

Western Hog Journal

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Dutch ESF system works well in Alberta

COVER PHOTO

Piglets at the University of Alberta's Swine Research and Technology Centre

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Nova Scotia Pork	www.pork.ns.ca
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Prairie Swine Centre	www.prairieswine.com
U of A	www.afns.ualberta.ca
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• Editor's Notes



Pig prices showed a welcome increase over the summer and there is more than a glimmer of light at the end of the tunnel. During 2009 we are likely to see even higher prices as North American pig numbers start to fall. Despite high feed costs, it's likely that next year will be a profitable one. So, should Canadian producers breathe a sigh of relief and carry on as before, or is more radical change required? A look at recent history suggests that the environment for the industry is now different and some major adjustments are required.



The Canadian pork industry expanded rapidly from the mid 1990s on the back of a weak dollar, which gave it a major advantage over the USA. Unfortunately, the lack of economic pressures (other than in 1998-9) led to a reliance on commodity products sold on price, a strategy that is now untenable. The value of the Canadian and US dollars is unlikely to change very much in the foreseeable future, so the industry must adapt by adding more value to the pork products it sells, both in home markets and abroad.

Canada competes primarily with the USA in export markets and is currently at a complete disadvantage. We cannot produce pork as cheaply as in the US with a par dollar and therefore need a different strategy. We are now a relatively higher cost producer and need to act like one.

Exporting countries with high production costs, such as Denmark, add value in many ways, from farm QA schemes to

rigorous food safety measures and consistency of their product standards. There is a total focus on customer needs, down to the finest details. Products are tailored for specific markets and tastes, whether it is highly trimmed tenderloins for Japan or sides of bacon for the UK. The Canadian industry needs to move down this path; otherwise its long-term future will be in question.

Parts of the industry have already responded to the changed circumstances. Producer organizations must now work together for change in order to create more margin in the production chain. Alberta Pork's excellent revitalization strategy clearly lays out the model that needs to be followed by the industry as a whole. We need to grasp the nettle now and implement radical change, not become complacent when profitability returns.

Bonnie Peck

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Blueberries reduce cholesterol levels for pigs

Supplementing the diet with blueberries may reduce cholesterol levels by over ten per cent, suggests a new study

by Canadian researchers reported in the *British Journal of Nutrition*.

Feeding the animals a two per cent blueberry diet led to reductions in total, LDL and HDL-cholesterol of 12, 15, and eight per cent, respectively. The significance of this for humans lies in the fact that pigs have levels of LDL similar to humans and are susceptible to diet-induced vascular disease, according to lead researcher, Wilhelmina Kalt, from Agriculture and Agri-Food Canada. Pigs can also develop atherosclerotic plaques in the aorta and carotid artery, and have a similar blood pressure and heart rate as humans.

The two per cent blueberry diet is equivalent to approximately two cups of blueberries in the human diet, say the researchers, giving a dose that could be “reasonably achieved in the adult human diet and suggests that the observed effect from blueberry supplementation could occur in healthy humans.”

Blueberries are also increasingly linked to other health benefits including protecting against cancer and neurodegenerative diseases like Alzheimer’s.

New initiative aims to fill entry level agriculture positions

A new program aimed at bringing more candidates into the agriculture, food and bioresources industries, IgniteAg, has been launched by Calgary-based AgCall. The program’s primary goal is to expand the pool of candidates with an initial focus on entry level positions.

IgniteAg will act as the focal point for new talent in the industry. It will provide general information, career opportunities, industry promotion and immigration resources. It will also be a meeting place where candidates and employers can come together to learn more about each other’s needs.

“We want to help make sure graduates of agriculture programs stay in the industry,” says Arron Madson, Vice President, Sales and Marketing with AgCall. “But we want to look deeper. We want to talk to students with rural backgrounds who are not in agriculture programs. We also think there’s great potential with students who do not have a rural background to apply their education and skills to the agriculture industry. And, we want to help the industry facilitate bringing new Canadians into the agriculture workforce.”

“Even though we’ll have a presence on campus, we are not limiting our efforts to students,” says Madson. “We also plan to talk to recent graduates, attend trade fairs and engage others who may be interested in switching gears into agriculture. Essentially we want to talk to those whose career paths may still be undecided and guide them into the agriculture industry.”

“We need to portray agriculture as a diverse and long-term career choice,” says Lance Johnson, IgniteAg’s Executive Director. “One aspect of the program is to develop a career map to show candidates the potential in the agriculture industry. The sector is so important in today’s economy but it doesn’t necessarily have the profile of other careers. Agriculture not only feeds the world, but it is leading innovation, environmental stewardship, and alternative energies.”

He adds that agriculture has an image problem with young adults today. “We need to shift the perception of what agriculture is in the minds of youth,” says Johnson. “We don’t want to push them into agriculture, we want to attract and pull them in. This group is increasingly influenced by social media and non-traditional approaches. Their peer influence is one part of what we hope will help sell agriculture to them.”

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John Patience joins Iowa State University

Dr. John Patience has joined the Iowa State University Department of Animal Science, following 22 years at the Prairie Swine Centre. He will focus on current nutritional issues for the swine and feed industry. The Iowa Pork Producers Association (IPPA) is providing \$100,000 in funds to support the position and help build Patience's nutrition research program around Iowa swine industry priorities. The position also includes extension responsibilities and he will join the animal science department as an associate professor.

"With the increasing cost of feed, the leadership of the Iowa Pork Producers Association views this Iowa State University research and extension position in swine nutrition as a very important investment," said Rich Degner, IPPA executive director.

"I am excited about joining the faculty at Iowa State University, an institution with great strength in science and education and also one that works closely with the farming community," said Patience. "I have worked in the pork industry all my life, and understand the serious challenges facing Iowa pork producers. I look forward to working with producers and allied industries to meet these challenges head-on and find solutions that build on the traditional strength of Iowa pork production."

Patience received his doctorate from Cornell University in nutritional biochemistry. He earned a bachelor's degree in animal science and a master's degree in animal nutrition at the University of Guelph in Ontario.

CFIA approves DDGS as a feed ingredient

After months of negotiations between the Canadian government and U.S. distiller's dried grains with solubles (DDGS) industry representatives regarding the safety of DDGS exported to Canada, an agreement has been reached in terms of defining DDGS made from ethanol. Due to the efforts of various organizations including the U.S. Grains Council, the Canadian Food Inspection Agency (CFIA) reversed its earlier decision to

categorize U.S. DDGS made from ethanol as an unapproved feed ingredient, thus ineligible for export to Canada.

"When the CFIA first proposed its desire to regulate all chemicals used in producing DDGS from ethanol as per the process in the United States, it raised a lot of concerns among industry representatives," said Neil Campbell, consultant to the U.S. Grains Council in Canada. "In response, the National Grain and Feed Association (NGFA) wrote a letter testifying to the safety of U.S. DDGS, urging the Canadian government to approach the issue rationally.

The Canadian government's revised position stated that as long as a DDGS plant in the United States is regulated according to FDA rules, its products are acceptable for export to Canada.

This is significant because Canada has become a sizable market for DDGS. According to USDA trade statistics, DDGS exports to Canada during the first quarter of 2008 were at 180,000 metric tonnes. Based on sales made at that same pace, the projected total of DDGS exported to Canada for the rest of the year totals 718,000 tons.

Prairie Swine Centre opens new Sow Research Unit

Adapted from Farmscape

The Prairie Swine Centre (PSC) officially opened its newly renovated sow research unit located at Floral, Saskatchewan on June 10 with an open house. The Prairie Swine Centre is one of several University of Saskatchewan (U of S) research facilities, with a focus on animal nutrition, animal behaviour and engineering.

The approximately \$2 million upgrade replaced infrastructure constructed by the university more than 25 years ago. The original facility, built in 1979, consisted of four main buildings including two 100 sow barns, a small 50 sow barn and a grow finish barn. "Basically what we did was we undertook a complete replacement of our gestation, lactation and breeding areas and gilt

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development areas and consolidated what was previously in four barns into a single barn,” said Prairie Swine Centre outgoing president and CEO Dr. John Patience.

“The main reason was to lower our cost of operation,” says Dr. Patience. “The secondary objective was to enhance our sow research capability.” Dr. Patience adds that putting into one barn what was previously done in four different barns immediately leads to huge improvements in labour efficiency and there are some energy efficiencies that should save money as well.

PSC operations manager Brian Andres explains that the old facility, including the grow finish barn, required a compliment of five people to run production, breeding, farrowing and nursery as well as grow finish. That number can be reduced by one and a half to two staff members because of the increased efficiencies. “The automatic feed systems put in grow finish as well as the automatic feed systems throughout the new facility will greatly improve efficiencies,” he says.

Acting president and CEO Lee Whittington said that replacing four buildings built in 1980 with one brand new 2008 building that boasts more efficient heating and lighting is expected to reduce utility costs by 30 percent. He believes that represents a huge opportunity as utilities have jumped into



The free access sow stalls in the Prairie Swine Centre's new research barn

number three spot overall in terms of costs of production for commercial pork producers.

While the breeding area is very much like any other conventional breeding area, the gestation area is quite a bit different employing walk in lock in stalls, or freedom stalls, explained Dr. Patience. “They allow the sow to walk into the crate and there’s a mechanism that closes the gate behind her and then, when she’s finished eating and wants to leave the stall, she just backs up against the gate and it opens up again.”

“That was one feature we really wanted because it’s an excellent model,” says Dr. Patience. “It’s popular in Europe, therefore we can suspect that, as group housing becomes more common in North America, it’ll at least be a system that will be looked at and we’ll have the benefit of years of research to see how the system really does work.”

In the farrowing rooms the biggest innovation is the switch from three week weaning to four week weaning. Dr. Patience says that was under the advice of industry who said there are lots of units out there that are weaning at three weeks. “They can do that kind of research but, with industry moving more and more to four week weaning, they thought we should move to four week weaning to undertake research to support that change.”

“Weaning Capacity” is the best measure of lifetime sow productivity

Traditional measures of sow productivity, such as the number of pigs weaned per sow per year, do not adequately measure the reproductive output of the sow during her lifetime, says international pig breeding company Hypor.

“Genetic improvement in litter size has improved the sow’s potential to give birth to large numbers of piglets, but, in some cases, heavy selection pressure for total numbers born has resulted in some negative implications for piglet quality, growth rate to market, feed efficiency and carcass value,” says Marc Broadbent, the company’s marketing manager. “Hypor’s approach to this dilemma is to focus on a combination of traits, which balances many aspects of sow productivity in a composite selection index in order to give the best economic outcome.”

“The ability of a sow to wean large numbers of heavy piglets during her lifetime is central to this concept and we call this Weaning Capacity,” Broadbent explains. “This may be defined as the genetic potential to maximize the weight of piglets weaned and pork sold per sow productive lifetime.”

Hypor believes that Weaning Capacity is the best measure of reproductive performance because it defines the output of the sow as the weight of piglets weaned during the sow’s lifetime, which in turn determines the total amount of pork sold from her progeny. “A sow that is capable of consistently producing large litters of quality piglets maximizes the potential of her progeny in the nursery and finishing phases resulting in faster growth, more efficient feed conversion, heavier market hogs and improved carcass quality,” says Broadbent. “Furthermore, a regular flow of large, uniform piglets into the nursery maintains a consistent pig flow, which maximizes floorspace output and profitability.”

Hypor believes that a realistic target for Weaning Capacity is 505 kilos of piglets weaned during the sow’s productive life, which results from 12 pigs weaned per litter at an average

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weaning weight of 7.25kg and 5.8 litters per sow lifetime. This figure is already being achieved on some customers' farms, Broadbent notes.

"Weaning Capacity measure clearly defines the sow's lifetime productivity and recognizes the value of piglet quality and sow longevity, not just litter size or pigs weaned per sow per year, so it is truly the best measure of sow reproductive efficiency and profit potential of the breeding female," Broadbent concludes.

Canadian Pork Council announces new president

The Canadian Pork Council has announced that its new president is Alberta hog producer Jurgen Pruegschas, who takes over from Ontario producer Clare Schlegel, president for the last four years.

Pruegschas, who farms at Mayerthorpe, about 120 km northwest of Edmonton, is joined by a newly elected executive committee including first vice-president Jean-Guy Vincent of Ste-Seraphine, Que., representing the Federation des producteurs de porcs du Quebec and second vice-president Bryan Ferriss of Bowsman, Man., representing the Manitoba Pork Council, reports the Manitoba Cooperator.

Other executive committee members include Curtiss Littlejohn of Ontario, Stephen Moffett of New Brunswick, Herman Simons, also of Alberta, Jerry Gelderman of British Columbia and Florian Possberg of Saskatchewan.

Pruegschas' new role follows his recent appointment by the Alberta government as a farmer director of its Institute for Agriculture, Forestry and the Environment, to explore how the province can best tap into demand for environmental goods and services.

Maple Leaf to sell Burlington plant

Maple Leaf Foods has announced that it has begun the formal process of selling its Ontario pork processing business located in Burlington, Ontario. The 365,000 square foot pork processing facility is the largest in Ontario (third largest in Canada), and has a processing capacity of up to 50,000 hogs per week. The Company anticipates that the sale process will be completed by the end of 2008.

"Our Burlington, Ontario business is well established, with long-standing customer relationships, a skilled and stable workforce and an excellent mix of value-added business," said Michael Vels, Chief Financial Officer of Maple Leaf Foods. "It operates one of the more efficient pork processing

plants in North America, strategically located close to high density markets. Our investments in the plant and our people have resulted in a profitable business that represents an excellent investment in the global pork processing industry."

Maple Leaf has invested significant capital in this location over the past decade to develop a very extensive value-added business serving well-established domestic and international customers, says a company news release.

The decision to sell this business results from a re-focusing of Maple Leaf's protein operations towards prepared meats, meals and bakery, involving divestiture or exit of several of its primary processing and agriculturally oriented businesses.

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Alberta releases new animal health strategy

The new Alberta Animal Health Strategy was released for public consultation in August. Contained within the strategy is an animal welfare component with several goals that will improve welfare of all animals in Alberta and increase the understanding among Albertans of their responsibility for assuring animal welfare.

“There are many misunderstandings when it comes to the laws surrounding animal protection in Alberta,” says Adrienne Herron, livestock welfare tech transfer specialist with Alberta Agriculture and Rural Development, Red Deer. “For example, many people believe that only the owner of an animal can be charged or considered responsible for the welfare of the animal. In Alberta, you don’t have to be

the owner of an animal to be charged under the Animal Protection Act (APA). The APA states that any person who fails to prevent an animal from being in distress can be charged.”

Animal distress is defined in the APA as animals not being provided with adequate food, water, veterinary treatment, reasonable protection from injurious heat or cold, or if an animal is injured, sick, in pain, suffering or abused, subjected to undue hardship, privation or neglect.

This definition does not include the possible distress caused by reasonable and generally accepted practices. Animals in distress that result from an activity carried on in accordance with the regulations or in accordance with reasonable and generally accepted practices of animal care, management, husbandry, hunting, fishing, trapping, pest control or slaughter are exempt from the APA.

Fines for APA convictions are serious. The maximum fine set out in the APA is for \$20,000 and, if convicted, a prohibition order preventing the convicted person from owning animals could be issued.

Video shows how to increase piglet survival

A new video – Maximizing Piglet Survival – has been produced for the Red Deer Swine Technology Workshop being held on October 22nd. It will form the basis of a presentation by Jerri McMaster and Ciaran Ormond of Partners in Pork, whose County Line Farms barn was the location for the video. The content includes preparation for farrowing, managing farrowing to minimize stillbirths, colostrum management, fostering and care of small piglets. The Partners in Pork herd has an exceptionally low stillbirth rate and very high piglet survival to weaning.

