P2. Again, numbers born to the first litter also show little difference - around 12 born alive - when gilts are first served between 130-180kg, another wide weight range. Readers are invited to study the JSR work which is summarized in the company's Autumn 2009 Newsletter.

Specific to one breed?

Could this work apply just to JSR lines? Seemingly not, as from the (admittedly few records - 10 in all) I've seen of those producers hitting 500kg weaner capacity, a variety of bought-in genetics were involved. The range of those weaned in the first litter was 10.8 - 13.1, with an average of 11.2. But what contributed substantially to their high weaner capacity was the parities achieved before culling, which averaged 6.0, thus enabling them to sell some 14 more weaners from each sow's lifetime (or almost as many more finishers for that matter) than previously.

Does this later age at first service assist disease prevention?

To start with, problems occurred over second and sometimes even a third litter fallaway, all due to the hyperprolificacy of the genetically improved gilts which had difficulty in rebreeding effectively after their substantial litters. These painful snags seem to have been removed by special feeding, which I discuss next time, but very probably assisted by a more careful and longer (ie veterinarian-supervised) two-stage - note, two distinct stages - induction program before breeding. The extra 14 days before first service made it easier to carry out what the veterinarian advised so that the young sows in the herd were more able to deal with the increased stress of higher productivity.

I've suggested for many years now both in public and in print that I suspect PRRS in particular seems to be less of a problem on farms that are wedded to this unhurried, two-stage approach to acclimatization. Perhaps even more significant is that the continual re-emergence of this annoying scourge occurs in my experience on farms which are in too much of a hurry - for economic reasons, no doubt - to get those gilts in-pig. This policy I often encounter in North America where PRRS is still a real problem for them. Is this cause and effect? Could be! ≡WHJ≡

Two family businesses – Two continents – Two contrasting operations

By Stuart Lumb

What might a 2500 sow unit in SE Thailand and a 250 sow unit in northern England have in common? Well, both are run by father and son and both owners put biosecurity and herd health as the most important factors in terms of achieving high unit productivity.

Trang Wattana Farm Co is owned by Mr Rawat Pokawattana. Mr Rawat has been in the pig business for 26 years and when asked why he went into pigs he gave an answer which is given the world over - "I was told it was a good business to get into!" The business, which started with 100 sows, had risen to 1500 sows by the turn of the millennium. The unit now has 2500 females, producing 24-25 pigs per sow per year. This takes some doing in a very hot country like Thailand and much of this Mr Rawat puts down to his rigid biosecurity protocols. The nearest pigs are 20-30km away and the unit is surrounded by rubber and palm tree plantations. Visitors have to be 3 days pig-free, must shower in and also wear unit clothing. The farm produces its own feed and the feed mill is 0.5km from the actual pigs. No vehicles are allowed on the farm, with pigs being loaded and unloaded at the farm perimeter. All vehicles pass through a disinfectant wheel dip and sprayer. The unit has 180 staff on the payroll, with a section manager educated to degree level for each 20 employees. Mr Rawat's son Erawat is the general manager.

Breeding stock has always been imported from Scandinavia and Germany. Currently GGPs are imported from Denmark and the unit breeds its own Large White/Landrace F1s. Mr Rawat also imports Durocs from Denmark which he crosses with German Pietrains to produce his own Pietrain/ Duroc terminal sires. "I prefer German Pietrains to the Belgian lines as they have better growth rate," added Mr Rawat. Regarding health, stock are vaccinated against Swine Fever, FMD, Aujeszky's and pneumonia. Ivomec is used against mange. Luckily for Mr Rawat, PCV 2 is not a problem. The unit receives a veterinary inspection on a weekly basis.

