# Western Hog Journal

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Eduardo Beltranena, Pork Research Scientist with Alberta Agriculture and Rural Development, has produced high protein and low fibre fractions from wheat DDGS for feeding to swine and poultry using simple particle size separation equipment

## 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

Canadian pig producers are, at long last, making a profit, albeit not a massive one. With the hog price around $1.50 per kilo as I write, margins are much smaller than they would have been when the Canadian dollar was a weaker currency. If the loonie was worth US$0.75, producers would be getting around $2 per kilo, which would leave a handsome profit. However, commentators in the world of economics and finance suggest that the Canadian dollar will remain strong for some time, so producers will have to adapt to this new reality and work hard to reduce production costs. It will be essential to build up lost equity and strengthen the business in order to survive in the long term.

The last three years has seen producers battling to save money, which is not necessarily the same as minimizing production costs. A different approach is needed when margins are positive. Many producers reduced the intake of replacement gilts or retained F2 gilts from the finishing barn when times were tough, which has led to reduced breeding herd performance. Herd parity structure is likely to need attention and regaining the optimum profile takes a long time.

It's time to focus on being an efficient and low cost producer. Feed is by far the biggest cost and deserves the most effort, whether this involves utilizing by-products such as DDGS or incorporating alternative protein sources such as faba beans. Time spent making sure feed formulations are truly least cost in terms of the value of the output they deliver and which are matched to the genetics, health status and barn environment will be well rewarded. Similarly, paying attention to factors that influence feed efficiency will help to trim costs. Wastage is one that is an often unseen profit robber, so diligent feeder adjustment pays dividends. It's also worth having ventilation and heating systems checked by a professional to make sure the pigs' environment is optimal.

These topics are discussed in an excellent article – *Back in the Black – Maximize the Opportunities* - produced by the VIDO Swine Technical Group, which is referenced in News and Views. Some of them are discussed in feature articles in this issue and WHJ will endeavour to bring producers technical information that will help them to improve efficiency and reduce production costs in future.

Barrie Peek

WHJ

# • News and Views

## New research scientist at Prairie Swine Centre

Dr. LeAnn Johnston has been appointed to the research team at The Prairie Swine Centre. Dr. Johnston has made a career out of serving the commercial pork industry as a swine nutritionist. “Developing practical feeding programs and products to meet evolving customer needs was a key part of my work in the feed industry over the past decade,” she says. “It was stimulating work, but there were always those nagging questions that our current nutrition knowledge could not answer. There is a key role for research to anticipate those evolving needs and address them with practical solutions; that is why I was so excited to join the Centre.”

Dr. Johnston’s position will actually replace two vacant positions at the Centre; in addition to her role in nutrition research, Dr. Johnston will be leading the Contract Research group at Prairie Swine Centre. Since inception, Prairie Swine Centre has served the needs of private corporations worldwide that wished to have their products and services evaluated under commercial-like conditions with rigorous scientific oversight.

In making the announcement, President and CEO of the Centre Lee Whittington said: “With feed costs typically representing 60% or more of the cost of production, reinvesting in our ability to provide nutritional breakthroughs is an area where the industry and the Centre will see immediate and lasting return on investment.”

## Best management practices for livestock

***Beneficial Management Practices-Environmental Manual for Livestock Producers in Alberta*** is a new 95-page publication that completes a series of environmental manuals. In writing and compiling this book, experts from Alberta Agriculture and Rural Development concentrated on best management practices (BMP) information for feedlot, dairy, chicken and egg producers and pork producers.

*A new manual published by Alberta Agriculture provides a wealth of information on how to handle, treat, store and value manure nutrients*

“BMPs are any management practice that reduces or eliminates an environmental risk,” says Michelle McKinnon, agro-environmental specialist with Alberta Agriculture and Rural Development. “These are site-specific practices that take into consideration practicality, operational needs for a specific operation and the legislation that applies.”

The manual is organized into 10 chapters that will give producers a wealth of information on how to handle, treat, store and value manure nutrients. Livestock producers understand their accountability regarding manure management. This manual will help them adapt and fine-tune their operation to get the most from their management efforts.

“As well as chapters on collection, storage, treatment, transportation and application of manure, this book provides information on surface water management and tips on building good relationships with neighbours,” says McKinnon. “There is

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also a list of additional information resources included for easy reference."

The manual, which includes numerous photos, illustrations, charts and graphs, is free, and is available by calling Alberta Agriculture's Publications Office toll-free at 1-800-292-5697 or 780-427-0391. The manual can also be ordered online at www.agriculture.alberta.ca/publications

## Enzyme deficiency causes early weaning problems

A recent study at the University of Guelph suggests that one of the reasons piglets struggle with illness and sometimes die after weaning is due to shortage of the enzyme alkaline phosphatase in the piglets' gut. Early weaning reduces the production and activity of this enzyme in the piglet's gut, say University of Guelph researchers. According to their study, the enzyme – which is involved in digesting phosphate and fighting off harmful bacteria - is significantly compromised during the early-weaning process. Dale Lackeyram, a PhD student who worked on the study with animal and poultry science professor, Ming Fan, said: "We found that early weaning of piglets reduced the level and performance of alkaline phosphatase in the gut, which can lead to decreased growth development and illness. "These study results have benefits for the pork industry. Early weaning is critical for farmers when it comes to maximizing production, but it's also the time when a majority of piglets die or their quality of health suffers."

Published recently in The Journal of Nutrition, the researchers weaned piglets from their mothers at 10 days old and placed them on a corn-and-soybean meal-based weaning diet for 12 days. A second group of piglets was allowed to continue suckling during the 12-day study. Researchers then examined intestinal tissue from the two groups and found the piglets that were switched over from sow's milk to solids had reduced levels of alkaline phosphatase and reduced function in the remaining

*Problems after weaning are partly due to a shortage of the enzyme alkaline phosphatase, say University of Guelph scientists*

enzymes. Reducing the effectiveness of alkaline phosphatase has two major implications for a weaned animal, says Lackeyram. "From a nutritional standpoint, this enzyme plays a key role in making phosphorous available for bone growth and development. Currently, piglets are given supplements in their feed to make phosphorus more digestible, but this study shows that the animals don't express high enough levels of the enzyme needed to digest and make nutritional use of it." Alkaline phosphatase is also part of the body's natural defence system, he says. "This enzyme is capable of acting on the toxic components of bacterial cells such as E.coli. The impact of weaning on this enzyme is likely one of the contributing reasons why piglets often get sick, suffer from chronic bacterial-induced diarrhea and have trouble gaining weight when switched over to solids." Based on this finding, Lackeyram suggests that supplementation with



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encapsulated alkaline phosphatase may provide a novel way of defending against bacteria and enhancing phosphorous nutrition during the weaning transition.

## Alberta to get advanced biofuel plant

Alberta will soon be home to the world's largest fast commercial pyrolysis biofuel plant, which is due to be constructed in High Level, Alberta.

"Fast pyrolysis is an exciting next generation bio-energy process that generates synthetic oil from agricultural and forestry bio-mass that, in turn, can be transformed into transportation fuels," explains a Canadian Renewable Fuels Association (CRFA) news release.

When completed, the new plant will be capable of processing 400 bone dry tonnes of biomass per day into 85,000,000 litres (22.5 million US gallons) of pyrolysis oil annually, says CRFA.

Increasingly, cellulosic and other advanced technologies present new value-added opportunities for the forestry sector leveraging waste wood and by-products.

## Hypor acquires Designed Genetics

Swine genetics company Hypor has announced the acquisition of Designed Genetics, based in Lockport, Manitoba, widely recognized as a leader in Duroc breeding, with a growing share of the Duroc boar market globally. The Designed Genetics Duroc is popular in the Americas and Asia where it has a reputation spanning more than 25 years. The company will be fully integrated into and become part of Hypor, the swine breeding division of Hendrix Genetics, says a company news release.

"The Duroc breed provides robust, fast growing animals for producers", says Gerjan van Alst, General Manager, Hypor North America. "Just as importantly, it is a superb choice for meat producers looking for improved meat quality. We expect the inclusion of Designed Genetics into Hypor to accelerate our growth path in the Americas".

Primary shareholder of Designed Genetics, Paul Riese, along with his family, will remain active with Hypor post acquisition. "We are excited and proud that Hypor will carry on a company tradition of excellence well into the future and feel that our stakeholders are well served with this step".

## Synchronizing ovulation improves litter size

Synchronizing ovulation in weaned sows results in improved litter size compared to untreated sows, says a report of a study carried out by researchers in Ontario and Alberta.

Louisa Zak of Bioniche Animal Health in Belleville, Ontario, and her colleagues, together with researchers at the University of Alberta, investigated synchronizing ovulation with porcine luteinizing hormone for weaned sows with a fixed-time insemination protocol. Their paper is published in the latest issue of *Journal of Swine Health and Production.*

The objective of the trial was to determine reproductive performance of weaned sows inseminated twice at fixed times after controlling the time of ovulation with porcine luteinizing hormone (pLH) administered at the onset of behavioural oestrus.

Sows were randomly assigned to treatment at weaning. From weaning, twice-daily boar exposure facilitated oestrus detection. Untreated control sows were artificially inseminated at least twice.

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*Synchronizing ovulation and carrying out fixed-time insemination results in higher litter size*

Treated sows received 5mg pLH intramuscularly concomitant with the first detection of standing heat. To coincide with the normal working day, sows in oestrus in the morning were inseminated at 24 and 30 hours (am and pm), while sows in oestrus in the afternoon were inseminated at 24 and 42 hours (pm and am), after pLH administration.

For sows bred on days 4 to 6 after weaning, total litter size was greater in the treated sows than for the controls (12.88 and 11.80, respectively). However, adjusted farrowing rate was unaffected by treatment, being 87.28 per cent for sows given the hormone vs. 83.20 per cent for the controls. Neither variable was affected by day of breeding or a treatment - day interaction.

Treated sows averaged 2.0 inseminations per heat period compared with 2.13 for untreated sows.

Zak and her co-authors concluded that double insemination of sows, timed to coincide with optimal sow fertility, may improve litter size.

***Reference:*** Zak L.J., J. Patterson, J. Hancock, D. Hockley, D. Rogan and G.R. Foxcroft. 2010. Benefits of synchronizing ovulation with porcine luteinizing hormone in a fixed-time insemination protocol in weaned multiparous sows. Journal of Swine Health and Production, 18(3): 125-131.

## VIDO article suggests strategies for profitable times

Now that pork producers are making profits after three years of financial hardship, it is appropriate to review many aspects of farm

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protocols and management, says the VIDO Swine Technical Group. With the turnaround in the pork market the first objective should be to repair the damage to facilities, routines, and relationships caused by applying 'survival strategies' throughout the past three years, the group says in an article entitled *Back in the Black – Maximize the Opportunities.* Noting that producers now need to maximize their profit in order to reduce their debt burden, the article suggests that in order to accelerate the profit recovery, producers need to re-examine their protocols with regard to herd health, biosecurity and transportation, and their priorities on feed utilization, overall maintenance and labour utilization.

"Pork producers are resilient people and the past three years has demonstrated their ability to survive by reducing costs, delaying renovation and repair and altering well-established practices in an effort to conserve cash," comments Lee Whittington, chair of the VIDO Swine Technical Group. "Just as it was vital to find ways of reducing costs during an extended period of financial loss, it is now equally important to ensure that producers position themselves to maximize their efficiency when profits return."

The article examines various aspects of feed management, including wastage, feed delivery equipment, manufacturing and formulation. It considers how to get the best out of farm staff, including prioritizing where investments in labour result in productivity enhancements that yield the greatest economic benefit. Observing that some aspects of biosecurity may have slipped during the last few years, the VIDO group also urges producers to carefully review biosecurity measures and tighten up on protocols.

Another key area that producers should review is herd parity distribution. "If you have reduced the number of replacement breeding females being introduced to the herd for economic reasons you will need to take steps to restore a correct parity profile in the herd," advises Lee Whittington.

The article also contains information about vaccination and medication use, facility maintenance and transportation. It can be downloaded from the VIDO website www.vido.org.

## Biofuels add $2 billion to Canadian economy

The Canadian Renewable Fuels Association (CFRA) has released the first-ever comprehensive third-party economic impact assessment of renewable fuels investments in Canada. The assessment, conducted by econometric firm Doyletech Corporation, concluded that, "the grand total of the annual positive economic impact of renewable fuels is $2.013 billion."

The report studied 28 ethanol and biodiesel plants across Canada and added that there were major benefits from renewable fuels in "rural re-vitalization, increased oil exports from western Canada, industrial development, and valuable options for re-balancing fuel 'mix'."

The economic impact of operating the 28 Canadian renewable fuels plants was assessed to include:

- The production of a total of 2.25 billion litres of renewable fuels annually.
- A net annual economic benefit of $1.473 billion to the Canadian economy across Canada, including $14.1 million to municipal governments, $108.8 million to provincial governments, and $111.8 million to the federal government.
- The creation of a net 1,038 direct and indirect jobs annually.
- An estimated annual benefit of $540 million in additional oil exports that are possible because of western Canada biofuels production (using a value of CDN $80/barrel).

"Even making allowance for the opportunity costs of alternate investments, and the opportunity costs of alternate feedstock sales, renewable fuels plants in Canada represent a positive net economic benefit," the report concludes.

## CBS gets feed safety certification

Canadian Bio-Systems Inc. has been granted B-series HACCP certification under the Netherlands based, GMP+ Feed Safety Assurance (FSA) scheme. The B-series certification encompasses all aspects of feed production from cultivation, processing, transportation and storage. Within this series, Canadian Bio-Systems is certified as B1, which includes the production, trade and storage of feed and feed products. With this, Canadian Bio-Systems becomes the only Canadian company holding the B1 GMP+ certification.

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

GMP+ FSA is an international scheme and is applicable worldwide for assuring feed safety in all links of the feed chain - www.gmpplus.org.

For further information, contact Canadian Bio-Systems at info@canadianbio.com

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# • Industry Crisis

## Rate of attrition slows

Hog inventories for April 1 show that the high rate of attrition in the industry that occurred in 2008 and 2009 has started to slow down this year, although both the sow and gilt herd and total pigs are still going down year on year. The Statistics Canada data indicated that total number of hogs was 11.6 million, down 2.1% from the same date in 2009 and down 22.6% from the 15 million recorded in April 2006. Nationally, the number of sows and bred gilts was down 5.7% year on year and 19.4% less than the peak in 2005.

Regionally, there are large differences between the changes in pig numbers over the last year and during the last 5-6 years. In the east, Ontario experienced an 8.1% fall in both total pig numbers and also sows and gilts in the year to April. The province saw a high rate of applications under the Hog Farm Transition Program. In April 2004, Ontario had 422.3 thousand sows, but now has 324.1 thousand, a drop of 25%. In contrast, neighbouring Quebec saw total pig numbers increase by 0.8% in the year to April 2010, while sows and gilt inventory barely changed. Since 2004, sow and gilt numbers have fallen only 9.1%, despite the moratorium on new production.

In the west, Manitoba has shown the most resilience in terms of hog numbers, even though it has traditionally relied on US markets for isowean and feeder pigs, which have been badly affected by COOL legislation. While sow numbers fell 4.6% in the year to April, total hog numbers went up by 3%, a reflection of more pigs being finished in the province rather than being exported. Sow and gilt numbers have fallen by just 10.8% since 2004, very similar to Quebec, but for completely different reasons. Saskatchewan saw a 2.6% drop in total hog numbers, while the sow and bred gilt herd fell by 11.8%. The province's sow and gilt herd has fallen 32.1% over the last 6 years, while Alberta's has dropped by 25.5%. In the year to April 2010, total hog numbers in Alberta fell by 3.2% and sow and gilt numbers by 6.4%. British Columbia's pig numbers have been falling dramatically in recent years, especially in the year to April 2010 when total pigs reduced by 15% and sow numbers by 37.5%. The BC industry has virtually halved in size over the last 6 years and now has only 10,000 sows.

As one would expect, the number of farms with hogs has also fallen sharply in recent years. In the 6 years to April 2010, the number of farms reporting hog numbers has fallen from 13,175 to 7,150 or 44.7%. Over the same period, Quebec has lost 28.6% of its producers whereas Ontario has lost 44.1%. In the west, Manitoba was down 44.3%, Saskatchewan a massive 71.3% and Alberta 59.2%, while BC showed only a 24.7% drop. However, the numbers shown by Statistics Canada are somewhat suspect when they show 670 farms with pigs in BC, when the real number is more like one-tenth of this. Similarly, Alberta is shown as having 850 farms when a recent survey by Alberta Pork suggests that the real number is around 450.

With a proportion of the sows that are being taken out of production under the Hog Farm Transition Program still to be culled, the sow and gilt herd could fall still further. On the other hand, some farms that went out of production but were not part of the scheme have been sold and are being repopulated, so it is possible the national herd will stabilize at 1.25 to 1.3 million sows and gilts later this year.

## Improved profits stimulate packer activity

Improved margins in the industry have stimulated activity in the processing sector, with a number of recent announcements in both Canada and the USA.

Maple Leaf Foods, which had previously shelved the sale of its Burlington, Ont. plant due to the industry crisis, has launched a formal sale process for the business following renewed interest from potential purchasers and improved economic conditions and credit markets.

"The sale of the Burlington business will complete the last phase of Maple Leaf's protein transformation journey and supports our commitment to refocus our growth in the value-added meat, meals and bakery business," said Michael Vels, Chief Financial Officer. "We are reinvigorating the sale process following renewed interest, including the potential of completing a sale to a producer group."

The 365,000 square foot Burlington facility is one of the largest and most efficient pork processing facilities in Canada, says the company. Together with its management and sales teams it is a profitable business with a highly skilled workforce.

The Moose Jaw Pork Packers plant in Saskatchewan, which has been sitting idle since September 2006, has been purchased by Langley, BC-based Donald's Fine Foods.

Donald's, which has been operating since 1993, currently runs a 15 hundred head per day pork slaughter facility at Langley and a distribution and further processing facility at Richmond. The company distributes products both domestically and internationally, predominantly to Asia.

Senior vice-president Tony Martinez says with the number of hog producers in Saskatchewan and the company running out of capacity, it made sense to open up another facility.

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Mr Martinez says the company still needs to negotiate a union contract and then refurbish the facility to bring it up to Canadian Food Inspection Agency standards so products can be exported. He says ideally the company would like to see the first hogs being slaughtered and processed at the facility by the end of the year.

Sask Pork chair Jay McGrath says, although the Moose Jaw plant's capacity is limited to about five thousand head per week and its reopening won't take care of all of Saskatchewan's slaughtering needs, it's a positive step toward restoring some processing capacity in the province.