“This initiative is very exciting and will enable us to show the hands-on techniques used in this barn that produce such excellent results,” says Bernie Peet, the workshop coordinator and producer of the video. “It is also consistent with our aim of focussing

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NEWS AND VIEWS CONTINUED

the workshop on practical management-related topics aimed at increasing productivity and profitability.”

Copies of the half-hour video, in DVD format, are available from Pork Chain Consulting Ltd., 37, Coventry Lane, Lacombe, AB, T4L 1T6 Phone: (403) 782-3776, Fax: (403) 782-4161. They cost \$30 each and cheques should be made payable to Swine Technology Workshop.

Registration for the one-day workshop, which is held at Westem Park, Red Deer, costs \$75, with a special “5 for the price of 4” package available for \$300. Contact Kate or Kyla of ConventionAllManagement at (403) 244-7821 or 1-800 267-9180 or email swinotech@conventionall.com to register.

Manitoba producers’ culled sows going to food banks

By Myron Love

A provincial government program aimed at helping financially hard-pressed hog producers is also benefitting Manitoba’s neediest citizens. In April, the government announced that it was providing \$500,000 in funding to Winnipeg Harvest, the province’s leading food bank, to purchase up to 150,000 pounds of pork from producers for food banks and food bank users throughout Manitoba. The pork started flowing in late June.

As of the end of August, 700 sows - the equivalent of about 56,000 kg of pork - had been processed under the government

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program, reports Robyn Harte, the business development specialist for swine for Manitoba Agriculture. "We are aiming to process 2,000 sows under the program by late fall," she says. "Some weeks are busier than others. Some weeks, we receive 100 slaughtered sows, other weeks 300. It depends in part on scheduling."

Hart adds that the program has been particularly helpful for producers who are wanting to get out of the business. The 2,000 sows to be processed for the food banks under the program will account for about 10-20% of all the Manitoba sows needing to be culled under a Federal Government initiative to save the industry. The feds are paying producers across the country \$50 million to cull their herds by 10%. In Manitoba, that figure would be 35,000 sows.

Producers question benefit of workers compensation legislation

By Myron Love

New legislation which would place Manitoba farm workers under the Workers Compensation Board (WCB) umbrella is being greeted negatively by hog producers. The revamped WCB legislation, which goes into effect on January 1, extends WCB coverage to 30,000 employees in 33 industries that were not previously included in the WCB's programs. The problem for hog producers and other farmers is that most of them already have private insurance plans which offer a wider range of benefits than does WCB.

"Workers Compensation only covers workplace accidents," says hog Producer Karl Kynoch, the Manitoba Pork Council's chairman. "The insurance policies we currently have provide many more benefits, such as eye and dental care. Producers can only afford to pay so much for insurance. If we are going to be forced to pay WCB premiums, than many of us are going to have to drop our other insurance policies."

Kynoch says that producers would rather the government had given them a choice between WCB coverage and private insurance plans, most of which are equal to or better than what WCB provides. "The government doesn't really consult with us," he says. "They pretend to listen then do whatever they want. We are in an economic downturn. For many producers, this may be the last straw. I am hearing quite a few people tell me that they are ready to throw in the towel."

Kynoch himself has been a hog producer for 30 years. He has also recently downsized.

"It's a challenge to keep on going," he says. "Government policies are forcing smaller producers out of business and even larger producers are finding that it's a struggle to continue."

New General Manager at Vétoquinol

Vétoquinol Canada Inc. is proud to announce the appointment of Mr. Daniel Beauchamp as General Manager. Daniel has more than 20 years' experience in the Animal Health Industry, acquired in sales, marketing and business development.

He obtained a degree in animal science at McGill University and joined *Hoechst Roussel Vet Canada* as Sales Representative. In 1997 he became Product Manager for *HR Vet* in Saskatchewan. Three years later, following the acquisition of *HR Vet* by *Intervet*, he moved to a Market Development position at the US Head Office, acting as main contact between local marketing and R & D.

In 2003, Pfizer Animal Health invited Daniel to come back to Québec to join its ranks as Area Sales Manager (Swine Products). One year later he joined the marketing department as Companion Animal Team Leader. Then, in January 2007 he was promoted Director of the same division and was responsible for sales, marketing and technical services.

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The new FeedSaver S-Series is designed for swine producers with all-in-all-out flows seeking to lower production costs through improved feed utilization and more focused management, says a company news release.

“With skyrocketing feed prices, it’s never been more important to get maximum nutrient value out of every pound of feed that gets delivered to a barn,” said Drew Ryder, Feedlogic president. “There’s plenty of science out there to tell you the right way to feed a pig. The problem has been execution.”

“With the many diet phases fed in different stages of swine production, the industry is being challenged to manage

feed deliveries and feed budgets. As a result, many pigs are not receiving the correct feed or are out of feed at any point in time. There are also added costs associated with removing incorrect diets from bins at the end of a turn.”

The FeedSaver S-Series addresses these issues by automatically creating the correct diets at the barn using just two or three base diets. Diets can be dedicated to specific bins, making it easier for the feed mill to plan deliveries and reducing errors made by feed truck drivers.

The S-Series utilizes a stationary version of Feedlogic’s automated blend-on-the-fly system which blends the base feeds into standard feed lines and feeders and can alter the diet frequently according to a prescribed feed strategy. The system measures every pound of feed pulled from bins and dispensed into feed lines, ensuring pigs only ever receive the budgeted amount of specific diet before moving them on to the next diet. Bin inventories are constantly updated in the system and the feed mill can be alerted automatically when they reach critically low levels.

The S-Series collects data constantly on feed intake, allowing a producer to track growth and performance throughout a turn. Systems can be monitored remotely and used as a management tool, highlighting areas where dollars are being lost and allowing the producer to take quick action.

The constant feed intake data also allows S-Series users to build growth curves unique to their genetics and facilities. “Feed intake can vary a lot from one genetic line to another,” said Ryder. “It’s more critical now that

producers feed diets that are tailored to their genetics.”

The S-Series can be installed for as little as \$7/pig space. It is easily retrofitted into virtually any swine production facility. Most producers can expect to see a return in less than 12 months in lower feed costs, reduced feed waste, and more focused management.

To help producers with adoption of the technology, the S-Series can be purchased, leased, or rented. “With the current difficulties faced by producers, we recognize that not everyone is in the position to purchase right now,” said Ryder. “But producers need to be reducing their input costs as quickly as possible.”

The S-Series joins the original FeedSaver M-Series and FEEDPro in Feedlogic’s line of products. The M-Series is a rail-based mobile version of FeedSaver best suited to producers with smaller flows and needing to target diets to smaller groups based on age or weight. The FEEDPro is designed for producers conducting research trials in various production facilities.

For more information, contact Drew Ryder on 320-222-3008, or Email dryder@feedlogic.com



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Sow fertility using AI with 3 or 1 billion sperm

Although artificial insemination (AI) of sows has been established for many decades, the use of boar ejaculates remains inefficient, in that relatively large numbers of sperm are inseminated multiple times during estrus. Early research suggested that 5 to 10 billion sperm in 100 mL extender was necessary to achieve optimal fertility.

Since then, numbers of sperm per dose have decreased, but 2 to 4 billion sperm in 80 to 100 mL extender are still currently considered necessary for optimum fertility. Improved efficiency of use of boar ejaculates requires insemination of fewer sperm. The number of sperm inseminated per service may be reduced either by reducing the number of sperm per insemination dose or the number of inseminations per service.

Adoption of new techniques involving insemination of low sperm concentrations requires optimization of insemination protocols. The objective of this study was to determine sow fertility to a single timed intracervical or intrauterine insemination of conventional or low sperm numbers.

A total of 411 mixed-parity sows were subjected to controlled ovulation by injection of 600 IU equine chorionic gonadotrophin at weaning and 5 mg porcine luteinizing hormone (pLH) 80 hours later. Sows were assigned to a single insemination of 1 or 3 billion sperm delivered into either the cervix or uterus. Inseminations were performed approximately 36 hours after pLH injection. Intensity of standing estrus at insemination was subjectively scored as 1 to 3, with 3 being a stronger response, and semen backflow was recorded as yes or no.

Results show number of sperm and site of deposition did not affect pregnancy or farrowing rates or subsequent litter size. Mean farrowing rates were 68.32% and 68.63% in sows inseminated using an intrauterine catheter and either 1 or 3 billion sperm, respectively. In sows inseminated using the cervical method, farrowing rates were 77.88% and 67.31% when 1 and 3 billion sperm were used, respectively. Greater intensity of estrus at insemination was associated with higher pregnancy and farrowing rates and backflow during insemination was associated with lower pregnancy and farrowing rates.



WHJ comment: This trial suggests that, when appropriately timed after induced ovulation, insemination of low sperm numbers does not adversely affect sow fertility, and this lack of effect is independent of the site of sperm deposition. Whether AI studs or commercial producers will have the confidence to move towards lower sperm doses remains to be seen. Other studies have shown a decline in fertility with a dose of 1 billion sperm and despite the cost advantage I suspect most producers will want to play safe and use a minimum of 2 billion sperm.

Reference: C. Pelland, G. Cassar, R. Kirkwood, et al. - Fertility after intrauterine insemination with conventional or low numbers of spermatozoa in sows with synchronized ovulation. *J Swine Health Prod.* 2008;16(4):188-192.

Does marbling affect pork eating quality?

Various research work on pork eating quality has suggested that tenderness and juiciness of pork is influenced by the level of intramuscular fat, or marbling. However, recent work at the University of Illinois showed that there was no effect on a range of pork quality parameters.

For the study, fresh pork loins were selected from a commercial packing facility based on subjective marbling of the intact loin and also the muscle pH 24 hours after slaughter to determine the influence of marbling on sensory attributes. Pigs were from a similar genetic background, raised in similar production facilities, and slaughtered on a single kill day to minimize the effects of genetics, management, environment, and slaughter day. Loins were vacuum-packaged, transported to the University of Illinois Meat Science Laboratory and aged for 7 days, after which a chop was removed from the area of the tenth rib for analysis. Quality measurements were determined after aging. After the composition was measured, 150 loins were selected to provide a range of fat levels, from 1 to 8%, and a pH range from 5.5 to 5.8. A trained sensory panel tested chops cooked at temperatures of 62, 71, or 80°C and a mechanical shear force test was performed

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on chops from the 150 loins. Consumer evaluation was also conducted on a subset of 40 loins, which were broken down into 5 discrete levels of intramuscular fat, with averages of 1.6, 2.5, 3.6, 4.5, and 5.7% extractable lipid. Consumers were also asked to select the chops they would most prefer from a retail display case based on the amount of marbling present. Results from the consumer portion of the study indicated that intramuscular fat content had limited effects on perceived tenderness, juiciness, pork flavour, and oiliness; some significant differences were detectable, but they were numerically small. Most consumers also selected lean chops from the retail case, with nearly 50% selecting chops with less than 1.7% extractable lipid. The shear force was negatively related to extractable lipid, in other words, sheer force was reduced as lipid level increased. Results from the trained panel sensory analysis indicated that the percentage of extractable lipid did not correlate strongly with perceived tenderness, juiciness, or pork flavour for this group of pork loins that was controlled for genetics, pH, management, and day of slaughter.

WHJ comment: There has been a perceived reduction in eating quality of pork as its fat content has been reduced genetically, although no doubt other factors are involved. In this trial, however, there appeared to be no major effect of marbling on eating quality. It is surprising that it was possible to obtain loins with such a wide range of intramuscular fat from the same genetic background and production conditions, indicating huge variability. This study also found that consumers select pork chops on the basis of leanness, something noted in many consumer surveys.

Reference: P.J. Rindker, J. Killefer, M. Ellis, M. S. Brewer and F. K. McKeith - Intramuscular fat content has little influence on the eating quality of fresh pork loin chops. *J. Anim. Sci.* 2008. 86:730-737. doi:10.2527/jas.2007-0490

The influence of method of administration of prostaglandin

To induce farrowing, a single dose of prostaglandin (PGF) can be injected intramuscularly up to 2 days before the average due date for the herd. It has been reported that when this protocol was used, approximately 50% to 60% of sows farrowed within a day of treatment. The cost of PGF treatment can be reduced if 25% to 50% of the label dose is injected into the vulva (extra-label use). The likelihood of farrowing during the next 10-hour working day was increased when two IM injections of PGF were administered at a 6-hour interval (split dose). The objectives of this trial, carried out by researchers at the

University of Michigan, were to compare stillbirth rates for litters born either during the work day (with personnel present) or during other hours of the day; to compare the effectiveness of different methods of administering PGF to induce farrowing within 23 to 31 hours; and to determine whether gestational age of a piglet at birth affects its weight at 122 days post insemination and at 12 days of age. Three methods of giving PGF were used – either a single or double intramuscular injection, intravular injection (either single or double dose) or administration onto the vagina lining without injection. Administrations were given at 8am for single doses and at 8am and 2pm for split doses.

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Approximately 17% to 54% of treated sows and 17% of controls farrowed during the work day on gestation day 114. The single-dose mucosal application of PGF was less effective in inducing farrowing during working hours of day 114 than the other three methods of administration, which produced comparable results. In this study, the likelihood of farrowing the next working day was not greater when two injections of PGF were administered 6 hours apart, as was previously reported by Kirkwood and Aherne. Number of stillborns per litter did not differ in treated sows and controls, or in litters farrowed at night compared to those farrowed during the work day. Shorter gestation length was associated with lighter birth weight, but birth weights and weights 122 days after the last insemination and at 12 days of age did not differ among piglets of treated and control sows. The

farm, like most commercial farms, did not employ a designated farrowing attendant, as was the case in many studies that investigated the use of prostaglandin to induce farrowings in the 1980's. This explains why no differences in stillbirth rate or mortality were seen.

In this study, induced sows farrowed, on average, 1 day earlier than non-induced sows. With this small gestational age difference in induced and control pigs, it was not surprising that their weights did not differ at 122 days after the last insemination and 12 days after birth, although induced pigs were smaller at birth as observed in other studies.

WHJ comment: It is interesting that in this trial, no special measures were taken to reduce stillbirths and piglet mortality, despite using prostaglandin to ensure farrowing occurred during the day. Much of the original trial work on induced farrowings involved supervision of farrowing, paying particular attention to sows at risk of having stillbirths, intervening in farrowing when necessary and taking steps to improve piglet viability. What this trial shows is that there is little point in using prostaglandin if such measures are not taken to increase survival rate.

Reference: B. Straw, R. Bates and G. May - Influence of method of administration of prostaglandin on farrowing and relationship between gestation length and piglet performance. *J Swine Health Prod.* 2008;16(3):138-143.


Exercising stall-housed gestating gilts

Lameness in breeding age gilts and sows is a major cause of culling, resulting in increased economic losses and welfare concerns. A study carried out at Purdue University determined if exercise during gestation would affect the musculoskeletal system, production parameters, and behaviour. Gilts were assigned to one of three treatment groups; Control (no exercise), Low exercise (122 minutes of exercise per day for 5 days per week), and High exercise (122 minutes of exercise per day for 2 days per week and 427 minutes per day for 3 days per week). All gilts were stall-housed during gestation and gilts were exercised between days 35 and 110 of gestation. Lameness score, body condition score, bodyweight and blood were taken at multiple points before gestation, and during gestation and lactation.