The farrowing houses are cooled using a tunnel ventilation system, with sows being housed in 3 rows with 2 feeding/access passages. Interestingly, the sows are all housed by parity. The reasons for this are easier management; similar parities have similar immune systems, which make disease control easier, plus sows are of similar weight which makes feeding easier. The farrowing houses are staffed 24 hours a day with women, a typical Thai management practice. Lamps are used at farrowing and temporary boxed creeps are put in place for the first few days after farrowing. Piglets are dusted with Mistral at birth to dry them off, reduce chilling and to encourage early intake of colostrum. Mistral has been used for 2 years by Mr

The finishing pens at Trang Wattana Farm have mainly solid floors, with a flush gutter

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Rawat. Getting feed into lactating sows is very hard in hot climates. Mr Rawat's policy is to manually feed a 1.2% lysine ration 4 times a day, at 6am, 11am, 4pm and 9pm. Piglets are fed Porcolac, a Dutch milk replacer, for the first 10 days after which they get a home milled creep meal mixed with water, as porridge. The creep also contains 3000ppm of zinc oxide.

Gilts are weaned at 30 days and sows at 26 days, which is slightly later than most Thai units (24-25 days is the average), after which the piglets get moved to fully slatted nurseries where they stay until they reach 20kg. A plastic slatted panel is positioned on top of the steel slats as a piglet comfort aid. Piglets are meal fed and antibiotics are added (CTC) at 200ppm for the first week after weaning.

Pigs are moved at 20kg to the finishing sheds where they are housed in 90% solid floored pens. Manure is regularly hosed off the lying area into a drain running the full length of the building. This uses a lot of water; however the farm has its own borehole supply with water being chlorinated before being circulated through the piggeries. Tunnel ventilation is again employed with extractor fans being imported from Italian manufacturer Euroemme. Carcase weights range from 91-100kg deadweight (av. 95kg), with FCR from weaning to slaughter standing at a very respectable 2.3:1. Mr Rawat has tried using Improvac "but he found problems with it".

After weaning sows are housed in traditional part slatted gestation stalls. The farm has its own boar stud and sows are generally inseminated twice over 24 hours, although some sows receive 3 inseminations. Incidentally, insemination is deemed a man's job on Mr Rawat's unit.

Slurry is used to produce methane which powers a Deutz engine linked to a generator which produces 70,000Kwhr of electricity per month, with the solids being sold to local arable farmers.

Trang Wattana has its own substantial feed mill which produces 18,000 tons of meal annually. Meal is distributed round the unit in bulkers and augered into feed bins, with all the stock being fed by hand. Mr Rawat has some interesting views regarding his feed policy. He is not keen on using mycotoxin binders, preferring to pay a premium for top quality ingredients. Ingredients used are maize, full fat soya, broken rice, cassava and fishmeal, with coconut oil, palm oil and soya oil providing extra energy. Plasma can be fed in Thailand but it's very expensive. Meat and bone meal, which has to be imported, can also be fed, but it's not used in the rations. Pre-mixes are bought in from Betagro, one of Thailand's well known integrators.

In contrast to the Thai operation, Ian Broumpton's unit located near Driffield, East Yorkshire, UK, is pretty "small beer". He is a small producer by modern day standards and like the Rawats, Ian's is also a father and son operation. Ian runs a 210 sow unit, helped by his son and another stockman, plus has 120acres of arable land. Big is not always beautiful though and Ian's unit is weaning just under 26 pigs/sow year. Ian has always bought his breeding stock from ACMC, whose HQ is just 20km NE of Ian's farm. Traditionally Ian has bought in AC 1 F1 gilts but has recently bought in 20 GPs and will soon produce his own F1s

The older farrowing crates with solid floors with straw bedding result in more piglets weaned than newer pens

to reduce the number of animals coming on to the farm. Feed is all bought in from a local manufacturer. Many of his buildings were put up in the mid 1970s and are still going strong and are of the prefabricated style, popular with UK farmers. Ian had a mid life crisis a few years ago which threatened his way of life. He had hip problems and so was unable to bend over - not good for a pig farmer and active cricket player! However Ian has had both hips replaced and in his words "has had a new lease of life". When the industry was on the floor a few years ago Ian sensibly decided to depopulate and re-stock with clean pigs. Unfortunately 20 months later the unit broke down with Enzootic Pneumonia and piglets now get vaccinated 5 days after weaning. Fortunately the herd has remained PRRS negative, which Ian is very relieved about.