These two announcements followed the purchase of the former J & M Meats plant at Warburg, Alta., by Country Fresh Pork. The plant has a capacity of 2300 hogs per week.

In the USA, Triumph Foods said it is dusting off blueprints for a pork processing plant in East Moline as the hog market improves, according to a report by KWQC-6 in Davenport, Iowa.

Triumph bought the 116-acre property in East Moline in 2007 with plans to build a $150 million plant that would employ at least 2,000 people, but the company put those plans on hold in the fall of 2008 when the economy tanked. But with the market rebounding, the company says it can put together financing and is reportedly asking USDA to guarantee a loan. If the financing comes together in time, Triumph would begin construction this year, the report said.

## US imports rise sharply

The strong Canadian dollar resulted in sharply higher US pork imports during the first quarter of 2010. Canada imported nearly 12,000 tonnes of US processed pork from January 1 to March 27, a 43 % increase from the same period a year ago. "What you see (at stores) is lots of US pork being featured," said Jacques Pomerleau, executive director of Canada Pork International. He said that the influx results from the Canadian dollar's rise to near parity with the US dollar, according to a Reuters report.

Demand for US cured hams has been especially strong, with Canadian imports more than quadrupling to 3,344 tonnes. That demand likely reflects earlier Russian bans on imports from some U.S. pork plants, said Kevin Grier, senior market analyst at the George Morris Centre.

Canada has also exported more pork and beef this year. The outlook for pork exports is improved from a year ago, when China banned Canadian pork in connection with the H1N1 flu outbreak, Pomerleau said. China reopened to Canadian pork in February and pork supply worldwide has declined, he said. ≡WHJ≡

# Zero to thirty in 12 months

***By Bernie Peet***

For most producers, the goal of weaning 30 pigs per sow is too far out of reach to be a meaningful target, but is something they may aspire to. Only a handful of Canadian producers achieve this level of breeding herd performance and it's taken them a long time to find the magic formula. So to reach 30 pigs per sow from a standing start in just 12 months seems nothing short of impossible; but that is exactly what Hog Boss Martin Waldner and his team have done at Hartland Colony, near Bashaw, Alberta, where a new 800-sow farrow operation was set up in 2008. The first gilts were bred at the end of February 2008 and by January 2009, the herd records show that the 30 pigs per sow milestone had been reached.

Waldner and his colleagues had been working for some time on the design of a new 600-sow hog barn to replace the old one at Pleasant Valley, so when the new colony started to be built, they had already done a lot of creative thinking. The most radical approach was to design everything based on the highest levels of pig performance and also allow for future improvements. "We based everything on 12 pigs weaned per sow and the nursery and finisher rooms were sized accordingly," explains Waldner. Not only that, but the new facility is equipped with the latest technology in feed manufacturing, feeding, environment and pig care. So, what was the route to such an impressive achievement?

The starting point for such high performance is the gilt, Waldner believes. Hartland breeds its own F1 gilts from pure Landrace females mated to a Large White boar, while the initial stocking and some subsequent replacement was done with F1 gilts from Fast Genetics. "Our home-bred gilts are moved out of the finishing barn at 120-140 lbs and into a dedicated isolation unit away from the barn, Waldner explains. "They are housed in part slatted pens to help develop strong legs and fed a gilt developer diet. We want to have good bone strength and so we don't push them too hard." Any heats observed in isolation are recorded and gilts are later moved to the breeding area, where they are mated at their third heat and at a minimum of 220 days. This attention to detail is reflected in the first litter size - which was 13.3 total born in 2009 - and the extremely low drop-out rate of gilts and first parity females.

In the breeding barn, gilts are housed in groups of 4-5 and weaned sows are placed in single pens opposite a row of boar pens. Breeding is natural, using pure Duroc boars from Fast

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**Table 1: Breeding herd performance for 2009 – Hartland Colony**

| | |
|---|---|
| Farrowing rate (%) | 90.6 |
| Average pigs total born/litter | 15.44 |
| Average pigs total born/litter | 15.44 |
| Percent stillborn pigs | 6.4 |
| Pre-weaning mortality (%) | 12.1 |
| Pigs weaned per litter | 12.3 |
| Litters/mated female/year | 2.43 |
| Pigs weaned/mated female/year | 29.93 |

Genetics, and the regime is simple and effective. "All gilts and sows are bred twice, with a 24-hour interval," notes Waldner. Immediately after service, females are moved into the gestation stalls. Sows receive 6 lbs of feed for the first week and then are fed to regain any condition lost during lactation. "Sows may get up to 10 lbs per day if necessary, but we check sow condition weekly and adjust the feed level downwards as sows regain condition," he says. "From day 56 up until day 84, all sows receive 6 lbs per day and then feed is increased again until just before farrowing."

Once in the farrowing pens, care is taken not to overfeed as this can cause udder problems and reduce lactation feed intake. Sows farrow naturally, but are carefully observed whenever possible to minimize stillbirths and to make sure piglets receive adequate colostrum. With such a high litter size, fostering is a key aspect of management and a lot of emphasis is placed on matching the number of piglets to the sows' udder capacity. Also, a supplementary rearing system is used to rear surplus piglets.

Piglets in the supplementary rearing unit at Hartland Colony, Bashaw, Alberta

The new 800-sow hog barn and feed mill at Hartland Colony

Each farrowing room contains two rows of nine crates and at the end of each row is an additional creep area with a heated mat, which is used to rear the surplus piglets. "We take a litter of large piglets at 7 days of age and put them in this area," explains Waldner. "They have access to milk in trays and creep feed when they go in, then the milk is removed 7 days before the room of sows is weaned at 24 days." Piglets that are too small may be moved back to the previous room and weaned a week later. The sow that has had the piglets removed is used as a foster mother and given surplus newborn piglets. "It's important to use a sow that is very calm and has good teats," he stresses.

The farrowing pens are 8 feet long and 6' 6" wide in order to accommodate large litters of big piglets. Sow feeding is geared to maximizing milk supply, with sows starting on 4lbs/day at farrowing and increasing by 1 lb per day during the first week, then by 2 lbs per day after that until their intake limit is reached. "Once sows are eating 12lbs of feed per day, we start feeding three times per day, at 8.00am, 2.30pm and 7.30pm," notes Waldner. "Sows will typically reach an intake of about 24 lbs per day and sometimes up to 28 lbs, while gilts eat about 20 lbs. Such high feed intake not only ensures that sows are weaned in good condition, but that they wean heavy piglets. At the time of my visit in March, the weight of 5000 piglets weaned so far in 2010 had averaged 19.3 lbs (8.8kg) at 25 days.

After weaning, the objective is to get these pigs eating and growing as quickly as possible. To do this, says Waldner, there are five key points to address – good hygiene, an adequate supply of clean water, high quality feeds, a suitable environment and careful management.

The barn has 8 nursery rooms, each with two pens of 200 pigs. At the end of each batch, rooms are washed and left to dry for at least 24 hours. "It's really important that the pens are clean and dry before pigs are brought in and we always ensure that the room temperature is at least 80˚F (27˚C)," comments Waldner. "It's also essential to make sure there is clean water in the drinking bowls, that nipple drinkers are functioning correctly and that there is some fresh, dry feed in the bottom of the feeders." The inside of the feed hopper should be just as clean as the outside, with no lumps or wet feed, he adds.

At weaning, pigs are split by sex, given a Circovirus vaccine and weighed on a platform scale en route to the nursery. The first few days after weaning are critical, Waldner believes. "We monitor the pigs very closely for the first day, making sure there is feed and water in the bottom of all the feeder pans," he explains. Rooms get checked by walking through at least 3 times a day." In a system with large groups of pigs, it's essential that sick or disadvantaged pigs are removed promptly, he emphasizes.

Waldner is convinced that water intake is the most critical aspect of getting pigs off to a good start. The 12 wet/dry feeders in each room have two nipple drinkers over a water trough each side of the feed tray. In addition, there are 12 hanging water nipples per room. "It is very important during the first 2 or 3 days to make sure that pigs know where the water is," he stresses. We provide additional water troughs for the first 3 days until the pigs find that there is water at the feeder too." Hanging water nipples are adjusted once a week with a hand winch so the height is at the shoulder level of the smallest pig in pen.

The ventilation system was designed to give very precise control of temperature. "The temperature is set on a curve starting at 84˚F (29˚C) on day 1, to 80˚F (26.7˚C) at day 5, then down to 65˚F (18˚C) at day 50 when the pigs are removed," notes Waldner. "Humidity is also controlled and set at 60 – 65%.

Pigs receive a creep diet for the first 7 days in the nursery, then they are changed over to a starter diet for 3 weeks, moving on to a starter #2 for the last 3 weeks. The equipment used for feeding allows a series of four diets to be delivered through the same

*Martin Waldner, Hog Boss at Hartland Colony, adjusts the computerized environment controller for one of the nursery rooms*

**continued on page 20**

*Finishing pigs at Hartland Colony are moved from pen to pen using an automatic sorter as they grow*

feed line. "There is an air valve on the line above each feeder, which opens up to deliver the correct feed for the age of pigs in the pen," he explains. "When all the feeders are full and feed starts coming back through the feed line, the feed line is automatically emptied and the next diet is fed."

Performance of pigs in the nursery is impressive. During the 7 week growth period, pigs average 630 grams/day, reaching a weight of 39 kg at removal, with a death loss of less than 2%.

Prior to the finishing stage, pigs are housed in a pre-grower room where they are trained to use an auto-sort system in order to access a feeding area. When they reach 45 kg, the scale selects them and diverts them into the first pen in the finisher barn. As they grow, they move from pen to pen down the barn based on weight.

There are two rows of 6 pens, each 82 ft deep, of which 20 ft is a feed court with 5 circular wet/dry feeders. "We kept the feed court size to a minimum to avoid pigs lying in that area once they have eaten," comments Waldner. The first pen in each row is 28 ft wide and each successive pen is bigger to accommodate pigs as they grow, with the final pen before selection for market being 53 ft wide. Gilts are housed in one row of pens and barrows in the other. On one day each week, the scales in each pen in the barn are set to select pigs at a pre-determined weight and divert them into the next pen. "We typically find that 200 pigs move from one pen to the next," Waldner notes.

**Table 2: Finishing pen widths and selection weights**

| | | | | | | |
|---|---|---|---|---|---|---|
| Pen width (ft) | 28 | 32 | 36 | 42 | 47 | 53 |
| Total pen area (ft$^2$) | 2296 | 2624 | 2952 | 3444 | 3854 | 4346 |
| Area/pig (ft$^2$), based on 420 pigs | 5.47 | 6.25 | 7.03 | 8.20 | 9.17 | 10.35 |
| Min. weight at transfer (lb) | 128 | 152 | 170 | 203 | 228 | 255 |

Table 2 shows the pen areas and pig space allowances, which are very generous relative to recommended figures, but do include the feed court area. Also, the minimum selection weights which are set for the scale between each pen are indicated. "The weights that we set for the scales are done by trial and error and are changed regularly in order to ensure the correct number of pigs in each pen," Waldner explains.

At the end of each row of pens is an 18 ft wide shipping pen for selected market hogs over 255 lbs. Pigs are diverted into the shipping pen the afternoon prior to shipping and have access to water but not feed until they are shipped the following morning.

The finishing system challenges conventional thinking on mixing pigs, or rather not mixing pigs, yet there is no doubt that it works extremely well. The most surprising thing is that there seems to be no aggressive behaviour or indication of injuries due to fighting. "When you see pigs that don't know each other interacting, they seem to just peck at each other, then one backs off and they go their separate ways," Waldner notes.

The impressive performance at all stages of production in the barn is clearly achieved through the hard work and dedication of Martin Waldner and his team. Only Waldner and Eli Stahl, who runs the breeding and gestation area, had worked with pigs at Pleasant Valley. John and Andy Waldner, who look after the farrowing rooms, and Dave Stahl, who is responsible for nursery and finishing, had no pig experience. When I tell them that I have visited thousands of barns around the world and theirs ranks as one of the best I have ever seen, they are understandably proud. There is no doubt that their success is well deserved. ≡WHJ≡

# Australia strong market for Canadian hog producers

***By Myron Love***

Australia has become a good market for Canadian-produced hogs. Ross Brown, a training organization manager for CHM Alliance in Australia and a 25-year veteran of the hog industry Down Under, noted that 50% of Australian hog imports are from Canada. "Canadian producers have a great genetics program and Canadian hogs have less carcass variation," he told producers attending the 2010 Manitoba Swine Seminar. "In Australia, we have not concerned ourselves with genetics – to our detriment."

Brown was actually in Manitoba to meet with Mary Petersen, the Program Coordinator for Agriculture Extension at Assiniboine Community College in Brandon, to discuss the prospects of the Manitoba College exporting its Hog Management course to Australia. "One of the biggest issues we have in our industry in Australia is a shortage of labour," he told the Manitoba producers. "Working in the pig industry is not seen as a good job."

He noted that the industry has had to import numerous foreign workers largely from the Philippines. And Australian labour law requires that foreign workers be paid a higher salary than home-grown employees. "Four imported workers cost us the same as five Australian-born workers," Brown noted.

Brown is from Darby – a centre of Australian hog production – in Queensland, northwestern Australia. He started working in the industry as a stock person and was in management prior to become a trainer. "Eighty percent of Queensland's pig population is within a few miles of Darby," he noted.

He also reported that his region has been suffering from drought for the past ten years. "We are dealing with water restrictions and have to collect rainwater," he said. He further reported that the number of hog producers in Australia was about 50,000 in 1960 and now numbers about 1,800. "One-quarter of the farms produce more than 90% of the pigs," he said. The largest producer by far has 50,000 sows. Brown's CHM Alliance is in second place with 27,000 sows. He noted that sows average 18.1 piglets per year. The animals are housed in open barns with straw or sawdust coverings on the floors. "We are getting $3.60 a kilo dressed weight now for pigs," he said. "Eighteen months ago, because of high feed costs, we were losing about $50 per pig."

Herd health is naturally a primary concern, he noted. "We have very strict biosecurity conditions. While we have conditions such as Lawsonia intracellularis, Mycoplasma hyopneumonia and Haemophilus parasuis, we have absolutely no PRRS, PRV, SIV, TGE, PMWS, ASF or FMD.

The industry in Australia is looking for ways to improve herd feed conversion efficiency, reduce feed costs, increase the variety of pork products and enhance its international competitiveness, Brown said. To that end, and with support of the Australian government, in 2005 the industry established the Pork Cooperative Research Centre. The Centre is also charged with undertaking education and training programs to attract more people into the field.

Brown also spoke about Australia Pork Limited, a producer-owned company delivering integrated services to enhance the viability of Australian pig producers. The organization is funded by a $2.50 levy on every pig that is slaughtered. ≡WHJ≡

# CPC traceability program aims to improve response to disease and food safety emergencies

***By Myron Love***

*Jeff Clark*

Thus far, Canadian pork producers are responding slowly to the Canadian Pork Council's newly-launched National Traceability Program. Speaking to producers attending the 2010 Manitoba Swine Seminar in Winnipeg (February 3 and 4), Jeff Clark, the program's manager, reported that orders for the traceability tags have been slow since they were made available at the beginning of October.

"Within two years," he said, "the tags will become mandatory. We are trying to encourage producers to get a head start on tagging their herds. Tags can be ordered by phone. (Clark works out of the Manitoba Pork Council offices. The MPC phone number is 204 237-7447.)

The CPC initiated its PigTrace Canada (PorcTrace Canada) in 2002 in response, Clark noted, to more animal movement worldwide with the resulting increased risk of the spread of domestic animal disease. The aim of the program is to improve Canada's response to potential disease and food safety emergencies.

"A faster and more efficient response by animal health officials to disease and food safety programs improves the industry's recovery time and return to normal trade following a crisis," Clark pointed out. There is also pressure coming from major markets such as Japan and Korea. Traceability thus has trade benefits." He added that several American meat packers are considering adopting a policy of only dealing in animals that have been tagged. "It's a matter of increasing the consumer's confidence in the product," he said.

In 2004, CPC launched a pilot study to determine the most effective and efficient design for reporting the movement of swine. The study pointed to individual ear tags as the optimum choice although, as Clark noted, swine tend to be moved in groups and all individuals in the group are assumed to have the same health status.

"We concluded that there are cases where animals need to be identified individually for optimum traceability," he said, citing breeding stock, assembly yards where pigs from different groups intermingle before the slaughter – or at places such as auctions, shows or testing stations where pigs may also intermingle with those from other herds.

Clark noted that Canadian swine producers began registering their premises and adopting the national slaughter tattoo numbering scheme for tracing market hog movements in 2006. He reported that 90% of producers are now registered.

Last year, Clark reported, the CPC selected Agri-Tracabilite International as its national traceability service provider and Allflex Inc. to manufacture the ear tags. The program also received funding to the tune of $7.3 million from Agriculture and Agri-Food Canada to implement the PigTrace Canada initiative.

PigTrace Canada's goals for 2010 include establishing "real time" database connections between the PigTrace database and provincial pork office databases; consult with federally-approved packing plants to begin compiling slaughter movement data; begin working with producers to field test different technologies and methods of reporting farm-to-farm movements and work with packing plants with limited technology to find a way to collect their slaughter movement data in a timely manner.

"We might develop a web application which could be accessed by cell phone," Clark said. "We are also looking into adding further information that could be of benefit to producers."