Sow lying behaviour was recorded for 3 days after farrowing. Farrowing data included litter weight and size at birth and weaning, and pre-weaning mortality. After weaning, 38 sows were slaughtered and muscles and the bones of the left fore- and hind-limbs were harvested. Bone


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density and quality were determined by CT scans, dual energy x-ray scans (DEXA), and bone breaking force tests. The Control group took longer to lie down than both exercise groups and the Low exercise group took longer to lie down than the High exercise group. The number of pigs weaned was significantly higher in the High exercise group than the Control group. Piglet pre-weaning mortality was greatest in the Control group compared to both exercise groups. The Low exercise treatments exhibited a greater bone density (CT) in the humerus, radius, and tibia compared to that of the Control group. The bone density (CT) of the humerus in the Low exercise group was greater than

that of the High exercise group. Breaking force in the humerus and femur was greater in the Low exercise group than the Control group. Breaking force in the tibia of the High exercise group was greater than the Control group. The tibia of both the Low and High exercise groups had a greater breaking force than the Control group. Although there was no benefit of exercise on lameness, the differences in bone density and quality, lying behaviour and piglet survivability may provide useful insight into alternative housing for sows, concluded the authors.

WHJ comment: This study mirrors similar work carried out in Europe comparing stall housed and group housed sows, both showing the advantage to bone strength of exercise. No comment was made about number of stillborn piglets, whereas in some European trials group housed sows produced fewer stillborn piglets. It also appears that pre-weaning mortality may be lower for sows that are able to exercise, as it was in this study. As interest in group housing increases in North America and more research is carried out, work such as this will be useful in understanding the benefits and possible disadvantages of group systems.

Reference: E.L. Schenck, K.A. McMunn, D.S. Rosenstein, R.L. Stroshine, B.D. Nielsen, B.T. Richert, J.N. Marchant-Forde, D.C. Lay Jr. - Exercising stall-housed gestating gilts: Effects on lameness, the musculo-skeletal system, production and behaviour. J Anim Sci. 2008 Jun 20. [Epub ahead of print]



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The effects of space allowance for rearing gilts on subsequent performance

A total of 1,257 gilts were used to determine the effect of space allowance during rearing and age at puberty on total pigs produced and removal rate over 3 parities. There were 2 treatments, gilts were given a space allowance of 1.13 m²/gilt (15 gilts per pen) in treatment one, while in treatment two, gilts were given 0.77 m²/gilt (22 gilts per pen). Gilts were individually weighed on entry (38 kg and 75 days of age) and before leaving the rearing site. They were scanned for backfat thickness, loin depth, and had their feet and legs scored for structure, movement and toe evenness before leaving the rearing site. Commencing at approximately 140 days of age, gilts were exposed to a vasectomized boar once daily with age of puberty recorded for all gilts attaining puberty before leaving the rearing site. Gilts were then moved to a specialized gilt breeding farm. When confirmed pregnant, they were moved to 1 of 9 sow farms at random, where gilts remained until removal from that herd. Space allowance in rearing had no effect on growth rate in rearing, backfat thickness and loin depth, total pigs produced and removal rate. A greater percentage of gilts attained puberty and attained it at a younger age when given the greater space allowance in rearing. Gilts given the lower space allowance in rearing had more cracks on their rear hooves. Gilts attaining puberty at a younger age (< 185 d) had a greater growth rate in rearing, greater backfat thickness at 200 days of age and produced more pigs over parities 1 to 3. Gilts in the highest growth rate group in rearing (> 860 g/d) had greater total born in parity 1, but total pigs produced to the end of parity 3 was not different. Contrary to expectation, fast growth rate in rearing did not negatively impact removal rate. Gilts served between 240 to 260 days of age produced more pigs by the end of parity 3 than those served at > 260 d of age, while a greater percentage of gilts served at > 280 days of age were removed by the end of parity 3. In conclusion, space allowance in rearing did not affect total pigs produced or removal rate; however, gilts that attained puberty at a younger age produced more pigs over parities 1 to 3.

WHJ comment: This study confirms that gilts destined for breeding will benefit from more space than normal commercial space allowances, despite the lack of effect on growth rate. The higher number of gilts showing puberty and the lower age at puberty is a reflection of the greater ability

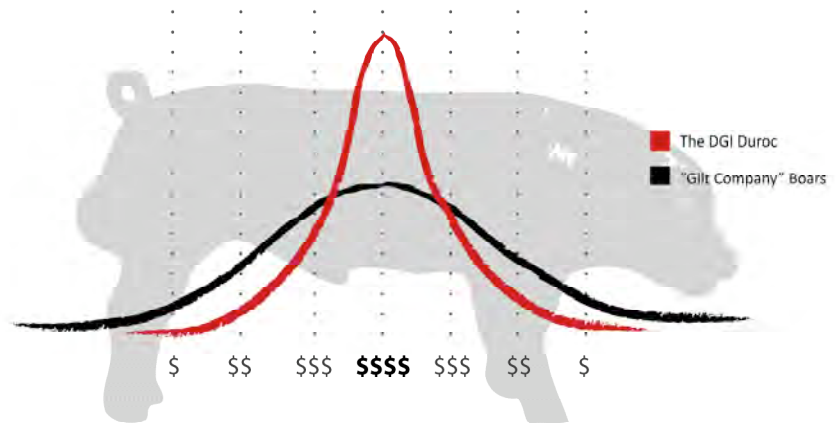
of gilts to interact socially. There was also an effect on hoof quality, although this did not result in a lower removal rate for the gilts given more space. Gilts in this trial were bred relatively late and it is interesting that those bred later than 280 days of age had a higher removal rate by the end of the third parity.

Reference: M. G. Young, M. D. Tokach, F. X. Aheme, S. S. Dritz, R. D. Goodband, J. L. Nelssen and T. M. Loughin - Effect of space allowance during rearing and selection criteria, on performance of gilts over three parities in a commercial swine production system. J. Anim. Sci. 1910. doi:10.2527/jas.2007-0600

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• Industry Crisis



July hog inventories continue downward trend

The latest hog statistics, released in August, indicate the continuing decline of the Canadian pork industry, although the dropout rate appears to have slowed in recent months. Year-on-year reductions in hog numbers were similar to those in the April data, with 11.6% fewer hogs on farms and 13.0 million hogs in total, the lowest since 2000. The number of farms with pigs fell by an average of 19% between July 1, 2007 and the same time in 2008 with Saskatchewan the biggest loser at 30% and Alberta showing a 24% fall in producers.

Western provinces have been affected more than the main pork producing provinces in the east, Ontario and Quebec. Total numbers of hogs in Manitoba fell by 8%, Saskatchewan by 19%, Alberta by 16.3% and BC by 7%. This compares with a 6.7% reduction in Ontario and only a 2.9% drop in Quebec. Breeding stock numbers fell most in Alberta and Ontario, both averaging 8% over the year, whereas Manitoba and Saskatchewan fell by only 3%. Quebec lost very few breeding animals, with a drop in numbers of just 1%.

Numbers of pigs in the categories for pigs from birth to market indicated the changing production structure of the industry. In Manitoba, pigs in the 20-60kg category have fallen 27% since 2006, while numbers in the over 60kg category have dropped by

27.7%, indicating increased exports to the USA. However, following a record first quarter for live exports, when an estimated 2.9 million pigs moved to the USA, the second quarter numbers were put at 2.2 million by Statistics Canada. Large reductions in weaner and finisher pigs were also seen in Saskatchewan, where year-on-year numbers for the under 20kg category fell by 16% and were down a massive 35% since 2006. However, the biggest fall was in the 20-60kg range, where numbers fell by 28.2%, while pigs in the over 60kg category dropped by 18.2%.

In Alberta, hog numbers in the under 20kg, 20-60kg and over 60kg categories fell by 17%, 20.6% and 14% respectively, while in BC, only the number of pigs in the over 60kg was lower, being down by 38%. Over the last year, Ontario has shown signs of reduction in its nursery and finishing pigs, with an 18% reduction in both the 20-60kg and over 60kg categories. Quebec, meanwhile, has shown little change in numbers apart from in the over 60kg category, which fell by 6.4%.

Advance payments uptake good

From Farmscape files

The Manitoba Pork Credit Corporation reported that about 45 million dollars have been allocated to pork producers from the *continued on page 28*



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four western provinces by mid-August under the Federal Advance Payments Program, a financial loan guarantee program provided under the Federal AgriStability Program that offers access to credit through cash advances.

Advance Payments Program Manager Ron Marchenski, with Manitoba Pork Credit, the agency administering payments to pork producers in Manitoba, Saskatchewan, Alberta and B.C., says producers are eligible to receive advances of up to 400 thousand dollars. The first 100 thousand dollars is interest free for one full year.

“Anything over 100 thousand up to the maximum of 400 thousand would be prime minus 0.625% and there is quite a bit of uptake on the interest bearing side,” says Marchenski. Manitoba represents about 63 percent of applications, Saskatchewan five percent, Alberta 26 percent and B.C. about seven percent, with a total of about 271 applications so far.

Producers have until March 31, 2009 to apply for funding.

Alberta unveils long-term strategy for livestock industry

Alberta’s provincial government unveiled a long-term strategy and investment of \$356 million to stabilize and strengthen Alberta’s livestock industry.

“Alberta’s livestock industry is facing significant challenges and needs a major and fundamental change,” said George

Groeneveld, Minister of Alberta Agriculture and Rural Development. “Albertans want a competitive and sustainable livestock industry, but this will not happen until we start doing things radically different. The industry needs to regain its competitive advantage and although these changes will not be easy, they are necessary.”

Mandatory traceability and the development of a new Alberta Livestock and Meat Agency are key to implementing this new strategy. The government will invest \$56 million this year to create the agency, which will report directly to the Minister of Agriculture and Rural Development. Included in that amount is \$40 million that will be redirected from the ministry’s existing budget. The Alberta Livestock and Meat Agency will support the livestock industry with a focus on directing funds, resources and programs towards strategic priorities.

The Alberta Livestock and Meat Strategy outlines eight priority initiatives developed to achieve significant change in the industry. These changes will redirect resources to key priorities, revitalize the livestock industry, enhance the value chain and refocus efforts to achieve a sustainable and competitive livestock industry.

To assist in stabilizing the industry during the first phase of this transformation, producers will receive \$150 million in immediate funding. An additional \$150 million will be available in January 2009 once certain conditions have been met. This second payment will be issued only after age verification and premise

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identification practices have been adopted and verified for each individual producer.

“Government will work closely with the livestock industry throughout this transformation process,” said Groeneveld. “Producers who are unable or unwilling to transform their business by meeting these new verification and identification conditions may need to consider ways to exit the industry. It is vital that producers believe in the sustainable future of this industry.”

The challenges facing the livestock industry include persistent labour shortages, restricted access to foreign markets, packing plants operating significantly under-capacity, lack of a shared strategic vision, lack of product differentiation, overdependence on the US market, lack of an integrated federal-provincial government policy framework, and increasing environmental impacts, said a government news release.

COOL requirements less onerous than expected From Farmscape files

North American pork producers, processors and retailers are preparing for the introduction of what is expected to be a complex but far less onerous U.S. food product labelling system than had originally been feared.

Mandated in the 2002 U.S. Farm Bill, Mandatory Country of Origin Labelling (M-COOL) will be expanded effective September 30, 2008 to several agricultural commodities. The

regulation will compel food retailers in the United States to provide their customers Country of Origin information on a range of products, including pork. Although the new rules officially take effect September 30, USDA will focus on education and awareness rather than enforcement for the first six months.

The legislation provides for the use of four labels to define a pork product's country of origin. Label A - “Product of the United States” - will designate meat from animals born, raised and processed exclusively in the U.S. Label B - “Product of the United States and Canada” or “Product of Canada and the United States” - designates meat from animals born in Canada and partially raised and slaughtered in the U.S. Label C identifies meat from animals imported for direct slaughter and Label D identifies meat that arrives from another country. Exempt from the rule are pork products that have been processed, products distributed through food service and products that are exported out of the U.S.

Canadian producers have welcomed the USDA's latest version of the proposed rule. “As a result of the changes made to the U.S. farm bill this year the record keeping requirements are much less onerous than what would have been the case under the 2002 farm bill. And there certainly is much more accommodation of existing market chains or value chains,” observes Canadian Pork Council (CPC) Executive Director Martin Rice.

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One of the key changes relates to the commingling of animals from different countries. "They are allowing the Americans to put product from Label A into Label B," says Manitoba Pork Council Chairman Karl Kynoch. That will allow U.S. processors to mix U.S. born, raised and processed hogs with, for example, Canadian origin hogs. In that case the meat could be labelled "Product of the United States and Canada."

Kynoch notes meat from hogs that have been in the U.S. a minimum of 15 days qualify for the Label B designation so any of the isoweans or 50-pounders sourced from Canada will qualify for that label. The meat from market hogs imported into the U.S. from Canada for direct slaughter, however, will be restricted to Label C. Rice explains while Label B allows processors the choice of using "Product of Canada and the United States" or "Product of the United States and Canada", Label C only allows "Product of Canada and the United States".

Saskatchewan Pork Development Board policy analyst Mark Ferguson believes the impact of the new labelling requirements on Canadian pork producers will ultimately be determined by U.S. processors and retailers and their ability to efficiently comply with the rule while at the same time utilizing Canadian product. Ferguson fears that if the rules are considered too complex or costly some U.S. pork processing plants could decide not to purchase Canadian hogs or discount the price.

European pig numbers fall by 10%

The European Union pig herd has fallen nearly ten percent in the last few months, with every country reporting contraction. The continuing trend means that by the end of 2008 the herd will be at its lowest for at least 20 years.

Denmark has suffered from having to compete with the USA in export markets and hog prices there have been poor compared to other European countries, leading to a reduction in pig numbers. At the beginning of July 2008, there were 12.35 million pigs in Denmark, a 9.5% year on year decrease from the same month in

2007. The number of sows was around 8.5% lower than in July 2007. However, since spring 2008, the number of sows has remained constant.

Meanwhile, the Netherlands has also seen a reduction in the number of sows. In April 2007 there were 1.15 million sows in the Netherlands, but one year later this number had fallen to 1.07 million, 7% lower.

Results of the June 2008 pig survey in the UK showed a 7% drop in total breeding pig numbers since the previous year, although the number of in-pig gilts fell by 12.8% indicating further contraction is likely. Industry body the British Pig Executive (BPEX) was predicting a drop of around 10%, and some people thought that was erring on the optimistic side. However, the latest decline continues the trend of the last decade, which has seen the UK breeding herd fall from 900,000 sows, gilts and boars to its current 500,000.

France's May census showed only a small fall in the French national herd compared with a year earlier. The breeding herd was down 3%. This is the fifth successive year the French herd has shown a drop and it is down 10% since May 2002.

Meanwhile the new EU member countries in Central and Eastern Europe are suffering due to their lack of modern production systems and small unit size. In Poland up to 150,000 of the country's 580,000 pig producers are predicted to quit as a result of the current crisis. By March sow numbers were down 20% on the same time last year, and the downward slide is continuing. The current fallout suggests a major restructuring of the national herd is taking place. However, although the Polish herd is falling in numbers, it still has 11% of the EU pig herd. Similarly, Hungary has seen its pig herd fall 10% in a year according to its April survey, with smaller producers bearing the brunt of the attention caused by high feed prices.

Tightening availability of pork in the EU has triggered large price gains, up to 30% in some countries, but overall around 20%, equivalent to about \$2.50 per kilo, with the UK price approaching \$3.00/kg.

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Pork production improvement expected from the use of new genetic markers

By Ken Stalder, Associate Professor and Extension Swine Specialist & Max Rothschild, C.F. Curtis Distinguished Professor Department of Animal Science, Iowa State University, Ames, IA 50011-3150

Background

Breeders have been using gene markers since the 1990s to remove genes known to negatively impact pork production. Genes like the porcine stress syndrome (HAL) and the NAPOLE gene (RN-) have been identified and are commonly selected against in most breeding herds so the deleterious genes are removed from their herds. In this manner commercial pork producers do not have to address these genes in their breeding herds because their genetic supplier has already managed the genes for them.

Today, swine breeders have new gene marker tools commercially available to them at relatively low costs. These new gene markers are for traits that include feed efficiency, growth, backfat and pork quality and litter size.