Ian looked at batch farrowing but has stuck with a weekly system, as batching didn't suit him. Sows farrow each Thursday (with around 75% of sows being induced). Like the Thai unit, time spent in the farrowing house is always a good investment and so Ian spends pretty well all his Thursdays in the farrowing house. Thanks to his new hips he has no problem collecting colostrum from milky sows and bottle feeds the weaker piglets, a technique which he considers very valuable. Many of Ian's crates are quite old, so his pre-weaning mortality is quite reasonable, given this fact. Also the farrowing pens have solid floors and hence are very labour intensive, but Ian is a strong believer in sows having access to straw at farrowing in order to satisfy their maternal instincts. Ironically Ian's older houses rear more pigs than his newer ones, 11.5 vs. 10.5. The newer house has front covered creeps which, in Ian's view, make piglets harder to see and contributes to the higher mortality.

Piglets are weaned at 4 weeks and get moved into a nursery. Sows are put in yards for service, a combination of natural service and AI, after which they are moved into a big shed where they are group housed and fed through a Microware ESF system. Weaners are housed in small groups in prefabricated "Pigibox" nurseries, a type of building very popular in E. Yorkshire 30 years ago. At around 30kg pigs get moved into the new fully slatted finishing house which has 800 pig places. Built by local building company AM Warkup Ltd, it was finished last August and cost $255,000 or $318 per pig place. Pigs are ad lib fed through Osborne circular rotating feeders. Prior to building his new house Ian's finishing pigs were on a "bed and breakfast" system. The concept involves a farmer using his buildings to house finishing pigs, for which he gets paid a daily management fee. Ian "bed and breakfasted" most of his finishing pigs at an annual cost of $25,000, but of course now this money stays in the business.

One concern that Ian has is that his stockman is nearing retirement and Ian is not sure where his replacement will come from as good labour is a scarce commodity in East Yorkshire, unlike SE Thailand.

≡WHJ≡

Australian producers still in the black

In the last 20 years or so the attitude of many governments has been to ignore domestic agriculture and import products as and when needed. With the increasing costs of transporting commodities, there appears to be a change in the political and public attitude towards agriculture. In Australia there is a national campaign using sporting heroes, which states that "Every family needs a farmer". The response from the consumer is a demand for clearer labelling of the country of origin of products sold in the supermarket. Since all pork and pork products imported into Australia must be processed off shore, so "every Australian family needs an Australian pig farmer to meet their needs for fresh pork".

Australian producers therefore remain optimistic about the future despite the price of bacon pigs falling by more than 60 cents per kilogram in the last 12 months. Fortunately for the pork producer the welcomed rains in the eastern states in March have resulted in promising yields of sorghum and high plantings for winter wheat and barley. The effect is that grain prices remain attractive to the intensive livestock producer if not the grain producer. In fact with increasing costs of fuel, fertilizer, seed and labour the grain farmer needs above average yields to survive.

Table 1: Average market returns and grain price, Queensland, 2008-2010

	March 2008	March 2009	March 2010
Bacon pig $/kg	2.42	3.69	3.02
Wheat $/tonne	490	220	210
Barley $/tonne	350	215	212

Source: Australian Pork Ltd (CAD1 = AUD 1.08)

The high value of the Australian dollar against world currencies, including the US dollar, continues to depress the export of pig meat to Asia. The moving annual total for the period ending January 2010 totalled only 35,229 tonnes shipped weight, a decrease of 15.5% on the 12 months ending January 2009. The main markets are Singapore, New Zealand and Hong Kong.