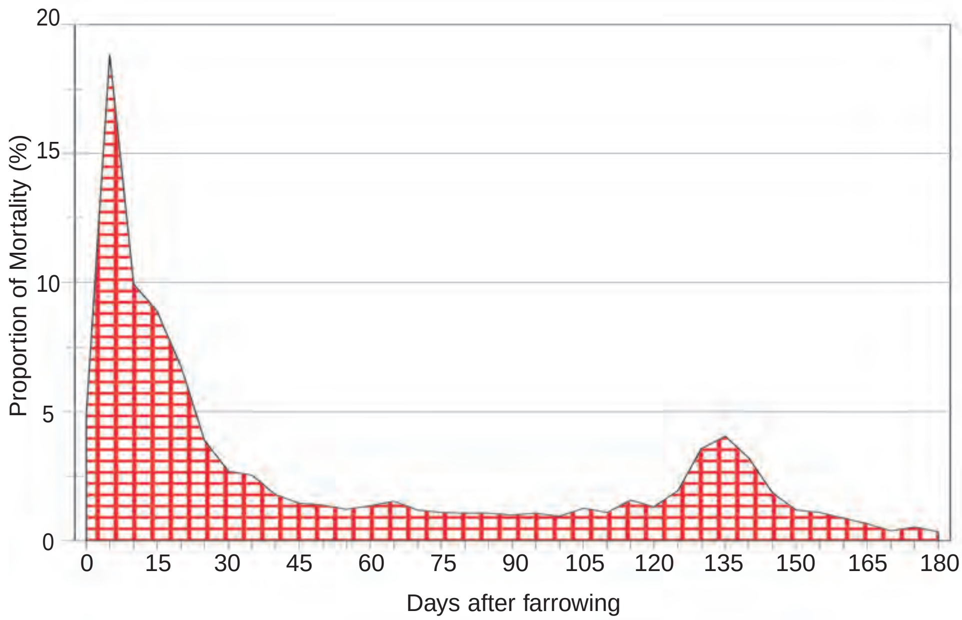
≡WHJ≡

# Focus on sow quality at farrowing

More focus on the quality and health of the sow at farrowing will result in higher numbers of heavier piglets being weaned, according to Dr. John Deen, a veterinarian at the University of Minnesota. Speaking at the Manitoba Swine Seminar, he said that in the past there has been a lot of effort placed into understanding the piglet factors that influence survival and growth up to weaning but not enough emphasis on the sow. This means that a number of aspects of farrowing management and environment actually compromise sow performance which, in turn, affects piglet performance.

Sow mortality is high around the time of farrowing (see Fig. 1) and there is a continued high risk of mortality through the lactation period, Deen points out. Also, there is a high level of culling and death loss in the immediate post-

**Figure 1: Proportion of sow mortality by days post parturition**



weaning period, in part due to the stresses of lactation. "The sow is under extraordinary metabolic challenges as it produces a high level of milk production and progeny growth during the lactation period," he notes. "There are few species that put such a high proportion of their body weight into the growth of their progeny. Cattle or sheep come nowhere close to this high level of maternal contribution."

Deen suggests that the quality of the sow at farrowing has been an understudied area. "We can find a number of reports that studied the effect of piglet quality upon the subsequent ability to survive and thrive," he explains. However, the protection of the sow has been studied in less detail. "We argue that we should look more closely at the effect of sow quality and comfort on survivability not only to protect the sow during the parturition and lactation periods but also increase the quality of the progeny."

Deen believes that there is an inherent bias in the management of the farrowing room that results in more care for piglets than for sows and quotes two examples that illustrate this, the first being farrowing room temperature. "The optimal temperature for the sow, especially during periods of high metabolism appears to be in the area of 14°C. Conversely, newborn piglets could use a temperature closer to 32°C," he notes. "In many farrowing rooms we see a bias towards protecting piglets rather than protecting sows by ensuring comfort and appetite."

Second, farrowing flooring materials tend to compromise sow comfort. "For the size of the sow, the claws are relatively small and a great deal of pressure is exerted per square centimetre of surface area," Deen explains. "Yet the farrowing room has an extraordinarily high level of void space in most flooring materials. Most of these flooring materials have been chosen for the protection of piglets through high levels of sanitation. Yet we are seeing that such floors increase the discomfort of sows, especially when there are pre-existing lesions on the claws of the sows."

Much of this bias can be explained through the record-keeping system, Deen suggests. "Farrowing room records are mostly directed towards piglet quality and survivability," he says. Little is focused on the pre-existing conditions of the sows entering the farrowing crate, nor the quality of the sow at exit. In some cases we do have records for sow weight and back fat, but these are limited."

Studies have shown that sows that are lame at exit from the farrowing crate have a much lower chance of survivability and also the quality of piglets from lame sows is lower. "Behavioural studies are showing that one of the main measures of concern is actually the willingness of the sow to get up and eat and drink," Deen points out. "When this is limited, we do see compromises in the capability of the sow to maintain its weight and milking abilities."

"We think that more focus should be placed on the care of sows during the farrowing period," Deen concludes. The use of rubber mats in the farrowing pen is one suggestion to improve comfort. "For sows that are lame, especially with claw lesions, we are finding that there is an increase in the amount eaten with the use of rubber mats under the hind feet," he says. "The numbers are limited for survivability studies but we would expect from previous studies that the likelihood of survival would increase as well."

The choice of slatted flooring materials is another area that warrants attention, Deen suggests. "We must put more focus on the choice of flooring for lactating sows to ensure that they feel comfortable enough to get up without slipping and maintain their stance for an adequate amount of time," he says. "Lower void space on flooring appears to be an effective way of increasing that comfort level. It may also be useful to provide separate padded areas for the sow's feet."

The use of long-acting analgesia is an effective way of increasing the comfort of those sows in pain, Deen adds. This again has been shown to increase the survival of both sows and progeny, he notes. Also, the use of cooling systems in hot weather increases sow comfort, bearing in mind the earlier comment about re-evaluating farrowing room temperature regime.

A greater emphasis on the sow's needs will not only help to reduce culling and death losses, but will result in higher piglet survival and faster growth to weaning, Deen believes.

≡WHJ≡

# Parity distribution management and culling

***Herd parity profile influences both the physical and economic performance of sow herds. Understanding the factors that influence parity structure and being able to manipulate them is essential to optimize long term profitability of pig producers, says Dr. Juan Carlos Pinilla with PIC North America. Optimum parity profile is a mathematical function of sow removal rate, gilt availability, hog market price and feed ingredient cost, he notes. He reviews the implications of culling and parity structure and also provides management recommendations to optimize performance of sow farms.***

## Targets

When evaluating farms or systems, it is necessary to understand where they rank with industry benchmarks, Pinilla suggests. He shows benchmarks based on PIC targets and the top 25% of the producers and companies recorded by Agristats (Table 1).

Control of culling rate provides the main opportunity to reduce removal rate, optimize parity structure, average sow age, average age at removal, and consequently to optimize herd performance and profit.

**Table 1: Key Performance Indicators (based on 2.5 litters/sow/year)**

| Indicator | PIC targets | Agri-Stat top 25%(I) | Difference | Interference level |
|---|---|---|---|---|
| Sow mortality (%) | < 6.0% | 5.0% | 1.0% | > 9.0% |
| Culling rate (%) | < 44% | NA | NA | > 50% |
| Annual replacement rate (%) | < 50% | 56% | (6%) | < 30%; > 60% |
| Average herd age (parities) | 3.5 | 3.0 | (0.5) | <3.0; >4.0 |
| Average age at removal (parities) | 5.5 | 4.5 | (1.0) | < 5.0 |

*(I) Top 25% ranked on cost of production*

Even though there is an opportunity to capitalize on culling rate, the US industry has not been proactively dealing with this, Pinilla believes. Perhaps what the producers are missing are clear targets for culling, he suggests (see Table 2).

**Table 2: Culling targets**

| Criteria | Target(II) | Target(III) |
|---|---|---|
| Voluntary | 30% | 68 |
| Reproductive failure | 10% | 23 |
| Unsoundness & others | 4% | 9 |
| **Total culling** | **44%** | **100** |

*(II): % of the average sow inventory.*
*(III): Breakdown of 100 culled females.*

## Use of performance records

Understanding why, when and how sows are removed from the farm is the first step to establishing corrective actions when there are deviations from the target, Pinilla explains. When facing high sow removal and/or early sow removal, the first approach to the issue is a record review.

"It is essential to train farm personnel in the correct identification of the reasons for sow mortality and culling," he says. "It is common to see 30 or even more culling reasons in a system, so training and expertise can reduce the number of reasons that different farms are currently reporting." In turn, he says, this helps to simplify the farm staff's job, sheds light on the field diagnostic, and supports the establishment of action plans to deal with the issue and be successful in controlling it.

Making sure that destroyed females are included in the records as part of the sow mortality is part of the initial approach so that they are not added into the culling numbers, Pinilla adds.

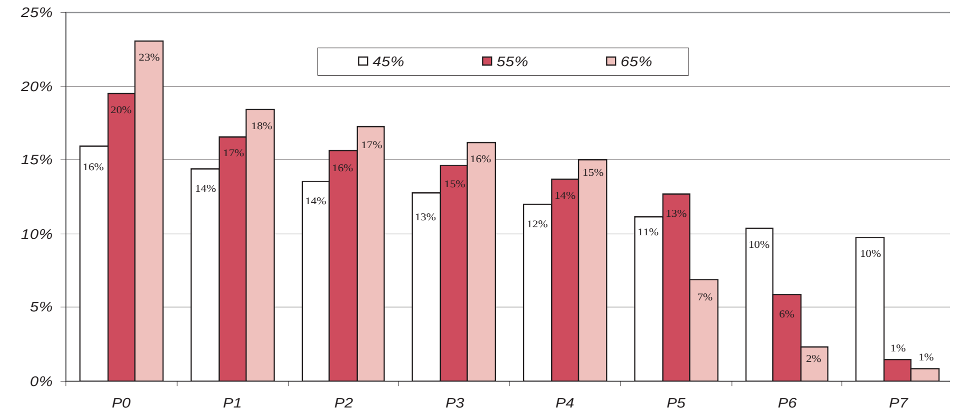
## Culling and parity profile

A review of culling records from a total of 50 sow farms in the Midwest, with an inventory of more than 180,000, revealed that almost a third of the females are unable to wean more than three litters before culling. This fact is one of the main opportunities that the industry has to realize, Pinilla believes. "It identifies the need to look for management procedures and health programs to allow pig producers to capitalize on the benefits of higher sow retention rates and consequently a more mature sow herd," he says.

Younger parity females are often removed by involuntary culling. Young females removed from the herd are not fully amortized so they increase cost of the weaned pig, Pinilla points out. "These young females are replaced by even younger females, adding the cost of additional replacement rate to the challenges on production associated with lower immunity against reproductive diseases and digestive diseases, lower litter birth and weaning weights, and potentially compromising pigs' performance after weaning."

The most important single factor that makes gilts eligible to be bred is body weight but in reality few sow herds can weigh gilts, Pinilla notes. Thus, flank taping or gilt age is the most common methods to estimate eligibility. "When comparing age at first breeding versus culling rate from breeding to first weaning it is noticed that removal rate remains constant in gilts first bred at 28 weeks of age to 31 weeks of age," he explains. "From 32 weeks of age, there is an increased culling rate. It is unclear why older gilts tend to have a shorter productive life; however it can be speculated that they were bred late in life due to limitations in growth rate, in their reproductive ability, or both."

**Figure 1: Percent of sows in each parity with three levels of annual replacement rate**




Producers should consider implementing action plans to retain sows longer in farms, Pinilla suggests. Retaining sows in the herd longer optimizes the production of full value piglets, and consequently finisher performance and percentage of full value pigs to market. He proposes 45-50% annual replacement rate as a reasonable target, with an average age in the neighbourhood of 3.5 parities, 33% of the breeding group in the P-0 and P-1 category and more than 50% in the P-2 to P-5 group (Figure 1).

"Farms not retaining 70% or more of bred gilts through to P-3 are not able to consistently hit the targets associated with 50% annual replacement rate and average removal age of P-5," Pinilla points out. "This emphasizes the concept that producing enough high quality gilts is a key element of any plan to have the right parity profile."

"From selection, gilts should be raised in no less than 12 sq. ft per gilt to ensure proper growth rate and make the heat detection simpler," he continues. "In order to maximize the number of eligible gilts from any given batch of gilts, they should be provided with a dry environment, non-slippery floor, full feed, one drinker per every 15 gilts and daily boar exposure to a mature boar for at least 6 weeks prior to the actual first breeding." It is also important to acclimatize gilts to a stall and being fed only once or twice a day for a minimum of 15 days, Pinilla adds, otherwise first litter size may be reduced by 0.5 to 1.0 pigs.

Pinilla notes that there are often large variations in sow retention rate within systems, even though most aspects of the production system are the same. "Factors like annual feed usage and body condition, labour turnover and

*continued on page 28*

qualifications, staff motivation, herd health and facility layout should be investigated as potential risk factors," he says.

He believes that the use of ad-lib feeding for lactating sows in order to maximize feed intake will improve sow retention.

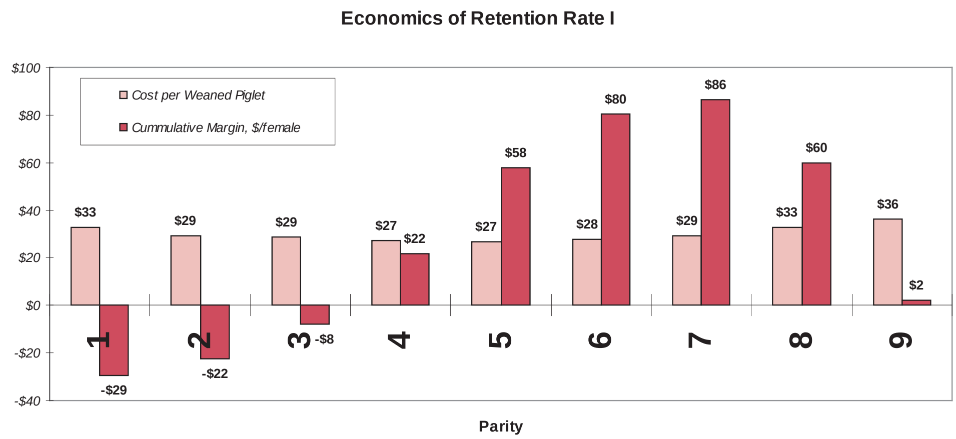
"Any disruption of the normal production flow can potentially impact culling rate, average age at removal, annual replacement rate, and even sow death losses, Pinilla explains. "In this case, farms have to retain marginal sows and/or have a low selection pressure on the replacement gilts to hit their breeding targets. This is the beginning of what has been called the death spiral, characterized by higher sow mortality rates, lower sow retention rates and reduced reproductive efficiency."

## Genetic considerations

It is well accepted that heritability of sow longevity and sow mortality is low, however, structural soundness of legs is moderate to highly heritable, so breeding stock supply companies can make a difference when they select against unsoundness.

"The current PIC GN Cross Bred Program allows the Genetic Nucleus Operations to select pure lines based on family performance in commercial environments," Pinilla notes. "Selecting for good performance in those environments is selecting for robust pigs and significant improvements have been realized. In terms of use of indexes, the estimated breeding value in dam lines includes sow mortality and leg scoring."

**Figure 2: Cost of production of weaned piglet and cumulative margin per female by parity**




## Economics

In an expensive feed ingredient environment, sows enter into positive margins later in life, says Pinilla. "In a model based on cost of production of $29/weaned piglet, 11.1 weaned piglets per litter and a purchase price of $200/gilt, females remain in negative margin until P-3 and start to move into positive territory at P-4 (Figure 2). They gain in economic advantage until P-5, remaining in this area until P-7. After that, there is no advantage to retain them in the farm."

## Culling: Practical recommendations for farm staff

Pinilla suggests 10 rules for culling sows:

1. Avoid culling sows before their third weaning. Cull the ones that were not able to wean 30.0+ piglets in parities 1-3
2. Avoid retaining sows after P-7
3. Pick the sows to be culled in the farrowing house and avoid housing them in the weaning row
4. Cull gilts with no recorded heat 6 weeks after the beginning of boar exposure
5. Cull sows with no heat after 4 weeks from their weaning date
6. Cull sows with metritis (uterine infection and discharge) which return 2-5 days later
7. Cull sows having mastitis and/or less than 8 functional teats
8. Cull sows that have low chances to farrow next time
9. Cull sows which abort (excluding an abortion storm when facing PRRS outbreaks)
10. Cull sows in extremely poor body condition at weaning

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# Speakers provide perspective for Canadian hog producers

***By Myron Love***

Karl Kynoch remembers when sows sold for 58.5 cents a pound and boars for 42 cents a pound. "In 1982," recalls the chairman of the Manitoba Pork Council. It has been a roller coaster ride for the Canadian hog industry over the past 25 years and there is more to come, noted Kynoch, the opening presenter at the 2010 Manitoba Swine Seminar.

Kynoch identified the elimination of the Crow Rate in 1986 as the beginning of turbulent times for producers. The Crow Rate kept feed costs low, he noted. "The only way we have been able to survive was to get more out of our herds," he said. "Where we used to be happy with eight piglets per litter, we are now getting as much as 30 piglets and more per sow per year."

Two major trends have shaped the past 25 years of the industry in Manitoba, Kynoch pointed out. On the one hand, there has been an overall increase in product demand. The opening of the Maple Leaf Pork plant in Brandon in 1999 was a major boost to Manitoba producers. "Maple Leaf is running a full double shift and has helped us maintain capacity and grow," Kynoch said. Also, the opening of the United States to large scale import of hogs particularly from Manitoba has greatly benefited producers' bottom lines.

At the same time that demand has been growing, the number of hog producers in Manitoba has been steadily declining. Kynoch recalled that a crash in market prices resulted in restructuring in the industry and a large number of amalgamations. And, since 2007, a growing number of Manitoba producers have been packing it in due to a combination of increased feed and fuel prices, depressed hog prices and more stringent environmental and food safety regulations.

"There was no justification for (the provincial government') Bill 17 (which bans the expansion of hog barns or construction of new ones in the Red River Valley)," Kynoch said. "And a new bill – which will ban winter spreading of manure as of 2013 – will undoubtedly push more producers out of business."

He added that the American introduction of "Country of Origin Labelling" in 2008 also dealt a strong blow against Manitoba producers exporting hogs to the US. Manitoba producers accounted for 68% of all hogs shipped into the US. "Hog producers have been hung out to dry by our provincial government," Kynoch said, "even though we produced the largest farm gate receipts and generated more GDP than Manitoba Hydro."

Despite the industry's myriad of problems of late, Kynoch is confident that there will still be a hog industry in Manitoba in 25 years. Picking up the baton from Kynoch, Ted Bilyea provided an overview of the shape of things to come over the next 25 years. One of the key changes currently taking place is the declining consumption of pork in Canada and the United States and corresponding rising demand in eastern Asia.

"People don't understand the Asian market very well yet," said the agri-food consultant and former president of Maple Leaf Foods Inc. "The world is changing, but North Americans aren't really plugged into that yet.

"Last year," he continued, "over 21 billion food animals were produced to help feed a world population of over 6 billion. Projections for 2020 indicate that the demand for animal protein will increase by 50%, especially in developing countries."

He noted that one of the challenges facing hog producers is that oil price increases are leading to higher feed costs. At the same time, he reported, crop yield growth and agricultural research investment are declining. He further noted that North American consumers are more concerned about health and wellness and the environment. "Those are concerns that we in the industry have to work on," he said.

A growing number of consumers also prefer to buy locally-produced products, in particular from farms that raise their animals in an organic environment and are dedicated to environmentally friendly, sustainable agriculture, he pointed out. "Pork has a significantly greener footprint then beef," he added.