Two companies, DNA LandMarks, a BASF Plant Sciences company that performs genetic testing located in Quebec, Canada and GeneSeek Inc., a molecular biology company in the US, have purchased the licensing agreements from the researchers who originally developed them. Included in the group of available tests are markers developed in Max Rothschild's lab at Iowa State University, which is responsible for developing tests for litter size, pork quality and feed efficiency, backfat and growth rate. A breeder wanting to screen animals can simply submit a blood or tissue sample (whole blood, blood blotter cards, ear notches, docked tails, or tissue obtained through a new ear tagging system from Typifix are all examples of sources of DNA that can be used to run these tests) and have the marker genotypes determined on as many animals as they desire. The costs for these tests are relatively inexpensive and as technology improves it is likely that more and more tests can be offered and prices for these tests typically decline.

As an example, we discuss the commercially available tests from DNA Landmarks (http://www.dnalandmarks.com/english/livestock_overview.html)

Markers for growth rate, feed efficiency, feed intake, and backfat

Three markers associated with growth rate and feed efficiency are available. These markers are MC4R, HMGA1, and CCKAR. Briefly, the MC4R locus impacts growth and leanness in the pig. The name MC4R is taken from the gene's name Melanocortin-4 receptor. There are two alleles or variants for this marker, A and G. The A allele is associated with fast growth while the G variant is associated with lean and efficient growth. The producer and breeder can decide if they wish to choose the "fast" growth form of the gene or the "lean/efficient growth" form of the gene. Pigs that are homozygous for the fast growth alleles (i.e. AA) have been shown to reach market weight 3 days sooner compared to pigs that are homozygous for the lean allele. If producers chose to select for the MC4R lean alleles (i.e. GG) pigs will have 8% less backfat and eat significantly less feed (improving feed efficiency). In Table 1 research results are shown indicating the effects of MC4R in two different populations of pigs. These results have been well validated and are effective in all breeds except Hampshire.

Table 1: Example effects of the MC4R molecular marker in pigs.

Genotype	Number of Pigs	Backfat (mm)	Shoulder Fat (mm)	Loin Depth (mm)	Average Daily Gain (g/d)	Feed Intake (kg/d)
GG vs. AA						
2 Commercial genotypes ^a	679	-1.3	-1.4	+1.4	-26.0	-0.15
P value		<.05	<.05	<.10	<.10	<.05
GG vs. AA						
Pure Line Data	2,366	-1.1	n/d	n/d	-28.0	-0.17
P value		<.0001			<.0001	<.01

continued on page 34


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The second marker available is HMGA1. The abbreviation HMGA1 is taken from the gene's name, High-mobility group A. This gene marker is highly associated with backfat and lean growth. HMGA1 variants are consistently associated with fat deposition, growth rate, and lean mass percentage traits across several pig populations. With this particular marker, producers need to remember that the T allele is the beneficial allele and the one that should be selected for to reduce backfat and thereby improve lean percentage. Producers can test and select animals which are likely to be leaner and produce offspring that are leaner. Thus, selection of the beneficial alleles will reduce backfat and improve percentage lean in terminal market animals that are from breeders that have incorporated the beneficial alleles into their breeding program. Improvement in feed efficiency should also occur when selecting for the beneficial allele of this marker because a reduction in the amount of fat deposited reduces the

amount of feed needed to add weight to the animal.

The last gene marker in this group is CCKAR. CCKAR is an abbreviation for cholecystokinin type A receptor. This marker is associated with the control of feed intake, hunger control, and obesity. There are two genetic alleles or variants, G and A, for this marker. In this case the G allele is dominant to the A allele. Pigs that have at least one copy of the G allele (i.e. can be GG or GA) for this marker have, on average, about 5% higher daily feed intake, 3% higher daily gain, and 3% fewer days to reach market weight, when compared to homozygotes (i.e. AA) for the A allele.

Markers for meat quality

Production of high quality pork to meet both domestic and export market demand has been a selection goal of most swine breeders in recent years. Many niche market programs are in place to meet white tablecloth and export demand for quality pork. In the past several years, markers have been identified which improve pork quality.

Two genetic marker tests that impact pork quality have been licensed to DNA Landmarks from ISU. The two markers associated with meat quality offered in this package include PRKAG3 and CAST.

The PRKAG3 is an abbreviation for protein kinase, AMP activated, gamma 3 subunit. This marker is associated with muscle glycogen content and meat quality. Producers and breeders can select for animals that have the higher pH and better meat color from of the gene. Other variations of this gene have been referred to as the Rendement Napole (RN) gene marker. The RN gene marker has been shown to cause low ultimate pH and reduced water holding capacity in pork. This gene marker has been largely observed in pure bred Hampshire or crossbred animals involving Hampshire. Hence, this gene was also known as the Hampshire effect. Another variation of this gene has been identified and is what DNA Landmarks is offering in the PRKAG3 gene, which determines the presence of the 199Ile, A-nucleotide variant, which is the one that is preferred.

This marker is also associated with lower glycogen, higher ultimate pH (about 0.1) and favorable color in loin and ham

tissues. Animals possessing this beneficial genotype have a pH of nearly 0.1 higher in their loin and ham samples than those that are homozygous for the non-beneficial allele. Thus, producers should select animals that have at least one copy of the A allele with the ultimate goal of having the genotype of all animals be AA. The effects of this marker have been observed in all major pig breeds and this test would be very useful in breeds like the Berkshire and Duroc to remove the unwanted forms of the gene.

The second meat quality genetic marker is called CAST, which is an abbreviation for Calpastatin. Calpastatin is responsible for inhibiting enzymes called proteases that affect meat tenderness after harvest. Two variants have been identified within the CAST gene area. This gene impacts firmness, juiciness, Instron force, cooking loss, chewiness, and tenderness scores. Breeders should select for the favorable CAST A allele.

ESR marker for litter size

Increasing litter size is one way to improve production efficiency of a pork operation using fewer sows and less feed. Selection for increased litter size is responsible for the large gains breeders have made in this trait in the last 20 years.

One gene called ESR, the Estrogen Receptor, is associated with litter size in pigs and has been used for many years by a large pig breeding company. It was first discovered in Meishan pigs (Figure 1). Estrogen is a key female hormone that plays a key role in many reproductive functions in the sow including embryo survival, fetal development, fertility, maintenance of fertility, and secondary sexual characteristics. Based on all of the fertility traits that have been shown to be impacted by estrogen, it is easy to believe that this gene for the hormone receptor is associated with litter size in swine. Animals that carry one copy of the favorable variation of the gene will, on average, have 0.4 more pigs per litter. Sows that are homozygotes (2 copies) for this marker would on average have 0.8 pigs per litter. This test has been shown to be effective in breeds or lines involving Large White or Yorkshire breeds and crossbred sows that have this breed involved in them.

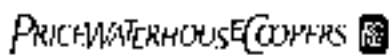
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The assets include 158.87 acres of land, three hog barns built in 2002 which have a 2,000 head cow time capacity per barn (6,000 total head) and equipment generally associated with a finishing hog operation. The barns are constructed with concrete panel construction with a metal clad roof on wood frame truss rafters. As well there is an office building with furniture and fixtures.

Bids are to be submitted no later than 3:00 pm Calgary time Friday, October 24, 2008.

For further information including a copy of the Court Order, an Information Memorandum, Bid Letter, Terms and Conditions, and details for arranging site visits please visit our website at www.pwc.com/can-pradplainsfarms or telephone Donald J. Roberts, Senior Vice President at 403-648-7317 for further information.



Where do breeders begin when considering the use of the molecular markers?

Our advice to producers is to begin testing their herd boars and/or boars in the boar studs they use to make pure matings. For boars used in the development of terminal sire lines, the best approach would be to determine the status of all herd boars and boars in the boar stud for the markers impacting growth, backfat, and feed efficiency including MC4R, HMGA1 and CCKAR. Additionally, the same approach could be used to examine the status of herd boars or boars in the boar stud for the markers used to improve meat quality including PRKAG3 and CAST. Similarly, all boars used to make maternal purebred matings should be tested using the ESR marker used to improve litter size.

Once the results are obtained, breeders can determine what the frequency of the alleles, both good and bad, are for the breeds or lines of sires in the boar stud. This information can be used to determine if further testing of females from each breed or line is necessary. Breeders can determine which alleles they would like to fix or be sure that all animals have two copies of in a given breed or line of animals. Selection of the preferred animals and culling of those without the desirable alleles can then be done.

How can the marker information be used to develop breeding programs?

Many of these markers or genes are best used in combination. Use of all five, MC4R, PRKAG3, CAST, CCKAR and HMGA1, would be beneficial for overall terminal line development to improve growth, leanness and meat quality. Using MC4R (growth allele) and HMGA1 could be used for to develop a line that grows fast and has some backfat improvement. Similarly, selecting animals that have the MC4R (lean allele) and HMGA1 could be used together for make even faster progress in improving leanness and efficiency in breeding stock. The PRKAG3 and CAST could be used in combination to improve meat quality. Furthermore, some breeders may choose to select animals for all of the growth and meat quality markers to develop lines of pure breed animals that excel in the production of lean, high quality pork. Maternal lines should be developed that have the favorable alleles for the ESR gene marker. This will enhance the chances of the lines having large litters, which are extremely important to production efficiency and overall profitability of any pork operation.

Breeders and producers should work to develop the best multi-gene combination for their lines that meets customer needs for both maternal and terminal lines.

Marker test costs

The cost for the marker tests varies depending on how many tests are done. Check the DNA Landmarks web site for more information on the market tests and cost information http://www.dnalandmarks.com/english/livestock_overview.html.

While testing is not inexpensive, especially if attempting whole herd tests, useful information can be obtained by testing sub populations of animals at a much lower cost. This allows a strategy to be put in place before entire whole herd testing programs are required to determine status for all of the markers available.

Combined or used in thoughtful combinations these gene markers offer real benefits for future genetic and economic improvement for swine breeders and commercial pork producers.

Figure 1. The Meishan breed of pigs which originated in China and is known for their outstanding litter size, longevity and other reproductive traits. This breed has made significant contributions to the discovery of molecular markers for a variety of economically important reproduction traits in swine.



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Incorrect temperatures found in 36% of semen storage units

A recently published study of semen storage temperatures carried out in Ontario showed that inappropriate temperatures were recorded in 36% of on-farm storage units. The authors, Drs. Beth Young, Cate Dewey and Robert Friendship, noted that producer errors, including adding warm semen to the unit, poor unit maintenance, and poor temperature control, were the most frequent causes of incorrect temperatures.

“Semen is cooled during storage to decrease the metabolic rate of the sperm,” explained the authors. “When semen is stored at temperatures of more than 20°C, sperm maintain a high metabolic rate with rapid energy consumption and by-product production, resulting in a short shelf life. Temperature fluctuations can also impact stored semen quality, and it has been suggested that for each 2°C to 3°C fluctuation in semen temperature, the shelf life of that semen is decreased by one day, they noted. Because boar sperm are particularly temperature sensitive, appropriate on-farm semen storage is a critical factor in achieving good AI results.”

For the survey, a sample of 27 Ontario swine farms was visited and on each farm, an air-temperature-logging device, set to record air temperature at 1-minute intervals, was placed in the farm’s semen storage unit. A log sheet was taped to each storage unit, and producers were asked to record the date, time, and reason each time the storage unit door was opened. The type of storage unit (refrigerator-type or cooler-type) was also recorded.

Storage unit temperatures that fell outside the temperature range of 15°C to 20°C for 40 minutes were considered unacceptable. Storage-unit temperatures that fluctuated by 2°C for 40 minutes were also considered unacceptable.

In one herd, semen was stored in two separate storage units, so temperature data was collected from a total of 28 storage units. The average number of times the storage units were opened was 2.8 times per day, with the minimum zero times per day and the maximum eight times per day. The most commonly reported reason was to remove semen doses for breeding (Table 1).

Table 1: Reasons recorded by producers for opening their semen storage units, reported as a percent of 166 door-opening events*

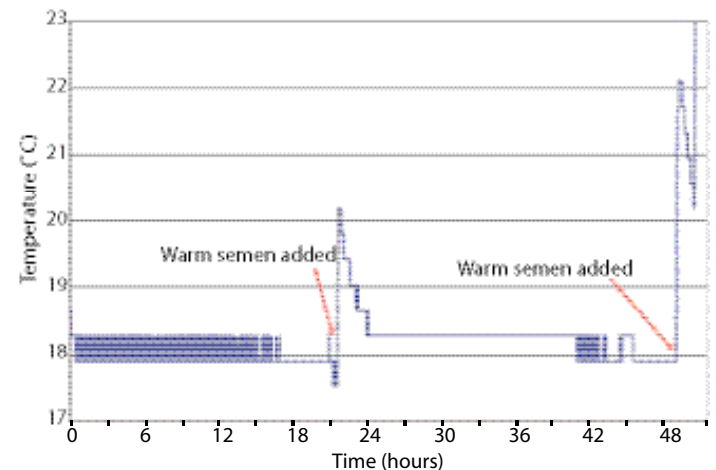
Recorded reason for opening storage unit	Percent
Removing semen doses for breeding	56.0
Returning unused semen after breeding	19.3
Loading fresh semen into storage unit	6.0
Turning semen doses	6.0
Adding frozen gel packs to storage unit	4.2
Removing doses for semen evaluation	2.4
Checking thermometer in storage unit	1.8
Removing-replacing drug bottles in storage unit	1.8
Counting semen doses	1.2
Returning gel packs after breeding	1.2

* Results reported for 26 storage units on Ontario farms visited between May and October, 2004. Door-opening events were recorded for 72 hours.

Unacceptable semen storage temperatures were recorded in 10 of 28 (36%) of the storage units examined. Nine of these 10 storage-unit temperatures were considered unacceptable because temperatures were outside the 15°C to 20°C range for 40 minutes. In eight of the nine units in which temperatures fell outside the 15°C to 20°C range, temperature fluctuations of > 2°C were also recorded. The type of storage unit used was not associated with inappropriate semen storage temperature. However, a polystyrene picnic cooler used by one farm performed very poorly.

In seven of the 10 problem storage units (70%), the unacceptable temperatures appeared to have been triggered by specific events recorded by the producers. In three cases, unacceptably high temperatures occurred when warm, fresh semen doses were put into the storage unit (Figure 1).

Figure 1: Temperatures recorded by an air-temperature-logging device at 1-minute intervals in a semen storage unit in which temperatures exceeded 20°C and fluctuated by > 2°C when warm semen was placed inside the unit.



Poor maintenance of the storage unit was the cause of unacceptable storage temperatures in two cases. In one, the storage-unit door did not close properly and occasionally opened unexpectedly. This happened once during the temperature-recording period. The temperature in the storage unit fell to the air temperature of the barn (13°C to 14°C) and the temperature remained low for approximately 10 hours until the door was closed. In the other case of poor maintenance, a storage unit with a frayed electrical cord failed while the temperature logger was in place. In less than 2 hours, the temperature in the storage unit rose to 22.5°C. The problem was noticed and ice packs were added to the storage unit, which caused the temperature to drop rapidly to 8.6°C. Approximately 4 hours after the storage unit first failed, a new electrical cord was installed and the temperature in the storage unit stabilized within the appropriate range.

In two instances, poor temperature regulation of the unit caused unacceptable storage temperatures. In one case, the thermostat was set too high and the storage unit consistently maintained a temperature > 23°C. In the other case, a polystyrene picnic cooler with ice packs was used as a semen storage unit. Each time an ice pack was added, large temperature fluctuations occurred (up to 4°C), and the temperature fell below 15°C for approximately half of the temperature-recording period.

In this study, more problem storage units produced temperatures that were too cool than temperatures that were too warm. Boar sperm is extremely sensitive to cold shock, which is one reason the use of frozen boar semen is not a practical alternative for the swine industry.