Free access sow stalls, in a low cost uninsulated shelter, are popular in South Australia (photo courtesy Graeme Pope)

The high value of the Australian dollar makes imports very attractive for the processor and imports remain at a high level. The moving annual total tonnage of imports from Canada for the year ending January 2010 was 47,682 tonnes shipped weight, an increase of 34.1% on the same period the previous year. Imports in the period totalled 135,424 tonnes shipped

weight with Canada, Denmark and USA responsible for 99.8% of the trade.

The average price paid per kg for the product imported from Canadian is $2.77, from Denmark $3.97 and the USA $2.44.

The industry's representative body, Australian Pork Ltd (APL) is responsible for the administration of the industry's quality assurance program namely APIQ. APIQ is a HACCP based program incorporating physical, chemical, biological, meat quality, management, welfare and bio-security standards. Since APIQ was introduced in 2000, consultants have been allowed to audit their own clients. To improve the integrity of the program still further, APL is introducing new rules regarding the auditing process. Auditors are required to be registered with RABQSA International and also to have passed the appropriate skills examination. The impact on auditors is higher affiliation fees and with less business to service, several auditors have retired resulting in a shortage of auditors in some areas and some states.

The shortage gave me an opportunity to travel to South Australia earlier this year to audit a number of production units. The production systems in South Australia are slightly different to the production systems in Queensland where I reside, as would be the production systems practiced in Ontario compared with systems in Alberta. The developments in the South Australian industry have been influenced by the availability of straw and the use of deep litter shelters for gestating sows, weaner pigs, growers and finishers.

The shelters are usually between 7m and 9m wide by multiples of 9m long and have a duraflex sheeting cover. Normally the base is concrete but in some situations rammed stone has proved cheaper to install but more costly to maintain.

When used as grower facilities, the shelter allows pigs to be run in groups of 200 – 300 head. Many producers in South Australia have adopted batch farrowing systems to achieve the number of pigs required to fill a shelter.

The batch farrowing system, as many WHJ readers will know, has considerable benefits for the grow-out manager but demands considerable skill on the part of the breeder herd manager to maintain the required sow group size. On many units, breeding groups are only maintained by running a large and costly gilt pool.

The shelters for the growers are operated on an all in all out system with shelters being cleaned out between batches. The solid manure is normally stacked and sometimes composted before spreading on cropping land or sold off site.

The new Australian Codes of Recommendations for the Welfare of Animals – Pigs dictate that sows can only be kept in sow stalls for six weeks during gestation. In South Australia a number of producers are installing individual feeders or modified stalls in shelters to meet the new codes. The sows have access to the stall or feeder and a straw bedded exercise area. The system is very similar to systems seen in Denmark and Holland but the shelters cost much less per sow housed than the insulated, climate controlled housing required in Canada and Europe. ≡WHJ≡

Better for you pork tandoori

Marinated fast-fry pork chop recipe

By Roy Kruse and Justin Chatlain, Alberta Pork

Yield: serves 4 ❖ Preparation Time: 2 minutes ❖ Cooking Time: 6 minutes

Ingredients

1 lb (500 g) Canadian boneless fast fry pork chops (1-2 cm thick), trimmed of any visible fat

1/2 cup (125 mL) Tandoori paste

1/2 cup (125 mL) plain yogurt

Cooking Instructions

Mix yogurt and Tandoori paste in a sealable plastic bag or dish. Add pork to marinade for a minimum of 30 minutes or overnight in refrigerator. Pre-heat grill to med-high/high heat and fry chops on a well-oiled section, cook 2-3 minutes a side, then set aside to rest for 2-3 minutes under tinfoil. S erve immediately with rice and a cucumber salad.