"Canadian pork does best in markets such as Japan where the bar on meat quality is higher and where the Canadian image and the trust in the safety of our food products are important. We need to better identify Canadian pork and keep working on improving quality and our image of health and safety." ≡WHJ≡

# Grinding and mixing to produce quality feed

***Considerable effort goes in to ensuring pigs receive the correct amounts of energy and amino acids in their diets, through correct formulation according to the stage of production , genotype and other factors. Similarly, great emphasis is placed on sourcing of suitable feed ingredients to provide those nutrients at least cost. However, good feed manufacturing practices are given much less attention, says Dr. Joe Hancock, a professor and researcher from Kansas State University. This article summarizes the basic considerations for grinding and mixing that can be used to maximize nutritional value of ingredients and complete diets for pigs, presented by Dr. Hancock at the Manitoba Swine Seminar.***

## Grinding feedstuffs

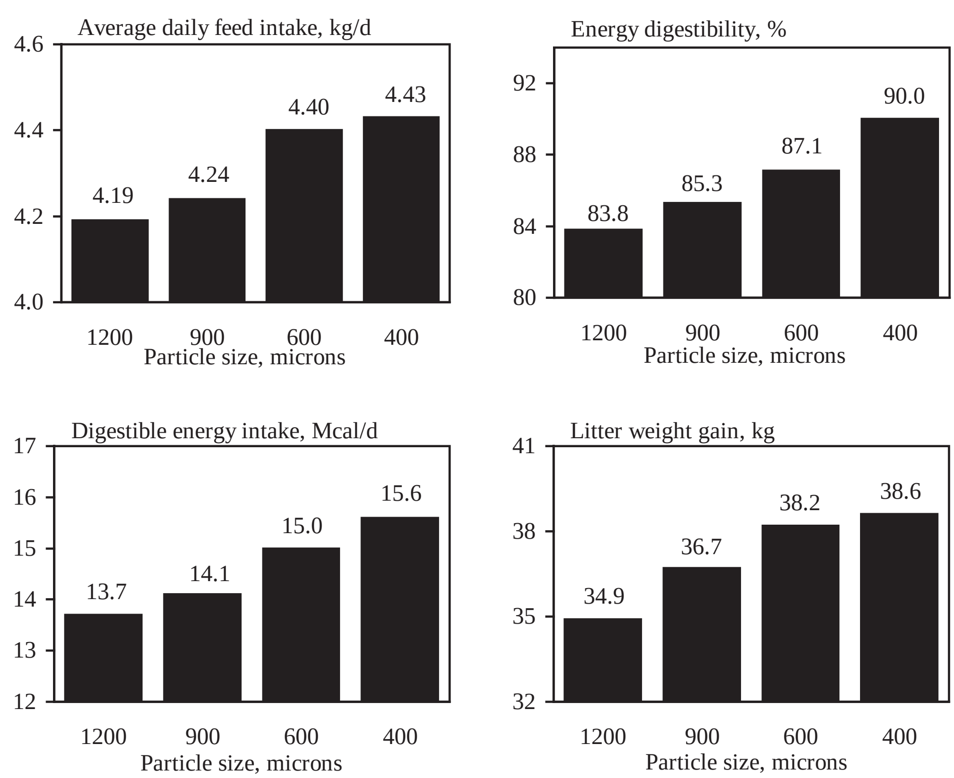
Research has shown that decreasing particle size increases the energy required to mill corn, while reducing the production rate of the milled product, however the effect is not linear. In one trial, reducing particle size from 1000 to 600 microns increased energy consumption from 2.7 to 3.8 kWh/tonne, but reducing particle size to 400 microns increased it to 8.1kWh/tonne. Similarly, production rate decreased only slightly when particle size was reduced from 1000 to 600 microns, but fell by around 50% when particle size was further reduced to 400 microns. These effects vary somewhat depending on the type of grain being milled, for example sorghum is easier to grind than corn. The cost of increased power and reduced throughput needs to be balanced with the value of the benefits of smaller particle size.

Reducing particle size increases digestibility of the grain and therefore improves growth rate and feed efficiency. One trial reported 12% greater gain/feed when the particle size of oats was reduced from coarse (> 1,000 microns) to fine (< 600 microns). Work by Mavromichalis et al., reported in 1998, showed 10 and 9% improvements in rate and efficiency of gain in nursery pigs as the particle size of wheat was reduced from 1,300 to 600 microns. The authors also reported improved efficiency of growth in finishing pigs as particle size of the wheat was reduced from 1,300 to 600 to 400 microns. Wondra et al. ground corn to particle sizes ranging from 1,000 to 400 microns and reported a 1.3% improvement in gain/feed for every 100 microns decrease in particle size of the corn. Indeed, a thorough review of the literature suggests that a 1.2 to 1.4% improvement in gain/feed for each 100-micron reduction in mean particle size of corn as an appropriate “rule of thumb” for growing pigs.

There are very few reported experiments looking at the effects of feed processing on the performance of lactating sows. Wondra et al. fed first



**Figure 1: Effects of corn particle size on lactation performance of primiparous sows and apparent digestibility and intake of energy (from Wondra et al., 1995)**



litter gilts diets with corn milled to four particle sizes (1,200, 900, 600, and 400 microns). Feed intakes increased as particle size of corn was reduced from 1,200 to 400 microns, as did digestibility of nutrients (Figure 1). This increased feed intake and marked increases in nutrient digestibility resulted in a 14% greater intake of DE and an 11% increase in litter weight gain. Also, because of the improved digestibility of nutrients with reduction of particle size, a 21% decrease in fecal excretion of dry matter and a 31% decrease in fecal excretion of nitrogen occurred. These reductions in fecal excretion of nutrients have obvious and immediate implications in reducing the burden of waste management for swine operations.

The improved performance of growing pigs and lactating sows in response to grinding ingredients results largely from greater nutrient digestibility. Various research trials have shown that the digestibility of dry matter, starch, amino acids and other nutrients is increased as particle size reduces. It has been suggested that increased surface area of finely ground feedstuffs and increased fluidity of the material in the gut (thus, more potential for mixing with digestive enzymes) might be involved in improved digestibility of diets for swine.

One trial with lactating sows showed that as particle size was reduced from 1,200 microns to 900, 600 and 400 microns, digestibility of energy and nitrogen improved. Digestible energy and ME values were maximized where the diet contained 400-micron corn. Indeed, the ME concentration of the diet was increased from 3,399 to 3,745 kcal/kg as particle size of corn was reduced from 1,200 to 400 microns. To achieve the same increase in energy density with diet formulation methods, a 9% addition of soybean oil would be needed.

In summary, experiments with nursery pigs, finishing pigs, and lactating sows, data indicate significant improvements in performance with fine grinding of feedstuffs. Furthermore, the marked improvements in nutrient digestibility associated with fine grinding undoubtedly contribute greatly to the observed responses in growth and lactation performance.

## Mill type

Of the various mill designs that can be used to grind feedstuffs, hammer mills and roller mills are by far the most commonly used in production of pig feeds. Hammer mills are simpler to operate than roller mills and require little oversight, even when grinding a wide variety of feedstuffs. Roller mills generate less heat than hammer mills while grinding and are thus more efficient.

It has been suggested that the more uniform particle size produced by a roller mill may have nutritional implications. One experiment compared a blend of coarsely rolled and finely ground corn with a large variation in particle size, hammer milled corn with an intermediate degree of variation in particle size and roller-milled corn with a low variation in particle size. Mean particle size of the corn was similar for all three treatments. The digestibilities of dry matter, nitrogen, and Gross Energy were greater when the particle size variation was smaller but no differences in growth performance were noted.

An effect of mill type separate from any effect caused by reduced variation in particle size has been suggested. Reece et al. described particles of hammer milled corn as more spherical in shape with more uniform edges than particles of roller milled corn. The spherical shape would reduce susceptibility to attack by digestive enzymes, thus decreasing digestibility of nutrients in hammer milled corn. This explanation is difficult to verify, but the possibility of particle shape affecting the nutritional value of cereals is intriguing. Equally interesting observations involve the anecdotal reports of greater flowability and improved handling characteristics for the uniform and granular particles resulting from roller mills compared to the less uniform particles resulting from hammer mill grinding.

The increased particle size uniformity achieved by using a roller mill may improve digestibility of nutrients, but this effect does not seem to be accompanied by predictable improvements in growth performance. Therefore, the industry has focused attention on the consistent improvements in performance that accompany decreased mean particle size rather than the subtle changes associated with greater uniformity of particle size. Because of the focus on reducing mean particle size with as much ease as possible, the hammer mill continues to be the

*continued on page 32*

favourite grinding system used for manufacture of pig feeds.

## Mixing diets

There are numerous mixer designs, with the most common being vertical screw, horizontal paddle, and horizontal ribbon. Suggested mix times are generally near 15 min for a vertical screw mixer, 6 to 7 min for a horizontal paddle mixer, and 3 to 4 min for a horizontal ribbon mixer. Experience suggests that any of these mixer designs will provide satisfactory mix uniformity if given enough mix time. Thus, feed manufacturers and nutritionists should focus on mix uniformity and not mix time as a desired endpoint.

From a feed manufacturing viewpoint, the optimum mixing procedure would require minimal inputs of time, electricity, and labour. Thus, a standard is needed to indicate adequate (but minimal) mix uniformity. That standard typically is a coefficient of variation (CV, a measure of variability – a higher figure indicates more variability) for the distribution of some nutrient or marker within the feed, and a CV of < 10% has been suggested by various researchers. There are a number of ways of measuring the distribution of feed ingredients, usually by using some sort of marker compound that can be measured after mixing to determine how effectively it has been distributed in the mix. In experimental situations, the use of chromic oxide as a marker is widespread, but the difficulty and cost of measuring chromium precludes its use in the commercial situation. The Quantab“ assay for salt (actually, Chloride ions) and the Microtracer‘ procedure, which uses coloured iron filings, are used in the feed industry. The question still remains, however, of just how well any of these assays predict differences in nutritional value of a finished feed.

How does the efficiency of mixing affect pig performance? Traylor and his co-workers carried out a 21-day growth trial with nursery pigs with mix time treatments of 0, 0.5, 2, and 4 min in a double-ribbon mixer. Increasing mix time from 0 to 0.5 min decreased the coefficient of variation (CV) for the chromium used as a marker from 107 to 28% (Table 1). Diet uniformity was improved further as mix time was increased to 4 minutes (a CV of 12%). Rate and efficiency of gain increased markedly as mixing time was increased from 0 to 0.5 minutes, with little response to increasing mixing time further to 4 minutes.

The authors also used the same mix time treatments to prepare diets for finishing pigs. In this case, growth performance was not affected by reducing the CVs of the diet from nearly 54% (0 min mixing time) to < 10% (4 min mixing time). Bone strength did not differ among pigs fed the various treatments, suggesting that minimal mixing of the diets did not create problems with Ca or P status of the pigs. Numerically at least, the lowest ADG and gain/feed and fattest carcasses were for pigs fed the diet with 0 min mix time (i.e., the CV of 54%). Nonetheless, these two experiments suggest that growing pigs are probably less sensitive to diet non-uniformity than once thought and that a CV of something more than 10% (perhaps 15 to 20%) is quite adequate.

**Table 1: Effects of mix time on diet uniformity and growth performance of nursery pigsa**

| | Mix time, min | | | | | Probability value, P < | | |
|---|---|---|---|---|---|---|---|---|
| Item | 0 | 0.5 | 2 | 4 | SE | Linear | Quad | Cubic |
| CV for Cr, %b | 106.5 | 28.4 | 16.1 | 12.3 | N/Ac | N/A | N/A | N/A |
| ADG, g | 267 | 379 | 383 | 402 | 18 | 0.01 | 0.02 | 0.01 |
| ADFI, g | 598 | 711 | 701 | 720 | 22 | 0.01 | 0.08 | 0.02 |
| Gain/feed | 0.446 | 0.533 | 0.546 | 0.558 | 0.017 | 0.01 | 0.03 | 0.02 |

a From Traylor et al. (1994). A total of 120 weanling pigs (average initial BW of 5.5 kg) with five pigs/pen and six pens per treatment.
b Coefficient of variation for Cr was determined from 10 samples for each batch of feed.
c Not applicable for mix analyses.

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# Euthanasia – When, where and how? Part 3: Euthanasia assessment guide

***By Jeff Hill, Alberta Agriculture and Rural Development***

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.

No matter which method of euthanasia is chosen, it should result in a rapid loss of consciousness, followed by cardiac and/or respiratory arrest and subsequent loss of brain function resulting in death (AAZV, 2006). All primary euthanizing agents cause death by one of three modes:

- Direct depression of the central nervous system is achieved through lethal injection of approved agents.
- Hypoxia means lack of oxygen and is achieved by exposing animals to high concentrations of approved gases (such as $CO_2$) or through rapid blood loss.
- Physical disruption of brain activity such as is achieved by gunshot, blunt force trauma or penetrating captive bolt that leads to death through cardiac and respiratory failure

However, irrespective of the chosen method an assessment system should be developed and implemented to verify effectiveness of the euthanasia procedure. There are three primary types of standards that should be included and evaluated during the assessment 1) Animal based measures, 2) Engineering standards and 3) System process.

Animal based measures are those that can be directly observed during the euthanasia process or by evaluating the resultant carcass after the euthanasia process. Examples would include time till confirmation of death, traumatic brain injury score (for physical modes), depth of penetration (for penetrating captive bolt), etc.

Engineering standards evaluate if the equipment (and supplies) utilized meets accepted minimum standards for the specific size, age, species of animal euthanized. Examples would include caliber of firearm, muzzle energy of cartridge, bolt length, etc.

Comparison of the euthanasia process to your written euthanasia SOP's (and subsequent training materials) allow assessment of your personnel performance and an indication of the effectiveness of the training program. This evaluation should include direct observation of all facets of the process including animal selection, handling, euthanasia, disposal, and clean-up. Example assessment questions could include; Was the animal handled and restrained in a manner that causes minimal stress, pain and anxiety? Was the euthanasia method applied in accordance to SOP and training program? Etc.

Depending on the euthanasia method chosen and application technique specific evaluation criteria should be developed in consultation with your herd veterinarian. Overleaf is an assessment that was developed and is currently in use by a large farrow to wean production operation. This form is utilized to evaluate the effectiveness of a non penetrating captive bolt system for the euthanasia of piglets from birth up to 20 lbs. The herd veterinarian not only worked with the operation to develop the assessment but also trained the farm managers to properly evaluate the euthanasia process, determine death and provided a simple scoring system for paddling and resultant traumatic brain injury.

*continued on page 34*

*Application of Cash Euthanizer Non-Penetrating Captive Bolt*

## ANIMAL WELFARE ASSESSMENT FOR ON-FARM EUTHANASIA

**Controlled Blunt Force Trauma; Non-penetrating Captive Bolt**

Date of assessment: ______________________ Location: ______________________

Assessed by: ______________________ Employee: ______________________

Animal type and weight: ______________________

**Assessment Criteria**

### Pre- Euthanasia

1. Is the employee trained in the process and technique of euthanasia? Yes or No
   Name and Date of training program______________________
2. In accordance to the euthanasia SOP was the appropriate cartridge selected for the weight class of piglet? Yes or No
   Cartridge Designation______________________
3. Was the necessary equipment (handling equipment, restraint device, euthanasia tool, etc) available and in proper working condition? Yes or No
4. To minimize stress, pain and anxiety during the procedure was the animal handled and restrained in accordance to the piglet handling SOP Yes or No
5. Was the euthanasia decision tree (refer to euthanasia SOP) followed to ensure euthanasia was conducted in a timely manner? Yes or No

### Euthanasia

6. Was the procedure applied in accordance to the euthanasia SOP and training program? Yes or No
7. Were indicators of the onset of death confirmed within 30 seconds following application of the euthanasia technique? Yes or No
   If No - were immediate steps to taken to rectify the situation to ensure death? Yes or No
8. If a secondary kill step (i.e. exsanguination, second shot, etc.) was required, did it occur in a timely manner necessary to ensure a humane death? Yes or No or Not required
9. Paddling Score (0, 1, 2)______________ Duration________seconds

### Post Euthanasia

10. Was death confirmed within 3 minutes following application of the euthanasia technique? Yes or No
11. Traumatic Brain Injury (TBI) Overall Score (0,1,2) ______________________
    Cerebral Cortex_____Thalamus______Cerebellum_______Medulla_______
12. Was the carcass disposed of in accordance to carcass disposal SOP? Yes or No
13. Was the location of euthanasia properly cleaned and disinfected? Yes or No
14. Was the euthanasia equipment clean and properly re-stored? Yes or No

If any of these questions were answered NO, it is recommended that the euthanasia training program be reviewed and the euthanasia process re-evaluated at the next three euthanasia opportunities.

### Notes or recommendations:

______________________________________________

______________________________________________

### Willful Acts of Abuse to neonatal piglets;

Any willful act of abuse during the euthanasia process is grounds for automatic disciplinary action. Willful acts of abuse include but are not limited to; 1) use of an electric prod on piglets 2) slamming of gates on piglets; 3) picking up or restraining a piglet by its ears or tail; 4) tossing/throwing a piglet; 5) hitting/beating an animal.

15. Were any willful acts of abuse observed? Yes or No

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# Low cost processing of wheat DDGS yields fractions targeted for monogastric and ruminant animal feeding

***By Eduardo Beltranena, Alberta Agriculture and Rural Development***

Pilot scale processing of the main co-product of prairie ethanol production, wheat distillers dried grain with solubles (DDGS), has yielded different fractions targeted for monogastric and ruminant animal feeding. The low cost dry fractionation of DDGS has prompted research into digestibility and nutrient attributes of these fractions.

"During ethanol production, the starch in wheat grain is broken down and the sugars fermented to ethanol for mixing with gasoline. Because of the starch conversion to ethanol, the remaining protein and fibre concentrate about three times in DDGS compared to wheat grain," says Eduardo Beltranena, feed research scientist with Alberta Agriculture and Rural Development.

As long as the DDGS are gently dried and not scorched, the protein in wheat DDGS (38 to 40 per cent) has good feeding value for livestock. However, the high fibre content of DDGS limits its nutrient utilization by monogastric animals. Chickens and pigs do not have a rumen full of bacteria like cattle do to digest the fibre for them.

"We had to come up with a way of enriching the protein and reducing the fibre to effectively increase utilization of this ethanol co-product by poultry and swine. We had to do so at low cost, in an environmentally friendly manner, at the same time keeping in mind that prairie ethanol plants have already been built and are unlikely to modify their processes" says Beltranena. "Using readily available particle size and weight separation equipment we produced fractions ranging from 29 per cent protein and 37 per cent fibre for ruminants to 49 per cent protein, but only 18 per cent total dietary fibre for monogastric animals.