Nine of the 10 problem units experienced temperature fluctuations of > 2°C. Variation in storage temperature forces sperm to re-adjust their metabolic activity in order to adapt to changes in their thermal environment. This depletes nutrients and buffer in the extender and diminishes semen quality.

Most problems with storage temperature in this study were directly attributable to the actions of the producers. This suggests that more emphasis on producer education in proper storage-unit

management and maintenance is needed, say the authors of the study.

Thirty percent of the unacceptable storage temperatures were attributable to adding still-warm semen to the storage unit. If there is cooled semen in the storage unit when the warm semen is placed inside, the higher air temperature caused by this action may have a negative impact on the quality of the cooled semen. Some means to avoid placing warm semen in the storage unit include allowing the semen to cool to below 20°C in an area of the barn cooled by a fan or air conditioner, or to have two separate units, one for cooling semen and one for storing semen once it is cooled, suggest the authors.

Because poor maintenance was identified as a cause of unacceptable storage temperatures, producers should be encouraged to regularly maintain their storage units. Storage units should be routinely inspected and damaged parts should be repaired or replaced. Units should also be cleaned regularly to prevent dust from building up around the air circulation system, which may cause inefficient operation or overheating. Daily temperature monitoring should also be a part of routine storage-unit maintenance. Simple high-low thermometers are an inexpensive, easy and effective method for producers to monitor temperatures inside their semen storage units, concludes the report.

Reference: Young B, Dewey CE, Friendship RM. Prevalence and causes of inappropriate temperatures in on-farm semen storage units in Ontario. *J Swine Health Prod.* 2008;16(2):92-95.



A study carried out in Ontario showed that inappropriate temperatures were recorded in 36% of on-farm storage units

Take Home Messages

- Unacceptable semen storage temperature is a common problem in swine herds.
- Under the conditions of this study, unacceptable storage temperatures are associated with activities of producers, suggesting that better producer education on proper semen storage-unit management and maintenance is necessary.
- Adding warm semen to the storage unit, poor unit maintenance, and poor temperature regulation commonly cause unacceptable storage temperatures.

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Controlling energy costs in the barn

By Dr. Mike Brumm, Brumm Swine Consultancy Inc., North Mankato, MN

As we approach winter in tight financial times in the swine industry, producer's thoughts are turning to how to best manage their heating and ventilation systems to keep their utility and energy expenses in line.

There are few publicly available production cost summaries. One of the best is the information from the Center for Farm Financial Management at the University of Minnesota (www.finbin.umn.edu). For the 4 year period of 2004-2007, wean-to-finish cooperators in this record program reported an average fuel and oil expense of \$1.43 per pig and a utilities expense of \$1.04 per pig. Fuel and oil includes both propane and any diesel and gasoline charged to the swine unit for such items as tractors, lawn mowers, power washers, generators, pickups, etc. Utilities include electricity and telephone/internet. Surprisingly, both fuel and oil and utilities varied little for the 4 year period. There was no indication in the data set of what the mix is of curtain sided versus tunnel wean-finish facilities.

Finishers of feeder pigs reported fuel and oil expenses of \$0.71/pig and utility expenses of \$0.62/pig. For farrow-weaning cooperators (average inventory of 950 sows), the fuel and oil expense was \$0.49 per pig weaned while utilities were \$1.03/pig weaned.

Once facilities are tightened for winter operation and have the appropriate insulation in the ceiling and side walls, the major causes of excessive heating expenses are:

1. improper minimum ventilation rates
2. improper furnace sizing
3. improper temperature selection

As I work with a large number of different types of facilities and production systems in the upper Midwest and Canada, I continually find that producers have a very limited knowledge of their ventilation system. In most situations, they don't have any idea of the capacity of their system, nor do they fully understand the impact of small ventilation mistakes on propane usage.

The MWPS (Midwest Plan Service) recommends the following minimum ventilation rates for moisture control in swine facilities:

Weaning – 30 lb (13.6 kg)	2 cfm/pig
30-75 lb (13.6- 34 kg)	3 cfm/pig
75-150 lb (34-68 kg)	7 cfm/pig
>150 lb (> 68 kg)	10 cfm/pig
Gestating female	12 cfm/female
Farrowing	20 cfm/crate

These numbers don't mean much to most producers until you add in the approximate capacity of various sized fans. While such items as shutters, discharge cones, hoods, etc have an impact on the capacity of exhaust fans in negative pressure systems, the following rough estimates are valuable starting points for producers trying to understand their ventilation systems:

Fan blade diameter, in.	Approximate CFM
12	1200
14	2000
16	2500
20	4500
24	6000
36	12000

Suppose that you have a 300 head weaned pig room, and there is a 12" fan running as the minimum fan. This fan has the capacity for 4 cfm per pig, which is twice the recommended minimum ventilation rate. Either this fan needs to be replaced with a smaller fan, or it needs to be connected to a variable speed controller and set to operate at 50% of its rated output. Notice that I didn't say 50% of its rated speed or 50% on the controller. Generally small variable speed fans achieve 50% of their rated output at approximately 65-70% of their rated rpms. Twenty four (24) in. diameter fans often achieve 50% of their rated output at 60-65% of their maximum rpms.

There is quite a bit of variation between ventilation controllers on how they control variable speed fans. Depending on the controller specifics, a 50% setting as the minimum speed may or may not be anywhere close to the intended 50% operating performance.

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Watts per KWH	ANNUAL SAVINGS PER CYCLE IN U.S. DOLLARS		
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5	36.24	68.14	106.23
5.5	39.87	82.26	130.03
6	43.49	92.77	150.13
6.5	47.12	101.53	168.23
7	50.74	111.40	187.33
7.5	54.37	117.22	196.43
Watts per KWH	RETURN ON INVESTMENT IN MONTHS/YEARS		
4.5	1.7	1.1	0.7
5	1.5	1.0	0.6
5.5	1.4	0.9	0.6
6	1.3	0.8	0.5
6.5	1.2	0.7	0.4
7	1.1	0.7	0.4
7.5	1.0	0.6	0.4

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CONTROLLING ENERGY COSTS CONTINUED



Having more furnace or heater capacity than required leads to more variable temperatures and higher energy bills

Improper furnace sizing is usually the result of installation of a furnace that is too large for the facility. A furnace is large enough if it shuts off occasionally on the coldest day of the year. When furnaces are too large, the end result is rooms that have large temperature variations when the furnace operates. Many times this results in the temperature at the controller temperature probe rising beyond the room set point, resulting in the ventilation system increasing the ventilation rate to remove the extra heat, which means the room cools and the process starts again.

Most ventilation controllers log the high and low temperature for the last day or since the controller was last reset. Using the controller's temperature logs, the high, low and set point temperatures should be recorded on a daily basis. When the facility is operating in the heating mode, the daily high temperature should never be at or above the set point temperature. If the high gets to or above the set point, this suggests that the ventilation system responded by exhausting the heat just added to the room

with the furnace. To prevent this from happening, as a starting point, set the furnace to shut off at 2°F (1°C) below the room set point temperature.

Many producers make the mistake of assuming that the set point temperature for the controller will be the room temperature at the temperature probe. This is not the case. In cold weather, if the furnace is set to turn off 2°F below the set point, the room temperature should be 2°F colder than set point as the furnace 'OFF' temperature is the control point for the room.

As pigs grow and produce increasing amounts of heat, the ventilation system responds by increasing the ventilation rate. If stage 1 is variable speed and has a 2°F bandwidth, when stage 1 is operating at 100% speed, the room must be 2°F warmer than set point. This is because the controller is set to not attain 100% speed unless the room is 2°F warmer. Set point is just the decision point from which the controller makes decisions as to which devices to operate in the ventilation and heating system.



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The Longarm: one woman's farm crisis leads to a hog management solution

Seventy hogs mill around a pen in Mary Haugh's large, open-concept, auto-sort barn in Listowel, Ontario. She needs to separate out just one pig; the gilt is in the back right corner. Though this might be a job dreaded by many, requiring a chase board, a second person, and a whole lot of sweat, Haugh isn't worried. She moves to a plastic cylinder mounted vertically to the pen gate and begins uncoiling a wall of red fabric. She wades in among the animals, which part before the growing wall of fabric, and after a few intentional sweeps isolating the gilt within the fabric to move it closer to the pen gate, Haugh has her gilt in the aisle, exactly where the pig is required to be. Fifty feet of fabric curtain retracts smoothly back into the cylinder, and what might have been a chore is done very quickly and effectively. This is Haugh's innovation, The Longarm, a hog-management tool she calls "indispensable."

Like most hog farmers before the Longarm, Haugh used conventional methods like a chase board to round up her pigs and thought this was simply the thing to do, until a serious medical crisis made necessity the mother of her new invention.

In May, 2005, while out running errands, Haugh's husband Wayne suffered a heart attack. Two days later, while in hospital,

he experienced a second one. Though he was sent home shortly thereafter, he was restricted from all strenuous activity while he awaited his scheduled bypass surgery in September. After a successful operation, Wayne still required time to convalesce. So, for many months, Haugh had to manage the family hog farm entirely on her own. "That was a real eye-opener," she says.

Haugh found herself overwhelmed by the sheer size of the operation - not only did she need to learn rapidly about running the barns, including all the barn equipment that her husband once maintained, she had the very physical task of getting 3,300 hogs to move when and where she wanted...and quickly. Mary recalls "things got to the point where I was doing morning chores all day only to find it was time for the evening chores. I was working from early morning until midnight each and every day." Physically exhausted and drained emotionally, Haugh desperately needed to get up to speed in the barns.

Then, one day in the middle of this crisis, a revelation: Haugh noticed that if she left a red chase board in the aisle of her barn, pigs would avoid it. This sparked her curiosity about using colour to her advantage. A consultation with Dr. Laura Beveridge at Purina confirmed that pigs were naturally



Mary Haugh demonstrates moving hogs with the Longarm

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stimulated by the colour red; this was the breakthrough Haugh needed. Her red chase board was not wide enough - with an eight foot gate and only a three-foot long barrier, pigs simply went around it. She tried a longer red cloth stapled to a wooden board, but this was too unwieldy, then a 50-foot cloth with a 2x2 at each end, though this still required a second person at the gate to hold the fabric taut. Amazingly the pigs left the pen in one sweep every time she had the luxury of a second person in the barn to help. Finally, Haugh approached her brother, Peter Jones, a licensed millwright. "I told him to make it retractable, make it adaptable to the hinges in my barn, and make it light!" she quips. At this point, the Longarm was born.

The effectiveness of the invention, Haugh explains, continues to be the visual barrier it presents to pigs, which react to the red fabric and move away from it with very little disruption and minimal effort by the user until it is out of their visual field. Because the motivation provided by the Longarm is purely visual, not physical, the device remains light at just 30 pounds and can be used by one person, one handed. This ease of use enabled husband Wayne to get back into hog management, even with a heart condition. Before this, Haugh used it alone and credits the device with "ergonomically saving her body." With the Longarm, however, Haugh noted that "pigs don't push against it," which amazed her. "It was my miracle," she adds. "It just blew us away. It was so efficient, so effective, and eliminated a lot of the muscle required for hog management." She realized she had something that's needed to manage hogs in today's commercial barns where good employees are difficult to secure.

Haugh decided to introduce her invention to an audience of her peers at the 2006 Ontario Pork Congress in Stratford, where it immediately won the Industry Innovation Competition Award. In 2007, the province recognized the value of the Longarm, when it received a \$5000 regional Premiers' Award of Excellence for Agri-Food Innovation. Since then, fame of the Longarm has spread. Sales are particularly strong in Quebec, and the device is used in Ontario, Western Canada, and the United States, and even as widely as France and Australia. Haugh is currently making adaptations for expanded use by meat packers where it provides a humane alternative to conventional handling with the bonus of minimizing stress on the animals.

"The girls at Troy Valley Farms tell us they would never want to work without one again and that the Longarm is saving them about 6 hours per week," Haugh observes. This has been a consistent reaction among her customers, who also report that the Longarm saves them time doing their chores. Haugh herself sees a two-hour reduction in work time each week, at which rate the Longarm pays for itself in a year.



The Longarm being attached to a pen

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Can we feed mycotoxin contaminated feed to pigs?

A.D. Beaulieu, J.F. Patience and D. Gillis, Prairie Swine Centre, Inc. Saskatoon

Deoxynivalenol (DON) is a mycotoxin produced by fungi which may contaminate cereal grains, including barley and wheat. The contamination is especially problematic when wet, warm conditions prevail during the growing season. The ingestion of grain that is severely contaminated by DON will cause overt symptoms such as vomiting (hence the common name “vomitoxin”). Less dramatic, but more frequently observed symptoms, reduced feed intake and growth, will result when pigs consume feed with a lower concentration of the mycotoxin. The Canadian Feed Inspection Agency suggests that 1 ppm mycotoxin in feed is a safe upper limit for swine.

There are several feed additives available which reportedly reduce the impact of the mycotoxin on the pig. Modes of action vary, and include; binding the mycotoxin in the gut and preventing absorption, chemically transforming the toxin to



decrease its toxicity, or enhancing immune system function.

The overall objective of this experiment was to determine the effect of these feed additives on the performance of nursery pigs fed diets contaminated with DON.

We used 5 nurseries for this experiment, 24 pens per nursery and 4 pigs per pen. Pigs were fed starter diets for 14 days

before being offered the treatment diets (BW 9.02 ± 0.36 kg) for the next 14 days. All starter diets contained in-feed antibiotics.

Treatment diets were formulated to meet or exceed all requirements for pigs of this age. A positive control diet contained no contaminated corn, while the negative control diet was formulated with contaminated corn but no feed additives. Samples of corn which were pre-analyzed and shown to contain DON were used for 70% of the corn (35% in the final diet) in diets 2 to 12 to provide 2 ppm DON in the final



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diet. This concentration was chosen because a preliminary experiment indicated this amount would cause a measurable reduction in feed intake but would not be fatal.

Performance results are shown in Table 1. Pigs on the positive control tended to be heavier than those on the negative control by day 22 (0.50 kg, $P = 0.09$). Overall, pigs consuming diets contaminated with DON had reduced ADG and ADFI compared to those consuming the positive control diet free of DON ($P < 0.001$). Weekly measurements of body weight and feed intake showed that the decline in feed intake preceded the decline in growth (data not shown).

Average daily gain and ADFI of pigs on the positive control was superior to those consuming the DON contaminated diet, regardless of the feed additive used. None of the feed additives ameliorated the effects of DON on feed intake or gain. Feed efficiency was unaffected by treatment ($P > 0.05$).

Based on a literature search and our preliminary experiment which indicated that 2 ppm would elicit a detectable decrease in feed intake but was non-fatal, we formulated the treatment diets to this level. Analyses of the diets indicated a mean concentration in the DON containing diets of 1.99 ppm, however, the individual diet concentrations ranged from 1.57 to 2.61 ppm.

The 1 tonne totes of contaminated corn were initially sampled from about 10 different locations within each tote to a depth of about 1 metre. These samples, composited by tote, were sent to two different labs for analyses for DON and moulds. The results were extremely variable, within and between the labs. Results from lab "A" ranged from 2.4 to 5.5 ppm with a mean of 4.5 while the results from lab "B" were 2.2 to 9.6 ppm and a mean of 6.9. We didn't use the totes which displayed the most variability, however, the DON concentrations in our diets were still quite variable (Table 1).

The above illustrates the difficulty of working with mycotoxins. Obtaining representative samples for mycotoxin testing is very difficult, however it is imperative that a good sample is obtained or the results will be irrelevant. It has been estimated that almost 90% of the error associated with mycotoxin testing can be attributed to the method used to obtain the original sample. Because contamination within a field may be localized, a truck-load which has come directly from a field at harvest is likely to contain only discrete areas of contamination. Moreover, mycotoxin contaminated grains are heavier, thus within a truckload or during storage, some stratification may occur.