Nutritional information

Marinated fast-fry pork chop recipe • *(1/4 of recipe)* • *Per 1 person serving*

Energy	242 kCal
Protein	32 g
Carbohydrate	12 g
Fat	5 g (1.8 g saturated)
Sodium	1563 mg

For more pork recipes, go to putporkonyourfork.com or porkfits.com

• Events Diary

May

11-12th	**British Pig & Poultry Fair**	Warwickshire, UK	www.pigandpoultryfair.org.uk Contact: Alice Bell +44 (2476) 858-276
16-19th	**Alltech's International Animal Health & Nutrition Symposium 2010**	Lexington, Kentucky	www.alltech.com
26-30th	**European Pig Producers Meeting**	Eindhoven, Netherlands	www.epp2010.nl Contact: (0) 621 212426

June

9-11th	**World Pork Expo 2010**	Des Moines, Iowa	www.worldpork.org Contact: John Wrigley (417) 451-6004

July

18-21st	**International Pig Veterinary Society Congress**	Vancouver, BC	www.ipvs2010.com Contact: (604) 688-9655 ext. 2

September

6-8th	**VIV China**	Beijing, China	www.viv.net
14-16th	**Brazilian Pork Expo**	Curitiba, Brazil	www.porkexpo.com.br
14-17th	**SPACE 2010 Animal Production Show**	Rennes, France	www.space.fr Contact: +33 223 482880
18-21st	**Allen D Leman Swine Conference**	St Paul, Minnesota	www.cvm.umn.edu/outreach Contact: (612) 624-3434

November

3rd	**Red Deer Swine Technology Workshop**	Red Deer, Alberta	Contact: Bernie Peet (403) 782-3776
16-19th	**Eurotier 2010**	Hanover, Germany	www.eurotier.de Contact: Friedrich Rach +49 69-24 788-202
17-18th	**Sask. Pork Industry Symposium**	Saskatoon, SK	www.saskpork.com Contact: (306) 244-7752
30th - Dec 4th	**Agromek 2010**	Herning, Denmark	www.agromek.dk Contact: +45 8675-4545

2011

January

18-21st	**Banff Pork Seminar**	Banff, Alberta	www.banffpork.ca Contact: (780) 492-3651

March

5-8th	**American Association of Swine Veterinarians 2011 Annual Meeting**	Phoenix, Arizona	www.aasv.org Contact: (515) 465-5255
9-11th	**VIV Asia**	Bangkok, Thailand	www.viv.net

Please let us know details of any events you would like to see listed above – call Bernie Peet on (403) 782-3776 or email whj@albertapork.com

Red Deer Swine Technology Workshop

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For further information, or to register, please contact Bernie Peet on (403) 782-3776 or (403) 392-3104 or Email: bjpeet@telusplanet.net