*Eduardo Beltranena, Pork Research Scientist with Alberta Agriculture and Rural Development, has produced high protein and low fibre fractions from wheat DDGS for feeding to swine and poultry using simple particle size separation equipment.*

"With little investment, existing ethanol plants could now scale-up this technology to differentiate their DDGS as a plant back-end process instead of altering their current processing. Having species-targeted DDGS would increase use of this ethanol co-product by more animal species than just cattle, and diversify the market opportunity for the ample supply of prairie wheat DDGS."

Fractions feeding trials with broilers, trout and growing pigs are now being carried out in collaboration with the University of Saskatchewan and University of Alberta.

| Wheat DDGS Fraction | Monogastric 1 | Monogastric 2 | Ruminant 1 | Ruminant 2 |
|---|---|---|---|---|
| Yield, % | 26.69 | 21.75 | 22.48 | 28.11 |
| Particle size, um | 242 | 521 | 711 | 753 |
| Crude protein, % | 48.51 | 39.86 | 34.95 | 29.34 |
| Lysine, % | 0.96 | 0.85 | 0.76 | 0.58 |
| Threonine, % | 1.28 | 1.07 | 0.90 | 0.69 |
| Methionine, % | 0.69 | 0.54 | 0.46 | 0.33 |
| Cysteine, % | 1.00 | 0.82 | 0.74 | 0.54 |
| Tryptophan, % | 0.36 | 0.30 | 0.28 | 0.22 |
| Crude fat, % | 2.66 | 3.29 | 3.00 | 2.73 |
| Crude fibre, % | 4.79 | 7.38 | 9.72 | 12.13 |
| Ash, % | 5.19 | 5.17 | 5.16 | 5.17 |
| ADF, % | 10.14 | 11.42 | 13.00 | 15.38 |
| NDF, % | 25.35 | 29.36 | 39.92 | 40.68 |
| Total dietary fibre, % | 17.55 | 26.55 | 31.84 | 37.36 |

# Free space utilization of sows in free access stalls

***Lang, F. C., Hayne, S. M., Heron, V., and Gonyou, H. W.***
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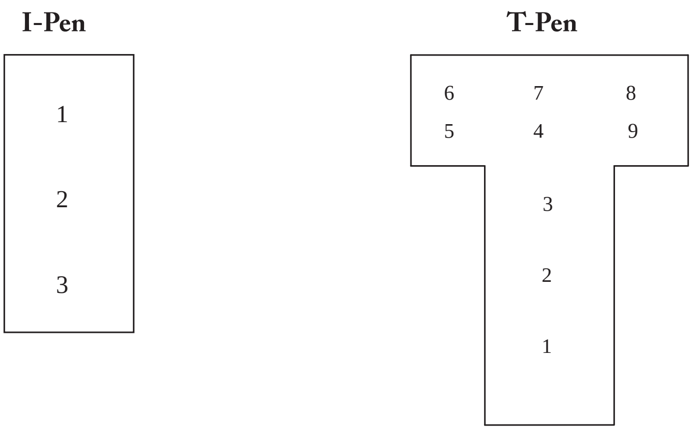
With announcements by the largest producer/packers in both the USA and Canada that they will transition all of their production facilities to group housing for sows over the next ten years, North American producers are anticipating a change to group housing. This can be a challenging step for producers, and it is made more difficult by the lack of scientific information currently available on the implementation and design of alternative systems. Group housing systems can be complex to initiate and require greater input from stockmen, however when done correctly, can produce sows that are able to socially interact with one another and have the freedom to move. Sows currently housed in gestation stalls have almost no opportunity to exercise and perform natural behaviours, leading to a possible decline in well-being. It has previously been suggested that exercise is required to maintain bone composition and strength, and when exercise is insufficient, calcium will be mobilized from the bone itself (Lanyon, 1984 and 1987). Exercise is important to allow the development of bone and muscle to their maximum potential. Decreased muscular strength (which is commonly observed in confined sows) can contribute towards difficulty in lying and standing, and higher susceptibility to lameness due to increased slipping. Lack of exercise in confined housing has also been shown to cause bone weakness in other species. For example, confined laying hens have significantly weaker humeri and tibiae than birds housed in non restrictive environments (Knowles and Broom, 1990). One possible alternative to gestation crates are free access or walk-in/lock-in stalls. This system provides sows with opportunities to interact as a group in a communal area, or remain alone in a free access stall. There is some concern regarding the degree to which sows use free space group areas, and how to avoid aggression, particularly when new sows are mixed into a group. This study investigates the implementation of walk-in/lock-in stalls for group housed sows. More specifically, the objectives of this study were to compare two different pen configurations by determining the proportion and type (size/parity) of sows that are using the free space areas of the walk-in/lock-in stalls, and also how sows utilize the free space areas.

Eight groups of about 25 sows were used in the study, and were housed in walk-in/lock-in stall gestation pens at the Prairie Swine Centre, Saskatoon. Groups were selected according to how many individuals were confirmed pregnant in a batch of animals within a 2 week breeding date window, therefore group size was not always the same. Each of the groups was exposed to one of two configurations of free space areas. The first is referred to as the 'I' pen as it consisted of an alley (10ft x 35ft) with slatted flooring running between two lanes of 16 stalls on each side. Any additional stalls, surplus to the group number, were locked off for the purpose of the trial. The second pen configuration is referred to as the 'T' pen as it consisted of an identical alley with an

*Looking down onto the 'T' pen*

***continued on page 38***

**Figure 1: Location of free space areas used for space utilization analysis.**

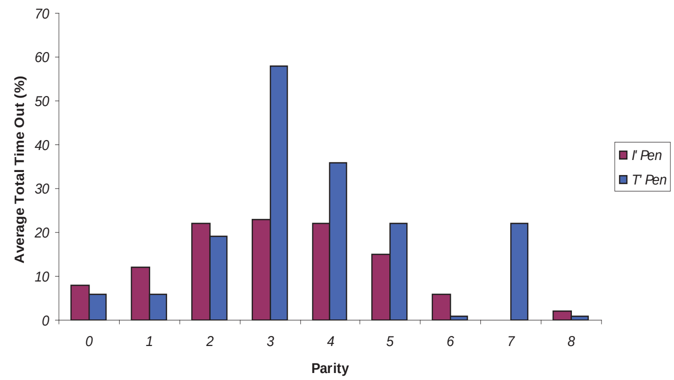



additional solid floor loafing area at one end (12ft x 23ft). Sows were weighed when moved from their breeding stall to the gestation pen, and individually marked with livestock paint.

Photographs were taken from mounted cameras at 2 minute intervals over a 24hr period, once a week, for 11 weeks throughout gestation. Two cameras were set up in the 'I' pen, one at each end of the pen. Four cameras were used in the 'T'

*Sows lying in the free access stalls and using the lying area*

**Figure 2: Average total time that sows of varying parities spend in the free access areas.**




pen in order to also observe the free space area. The pens were divided into 3 areas (I pen) and 9 areas (T pen) (see Fig. 1). The individual sow and location was recorded numerically by a trained observer. Measurements recorded from the photographs include the percentage of time spent out of the stall over 24hrs, and also the location and position of sows in the free space areas.

The majority of sows did use the free space areas (> 95% of sows) although not on a regular basis or for extended periods of time. The average usage for the 'I' and 'T' pens were both relatively low, however, the sows housed in the 'T' pens used the free space area significantly more than the sows housed in the 'I' pens (P<0.001). More than half the animals in the study spent < 5% of their time in the free space area, however the average usage was ~18% (with considerable individual variation). Heavier sows appeared to use the free space area significantly more than lighter sows (P<0.0001), and older (higher parity) sows also used the free space significantly more (P<0.001) (Fig. 2). Figures 3 and 4 illustrate the preferred lying areas of the sows. In the 'I' pens, the far end of the pens was the most preferred place to lie, with the highest recorded usage in Area 3 with 8.9% of the average total usage. Similarly, with the 'T' pens, the most preferred place to lie was also in the corners (Areas 5, 6, 8 and 9).

Although many sows did use the free space, it was at a much lower level than expected. This could be due to several possibilities, such as lower ranking animals feeling threatened by higher ranking sows, or larger sows utilizing the free space due to crowding in the stalls. It has been suggested that due to the rigorous selection for improved meat production, the body shape of modern domestic pigs has been changed (Whittemore, 1994). Selection has resulted in larger pigs which can have difficulty lying and standing, and may not fit comfortably into conventional stalls (24 inches wide).

The areas where sows have shown a preference to lie down all have more walls than the other available areas, which can act as support. This finding is in agreement with previous studies (mostly in the farrowing environment) where sows also show preference to use support when lying down. Marchant et al., (2001) reported that 89% of lying down events were carried out using either a sloping wall, or a wall fitted with a piglet protection rail.

Figure 3: Percentage of time that sows spend in each location during utilization of the free space areas, I-pen data.

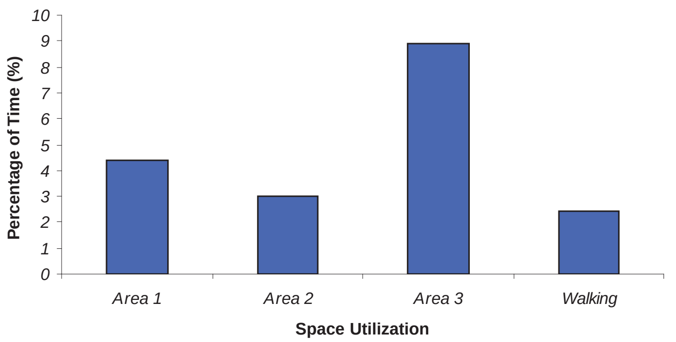
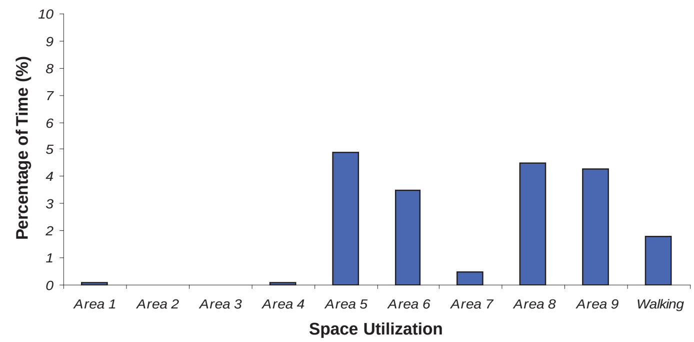



Figure 4: Percentage of time that sows spend in each location during utilization of the free space areas, T-pen data.




With the transition towards group sow housing it is important that scientific research is used to design the optimum housing system which can facilitate social interactions and minimize aggression and competition. Future research resulting from this study will focus on methods for encouraging the sows to utilize the free space areas. This will include improving the comfort of the free space area with rubber mats, providing environmental enrichment, or possibly allowing sows access to the free area in different social groups (alternate groups) i.e. gilts and sows.

## The bottom line

Group housing of sows is recognised as an alternative system for improving animal comfort and well-being however, we found that not all sows used the free space areas on a regular basis, or for extended periods of time. It is apparent that the older, heavier sows are utilising the space the most, therefore further research in this area will involve reducing social stress perceived by younger animals, and making the free space area more comfortable.

## References

Knowles, T. G. and Broom, D. M., 1990. Limb bone strength and movement in laying hens from different housing systems. Veterinary Record 126 354-356.

Lanyon, L. E. 1984. Functional strain as a determinant for bone remodelling. Calcified Tissue International 36 S56-S61.

Lanyon, L. E. 1987. Functional strain in bone tissue as an objective, and controlling stimulus for adaptive bone remodelling. Journal of Biomechanics 20 1083-1093.

Marchant, J. N., Broom, D. M., Corning, S., 2001. The influence of sow behaviour on piglet mortality due to crushing in an open farrowing system. Animal Science 72 19-28.

Whittemore, C. T., 1994. Causes and consequences of change in the mature size of the domestic pig. Outlook Agriculture 23 55-59.

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# A producer's dilemma: Integrating alternative ingredients in swine rations to lower feed costs

**By T. Greer, M. Ross, J. Wehlage and A. Zapesocki Mentor: Dr. Ruurd T. Zijlstra**
**University of Alberta, Edmonton, AB Animal Science 479 Capstone Class**

**Take Home Messages**

Alternative feeds have the potential to be used as substitutions for traditional ingredients like wheat, barley, and soybean meal. A producer survey carried out at the 2010 Alberta Pork Congress showed that producer adoption of alternative feedstuffs was relatively low at 35%. Reasons for non-adoption include lack of bin space, variation in the feedstuffs and traditional blinders. There are solutions and risk-management techniques that can be utilized to minimize these risks and maximize cost savings. From April 2009 to March 2010 across Alberta it was found that including the co-product corn DDGS could save a producer an average of $1.14 and up to $3.75 per pig per month. Including alternative feed ingredients in pig diets can play a major role in reducing feed costs and optimizing production.

## The project

Over the course of four months, as a final project for our Bachelor of Science in Agriculture degrees, we put our heads together to come up with a way to lower feed costs. Before beginning the project we understood the need to decrease input costs in the swine industry and the role that the pig plays as an opportunity feeder. With the help of researchers, nutritionists, and producers we have found that using alternative feed ingredients in hog diets is a viable and practical way to reduce feed costs, however not all producers use them. We set out to answer the question, "What are the hold-ups preventing Alberta hog producers from adopting alternative feed ingredients in their hog rations?"



## Alternative feed ingredients

Alternative feed ingredients are grains or legumes such as triticale or faba beans which are not commonly used in diets. Co-products are feed-grade waste products from industries such as the bio-fuel, ethanol and human food processing sectors. These feedstuffs have the potential to replace high cost main ingredients such as wheat, barley, and soybean meal giving producers the opportunity to lower feed costs. The value of incorporating co-products and alternative ingredients in rations can be assessed once the nutritional value is known, but there has been hesitation on the part of many producers to adopt these ideas. Through our research project, we were able to identify and address the primary concerns of many producers regarding utilization of 'opportunity' ingredients.

## The issues

There were four areas of concern presented by producers who are not currently using alternative feed ingredients which are shown in Table 1.

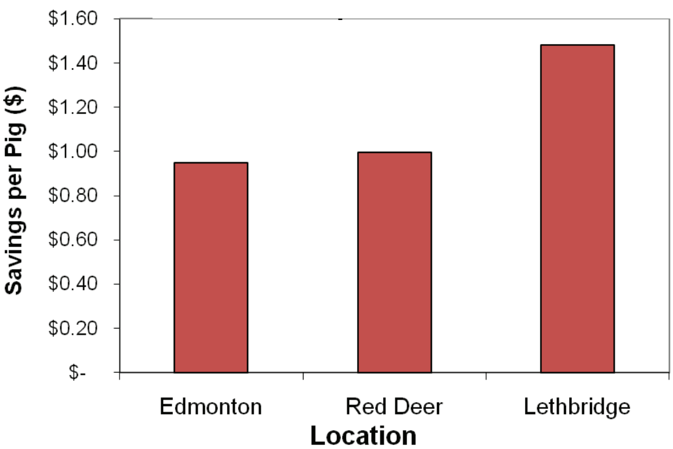
**Table 1: Issues presented by producers**

| Area of concern | Number sharing concern | Percent of non-adopters |
|---|---|---|
| Lack of bin space | 8 | 73 |
| Traditional views | 1 | 9 |
| No economic benefit | 1 | 9 |
| Variation and supply | 1 | 9 |

This data was collected from 20 randomly selected producers at the 2010 Alberta Pork Congress and represents medium-sized hog operations mostly from Central Alberta.

The primary issue was a lack of sufficient bin space. Some producers expressed interest in looking into utilizing alternative feedstuffs such as dried distillers grain with solubles (DDGS) or expeller-pressed canola meal, but lacked the necessary storage capacity. The issue of bin space is one that can be remedied by applying the monetary savings from including alternative feeds in rations to offset the up-front cost of purchasing another bin. For example, a hopper bottom bin with a 2,300 bushel holding capacity that costs $9,000 can be paid off in one year by a producer with a 450 sow farrow-to-finish operation, assuming savings of $1.14 per pig marketed.

**Figure 1: Average savings in 3 Alberta locations with the inclusion of Corn DDGS in swine diets since April 2009[2]**




[2] *Data adapted from Dr. Malachy Young's model with his permission*

Many producers have never fed anything but traditional grains. This issue may illustrate the disconnect between scientific research and on-farm application. This can be addressed by creating awareness on how research can be applied to a producer's operation. A greater emphasis should be placed on economic analysis in scientific research to inform producers of the economic benefits.

The perception that there is little to no economic benefit to including alternative feed ingredients in swine diets is another issue that needs to be addressed. Nutritionists and scientists agree that a balanced ration may be formulated and pig performance may be maintained with alternative ingredients which can represent value to producers; however, for producers from the Peace Country who face high transport costs and low co-product availability, the benefits must be weighed. The feed industry is subject to price volatility and individual commodity prices may fluctuate according to market conditions. We suggest that producers take advantage of ingredients when prices are low and have flexibility in their diet formulation to allow for utilization of these opportunity ingredients.

An example of the economic benefit associated with feeding corn DDGS in three Alberta locations over a period of one year is shown in Figure 1. This illustrates that the adoption of alternative feedstuffs is a viable solution to lowering feed costs in Alberta as savings occurred at all three locations.

The final issue presented by producers was the problem with the variation in quality of ingredients. This is a legitimate concern, especially with regards to co-products that are heat processed such as DDGS because heat may limit nutrient availability. However, this issue of variability is one that may be resolved as the use of alternative ingredients increases and producers make their demands for a high quality product known. Near Infrared Spectroscopy (NIR)

***continued on page 42***

can be used to determine variability in quality within feedstuffs. Moreover, modern feed formulation uses standardized ileal digestibility (SID) of amino acids and the net energy (NE) system to properly evaluate and rank feedstuffs including co-products.