The "Grain Inspection, Packers and Stockyards Administration (GIPSA) of the USDA only recognizes samples which have been obtained using a probe. Moreover, at least 4 samples should be taken from each lot, preferably 7 to 9, depending on the size and thickness of the trailer. A 2000 to 2500 gram sample should be obtained. This sample should be ground and then subsampled to obtain the approximately 100 gram sample required by the lab. Producers are advised to contact the laboratory they will be using for the analyses to obtain specific sampling procedures and amounts required.

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In summary, when nursery pigs were fed diets contaminated with approximately 2 ppm DON, feed intake declined by 10 % and growth by 7%. None of the feed additives mitigated this response, however, actual concentrations of DON in the test diets varied. This variability is an illustration of the difficulties inherent in correct sampling and analysis for mycotoxins.

Acknowledgements

Strategic funding was provided by Sask Pork, Alberta Pork, Manitoba Pork Council and Saskatchewan Agriculture and Food Development Fund.




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Table 1: Analyzed concentrations of DON in treatment diets and effect on performance of nursery pigs (initial BW 9.02 kg)

Trt # #	Treatment	DON ppm	BW Day 22 ^a	ADG, kg/d	ADFI, kg/d	Gain:Feed
1.	Positive control ^b	Neg ^c	21.72	0.58	0.88	0.67
2.	Negative control ^d	1.57	21.10	0.55	0.80	0.69
3.	Trt 2 + Ing. A	1.33	20.83 ^e	0.54 ^e	0.75 ^e	0.72
4.	Trt 2 + Ing. B	1.75	21.27	0.56	0.80 ^e	0.71
5.	Trt 2 + Ing. C	1.95	20.74 ^e	0.53 ^e	0.80 ^e	0.68
6.	Trt 2 + Ing. D	1.76	20.75 ^e	0.53 ^e	0.79 ^e	0.69
7.	Trt 2 + Ing. E	1.81	20.74 ^e	0.53 ^e	0.78 ^e	0.69
8.	Trt 2 + Ing. F	1.87	21.06	0.55	0.80	0.69
9.	Trt 2 + Ing. G	2.09	21.03	0.55 ^e	0.79 ^e	0.69
10.	Trt 2 + Ing. H	2.56	20.46 ^e	0.52 ^e	0.74 ^e	0.71
11.	Trt 2 + Ing. F + G	2.61	20.46 ^e	0.52 ^e	0.76 ^e	0.69
12.	Trt 2 + Ing. E + B	2.57	20.33 ^{e,f}	0.52 ^e	0.75 ^e	0.69
Statistics						
	SEM		0.25	0.01	0.03	0.02
	Overall P value		0.009	0.009	0.11	0.81
	P value		0.09	0.08	0.06	0.36
	P value (Contrast)		0.0004	0.0003	0.0008	0.13
	P value (Contrast)		0.20	0.20	0.35	0.77

^a Day 22 of the experiment, day 36 post-weaning.
^b Used exclusively non-contaminated corn.
^c Negligible
^d Formulated to contain 2 ppm DON
^e Different from Trt 1, (positive control; P < 0.05).
^f Different from Trt 2, (negative control; P < 0.05).





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When a little means a lot – getting the best from high-fibre feed ingredients

Feed prices at an all time high. Swine prices constantly under pressure. Biofuel production competing for grain supplies. Variable feed ingredient quality and increased access to some new raw materials with debatable value. These are just some of the key issues facing the swine industry today. Now, more than ever, swine producers need to exploit the newer technologies available to them to maximise margins for sustainable swine production, explains Dr. Milan Hruby, Regional Technical Services Manager, Danisco Animal Nutrition.



Feed ingredients – some nutritional challenges

By-products from grain milling and the biofuel industry are potentially a very cost effective, and therefore attractive, raw

material in grower-finisher feed formulation. However, as their use in diets increases, feed producers need to take account of the levels and types of fibre these feed ingredients contain.

The level of fibre in feed ingredients is often measured as crude fibre. However, crude fibre levels vastly underestimate the actual levels of total fibre in feed raw materials (Table 1).

Table 1: Approximate fibre levels in various grain by-products (as fed basis)

Feed ingredient	Crude Fibre* (%)	Total Fibre* (%)
Wheat shorts	8	29
Rice bran	9	20
Distillers dried grains with solubles (DDGS)	8	21

* Crude Fibre is predominantly cellulose and lignin; Total fibre includes cellulose and lignin, together with other soluble and insoluble cell wall fibre fractions e.g. arabinoxylan

Different types of fibre within raw materials affect their feeding value. Soluble fibres present in some of these grain by-products dissolve in the pig's gut, forming viscous gels which trap nutrients, slowing down the rate of digestion and passage of feed through the gut. Insoluble fibres, which predominate in grain by-products, can both bind water-soluble nutrients, and enclose them, so that they are less available for digestion. Both types of fibre create more bulk in the pig's gut, which can depress feed intake and subsequent growth at the same time as reducing feed efficiency.

Consequently the level and digestibility of nutrients in these by-products can be highly variable, potentially resulting in corresponding variations in pig growth and feed utilisation, leading to increased days to slaughter and increased pig production costs. For this reason their use in the diet has to be well managed.





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When feed prices are high, pig prices are low and margins are squeezed, the temptation might be to trim out some micro-ingredients which are perceived to add cost to the feed. The danger of this approach is that the cost per tonne is reduced, but so is the 'value' of that feed to the pig in terms of its benefits on live weight gain and feed utilisation. Now, more than ever, well-proven feed enzymes offer an extremely cost effective way to reduce feed costs, yet maintain pig performance and improve its consistency.

The contribution that certain fibre-degrading enzymes can make at all stages of pig production, from weaners through to finishers, has been consistently demonstrated. Adding xylanase-based feed enzyme systems (Porzyme®, Danisco Animal Nutrition) has been proven to increase nutrient availability and reduce variability in the feeding value of key cereal grains and their by-products. These enzymes break down the anti-nutritive fibres, resulting in more consistent diet performance, increased daily gain, improved feed efficiency and more uniform pigs. For example, in over 80 research trials (Porzyme Technical Report database) with both young and grower/finisher pigs fed wheat or barley-based diets, adding a feed enzyme improved daily gain and FCR by 6-7% in young pigs and by 4-5% in grower-finishers.

In diets containing high fibre by-products, xylanase-based feed enzyme systems have also been shown to improve pig performance. In a trial at the Prairie Swine Centre, Saskatchewan, pigs fed diets containing high levels of wheat shorts (25-27%) and supplemented with a specific xylanase gave superior performance to pigs fed a wheat-based diet (Table 2). Under the present economic conditions, the high wheat shorts plus xylanase feed would be approximately \$24/tonne lower in cost than the wheat-based feed.

Table 2: Xylanase addition improves performance of grower-finisher pigs fed wheat-based diets containing wheat shorts (~25%)

	Wheat based feed	High wheat shorts feed + xylanase (Improvement %)
Overall (33 -100kg)		
Daily Gain (g)	921	946 (2.7%)
FCR	2.79	2.63 (5.7%)

Wheat based feeds: 73-78% wheat; Crude Protein 18-20%; DE 13.5-13.6 MJ/kg (3225-3250 kcal/kg). **Wheat shorts feeds:** 49-51% wheat; 25-27% wheat shorts; Crude Protein 19-20%; DE 12.8-12.9 MJ/kg (3060-3080 kcal/kg)

However, with wheat prices currently out-stripping corn in Canada by more than 30% then the focus of attention has now switched strongly towards the benefits of xylanase-based enzyme systems in corn and by-product based diets. Again, the experience here is positive as evidenced by two 'grower-phase' trials done in Australia where corn was substituted by wheat shorts (20%) without detriment to pig performance when the xylanase was added (Table 3). Under the present economic conditions, the corn + wheat shorts plus xylanase feed would be approximately \$4/tonne lower in cost than the corn-based feed.

Table 3: Xylanase addition improves performance of grower pigs fed diets corn-based diets containing wheat shorts (20%)

	Corn based feed	Corn + 20% wheat shorts feed	Corn + 20% wheat shorts feed + xylanase
Trial 1 (42-74 kg bodyweight)			
Daily gain (g)	773	692	770
FCR	2.04 ^{ab}	2.31 ^b	1.86 ^a
Trial 2 (28-61 kg bodyweight)			
Daily gain (g)	944	886	938
FCR	1.92	1.88	1.82

Trial 1: Corn based feed: 73% corn; Crude Protein 19%; DE 14.1 MJ/kg (3365 kcal/kg). **Corn + shorts feed:** 53% corn; 20% wheat shorts; Crude Protein 20%; DE 13.35 MJ/kg (3190 kcal/kg)

Trial 2: Corn based feed: 65% corn; Crude Protein 20%; DE 14.4 MJ/kg (3440 kcal/kg). **Corn + shorts feed:** 45% corn; 20% wheat shorts; Crude Protein 22%; DE 13.6 MJ/kg (3250 kcal/kg)

a, b P<0.05

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These data support other experiences elsewhere in the world with trials run in research institutes and on commercial farms to test the concept of adding a specific xylanase to corn-based diets containing grain by-products (wheat shorts or rice bran in these particular examples). Across a total of 15 trials this xylanase, on average, improved daily gain and feed:gain by a round 6% (Table 4).

Table 4: Xylanase improves performance (Daily gain %, Feed:gain %) of grower-finisher pigs (average weight range 29-86kg) fed corn-based diets containing varying inclusions of fibrous grain by-products

Trial #	Grain by-product and level (%)	Improvement in daily gain (%)	Improvement in feed:gain (%)
1	Wheat shorts (20%)	5.6	10.1
2	Wheat shorts (20%)	6.7	4.3
3	Rice bran (15%)	5.9	9.0
4	Rice bran (20%)	7.9	-
5	Rice bran (15%)	12.0	-
6	Wheat shorts (43%)	4.2	3.0
7	Rice bran (20%)	6.3	1.9
8	Rice bran (30%)	4.5	3.4
9	Wheat shorts (20%)	11.3	19.5
10	Rice bran (30%)	4.1	6.5
11	Rice bran (25%)	4.0	6.9
12	Wheat shorts (20%)	5.9	3.2
13	Rice bran (8%)	5.5	8.1
14	Rice bran (4%)	5.7	3.8
15	Rice bran (20%)	4.5	4.7
AVERAGE	(21%)	6.3	5.6

The DDGS challenge

With the explosive rise in the number of bioethanol plants in recent years then the focus of research attention has moved towards the value of enzyme addition into diets containing by-products from this process (principally Corn Distillers Dried Grains with Solubles, DDGS). A recent trial conducted by the University of Illinois, USA showed that adding both a new-generation phytase (Phyzyme® XP) together with a highly effective xylanase to a corn-soy pig diet containing 20% corn DDGS significantly improved digestible energy by 5.6% (175 kcal/kg), ileal amino acid digestibility by around 4.5% and increased phosphorus digestibility from 22% to 51% (Table 5), illustrating the value of the enzyme combination in this application.

Table 5: Xylanase and new generation phytase improve energy and nutrient digestibility in swine fed corn-based diets containing 20% DDGS

	Control	+Phytase	+Xylanase	+Phytase & Xylanase
Digestible energy (kcal/kg)	3102 ^a	3209 ^b	3228 ^b	3277 ^b
Phosphorus digestibility (%)	21.6 ^a	46.7 ^c	33.6 ^b	50.7 ^c
Ileal protein digestibility	67.9 ^a	71.4 ^{ab}	71.7 ^b	73.5 ^b

^{a-c} Means not sharing a superscript differ significantly (P<0.05)

Feed accounts for at least 60% of the costs of pig production, and it's currently on the increase. In addition, 15-25% of the feed that pigs eat isn't digested. The modern pig producer now has the opportunity to fully adopt the latest developments in enzyme technology to improve performance, reduce cost/kg meat produced and remain more sustainable at such challenging times.





Dutch ESF design works well in Alberta

By **Bernie Peet**

A layout for group sow housing with electronic feeders that came from Holland has been working well for six years at Plain Lake Colony, Two Hills, Alberta. And, while there are a few things that he'd do differently with the benefit of experience, Hog Boss Ben Hofer says that he is very happy with the system and wouldn't go back to sow stalls. In 2002, the Colony replaced its old 120-sow farrow to finish barn and constructed a new 1200-sow unit producing isowean pigs. "We felt that sooner or later, we would be forced into using group housing, but we were also optimistic about its potential," says Hofer, who is a Director of Alberta Pork. "We thought we could learn from the experiences in Europe and build a good system." Having looked at both electronic feeding (ESF) and floor feeding, he felt that sow welfare was much better in the ESF system.

The decision was taken to use slatted floors rather than straw bedding, something the Dutch have a lot of experience with. All parts of the pen are slatted, apart from the lying areas. Overall pen size is 54ft x 25ft, providing a total of 24 square feet per sow and there are 6 separate lying areas divided by concrete walls, three each side of a slatted dunging area. The Nedap feeders, from Holland, are located at the front of the pen, adjacent to the access alleyway, so that they can easily be observed. "We chose the



The Nedap electronic feeder: note the exit race that takes sows away from the feeding area once they have eaten

Nedap feeder because it had the fewest moving parts and the least amount of electronics on the feeder itself, which means less

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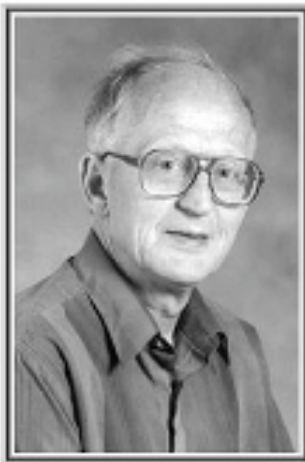
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¹ Polmann et al., Journal of Animal Science, volume 95, no. 5, p. 610-614
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One of the two gilt pens showing the layout of the lying area with the slatted area in between

maintenance,” Hofer explains. “Also, some people advised us to have a feeder with a sensor on the back gate to avoid sows returning to the feeder soon after eating, but we don’t believe that’s necessary with the layout we have.” When sows leave the feeder after eating, they have to walk along a slatted alley, where the drinkers are located, and around the back of the pen, in order to return to the feeding area, which prevents constant re-visiting of the feeder by dominant sows. “This allows less dominant sows easier access to the feeder,” notes Hofer.

Each week about 60 sows are bred in order to achieve the farrowing target of 56 per week, with sows being transferred to the group pens within 7 days of breeding. These “fixed” groups, with sows that were all bred in the same week, are much easier to manage. A boar is taken into the pen

to check for returns at 18-24 days and again three weeks later. Scanning takes place at 30 days and again at around 56 days. Sows that are not pregnant are removed and returned to the breeding area.

Prior to breeding, gilts are housed in two large training pens adjacent to the breeding area, which each have two electronic feeders. Gilts enter the unit in groups of 40 at a weight of 110-115kg and there are 80 gilts per pen. Any gilt that does not learn to feed quickly is placed in the feeder, but there have been very few problems with training, Ben Hofer notes. “Less than 1% of gilts have failed to use the feeder,” he explains. “Of the first 600 gilts, only one needed to be culled for this reason, so it’s hardly worth mentioning.” Vasectomized boars are used for stimulation and are used to breed gilts at

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least once prior to natural service at second or third heat. This practice has been shown to increase first litter size. After breeding, gilts are mixed in the weekly groups with sows, a practice that Hofer says he would prefer to avoid. "If we did this again, I would have three large groups so that gilts and parity 1 sows could be housed separately from older sows," he says.