AD INDEX

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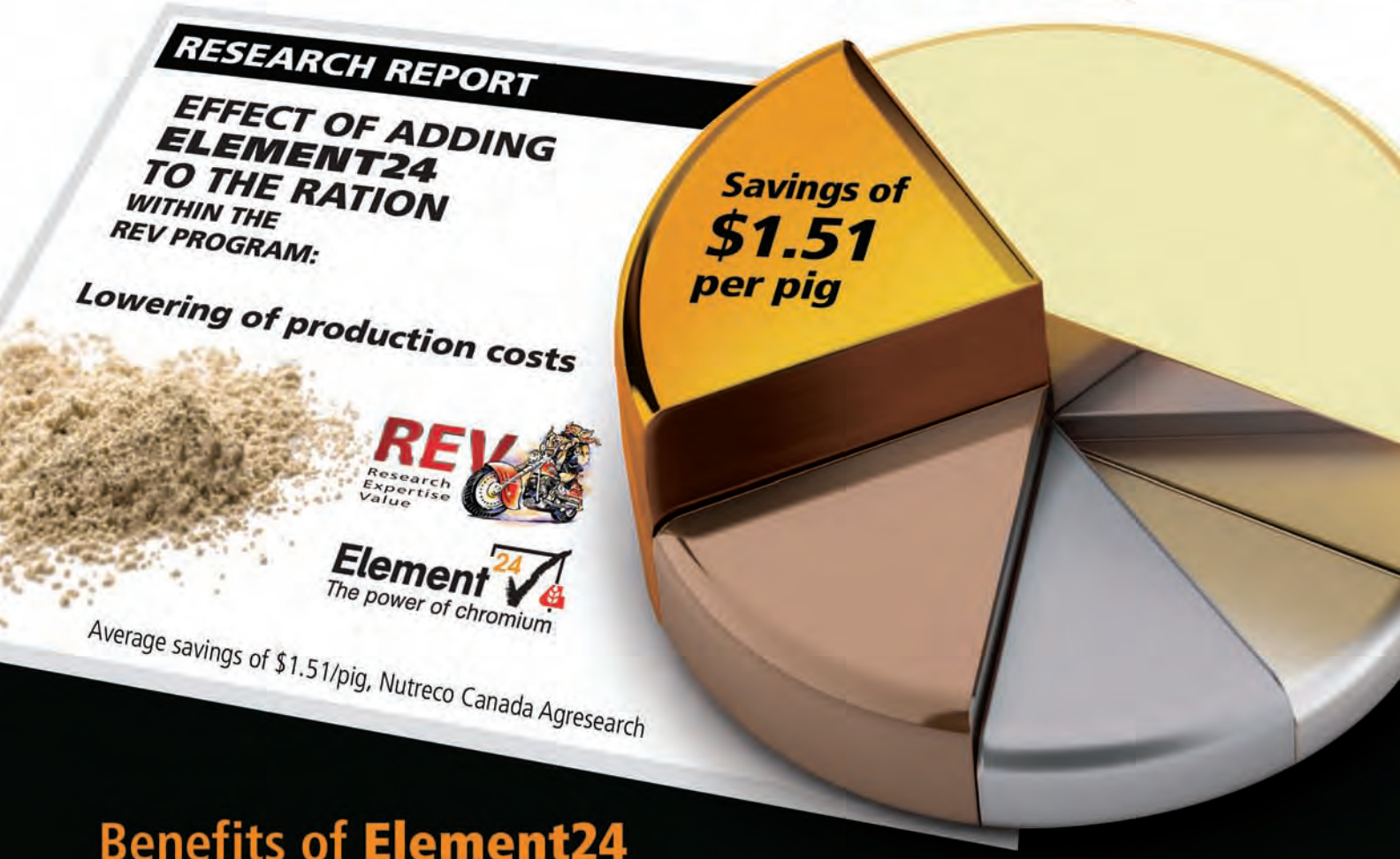

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WIKNER FARM
27.70

SEVILLE
27.67

ROSEDALE
27.60

LAKEVIEW
27.34

SHAMROCK
27.24

MIDWAY
27.21

BRENTWOOD EAST
27.20

WILLOW CREEK E.
27.16

CLEARWATER
27.15

HURON
27.13

SAGE CREEKS
27.10

HILLSIDE
27.01

MARTIN FARMS
26.90

GRASS RIVER
26.80

BERESFORD
26.79

SUNNYSITE
26.74

DECKER NORTH ACRES
26.74

RAINBOW
26.70

TWIN HILLS
26.60

TOBACCO CREEK
26.60

CYPRESS
26.50

SUNSET
26.44

SPRINGFIELD, MB
26.42

VALLEY CENTER
26.38

ELMSPRING
26.37

SHADY LANE
26.23

GADSBY SOUTH
26.20

BACON ACRES
26.20

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OAKLANE
25.60

OK
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25.48

SPRINGDALE
25.40

CLEARVIEW, MB
25.40

RUSTIC ACRES
25.34

OAK BLUFF
25.34

CLEARVIEW, AB
25.30

HANSEN HOG W.
25.20

WILLOW CREEK W.
25.17

LDL
25.10

EL TIGRE
25.10

ASHWOOD
25.10

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