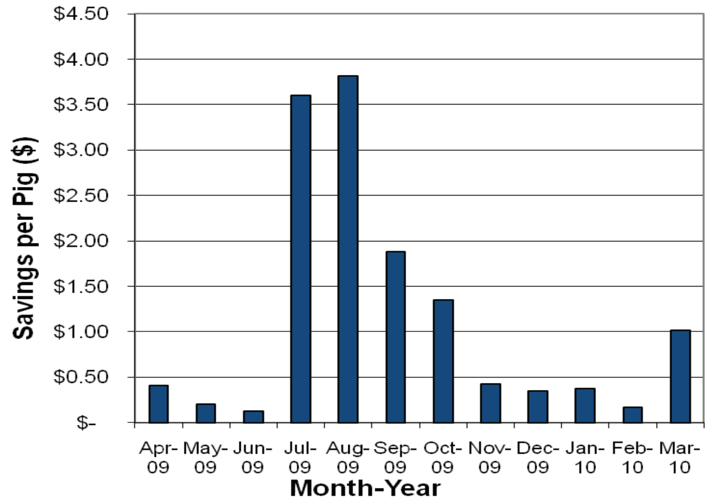
## A tool for sustainability

Alternative feed ingredients are a tool for sustainability in the swine industry as they address economic viability for producers as demonstrated by Figures 1 and 2. These figures show the potential alternative feeds may have on the bottom line, and while the numbers may be small, any decrease in feed cost will be beneficial. Utilizing alternative feed ingredients is a viable short-term solution to decreasing input costs.

## Making you money

The commercial industry relies heavily on a least-cost method to formulate traditional diets that maximize pig performance and keep outputs consistent. The idea of maximizing production is a paradigm that we have challenged in our research. We suggest that optimizing production may be more economically sustainable for the current condition of the Alberta swine industry. Optimizing production means less emphasis should be placed on throughput or final yields. Instead, the focus should be on minimizing production costs per kilogram of gain and maximizing return over feed costs. Alternative ingredients play a major role in optimizing production and addressing the issue surrounding high feed costs.

**Figure 2: Average savings with the use of corn DDGS in Alberta from April 2009 until March 2010[3]**




[3] *Data adapted from Dr. Malachy Young's model with his permission*

## Acknowledgements

We thank the producers who took the time to participate in our survey, Dr. Vince Gabert, Dr. Malachy Young, Rocky Morrill and Dr. Ruurd Zijlstra for their time, guidance and knowledge. For questions about this project, please contact Ruurd Zijlstra via e-mail: ruurd.zijlstra@ualberta.ca

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# Time to review our hog pricing system?

***Very few producers know exactly how the price they receive for hogs is calculated. Not only are the pricing systems used by processors and marketing organizations not always transparent, but they vary considerably between provinces, says Ron Gietz, Development Officer, Pork, with Alberta Agriculture and Rural Development. Formulating payment based on published prices from the USA is also criticised by some. Are Canadian producers getting a raw deal compared with their American counterparts? Is it time for a new Canadian price discovery system? A recent study on price discovery by Ron Gietz looks at these issues and comes to some interesting conclusions.***

## Link to US inevitable

Canada and the USA effectively have a free market in hogs and pork, notwithstanding the barriers to live pig movements recently created by COOL. Therefore, even if prices were set independently in Canada, they could not be too far out of line with those paid in the US, taking into account the cost of moving pork from one market to the other. The question is: how do the prices paid in Canada compare to those in the US? "It's difficult to make direct comparisons because the information needed to do this accurately is not available in Canada," explains Gietz. "In the US, mandatory price reporting, which went into effect in 2001, requires packers to provide information on prices and volumes to USDA twice a day, which provides a high degree of transparency." The USDA pricing reports show both contract prices and negotiated prices, which are weighted according to the number of pigs to provide the national price. Regional prices are also shown but these do not differ greatly, notes Gietz. Packer to packer sales are also shown but not included in the price calculation. Prices are shown as a "base" price or a "net" price. "The national net price is based on what producers are actually paid net of all premiums and deductions, so it gives a very good idea of what the procurement price actually is," he comments. "However, a lot of contracts in Canada use the base price, which is about $2 per hog less than the net price."

"In the USA, individual packers have different pricing structures based off published prices, with different premiums and penalties, but it is relatively easy to compare which is most profitable for a specific farm because the contracts are published," Gietz continues. "When I was working with producers in the USA, the aim was to find a packer contract that would get their payment per hog close to the national net price."

The national price represents about 60% of all producer sales, with a further 40% of hogs sold on some sort of risk sharing contract or non-market formulas. Usually the price paid is slightly lower where there is a degree of price protection. Slightly less than 10% of hogs are sold on a negotiated price. "The negotiated price is much more volatile and functions to push the contact prices up or down," Gietz explains. "Packers try to keep the plant running with contracted hogs and fill in any gaps with negotiated hogs, therefore, when pigs are short as at present, this pushes up the negotiated price." Over the long term the two are very similar, he adds.

Overall, while pricing must be aligned in some way to what US producers are paid, it is difficult to make direct comparisons due to the lack of published information, which is probably the reason some producers think they are getting a raw deal. "US prices are transparent by law, Canadian prices are not," comments Gietz.

## What price is actually paid in Canada?

If it is accepted that US published prices are representative of those actually received by producers, the next question is whether the price formulae used to convert US prices to what is paid in Canada result in a similar price per kilo for the same quality carcasses. The price calculation is made using "the factor", a

***continued on page 44***

multiplier that adjusts for differences in dressing percentage, the relative value of the US and Canadian dollar and the index payment added to Canadian base prices, while converting the price to dollars per kilo. "This factor varies from 1.77 to 1.85," explains Gietz. "Maple Leaf uses 1.775 in one of their contracts, but the price is derived from the higher US net price, whereas the Alberta price is based on a US base price but has a factor of 1.80-1.83. It's also adjusted quarterly according to the average index at the Red Deer plant." Most formulae are based on an index adjustment of 110-113, he adds.

Whether these adjustments result in a similar price to the US is a matter for debate. Again, lack of accurate comparative data hinders comparison, while the figures used for price adjustment are questioned by some producers. "The adjustment for dressing percentage assumes 74% for the USA and 80% for Canada. That was based on a US pig of 20 years ago," comments Rocky Morrill, Vice Chairman of Alberta Pork and a partner in Peace Pork. "Canadian pigs sold in the USA actually achieve a dressing percentage of at least 76%, which reduces the calculation to our price by over 2.6%. Similarly the index divisor is 113 when, Mr Gietz says, the average index in the Red Deer plant is nearer to 110. That is another 3% and, along with that, the quality index is backed out of the formula, so in a sense you do not get a quality bonus."

Gietz's study concludes that during 2007-9, the Manitoba price averaged $3 per head less than the US and the Alberta price about $6 less. However, many producers, including Morrill, feel that this is significantly lower than the real difference experienced when Canadian pigs are sold to US processors.

In the end, pricing is all about the processors' ability to compete with their counterparts in the USA. If they are making profits, it is possible to pay producers more. US packers have a number of advantages, says Gietz. "They have cheaper labour, larger scale and all the big plants double-shift, whereas only the Brandon plant runs a full double shift in Canada," he notes. If Canadian packers are at a disadvantage, they can overcome it in two ways; by selling their products for more or paying less for pigs. The latter is a lot easier, but adding value is better for the industry in the long term."

The fact that the Canadian pork industry has shrunk by nearly 25% over the last 5 years, while the US industry is now only marginally smaller, suggests something is wrong. Many point to the high Canadian dollar as being the culprit and it is certainly true that the expansion of the industry in the 1990s was based on a weak dollar which increased the price paid to the producer. Maybe now is the time to not only benchmark our competitiveness in terms of production costs but to make an accurate comparison of the prices producers receive.

## Lack of transparency and competition

One main factor that hinders accurate comparison between Canada and the USA is the lack of Canadian data, believes Gietz. "In the US, there is not only mandatory price reporting but a national contract database, so you can compare all contracts and make a decision about where to send your pigs," he points out. Here it's hard to compare the detail of contracts as the information is often not available."

US producers also have more processors to choose from and there is more competition for hogs, Gietz notes. "In Canada, there are usually only 2-3 options and sometimes only one," he states. "Producers can't really optimize their selling options as they have so little choice." If prices are lower here, it is probably a reflection of the lack of competition, Gietz feels. "You get what you negotiate and without huge numbers of hogs, it's difficult to negotiate a better deal. Hog boards and marketing organizations are primarily procurement agencies because they don't have enough customers to negotiate with." He notes that this isn't the only sector of the industry with this problem, pointing out the large difference in feed manufacturing costs between Canada and the USA.

## Improving the situation

Until there is a better system of price discovery in Canada there will always be arguments about whether Canadian processors are paying an equivalent price to their US counterparts for a similar quality hog. Such a comparison, while complicated, is not impossible and would be made easier by greater availability of the relevant data. "In the US, in order to get transparency, it required legislation and if that's what producers want here, perhaps they should be asking for mandatory price reporting," comments Gietz. In the meantime, more detailed comparisons of actual pricing systems and evaluations of producer returns where hogs are sold both in Canada and the USA will shed further light on this issue and provide producers with more accurate information.

## A PRODUCER'S VIEWPOINT

***Peace country producer and Vice Chairman of Alberta Pork Rocky Morrill has some strong views on current pricing systems and believes that Canadian producers are receiving 10 – 15% less for their pigs than their counterparts in the USA. The main reason for this is the price formulae used to calculate the price Canadian producers are paid, he says. In the past, the industry has benefited from a low Canadian dollar, but with a par dollar the existing pricing systems put producers at a big disadvantage, Morrill believes. "If we continue as we are the industry will continue to lose production capacity which will threaten the viability of some packers." He outlines his thoughts on the pricing issue.***

Mr. Gietz shows us that in the States, a producer averages a net of $2 per hundred pounds above the base price, which is another 3.5%. You have to keep in mind that this is net of what they call sort loss in the States. Most American producers don't own scales and ship a finisher barn with two pulls. The actual quality bonus they receive independent of the sort loss is $3 to $6 per hundredweight. That results in a quality bonus that is $8 to $16 per hog. Another point Mr. Gietz brings up is the difference in the primer (published US reference prices). He says that in Alberta we use the HG 204. In the last couple months the 204 has been 2% to 5 % less than other markets (primers) in the States. He shows that there are the four components within our formula that affect the outcome.

1. The conversion of carcass dressing percentage (2.6%).
2. The additional index divisor of 3%.
3. The quality index of 110 is divided out to begin with, so in fact we do not get a quality bonus other than a small loin or health bonus. The Americans do get a quality bonus (5+%).
4. The HG 204 primer is one the lowest primers in the States (2+%).

In general, it doesn't matter how you add it up, in my opinion, Mr Geitz's data shows at least a 10% difference in what the American producer receives, and talking to some Canadian producers that market finishers in the States they feel it is closer to 15% difference.

However, just because the Americans are paid more, it doesn't mean that our Alberta packers will pay more or can afford to pay more. We have cost disadvantages in Canada. It is not about cost of production to the farm gate. It includes the cost of production of the plant as well. The big issue wrapped up in this is the Canadian dollar relationship to the US dollar. For close to 35 years we have had a huge advantage by having a 75-cent or lower dollar. In the past the pricing could be 10% to 15% lower than the States but we more than made that up through the currency difference. The best example is to look back in May when producers in the States were receiving the highest price ever paid while we were getting about $1.55 per kg. If we had a 75-cent dollar that would equate to around $2.10 a kg. Wow, that sure puts this in its place! We are experiencing the highest price ever and it is $1.55. This is not about hog cycles or H1N1 or trade issues. Yes, all of those have hurt our sustainability, not unlike similar issues in the past. But today there is a paradigm shift. Our world is upside down. The on-par dollar is a place we have never lived before and which may not allow us to live in the future. We must redefine our industry to sustain our future.

The best thing to come out of Mr. Gietz's study is to have an open discussion of the competitive issues we face in Alberta. The ultimate understanding is that we need to have an honest, true discussion of where we are. Producers are tired of our industry organizations sugar coating the issues. If someone disagrees and says that we are paid the same as the States, then that is fine, but let us sit down, work together and discover the true situation. Only with open knowledge can we work together and find ways that can make this industry sustainable. We have a lot of challenges ahead of us. We will have to work together and find a new path to success. If we do not, the path will be clear. There will be less hogs raised next year and less hogs the year after that. We will continue to lose production until we cannot sustain a major packing plant. We will not compete if we are paid 10% less than our competition. When we are making $10, US producers are making $30. When they are at breakeven we are losing $20. We will continue to lose more producers until our industry is just a cottage industry built on producer / packer systems that together can find a way to make up that 10% to 15% difference and sustain themselves. As I have said, we have a huge challenge ahead of us. If there is a solution, it starts with open dialog of the true factors affecting us and from there we can start redefining ourselves to build a prosperous future.

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# Cost control measures start with your gilts

**_By Dr. Tom Riek_**

Unthinkable changes have taken place in the Canadian swine industry in the last three years. The industry as we've known it has changed forever, and producers must continually look at ways to control costs to remain competitive in North American and global markets.

The heart of the herd, your sows and gilts, represent two important areas to help control costs by benchmarking performance and comparing to industry standards.

## Performance targets

Let's start with gilts. As the next generation of your herd, managing the weight and age at first breeding sets the course for maximizing the productivity of your sow herd. It's generally accepted that gilts should reach a minimum of 136 kg (300 lb) for first breeding and should reach that weight by about 210 days, but let's look at what happens when we miss those targets. When we go much beyond the weight target, the gilt removal rate starts to go up because gilts that are heavier at first breeding generally have reduced longevity in the sow herd. And heavier gilts are eating up more in feed costs, a cost you are unlikely to recover with higher removal rates in the herd. Taking longer to get to the breeding weight target also costs more.

When you add some economics to these targets, or overshoot them, the extra costs are quite evident. Gilts bred at 240 days, instead of the targeted 210 days, can require up to $24/gilt in extra feed costs for the additional 30 days. When you add in housing costs and interest – and spread it over the expected productivity of 55 weaned pigs per sow per lifetime – those extra 30 days can add up to about $0.50/weaned pig in additional costs.

Three or four years ago, adding a half dollar to the cost of production per weaned pig may not have sounded so big. But these days, considering who Canadian hog producers are competing with, we have to look very closely at managing these numbers.

After first breeding, continue to track how your gilt herd is performing on targets for body weight gain and feed usage during first gestation. Aim for a net gain of about 45 kg (100 lb) during gestation for a maximum target of 181-191 kg (400-420 lb) at first farrowing. These targets help keep lifetime maintenance feed costs in check, because a heavier gilt at first farrowing will require additional feed costs throughout subsequent litters. Compare these costs – for every 23 kg (50 lb) extra body weight at first breeding (204kg vs. targeted 181kg), an additional 0.15 kg/day (0.33 lb) of feed is required for maintenance during each subsequent gestation. Factor in an average of five parities per sow, and additional feed costs can add up to $0.26/weaned pig.

## Compare your herd performance

Evaluate your own records and compare your herd performance with these targets. Benchmarking your herd doesn't have to be complicated, but these are numbers you need to know. Start simply; look at your feed costs, how much you feed per day and what it costs. From there, decide whether gilt management is an area to address.

The heavier your gilts are compared to weight targets, the more money you are spending on feed – costs that are likely weighing down your profit potential. Conversely, the sooner your gilts get to ideal breeding weight, the sooner they will start contributing to the productivity and profitability of your sow herd. And that growth rate advantage translates into improved performance of their progeny.

## Managing parity for maximum productivity

Depending on feed, facility and other costs, as well as market prices, it can take up to three parities to recover the initial investment in the gilt and her development, and begin generating positive net margins. And the sweet spot – when gilts are most productive – is between the third and fifth parity. After the seventh parity, there is generally no economic advantage over gilts, so it's important to look at young female retention rate and aim for at least 70% of gilts reaching third parity and an average age of culling at parity five.

Genetics certainly plays a role in improving herd performance beyond the reproductive performance indicators that we usually think about. Growth rate and feed efficiency are moderate to highly heritable traits that directly impact the cost of rearing gilts and feeding the sow herd, as well as contributing 50% of the genetic potential performance of the finishing herd. Talk to your genetics company if this is an area you've identified in your business. While heritability of structural soundness is moderately high, heritability of sow longevity and mortality are relatively low, meaning they are highly influenced by environment and management – factors you can control. Tracking these indicators, and managing genetics and herd management, will help you control feed costs (and profit potential) for the rest of the gilt's productive life.

As you evaluate your herd in the current market conditions, and continue to look for ways to trim costs without sacrificing productivity, start with your gilts. Aim for recommended targets for weight and age at first breeding, keep your cull rates in line and get more of them to that productive third parity and beyond to maximize lifetime productivity in your herd.

**Targets for gilts and sows**

| | |
|---|---|
| ***Gilts*** | |
| Age at first breeding | 210 days |
| Minimum weight at first breeding | 136 kg (300 lb) |
| Weight gain during first gestation | 45 kg (100 lb) |
| ***Sows*** | |
| Average age at removal from herd | Parity 5 |
| Annual replacement rate | 45-50% |
| Target lifetime productivity | 55 pigs per female (11/parity average) |

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

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# Can a robot clean your barn effectively?

***By VIDO Swine Technical Group***

***Pressure washing is probably the least favourite job in the barn, so the introduction to Canada of robotic pressure washers a couple of years ago seemed to offer a labour saving method of cleaning that would allow skilled stockpersons to spend more time with their pigs. But with a price tag of around $50,000 is it really cost effective? And does it do as good a job of cleaning the barn, especially in areas with a lot of equipment like farrowing pens? Members of VIDO's Swine Technical Group have been investigating.***

## Manufacturers

Ramstra Robotics, Sweden
Skiold Echberg, Denmark
Swine Robotics, USA

## How does it work?

In operation, the unit is connected to the high pressure water system in the barn (3000 psi, 4 gallons/min recommended). An electric motor powered by a rechargeable battery (48 hours per charge) moves the unit down the aisle in the room and the boom extends into the pens while the sprayer head rotates to clean the pen surfaces.

The robot is first programmed by operating it manually with a joy stick. The movement of the spray head, the extension of the boom into the pens and the forward movement of the unit are all recorded and saved to memory. The robot then follows this pattern to wash automatically. If pens are identical, only one set are recorded and the unit is programmed to repeat these instructions for the other pens. It is claimed it does not take long to master the use of the joy stick. Over 200 different patterns can be recorded.

The robot comes with a 150' hose on a reel which will be its maximum linear travel. The effective reach into the pens is 20' both to the left and right. (A model with a 25' reach is being developed). The robot has an expected life of 10 years. There have been 300 sold worldwide.

As far as cleaning performance, the manufacturer does not claim robotic washing is as thorough as manual pressure washing. A final manual wash will be necessary. They suggest the robot should be thought as doing 80% of the cleaning. They also suggest it is not as fast as manual pressure washing, probably 10 – 15% slower.

However, the robot always shows up for work, does not take breaks and works through evenings, weekends and holidays!