The benefits of individual feeding are apparent from the very even body condition of sows in the groups. Feed levels are regularly adjusted according to condition and the feeder ensures accurate feed delivery. Feed is dispensed in drops of 70 grams, every 20 seconds for sows and every 30 seconds for gilts, together with 50ml of water. The feeding cycle starts at 9.00pm, which means that, by morning, the majority of sows have fed, allowing the operator to identify any that have failed to feed. "The computer prints out an attention list and sometimes there will be 4-5 sows that have not eaten," explains Hofer. "We don't worry if they miss one day because most sows will eat the day after, but on day two we'll check on the sows." The most common reasons for feeding not taking place are lost electronic ear tags, sows that are lame and sows on heat, he says.

Experience with the system has been very positive and production runs at around 26 pigs weaned per sow, despite a roof collapse last year that put a bit of a dent in the figures. "It's a nice environment to work in," Hofer comments. "You can walk in and work with the sows whenever you want and they are very quiet." He also notes that sows get more exercise than those in stalls, which means that they have better muscle condition, leading to fewer problems at farrowing. Observing and understanding sow behaviour is the key to successful management, Hofer says. "You have to handle the animals and listen to what they are telling you, not tell them what to do!" he exclaims.

The only major aspect of the system that he would change is the type of slat. "We installed finishing slats and they are too narrow, which means we get some leg problems when sows fight after mixing," he says. "I would prefer a slat that's 5 to 6 inches wide, with a three-quarter inch gap to provide better support for the sow's feet and to minimize injuries." Another minor problem occurs when pens are part filled. "The sows tend to dung in any area that is not used for lying, which then needs cleaning out manually," notes Hofer.

The need for maintenance and repair of electronic feeders is often cited as a problem, but experience at Plain Lake has been generally positive. "We had some initial problems with the electronic boards, but they were changed and have been working without a hitch for the last three years," says Hofer. "The only other thing we occasionally have a problem with is the springs on the entry and exit gates, but they are easy to change." The barn staff does the maintenance themselves, with guidance from the manufacturer by phone




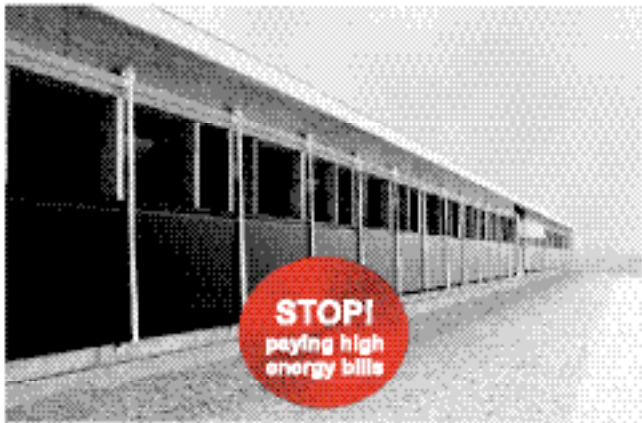
Sows resting in the lying area

if required. "We've figured it out ourselves because most electricians and computer guys don't understand it," Hofer adds.

Overall, the verdict is that the system is a success and the design works well. Gilts and sows have adapted well to the feeders and production is good. Not only that but sows are calm and quiet to work with, spending most of their time asleep in the lying areas. "Learning to get used to the system was a bigger learning experience for the people than the pigs," Hofer laughs.

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Management strategies to maximize weaning weight

While the traditional key performance indicator in sow units is weaned pigs per sow per year, the pork industry is now considering weaning weight with the same level of importance, says Dr. Juan Carlos Pinilla and his colleagues at pig breeding company PIC. Speaking at the 2008 American Association of Swine Veterinarians, he notes that heavier weaning weights are positively correlated with growth rate, feed efficiency and pounds of saleable pork. Current estimates of milk yield are 22 to 26 lbs (10-12kg) of milk per sow per day, says Dr Pinilla. Many factors influence this number: health, environment, genetic potential, mammary gland stimulation (lactation length, number and weight of the nursing piglets), nutrition, feed intake, body condition, and water intake. His presentation described strategies to wean heavier piglets by maximizing milk

production based on common practices utilized by some successful commercial systems in North America.

Maximizing milk production

Number of functional teats

To maximize litter weaning weight, it is necessary to select replacement gilts for number and quality of their teats. "The standard is to cull gilts with less than 12 teats, but too many producers do not have this standard in their operations," believes Dr Pinilla. "Generally, modern dam lines have more than 12 teats, in fact, more than 85% of gilts selected in our Genetic Nucleus show 14 or more teats at selection." Recognizing that the heritability of teat number is low and genetic improvement will take time genetic suppliers still have the responsibility to improve this trait, he feels.

Gilt growth rate and weight at breeding

In gilts, there is a significant correlation between the ADG in the period from 65 to 195 lbs (30-88kg) and the weaning weight of their litters. The current higher milk yield potential, and consequently the potential to wean heavier piglets, could be partially explained by larger body size and more mammary tissue in modern genotypes.

Beside the effects on retention rate and litter size, the current recommendation to breed gilts after they achieve 300 lbs (136kg) minimum to get farrowing weight to 400 lbs (181kg), will produce additional benefits. "Gilts bred in that window will gain less body weight during their first gestation and consequently they lose less body weight during their first lactation and are able to retain weight, or even gain some weight, during P2 and P3, versus gilts bred at lighter weights," explains Dr. Pinilla. "As a practical consequence, weaning weights could be increased due to higher milk yields."

Controlled weight gain in gestation

It is well documented that excess

weight gain in gestation limits the feed intake during lactation and increases the sow's body weight loss. Farm management must be aware of that and manage gestation feeding to limit excess body weight gain. "During their first gestation the female should gain around 80 lbs (36kg) of body weight. From P1 to P6, an average of 35 lbs (16kg) increase in body weight per gestation is acceptable," believes Dr. Pinilla. "A maximum of 12% of lost weight during the first lactation and a maximum of 8% average in older parity sows are considered as the limit body weight loss compatible with high performance."

In a project to control annualized sow mortality, the impact of gestational body weight gain control was seen in terms of reduction in production cost per weaned piglet, with no negative effect on the litter weight gain in farrowing. Annualized sow mortality effectively was reduced from 13% to 5%. "A rule of thumb was derived from that experience: every lb of reduction in the daily usage of gestation diet from 7.0 lbs per day to 4.5 lbs per day can be translated into 1.0 to 1.1 lbs/day of additional feed intake in farrowing and every additional lb of average feed intake in farrowing in turn can be translated into 20-22 extra lbs of piglets weaned per sow per year," explains Dr. Pinilla.

Number and weight of piglets nursed

Litter size (number and weight of the piglets nursed) is the major individual factor in the determination of milk production. "From a production management point of view, plan to have more than 50% of the sows weaning 11 or more piglets, particularly since milk yield is more than 50% greater when litter size increased from 6 to 12 piglets, advises Dr. Pinilla. "The female is able to react to a higher milk requirement by eating more feed. Suckled glands will be larger and more productive in subsequent lactations than unsuckled or poorly suckled glands." Lower performance in farrowing can be traced to the practice of loading P1



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females with just 9 to 10 piglets in order to “prevent extensive catabolism”. The current recommendation is to load gilts with 12 strong and heavy piglets and support that with proper feeding management, cooler rooms, limited cross fostering, and water availability, he notes.

The most recent and promising tool to produce heavier litters is to let the sows farrow naturally and/or limit the use of farrowing induction to risky sows (fat, lame or older than P5). Data collected from a commercial farm suggests that every additional day of gestation results in piglets weighing 0.15 extra lbs (70g) per day, in the range from 113 to 118 days. Consequently those heavier piglets at birth have greater opportunity to vigorously suckle the teats, survive and gain weight and be weaned at a heavier weight.

Dr Pinilla also advises drying off piglets after birth to prevent chilling, measures to control the incidence of diarrhoea and split suckling, especially where litter size is high. “Farms where split suckling has been fully implemented have seen increased survivability and weaning weight, and less variation in weaning weights,” he says.

Lactation length

It is well-known that increasing lactation length increases weaning weight. “PIC research has shown that for every additional day in farrowing with their mother, weaning weight

increases an average of 0.56 lbs/day/piglet (250g), which is in turn related to a reduction in the age to market, Dr. Pinilla explains. He recommends a minimum of 20 days at weaning, recognizing that this may require additional farrowing places to be constructed in some cases. “A reduction in the breeding target, and consequently the average sow inventory, is not as cost effective as adding more farrowing spaces,” he stresses.

Maximize lactation feed intake

It is critical to prevent and/or to control situations leading to off-feed sows, stresses Dr. Pinilla. “Proper hygiene measures associated around farrowing, such as room sanitation, a clean sleeving process, and individual treatment of fever and lameness are a must. Also, check the availability of fresh, cool and clean water is a daily duty in farrowing, making sure the sows have a minimum water flow rate of 0.5 gal (2 litres) per minute.”

Data from a commercial system suggests that a mild restriction for 3 days followed by full feeding from day 4 through the end of lactation results in increased feed intake and reduced body weight loss, Dr Pinilla explains. “Based on these data, the recommendation for feeding PIC sows is to scale feed at 4.0, 4.0, and 6.0 lbs per day for days 0, 1, and 2 of lactation followed by ad-libitum access to feed. This pattern ensures the

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maximum average daily feed intake, milk yield, litter weight gain, and minimum body weight loss.”

Alternatives to the traditional hand feeding systems include the use of self feeders, which are able increase the average daily feed intake by about 7% compared with hand feeding systems and are less demanding in labour. However, no feeding protocol or feeder design will work unless qualified staff gets the sows up two or three times a day to stimulate them to eat, believes Dr. Pinilla. “Other key duties are cleaning the feeders to prevent mould, adjusting the heat lamps height or simply turning them off when needed and checking room ventilation and temperature,” he says. “Caretakers must be able to ‘read’ the sow and piglet behaviour and make adjustments to ensure the sows eating enough feed to wean healthy and heavy piglets.”

Cross-fostering

Cross-fostering is a common and preferred management tool. While it provides opportunities to the smaller piglets in a room to get enough milk to grow, in too many situations the staff tend to use the fostering too much and/or too often, Dr. Pinilla believes. “Create the light litters as soon as possible after all pigs have received colostrum and before the social order is established, sometime during the first 12-16 hours of life,” he advises. “When the equalization by size is made after day 1, the benefits are limited because it is a disruption of the

normal process of nursing, sows get nervous and mastitis can become a problem.” Nurse sows to raise the fall-behinds can be created from day 4 to 7, moving a fresh sow from the next younger room, he says. “It is important to limit the fostering to a maximum of 10-15% of the litters disrupted after day 4-7 of age.”

Take Home Messages

- Select gilts with 12 or more functional teats
- Select the heavier gilts and mate them after they achieve a minimum of 300lbs (136kg) and a maximum of 330lbs (150kg)
- Limit body weight gain in gestation, particularly in younger females, by limiting gestation feed intake
- Challenge gilts to produce milk by loading them with 12-14 strong and heavy piglets at birth
- Limit the use of farrowing induction to just critical sows (fat, lame, older than P5)
- Use split suckling to ensure all pigs suckle sufficient colostrum
- Maximize lactation feed intake

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Getting the most value from your veterinary expenditures

By Western Swine Health Associates: Drs. Frank Marshall, Chris Misutka, Pete Pawluk, Shawn Davidson, Chris Byra, Gail Cunningham and Egan Brockhoff

"A cynic is someone who knows the price of everything but the value of nothing." Oscar Wilde

At a time when hog margins have been consistently negative for several months, pork producers have (understandably) been searching for opportunities to reduce their costs of production wherever they can. This article attempts to uncover opportunities to optimize veterinary costs.

Veterinary costs include professional services, laboratory diagnostics, and drug costs. For most pig farms, pharmacy costs represent more than 90% of total veterinary costs. The dollar range for veterinary cost is between \$1.00 and \$8.00 per pig. The wide range reflects the variation in the health status between pig herds, but more importantly the different 'drug usage personalities' within the pig farming community. This discussion will focus on getting the most value for your veterinary drug dollar.

1. Use the right product at the right time

There are several reasons for using a drug in an individual pig or a population of pigs, including therapeutic, preventive or performance enhancement. Sometimes these reasons overlap. Get a veterinary

diagnosis and professional advice so that you know what diseases you are treating. This is the 1st place to start when looking for the most value for your veterinary expense dollar. Do the math – does your intervention make financial sense? Vaccine choices should consider cost of vaccine versus probability and severity of disease. Consider the cost differences between short term interventions and long term therapy. Know when it makes sense to mass medicate and when it is better to treat individually. Some factors to consider are cost of mass medication instead of individual treatment, and the likelihood of disease spread within the population.

2. Use a sick pen

Early detection, separation and treatment of sick pigs can be very effective at reducing losses and preventing a health problem from steam rolling through your herd. Leaving the sick pig in the pen reduces your chances of saving him and leaves the other pigs susceptible to whatever he's shedding, which will ultimately increase barn treatment costs.

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3. Use the right dose for the right duration of treatment

One of the easiest ways to reduce drug cost – Read the label and use the right dose!! Many producers want to overdose (“if a little works,...”) while other producers habitually underdose, which may result in ineffective drug levels and possibly treatment failure and/or antimicrobial resistance. Take the time to learn the correct dosage for all the drugs you use in the pig barn. Weigh some pigs periodically to ensure that you and your staff can estimate pig weight relatively accurately. New broad spectrum long acting antibiotics are available that ensure the correct duration of action and reduce time spent on injecting.

4. Generic or commodity options.

Many “older” drugs, that is those whose patents have expired, can be purchased as generic versions of brand name products. Sometimes these generic drugs offer savings in cost when compared to the name brand product. However, this may be temporary as most name brand manufacturers compete in price to maintain market share with the generics. Commodity drugs include the injectable and water soluble penicillins and tetracyclines. There can be significant differences between manufacturers.

5. Vaccines versus antibiotics

“Prevention is cheaper than treatment.” Everyone knows that, but not enough practice it. Unfortunately many producers would rather “throw something in the feed” to control a disease that may be better prevented with a vaccine. Ileitis is the obvious example. Most swine veterinarians have witnessed the failure of feed medications to control this costly disease. However, when properly used, oral ileitis vaccine is extremely effective in preventing ileitis. Savings of \$1.00 to \$1.50 per pig have been reported when vaccine is used instead of feed medication. I believe one phrase we will hear less of in the future is “preventive antibiotic use”. As well, British researchers found that vaccination for Mycoplasma provided more net return when gross margins per hog were lower (as they are currently).

6. Raising pigs without routine antibiotic use

Sub-therapeutic or performance enhancing antibiotics make up more than half of the antibiotics used in livestock production. Drugs are often used as a (costly) way to cover up poor management. Consumers

often have negative views regarding the use of drugs in the food animals they consume. For these and other reasons, many producers are investigating pork production without antibiotics. The difference in health costs between a conventional health herd and one that raises pigs without routine antibiotic use can be \$6.00 or more per pig. Given the right (high) health status pigs and management capabilities, this is not as far out as it sounds. There have been many studies done to evaluate the production and economic losses when pork is produced without antibiotics; many of these studies are several decades old, or flawed because they used conventional health pigs. Today, many producers have demonstrated that other methods of disease management can work as well mass medication or use of antibiotics as growth promoters. The management techniques that are fundamental here include closed herd, quarantine, all in all out unidirectional pig flow, parity management for herd immunity and judicious use of vaccines as a preventive strategy. As other costs of production rise, management and husbandry skills will become increasingly valuable.