## Producer experience

### *Big Sky Farms' Korchinski unit – manager Levi Soltys*

We used the Wash Hand in the farrowing rooms for a couple of days. We found that it was getting tangled in the heat lamp chains and would tend to travel off course. We also found that it needed to be constantly monitored to ensure that it was working the way it was intended. This was almost a full time job just keeping an eye on it (not saving any time). If you were to help it through its course it would do a fine quality job, probably around 75%. Staff do not care for it very much. Maintenance is also needed every day with this unit because of sensors needing to be adjusted and batteries dying and needing charging. We then tried in the breeding barns in feed alleys and back alleys and had better luck with it there as the alleys are narrower and there are less things in its way. It takes approximately 30 minutes to set the Wash Hand up before use, and it will wash one row in 60


*A robotic pressure washer cleaning a finishing barn*

minutes, usually trouble free. We have made some modifications to the machine to better suit breeding barns, and now feel that we can expect a 90% job efficiency from it.

### *Alberta Pig Company – Production manager Tony Nicol*

I talked to one of our finishing unit contractors who has had one of the Swedish products for 18 months. He commented that for a capital cost of over $50,000 these machines need to have plenty of work to do, and with a barn that requires cleaning once every 17 weeks, it was difficult for him to justify, except that it relieved him of work that he did not have time to do.

He rated it as 80% efficient, in the sense that it could deal with flat surfaces relatively easily, but could not clean feeders or other multisided surfaces.

The 20% of time that he spent washing was to go over areas that the machine had missed, wash between slats where the sides had been missed and feeders. He also preferred to wash the ceilings himself because of lights and other electrical fixtures.

He commented that programming the robot was very time consuming, as each movement had to be "mapped" for the robot, and he has found that on occasion, if the robot breaks down he can lose the program.

Mechanical reliability has been fair, with the main problem being the platform on which the arm rotates being subject to wear too quickly. One unexpected problem found was that with the pressure washer running continuously for up to 24 hours, users need to check that their power supply and breakers can handle the power demand without overheating.

## The bottom line

With only a small number of machines in use in Canada, experience is very limited. The few producers we spoke to had both positive and negative comments about robotic pressure washing. The machines seem to do what they claim, which is to carry out about 80% of the washing, with an operator required to do the rest. They are clearly not as effective in cleaning complex equipment such as feeders. Cost-effectiveness will depend on the length of time they can be kept working and the operating costs, especially for programming and maintenance. Because of the limited experience, it's fair to say that the jury is still out.

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# In-water potassium penicillin G reduces mortality of weaned pigs with *Streptococcus suis*

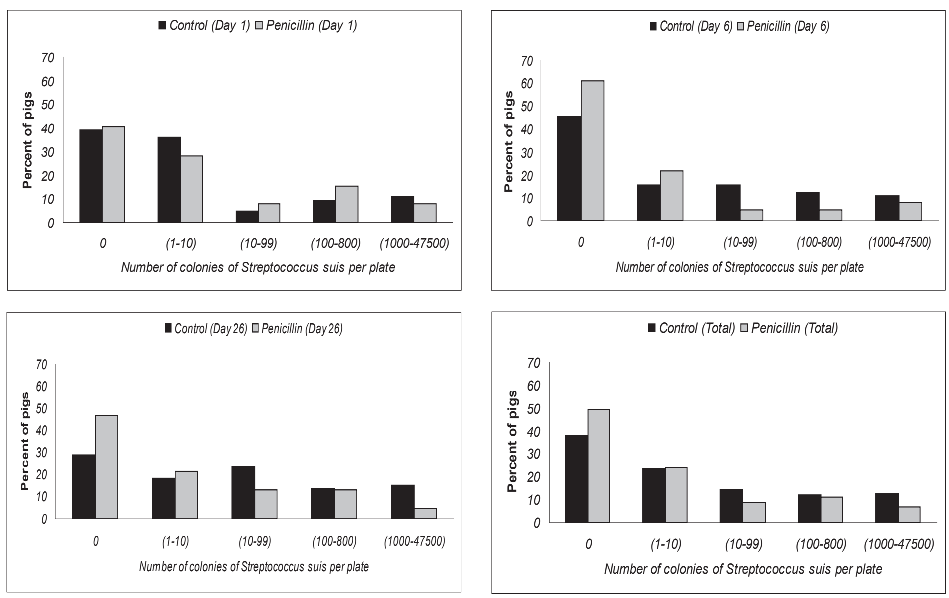
**By Chris Byra, Pierre Gadbois, William R. Cox, Marcelo Gottschalk, Vahab Farzan, Sharon A. Bauer, Jeff B. Wilson**

*Streptococcus suis* is an important pathogen affecting swine production worldwide. S. suis is a bacteria among many streptococcal species that can reside in tonsils, intestines and genital tracts of healthy pigs (1). Some of these bacteria have the potential to cause disease. S. suis can be shed from sows through bodily fluids such as vaginal secretions and newborn piglets may become colonized with S. suis during farrowing and suckling (2). Infectious S. suis can spread to other animals during this production stage, or cause disease due to stress at weaning (3). Management factors such as poor ventilation, overcrowding, and mixing pigs of different ages, as well as overall herd health status play a role in disease transmission (4).

Clinical signs of S. suis disease include high fever, septicemia, and in severe cases, meningitis (1). Most cases occur in pigs between 5 and 10 weeks of age. Without appropriate treatment, S. suis can be associated with high mortality rates in swine herds, and in North America, S. suis has frequently been identified as the cause of endocarditis in pigs (1).

There is also growing concern about the impact of S. suis on humans, particularly for individuals that handle pigs and pig carcasses. Southeast Asian countries such as China, Thailand and Vietnam have experienced the majority of human cases of S. suis infection (5). A recent US study reported that individuals exposed to swine had higher titres of antibodies to serotype 2 S. suis, compared with non-exposed individuals (6). This prevalence of S. suis appears to be very high in Quebec (7) and Ontario (8) swine farms.

**Figure 1: Distribution of the Control and Treated (penicillin) groups over five categories of counts of S. suis colonies prior to and post treatmenta in a study of the control of S. suis in weaned pigs using in-water potassium penicillin G.**




a Day 1: Tonsillar swabs were taken prior to the start of the first treatment period when the pigs were moved into the nursery barn; Day 6: Tonsillar swabs were taken one day after the completion of the first treatment period; Day 26: Tonsillar swabs were taken one day after the completion of the second treatment period.

Decreased performance and mortality resulting from S. suis infection have a significant economic impact on swine production (3). Attempts to eliminate S. suis at the tonsillar carrier state in early-weaned pigs have not been successful (9). Therefore, it is necessary to explore and implement possible interventions in order to minimize the impact and spread of S. suis.

Prudent use of antimicrobials can be an effective option in the prevention of disease for commercial swine herds. S. suis has been found to be susceptible to potassium penicillin G as demonstrated in previous studies (3, 10); however, there is little information available that indicates whether administering potassium penicillin G in-water can be effective to control S. suis infection in weaned pigs. It has been suggested that drinking water would be superior to feed for the delivery of penicillin treatment (11).

Recently, a clinical trial was undertaken to investigate whether mass in-water treatment with potassium penicillin G can control S. suis infections and mortality in weaned piglets. The study was conducted in British Columbia on a commercial farrow-to-finish operation with a history of S. suis serotype 2 infection. A total of 896 eighteen day-old weaned pigs were used. The pigs were randomly placed into one of two treatment groups in which either potassium penicillin G was given in-water, or no treatment was given. The treatment was administered over five days and occurred twice: upon moving to the nursery barn, and 21 days after moving into the nursery barn. The dose used was 297,000 IU of potassium penicillin G per litre of drinking water in accordance with the labelled dose rate of the product. Tonsillar swabs were collected from randomly selected pigs from each pen and sent for laboratory diagnosis to confirm the presence of S. suis. Swabs found to be positive for S. suis were confirmed as either serotype 2 or serotype 1/2. Overall, a total of 53 pigs in the Control group and 29 pigs in the Treated group died as a result of S. suis infection. Overall mortalities included 59 of 420 pigs (14.0%) from the Control group and 32 of 448 pigs (7.1%) in the Treated group. The mortality during this trial was higher than normal for the farm as they traditionally medicated nursery pigs in the water with potassium penicillin G more aggressively to keep mortality under 2%. Bacteriology results from tonsillar swabs indicated that Control pigs were significantly more likely to have >1000 colonies of S. suis per plate than Treated pigs (Figure 1).

In this study, total mortality and mortality due to S. suis infection, as well as bacterial counts from tonsillar swabs, were reduced with in-water treatment with potassium penicillin G. S. suis has become recognized as a key disease of swine that leads to economic losses for producers and is regarded as a potentially serious threat to human health. Appropriate use of antimicrobials to control the colonization of S. suis could be a valuable measure to prevent subsequent illness. In this study of weaned pigs, the results indicate that potassium penicillin G administered in drinking water is effective both in reducing mortality associated with S. suis infection and reducing tonsillar carriage of S. suis that may lead to disease and be a source of pig-to-pig transmission of infection.

*Potassium penicillin G administered in drinking water is effective in reducing nursery mortality*

## References


1. Higgins R and Gottschalk M. Streptococcal diseases. In: Straw BE, Zimmerman JJ, D'Allaire S, Taylor DJ, eds. Diseases of Swine. 9th edition. Oxford, UK. Blackwell Publishing. 2006; 760-777.
2. Amass SF, Clark LK, Knox KE, Wu CC, and Hill MA. Streptococcus suis colonization of piglets during parturition. Swine Health Prod 1996; 4: 269–272.
3. Staats JJ, Feder I, Okwumabua O, Chengappa MM. Streptococcus suis: Past and present. Vet Res Commun 1997; 21:381-407.
4. Dee SA, Carlson AR, Winkelman NL, Corey MM. Effect of management practices on the Streptococcus suis carrier rate in nursery swine. J Am Vet Med Assoc 1993; 203(2):295-299.
5. Wertheim HFL, Nghia HDT, Taylor W, and Schultsz, C. Streptococcus suis: An emerging human pathogen. Clin Infect Dis 2009; 48:617-625.
6. Smith TC, Capuano AW, Boese B, Myers KP, Gray GC. Occupational exposure to Streptococcus suis among US swine workers. Emerg Infect Dis 2008; 14(12):1925-1927.
7. Brisebois LM, Charlebois R, Higgins R, and Nadeau M. Prevalence of Streptococcus suis in four to eight week old clinically healthy piglets. Can J Vet Res 1990; 54(1):174–177.
8. MacInnes JI, Gottschalk M, Lone AG, et al. Prevalence of Actinobacillus pleuropneumoniae, Actinobacillus suis, Haemophilus parasuis, Pasteurella multocida, and Streptococcus suis in representative Ontario swine herds. Can J Vet Res 2008; 72(3):242-8.
9. Amass SF, Wu CC, Clark LK. Evaluation of antibiotics for the elimination of the tonsillar carrier state of Streptococcus suis in pigs. J Vet Diagn Invest. 1996; 8:64-67.
10. Sanford SE, and Tilker AE. Streptococcus suis antimicrobial susceptibility. Can Vet J 1989; 30:679.
11. del Castillo J, Martineau GP, Messier S, Higgins R. The use of pharmacokinetics to implement penicillin prophylaxis for streptococcal diseases. In: Proc Allen D. Leman Swine Conference. Minnesota. 1995; 93-96.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## Green algae used to make growth promoters

Italian scientists have developed new strains of antibiotics that can be used as a growth promoter without the detrimental effects of conventional products which are banned in the EU. Green algae can be an ideal production medium for manufacturing biochemicals, they say.

The algae are already explored as a source for biofuels but two scientists at the Italian Istituto di Ricerche Sciocchezе in Milan have manipulated them to produce natural antibiotics that promote growth in farm animals. The big advantage is that these antibiotics do not induce resistance or end up in the manure and environment, because they are completely broken down during digestion. Also the production system does not require expensive laboratory and fermentation equipment since the algae grow abundantly in the saline waters of the Mediterranean Sea.

"Current methods to produce antibiotics are expensive to set up and maintain", says Dr Antonio di Sapientone, leader of the research team. "Feeding yeast or other fungi requires large amounts of nutrients and sustaining them requires large amounts of energy. Also the sterile facilities required are costly."

Algae subsist on sunlight and carbon dioxide in the air, which make them an ideal and cost-effective substitute. "We have discovered a green algae type that only grows in certain bays along the Italian coast and which forms the basis for a micro biochemical factory", says Philippa so Molto, who is conducting a PhD study on the subject and is assisting Di Sapientone.

"We have inserted genes for production of several different therapeutic proteins currently being made in yeast, bacteria, and mammalian cells. After several mistrials we now have two proteins that are produced at levels high enough for commercial use."

When the method is scaled up, production costs could be lower than one euro per gram of protein, which would be a great benefit to farmers in trying to produce quality meat for an affordable price, say the researchers.

In laboratory trials the growth promoters improved feed conversions in pigs more than 20% without compromising meat quality. In broiler chickens feed conversions also improved considerably.



## Britain could lead the world in pig production information

Britain could soon be the acknowledged global supplier of technical information from the pig production factory floor — with pig-keepers, academics, researchers and advisers all over the world logging-on to buy the management information they need, according to Pig World magazine.

The information will be amassed over the next decade by using broadband to stream data about what is really happening in pig houses, to a central computer. It will be processed, to turn raw data into practical management information. This will then be available to site managers, to give them a better understanding of the health and welfare of their pigs, and to show them where staff skill levels can be improved to increase productivity.

Pig Improvement Via Technology (Pivit) is a multi-million pound project which will soon enter its pilot stage. In due course it is expected to become self-funding by selling management information from what will become the largest bank of raw data on pig production in the world.

The pilot stage of Pivit will monitor 50 United Kingdom post-weaning sites. Using broadband, the sites will stream back real-time information on the pigs' environment, feed and water use, electricity consumption, and growth and other production parameters.

Hugh Crabtree, of Farmex, which is the industry leader in farm control and monitoring systems, is one of the driving forces behind Pivit. He says that monitoring a pig building in the same way that an industrialist monitors his production line produces valuable management information, which can be used to cut costs and increase output.

But for as long as it remains as raw data, this information is not much use to shop-floor managers and workers. So a critical factor in Pivit's success will be recruiting the right people for the project bureau. These will include a manager, and a software technician who is also good at communicating. Other skills, such as consultancy, will be outsourced.

The overall aim is to help pig-keepers improve their skills and to achieve higher growth rates. It should also be possible to reduce energy costs by 30 percent and water costs by around half.

There is wide variation in pig unit performance. This project plans to raise the level of poorer-performing units by providing management advice in a digestible form.

The project will have two sites fully operational by the end of 2010 and by the end of 2012 will have 15 nursery/grower and 35 finisher sites. Total cost of the project is £1.1 million ($1.7 million).

## Neoprene mats benefit piglet survival

Recently published Chinese research suggests that the use of neoprene mats in the farrowing pen reduces piglet foot and leg lesions and the incidence of diarrhea, while reducing overall piglet mortality.

Many commercial farrowing pens are equipped with slatted cast iron floors to improve ease of manure handling, cleanliness of the farrowing crates and hence improved animal hygiene. However, the bare and hard floor surface can impair the welfare of the sow and litter because of some undesirable effects on the piglets, such as foreleg abrasion, large temperature gradients between the cold floor surface and the abdomen of the piglets (hence higher susceptibility to diarrhea), and higher pre-weaning mortality or morbidity. Although straw bedding helps to provide a better environment for the sow and litter, its use creates challenges in terms of economics, hygiene and manure handling. This research study investigated the use of neoprene mats in key areas of the farrowing crates - underneath the sow and in the piglet suckling area to improve the pigs' microenvironment and hence welfare. One experiment evaluated the thickness of a rectangular-shaped mat (7, 10 or 13mm thick) compared to the slatted iron floor, while a second follow-up experiment was intended to verify the benefits of supplying an improved, double concave (or H)-shaped mat with 10mm thick neoprene compared with the same control. Results of both experiments demonstrated considerable benefits of the neoprene mats in the farrowing crates. Specifically, they reduced the piglet foreleg lesion area and joint swellings from 8-10% in the control pens to zero in the pens with mats. Pre-weaning piglet crushing mortality was reduced from 18.5% in the control pens to 6.7% and 9.1% in the pens with 7mm and 10mm mats respectively. Also, piglet diarrhea morbidity was reduced and piglets in the pens with mats had smaller temperature gradients between the abdomen and the contact floor surface. The results of this study suggest that providing a neoprene mat underneath the sow and in the piglet suckling area is conducive to enhancing comfort, health and welfare of the sow and litter, concluded the researchers.

***Reference:*** Gu Z, Xin H, Wang C, Shi Z, Liu Z, Yang F, Lin B, Wang C, Li B, Effects of neoprene mat on diarrhea, mortality and foreleg abrasion of pre-weaning piglets, Prev Vet Med. 2010 Apr 9.

## Researchers turn swine manure into oil

Research at the University of Illinois is one step closer to opening up a billion-dollar market to the hog industry and reducing US dependence on crude oil imports. University scientists have teamed with industry partners to design a pilot plant for a large commercial livestock farm that will convert swine manure to crude oil.

The pilot plant is based on research led by Yuanhui Zhang, an agricultural and biological engineer at the University. Zhang and colleagues developed a system using thermo-chemical conversion, or TCC, to transform organic compounds, like manure, in a heated and pressurized enclosure to produce oil and gas.

"The process we developed is different from most conventional TCC processes," said Zhang. "There is no need for the addition of a catalyst, and our process does not require pre-drying of the manure."

Zhang's team has achieved as high as 70-percent conversion from swine manure volatile solids to oil. At that conversion efficiency, the manure excreted by one pig during the production cycle could produce up to 21 gallons of crude oil and add a $10 per pig profit. In the 100-million-hogs-per-year US industry alone, that adds up to a billion dollars.

Now, steps are being taken to build a pilot plant that will help determine if the TCC process can live up to those numbers.

***continued on page 52***

Worldwide BioEnergy is leading this effort in close cooperation with the University of Illinois research team.

## Comfier creep does not reduce piglet mortality

Improving thermal comfort and providing a layer of bedding in the creep area did not increase the time piglets spent away from the sow, nor did it reduce piglet mortality, concludes a recent study.

Indoor farrowing systems are based upon the assumption that the newborn piglets will leave their mother after suckling and enter a heated creep area, but newborn piglets are motivated to remain close to the sow.

Combined research from Norway, Czech Republic and the UK investigated how piglets could be stimulated to increase the use of the creep area. Several creep area features, attractive to piglets, were used to attempt to increase time spent in the creep area the first two days after birth and to find out whether increased time spent in the creep area would affect early piglet mortality in farrowing pens.

Forty-six loose-housed sows and their litters kept in individual farrowing pens were subjected to one of three creep area treatments; (1) control, with a concrete floor in the creep area, (2) an insulated floor with soft bedding in the creep area and (3) an insulated floor and soft bedding in the creep area plus an additional wall to increase the heat conserving capacity in the creep area.

"The attempts to make the creep area attractive did not increase the use of the creep area; piglets in the insulated soft bedding plus wall treatment spent less time in the creep area and more time resting near the sow than piglets in the concrete floor and bedding only treatment," notes the report. The researchers conclude that quality of the creep area appears to have little impact on piglet survival.

*Providing a comfier creep area does not appear to improve piglet survival, say researchers in the UK, Czech Republic and Norway*

WHJ

# Some new developments for 2010 and beyond

***By John Gadd***

One of the reasons why yours truly is still involved in the captivating subject of efficient pig production is the accelerating stream of new ideas, products and concepts I discover in my travels; it is really very heartening. Here are a few of them.

Keep your eye on all of these - they could make your life a lot easier and in any case whether you adopt them or not, they are indeed worth study.

## Records - Traffic-lights system

When recording progress towards your production targets (graphically, of course!) a sensible feature is to have a statistical overlay on any divergences from target - up or down - which the graphs reveal.

Automatically built in to this monitoring procedure, the following are flagged-up on the screen or against the print-out:

**Green** - the change is not statistically significant and no attention is needed.

**Amber** - Watching brief. The deviation against target may not yet be significant, but should be looked at carefully at the next weekly or monthly figure, and if of the same magnitude, the trend may become significant and herald trouble to come.

**Red** - Action needed. The divergence from target is significant and unless addressed will result in a problem, (the depth of which is indicated) plus a pre-planned rectification program is printed out. Whether it is a shortfall or alternatively an excess against target, the producer is advised what action to take. For example in cases of a significant predicted increase in litter size over target he is advised to consider making provision for extra weaner accommodation, or where underachievement threatens, to breed more gilts and how many could be needed. For example the latter is useful as an advance warning in counteracting the depredations of seasonal infertility.

## Nurse sows

These are returning to favour as one way of coping with the large litters we are getting these days. The Danes in particular are averaging 14s now. There were at least 8 dos-and-don'ts from the use of nurse sows years ago which have largely slipped from memory and need re-examination.

## Extra feed of lactation quality

Fed during the insemination period (+ 1kg/day of what is advised in the literature which with these new genetically improved gilts and sows could now be out of date) is giving 45g heavier birthweights, with the knock-on effect of faster growth to slaughter.

## Length of farrowing time

With today's much larger litters there is a kickback on more anoxic/weak/stillborn piglets born towards the end of the longer time taken to complete farrowing. This can be reduced by 20 minutes or more by a variety of techniques which need the attention of producers.

## Rescue decks

Farrowing boxes for neonates have been around for ages. The latest models provide a microclimate for underprivileged newborns once sufficient colostrum has been consumed. A specially-designed milk is available ad-lib together with a pre-starter creep feed. Top stockmanship and hygiene is essential and when this is present, a rescue deck pays back in under a year from being employed on 20 litters over that time.

## Freedom farrowing crates

Extensive work on prototypes is well-advanced on both the Scottish Agricultural College and Newcastle University research farms. Results are similar to a well-designed conventional restrictive crate and should satisfy the growing public concern over the sow's confinement at and after farrowing. Costs look like being 50% more.

## Automated dry feeding (pellets)

This is gradually making a comeback against the steady inroads which CWF (Computerized Wet Feeding) is making in the growing/finishing area. For example a specially designed package-deal building is now available which automatically:

- Feeds up to 3 diets to each group
- Feeds each pig optimally
- Predicts numbers ready for market
- Batches market-ready pigs
- Handles single groups of up to 500

The cost/m$^2$ is about 30% more than for a well-designed conventional barn and must depend on how attractive these benefits are to a new-build producer.

## Injection by needle to go?

This looks to have had its day, as pulse vaccination, where the dose is fired through the skin looks to be feasible and we shall see - patents permitting - a variety of instruments of this nature coming to the market. So far costs per dose seem to be +60% but hopefully this will reduce with time.

## Weighing by tomography (Whole body scanning)

Work on this concept, already developed for medical examinations, continues, mainly to design equipment accurate enough for livestock weight estimation purposes and to bring down the cost to an affordable level for producers. Current weight differences between 'fat-dense', 'lean-dense' and 'bone-dense' animals could be overcome by future pigs being more even in conformation due to genetics and applied nutrition to match. One to watch.

## Weaning weight accelerates in Europe.

This continues to climb past 8 kg - which seems permissible as long as the skills are there to defend the sow against a punishing demand for milk. Compared to 6.5 to 7kg weaning weights, 10 week weights at 31.5 kg are 4% -7% higher, and 20 week weights at 83.5kg, about 3.6% higher. Some very skilled breeders are even going to 9kg but on examining their long-term productivity figures this begins to worry me as their Weaning Capacity (the weight of weaners produced over a sow's lifetime) starts to fall. It is a trade-off between more slaughter weight per tonne of food used during the grow-out phase against the higher capital replacement needs in herds weaning so late. One to watch, especially as we can buy these much-improved genetics.

## Keeping the pre-starter feeds on longer

This seems to be an important part of the move to heavier weaning weights described above. Another trade-off, this time the extra feed cost against the faster time to slaughter. As I have continually advised for 20 years now this equation is best appreciated using MTF calculations (Meat per Tonne of Feed) rather than the old favourites FCR and daily gain. However now that (good) housing overheads are so high, days saved to slaughter are becoming more prominent in an assessment of fixed costs. So far both calculations support the trend towards better diets for heavier-weaned pigs rather than changing to the much cheaper grower diets as soon as possible.

This all sounds so boring - but I assure you it is very important!

≡WHJ≡

*The use of Rescue Decks is helping to save surplus piglets from very large litters*

# Real welfare for pigs

***By Stuart Lumb***

UK pig producers are finally smiling after 10 years of pain and purgatory. At the recent biennial Pig and Poultry Fair smiling faces were the order of the day with exhibitors boasting of bursting order books. UK pig prices are high and producers are in profit. Over the last few years the UK industry has been very proactive through the British Pig Executive (BPEX) and the National Pig Association (NPA) in making the consumer and, more importantly, the big supermarkets aware of the high welfare standards pertaining to UK pig production, along with the fact that this involves extra costs – in particular with regard to straw based labour-intensive systems.

It's very gratifying that this message has finally got across and that consumers are now prepared to pay a premium for UK pigmeat. Ironically one of the biggest attractions at the Pig Fair was a free farrowing pen, of very ingenious construction, which restrains the sow for the first 3 days post- farrowing but then opens out to allow the sow complete freedom - hence the name - the 360 degree Farrower.

## Some history

Welfare has always been an emotive issue here in a country where the Queen is the patron of the Royal Society for the Prevention of Cruelty to Animals, a charity that has an annual income in the region of 100,000,000 GB Pounds. When the UK stall and tether ban was going through parliament, demonstrators could be seen rattling sow tethers outside Westminster. Compassion in World Farming wants to ban farrowing crates yet they can't offer an alternative free farrowing system which gives equal piglet liveability to a farrowing crate. There's a well known old saying "you look after your pigs and they'll look after you". What these extremist groups don't seem to comprehend is that husbandry measures such as tail docking, which they claim is unnecessary and to be "mutilation", is done to prevent cannibalism, plus why would the industry spend time and money clipping tails if it was deemed unnecessary ?

## The politics

Welfare is now a big issue on the Brussels agenda, initiated by the pending EU partial dry sow stall ban due to come into law on Jan 1st 2013. Earlier this spring the English industry launched a radical welfare program to look at the topic from the pig's point of view. BPEX has initiated this project in order to assume leadership of a welfare debate that is increasingly spiralling out of control as it becomes dominated by groups that are ill-informed about pig welfare but who have the ear of UK and European law makers. It will yield science-based data showing the welfare status of producers units, focussing on real welfare. Launching the program, BPEX chairman Stewart Houston had this to say: "This welfare-outcomes program will give us the tools to demonstrate the industry's professionalism as stockmen and stockwomen at the same time being good for business. The English pig industry has set its stall out to improve performance by outcomes rather than by processes and that includes both the welfare and environmental aspects of our business."

The UK pioneered farm assurance schemes, with Malton Foods of N. Yorkshire, then part of Unigate plc, setting up The Malton Code back in 1997, with a database of 2000 farms. Houston continued: "Currently farm assurance is process-driven. It involves ticking a lot of boxes and that doesn't really tell us too much about pig welfare. In contrast the new program is going to concentrate on the welfare outcomes of the way we keep our pigs, whether that be outside, on straw or on slats. The program is a BPEX initiative and is being supported by research carried out by the University of Bristol, working closely with the RSPCA and is being funded by levy – payers' cash.

## Farm audits

The aim is to have 80% of the English industry involved, taking part in two hour "welfare outcome" audits carried out by specially trained pig vets

These vets will be specially trained to assess:

- Use of environmental enrichment
- Lameness
- Tail lesions
- Hospitalizations
- Body lesions

Initially BPEX is looking for around 400 producers to take part in a pilot study, split four ways between indoor and outdoor breeding units and straw based and slatted finishers. The aim of the project is to get away from the hackneyed "straw versus slats" debate currently flagged up by welfare groups, their tame politicians and the retailers.

Being able to produce sound data will be increasingly important in the future as DEFRA (the ministry responsible for agriculture) threatens a 5% cut in Single Farm Payments each time Rural Payment Agency inspectors claim tail docking is just "routine" along with claims that environmental enrichment (manipulative materials) is inadequate. Evidence from a vet visit of tail biting could then be used to support the need for tail docking to combat RPA inspector claims to the contrary.

By concentrating on welfare outcomes and benchmarking the results it should be possible to demonstrate that intensive indoor pig production systems have the capacity to be as welfare friendly as outdoor systems. Then again, how "welfare friendly" are outdoor systems? Consumers get seduced by pictures of pigs in grassy paddocks lazing in the sun – how about a shot of a sow slipping and sliding on ice covered puddles. How welfare friendly is it to have whole litters, farrowed outdoors, killed by a fox just to satisfy its bloodlust?

## Project objectives

The objectives of the project are six-fold:

1. Use science to develop welfare policy
2. Generate credible welfare outcome benchmarks for the industry
3. Evaluate the robustness of data
4. Promote the benefits of welfare assessments through advisory channels
5. Demonstrate that pig producers are good welfarists
6. Consider future marketing opportunities resulting from robust welfare audits

*The welfare outcomes program aims to demonstrate that indoor systems are just as welfare friendly as outdoor systems*

## Outcomes

- The project will enable producers to finally demonstrate objectively the real welfare status of their unit to welfare groups, retailers and consumers.
- Assessments will use science to show that indoor units are just as welfare friendly as outdoor ones.
- The welfare-outcome project will be added to farm assurance, replacing other components.
- New marketing windows, to promote "English Welfare Quality Pork"
- A weapon to be used to fend off future non - science based legislation.
- Potential for better regulation through reduced inspections.

Stewart Houston concluded: "As we get nearer to 2013 we need to find ways of keeping in front of the welfare debate and this is the best way of making it happen - from a marketing point of view as well as a welfare perspective".

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# Australian margins plummet

***By John Riley, IAS Management Services***

Since last writing for WHJ, the Australian industry has moved into a situation where market returns are not covering the costs of production. In May 2009 the average market return for a 75 kg pig was $3.60 per kg carcass weight. In May 2010 the price is less than $2.60. Australian producers are learning the harsh reality of the laws of supply and demand and the impact of a strong Australian dollar.

The number of pigs slaughtered in March 2010 was almost 12% higher than in March 2009 and indications are that numbers slaughtered in April and May 2010 are higher than the corresponding months in 2009. Reasons for the increase in the number of pigs slaughtered are difficult to pinpoint since no significant increase in the number of sows in the national herd have been reported to date. It is a feature of the Australian industry that pigs grow more rapidly in our autumn due to a reduction in climatic temperatures which in summer can hit 40°C for several days at a time and temperatures of 30°C are normal in many pig production areas. The result of the increased growth rate is a surge in the number of pigs placed on the market. In addition the strength of the Australia dollar has stimulated imports and depressed exports still further. Exports have been reduced to a trickle to Singapore, New Zealand and Hong Kong. Unfortunately once a market is lost it is difficult and costly to regain market share. Exports are running at 3,000 tonnes per month with almost 50% going to Singapore.

Imports have risen marginally. Canadian pig meat imports in March 2010 totalled 4,500 tonnes which represented 31% of total imports. The value however was down by 25% compared with March 2009 at $2.75 per kg.

The Australian industry is constantly being reminded of the merit of producing large carcasses. The more pig meat produced per sow the lower the non-feed cost per unit of production. However, when the market is in freefall the heavier carcass can be a liability since it is competing in the processing sector with imports.

High climatic temperature is a feature of Australian production. In some years the farrowing rate from mating in the summer months is depressing. The result of course can be a shortage of slaughter pigs in the last quarter of the calendar year.

**Table 1: Mean maximum and minimum temperatures - selected months 2009-2010 Goondiwindi**

| Month | June 2009 | July 2009 | Nov 2009 | Dec 2009 | Jan 2010 | Feb 2010 |
|---|---|---|---|---|---|---|
| Mean maximum temperature (°C) | 19.5 | 19.0 | 35.5 | 34.7 | 34.7 | 33.2 |
| Mean minimum temperature (°C) | 7.1 | 5.2 | 20.0 | 21.0 | 21.3 | 20.9 |

*Source: Bureau of Meteorology, Queensland*

To illustrate the temperature experienced by pig producers in Queensland listed in Table 1 are Bureau of Meteorology mean maximum and mean minimum temperatures for the winter months of June and July and the summer months November through to February for the town of Goondiwindi. Goondiwindi is on the Queensland - New South Wales Border around 300 km from the Queensland state capital Brisbane.

There are several large indoor units in the area and one large free range system. In both indoor and outdoor systems mating sows in the summer months is a challenge. It is not unusual for farrowing rate resulting from services in the summer months to drop by 10% -20% compared with the other months of the year. Strategies such as mating extra gilts, increasing energy and amino acid levels to compensate for the reduction in intake that is common in summer months and burying water pipes to keep the supply cool are all introduced with varying degrees ofsuccess. The outcome is, however, a shortage of pigs from August through to Christmas and a rise in pig prices.

Producers are now hoping that the number of pigs coming forward will fall to stabilize the supply and demand equation.

Out of interest I have listed in Table 2 the temperatures recorded by Environment Canada for Red Deer over the period 1971- 2000. The two sets of data (Table 1 and Table 2) illustrate the marked difference between the two areas and an indication of the different problems faced by the producers. Many Australian housing systems are based on natural cross flow ventilation. Keeping pigs cool not warm is the problem; maintaining appetite, particularly in lactating sows, is a problem.

**Table 2: Daily maximum and minimum temperatures - selected months 1971-2000, Red Deer**

| Month | June | July | Nov | Dec | Jan | Feb |
|---|---|---|---|---|---|---|
| Daily maximum temperature (°C) | 20.5 | 22.6 | 1.4 | -4.1 | -5.8 | -2.7 |
| Daily minimum temperature (°C) | 8.0 | 10.1 | -9.4 | -15.0 | -17.4 | -14.8 |

*Source: Environment Canada*

Compared with other major pork producing countries the number of pigs produced per sow per year is disappointing as illustrated in Table 3. The problem in Australia can be blamed on a number of factors including the ban on importing genes, the difficulty of maintaining sow condition in summer and simply heat stress in sows and boars in summer.

**Table 3: Pigs weaned per sow in selected countries: 2007-2008**

| County | Australia | Canada | Denmark | Holland | UK | USA |
|---|---|---|---|---|---|---|
| Pigs weaned per sow per year | 21.6 | 22.3 | 27.2 | 26.7 | 22.1 | 22.0 |

*Source: Pork CRC*

Increasing pigs weaned per sow per year is a key element of the Australian industry's research program. One of the strategies being investigated currently is the inducing of ovulation during lactation. Researchers at Sydney University have been using PG 600 and the removal of piglets for periods during the day over 3-5 days. The researchers have successfully and consistently been able to get 90% of sows mated by day 28 or 21 with conception rates and litter size better than normal weaning and re-mating.

The practice has been tried many times before. Roy Kirkwood and his colleagues at the Prairie Swine Centre evaluated the system in the 1990s and found that pregnancy can be achieved concurrent with lactation but because of the likely effect on sow fertility was not advised for commercial application. In the mid 1980's the writer published results of research carried out on commercial units in England and reached the same conclusions reached by Kirkwood later in Canada. ≡WHJ≡

# • Events Diary

| | | | |
|---|---|---|---|
| **July** | | | |
| 18-21st | **International Pig Veterinary Society Congress** | Vancouver, BC | www.ipvs2010.com<br>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<br>Contact: +33 223 482880 |
| 18-21st | **Allen D Leman Swine Conference** | St Paul, Minnesota | www.cvm.umn.edu/outreach<br>Contact: (612) 624-3434 |
| **November** | | | |
| 3rd | **Red Deer Swine Technology Workshop** | Red Deer, Alberta | Contact: Bernie Peet (403) 782-3776 |
| 15-19th | **Alberta Pork Regional Meetings** | Alberta | www.albertapork.com<br>Contact: Charlotte Schipp (780) 491-3525 |
| 16-19th | **Eurotier 2010** | Hanover, Germany | www.eurotier.de<br>Contact: Friedrich Rach +49 69-24 788-202 |
| 17-18th | **Sask. Pork Industry Symposium** | Saskatoon, SK | www.saskpork.com<br>Contact: (306) 244-7752 |
| 30th - Dec 4th | **Agromek 2010** | Herning, Denmark | www.agromek.dk<br>Contact: +45 8675-4545 |
| **December** | | | |
| 9th | **Alberta Pork Annual General Meeting** | Leduc, Alberta | www.albertapork.com<br>Contact: Charlotte Schipp (780) 491-3525 |
| **2011** | | | |
| **January** | | | |
| 18-21st | **Banff Pork Seminar** | Banff, Alberta | www.banffpork.ca<br>Contact: (780) 492-3651 |
| **March** | | | |
| 5-8th | **American Association of Swine Veterinarians 2011 Annual Meeting** | Phoenix, Arizona | www.aasv.org<br>Contact: (515) 465-5255 |
| 9-11th | **VIV Asia** | Bangkok, Thailand | www.viv.net |
| **May** | | | |
| 17-19th | **VIV Russia** | Moscow, Russia | 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*