7. What determines the cost of the medicines and vaccines that you buy?

The manufacturer incurs research and development (“sunk”) costs, also registration costs with the Bureau of Veterinary Drugs (BVD). The alleged inefficient actions of the BVD have been blamed for putting Canada’s livestock industries at a competitive disadvantage with other countries. It may be one reason why the same drug may cost less in the U.S. than in Canada. Another pricing consideration by the manufacturer is the relative value the drug is perceived to bring to the marketplace. To ensure that excessive margins are not added by the manufacturers, Canada has the Patent Medicine Price Review Board (PMPRB). In the past year, the spread between U.S. and Canadian pharmaceutical prices have narrowed. In the case of some feed medications, the prices are actually lower in Canada. At the retail level, drug prices may vary between competitors because of differential volume purchasing and overhead costs. A review of the costs of some key products shows a decline in cost and sale prices when 2008 is compared with 2003.

Hopefully producers will realize that they have more control over their veterinary costs than many of them realize, simply by consulting their veterinarian, reading the label, and using some good old fashioned common sense.



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Treating hog manure with borax cuts odour

The US Agricultural Research Service (ARS) has recently reported the results of a study in which “dusting” hog manure with borax powder - the same substance used in laundry detergents - helps to neutralize the malodorous microbes, which include sulphate-reducing (SR) and other anaerobic bacteria. Hydrogen sulphide is one of the compounds contributing to the stink from manure storage pits on hog farms. Microbial activity in the manure releases the hydrogen sulfide and other compounds.

Besides smelling foul, the hydrogen sulphides, ammonia and other gases emitted by stored hog waste can diminish air quality. The disagreeable odours can also lead to tension between livestock producers and their neighbours.

The researchers treated manure pits beneath swine nursery rooms with a powder containing either 1 or 2 percent borax once a week for six weeks. Other swine nursery rooms were left untreated so the team could compare gas emissions and indoor air quality.

Using molecular genetics tools, the team measured the treatment's effects on the manure's resident SR bacterial population, which produces hydrogen sulphide. This was possible thanks to the technology's ability to detect a particular gene that distinguished these bacteria from other manure-loving microbes.

Analyses of bacteria and air showed the borax treatments reduced SR populations by 99 percent after the first week, and hydrogen sulphide levels by 80 percent after six weeks.

Borax offers a promising addition to the “bag of tools” researchers are evaluating for manure-odor management because the mineral is naturally occurring, fairly safe to handle, and readily available, says the ARS report.

Pigs grow better with fewer feeds per day

Pigs raised in conventional indoor pens have different feeding patterns from those raised under more natural conditions, according to research published recently in the journal *Acta Veterinaria Scandinavica*. It shows that while pigs in the wild spend much time searching for food and eat little and often, the

preferred feeding regime for conventional raised pigs is three meals a day.

Lead author, Eva Persson, from the Swedish University of Agricultural Sciences explains: “The natural feeding behaviour of pigs is searching for feed by rooting activities throughout the day; self-feeding pigs randomly space their activities and generally consume between ten and twelve meals in an average day. By replicating this pattern in conventional indoor kept pigs, we had hoped they would fare better than those fed the traditional three meals.”

All of the 360 pigs in the study received the same amount of food, spaced out into either three meals or nine and delivered as liquid feed. Contrary to what might have been expected, feeding the pigs in a more ‘natural’ way did not result in a better outcome. In fact, the pigs fed three times gained over 100g more per day than the pigs fed more frequently.

As Persson reports, “Increased daily feeding occasions among group-housed pigs resulted in a poorer daily weight gain and an increased number of stomach problems. It will be of great interest to those in the farming and animal welfare fields that this study does not support increased daily feeding occasions in fattening pigs”.

Each group of nine pigs in this study had to share one 3 m trough. Due to the fact that pigs will naturally fight for prime feeding positions, one likely explanation for the poorer performance in the pigs fed more often is increased competition within the group. The authors note “More feeds means smaller amounts each time and it is possible that each feeding occasion in our study did not offer enough feed to satisfy the hunger of all the pigs”.

Ethanol's impact on food and gas prices

Two studies released recently in the USA show that federal ethanol mandates have placed significant pressure on food prices, while any effect on gasoline prices has been “almost too small to measure.”

Dr Keith Collins, former chief economist of the US Department of Agriculture and Dr Thomas Elam of FarmEcon LLC, submitted their new analyses to the Environmental Protection Agency (EPA) in June. This coincided with the end of the EPA's public comment period on a request from Texas Governor Rick Perry to partially suspend the Renewable Fuels Standard (RFS) in light of serious economic harm caused by the current policy.

The American Meat Institute reports that the Collins' study, “The Role of Biofuels and Other Factors in Increasing Farm and Food Prices”, indicates that unless the RFS is suspended or revisited, US grain stocks - already pushed to dangerously low levels - will fall even

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further as ethanol consumes a larger share of the dwindling corn supply.

“Government support for corn-based ethanol ensures a permanent, significant and increasing demand for corn,” Dr Collins said. “These policies interfere with the normal price rationing function of markets when supplies are short such as in 2008, with production being reduced by flooding and excess moisture. In this short-crop environment, biofuels policy, including mandated use of ethanol, causes even higher corn prices, shifts the demand adjustment burden to non-ethanol users of corn - particularly the livestock sector - and puts continuing pressure on food prices.”

Dr Elam’s study, entitled “Biofuel Support Costs to the US Economy: The Key Role of the RFS in a Feedstock Shortage Scenario” investigates two distinct scenarios: one in which there is crop damage and the RFS remains in place, and one in which there is crop damage but the RFS mandate is reduced by 50 per cent.

“Maintenance of the current RFS schedule in the face of a smaller 2008 corn crop will be devastating to meat, dairy and poultry producers,” Dr Elam wrote. “Consumers will suffer as food and fuel costs rise and supplies of corn-based foods diminish. The overall economy will be damaged from higher inflation and lost jobs in the food production sector.”

Smithfield Foods posts animal welfare policy

Smithfield Foods, the world’s largest integrated pork producer, has published its animal welfare policy on its website. “Smithfield Foods, Inc. is committed to being the industry leader in animal welfare practices to assure respectful and humane treatment of animals that we own or process, to produce wholesome food products for our customers and to analyze our operations and practices, including internal and independent third party audits, to ensure continual improvement,” says a company news release.

Smithfield says that when it comes to animal welfare policies and processes, the company is recognized by the world’s foremost experts in animal well-being as setting the standard for America’s pork industry and notes that it is applying

those same best practices in its global operations.

The standards are summarized as:

- Comprehensive written animal welfare programs to ensure animal well-being.
- Shelter that is designed, maintained and operated to provide a physical environment that meets the animals’ needs.
- Access to adequate water and high-quality feed to meet animal nutrition

requirements (production facilities) and in accordance with the Humane Methods of Slaughter Act 1978 (processing facilities).

- Humane treatment of animals that ensures their well-being and complies with all applicable legal and regulatory requirements.
- Identification and appropriate treatment of animals in need of care.

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- Humane treatment of animals which meets or exceeds the requirements of the Humane Methods of Slaughter Act of 1978, and all applicable American Meat Institute Animal Handling Guidelines (processing facilities).
- Timely use of humane methods to euthanize sick or injured animals not responding to care and treatment.

“Murphy-Brown, our livestock production subsidiary, has developed the industry’s most comprehensive animal welfare management program to ensure our animals receive proper care,” says Smithfield.

The Animal Welfare Management System (AWMS) was developed with two of the world’s foremost experts in animal behaviour and animal handling. “Experts from a variety of disciplines – veterinary medicine, reproductive physiology, production management, marketing management system administration, legal, logistics, and public affairs – participated in an animal welfare committee to make sure animal well-being practices would be evaluated from many different perspectives,” says Smithfield.

After the AWMS was implemented, adherence to its objectives and requirements was audited by the USDA Process Verified program and continues to be verified through random third-party audits as part of the National Pork Board’s Pork Quality Assurance program known as PQA Plus™.

Smithfield also points out that its Murphy-Brown division is in the process of moving towards using group pens for housing

pregnant sows. The process will phase out individual gestation stalls on all company-owned sow farms in favour of group housing.

Smithfield Foods based its decision on initial results from its own three-year study into sow housing to determine the impact such a switch would have on sows. Preliminary results showed that group housing arrangements work as well as gestation stalls in providing sows with proper care during their pregnancies.

Murphy-Brown’s antibiotic usage policy is also published on the Smithfield website. For further information, go to <http://www.smithfieldfoods.com/responsibility/animal.aspx>

Cargill Meat Solutions introduces Good Nature pork

Cargill Meat Solutions has launched a new pork brand called Good Nature. The products will be sourced from hogs raised antibiotic-free on family farms in the Midwest.

“Cargill is dedicated to monitoring and understanding the ever-changing meat industry,” said Joe Linot, pork marketing manager for Cargill. “Consumer demand for quality pork that not only tastes good but also contains only healthy, natural ingredients is a growing trend. We want to collaborate with our customers to help them answer market demand by offering Good Nature pork.”

One of Cargill’s processing innovations for the Good Nature pork brand is the use of air chilling which helps ensure good colour, tenderness and moisture for the end consumer.

“We offer consistently delicious, succulent, 100% natural pork produced on regional farms with no antibiotics or growth stimulants, while at the same time maintaining the most humane practices for the animals we raise,” says the company. “Our pork producers honour age-old farming traditions and embrace sustainable agriculture practices.” For more information, go to www.goodnaturepork.com

Organic minerals can improve pigs’ claw health

Supplementing sow diets with organic minerals can increase the claw health, according to Danish company Vitfoss. “Claw health in pig herds is an overlooked problem, which has a great impact on welfare and number of culled sows,” it says.

Historically there has not been any focus on claw health in pig production. “Often farmers try to solve leg problems by applying extra phosphorus or biotin – mostly without any effect. A greater effect can be achieved when organic micro-minerals (zinc, copper and manganese) are supplemented together with the biotin.”

Field trials by Vitfoss showed that after six months claw health was significantly

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improved. Also the number of leg treatments – using antibiotics – was reduced by 55%. “Farmers that use the organic mineral mixture on their farms also see fewer culled sows, better functioning sows in the farrowing pens and better growing weaners,” says the company.

According to Vitfoss, the organic minerals costs around €5,500 (\$5200) per year for a 500-sow unit, but lower sow deaths, less antibiotic use and increased productivity result in a 7:1 return on investment.

Scottish consumers view pork as “good for you”

The Scottish meat promotion organization, Quality Meat Scotland, says that people’s perception of pork is improving and the new view of it as an easy, versatile and healthy meat is attracting new groups of consumers.

New independent research has shown that the historically boring and uninspiring view of pork is being replaced with a more positive reputation following a successful marketing strategy by QMS.

All of the consumers surveyed agreed that pork was ‘easy to cook’, with 97% agreeing it ‘is really versatile for cooking with’. Of those questioned, 93% agreed with the statement ‘pork is good for you’.

“Research has shown a 15 percent rise in health as the main reason for choosing a meal, and if even some of these customers are aware of the health benefits of eating fresh pork it could be a great support to the hard pressed pig industry,” says Laurent Vernet, of QMS.

“The interesting news for the industry is that new consumers are being attracted to the category, particularly in the ‘dream demographic’ - young families with children - which has seen growth of more than 20 percent”.

The strongest levels of growth have come from people under 28, which has seen growth of more than 34% year on year.

UK has highest welfare standards, says report

Pigs in the UK are raised to world leading standards, but there’s a cost that


goes with this commitment, says a report by the Farm Animal Welfare Council, the government advisory body. The majority of pigs in the UK are kept to a higher welfare standard than elsewhere in the EU and other countries, it believes.

The report highlights the further animal welfare steps taken by the UK

industry to go beyond the minimum standards of pig welfare set out by EU directives. In particular it draws attention to the UK ban on stalls for non-lactating sows and the fact that the UK has the world’s only large scale farm assurance scheme focused on animal welfare.

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Having the most rigorous inspection of a producers' compliance with animal welfare legislation and a bigger focus on good practice than any other country comes with a cost attached.

The costs for UK producers are more than 12% higher than the EU average and more than 60% higher than North and South American exporting countries.

EU says cloning carries health and welfare risks

Experts at the European Food Safety Authority (EFSA) have raised serious questions about animal welfare and food safety in relation to cloning. That became clear in its final report on the implications of animal cloning for food safety, animal health and welfare and the environment.

The report was made after a request from the European Commission in 2007 for advice. Earlier in 2008, the agency published a draft opinion. At the moment, there is no European trade in cloned animals or their offspring. The practice is only used in Europe for research purposes – hence, products cannot be sold.

The EFSA said animals carrying cloned embryos, and their offspring had significantly higher health and welfare risks – and cloned animals died earlier.

According to the report, 40% of the cloned cattle and pigs would die within six months – in conventionally bred animals, this would be nearer to 10%.

EFSA's report says: "The health and welfare of a significant proportion of clones, mainly within the juvenile period for cattle and perinatal period for pigs, have been found to be adversely affected, often severely and with a fatal outcome." More information is therefore needed about the susceptibility of clones for disease transfer, it says.

Food safety concerns for cloned cattle and pigs were considered unlikely but the evidence base, while consistent, was still small. The agency stopped short of saying cloned meat was safe.

Last year, the European Commission asked for an opinion on ethical implications of cloning from the European Group on Ethics in Science. The group concluded, in the beginning of this year, that the practice was 'not ethically justified'.

The EFSA findings contrast with those of the US Food and Drug Administration (FDA), which concluded this year that such products were safe – although a voluntary moratorium on marketing them remains in place.

The Europeans seem likely to take an even more cautious approach similar to that followed with genetically modified crops – which has led to years of trade friction with the USA. Surveys show resistance in Europe to biotechnology remains high, especially when it comes to food.

The EC has launched a survey to learn the public's opinion on cloning. The results of this survey are expected to be published later this year.

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Improving sow longevity – part 1

By John Gadd

Around the world, sows are producing fewer litters per sow lifetime, which is a major drain on productivity. Consultant and author John Gadd says this is extremely costly and wasteful. In this article, the first of two, he looks at the cost of the problem, the herd age profile and offers some thought for the future.

You need to get used to a new mnemonic - SPL - Sow Productive Lifetime. Across the world, pig breeders think themselves lucky if they achieve 3.4 litters from each sow before she has to go. Currently this is considered quite good - the world average SPL seems to be no more than 3.1. But this is a significant waste of a valuable resource as a 5.5 litter SPL is commonly being averaged on the better farms.

Producers seem not to realize how much a short SPL is costing them especially when their productivity of finished pigs sold/sow/year is seen to be on target. It is on target because while the sow is alive and producing pigs, modern genetics and competent management ensures this. The problem is that these excellent high-performing animals are being worn out far too soon and the breeder is forced to replace them prematurely.

Let us look at the economic loss between the two figures of SPL 3.4 and SPL 5.5, using two excellent on-target farms as examples.

Capital costs

Take two 1000 sow farms each producing an excellent 22 finished pigs per sow per year. "No need to worry" say many farmers and their advisors. Certainly the productivity is good but, as we can see below, the use of valuable capital between them is bad. I've said this dozens of times: "It is **profit and good use of money**, not physical performance that counts" and I've even had to design more useful terms to make this clearer.

Back to the two farms. At the time of writing in Europe each replacement gilt costs around €75 to produce her first litter.

Farm A has to replace each sow every 3.4 litters (1.48 years).

Farm B has to replace each sow every 5.5 litters (2.4 years).

Thus farm A's replacement costs are higher. Considerably so, as... Farm A needs to find 17 gilts/week costing €735 to first litter.

Farm B only needs to find 9 gilts/week costing €375 to first litter.

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Thus Farm A needs twice the capital to 'oil' the breeding machine and keep it running. This is a waste of capital investment which could be used for other things.

Income benefits

Farm A sells only 33 finished pigs per sow lifetime while farm B manages 53. At the time of writing (which we over here hope will be higher by the time you read this) farm B has already banked nearly 2500 euros as income from the 20 extra pigs sold /sow before they need to find the 375 euros needed to finance the cost of the replacement sow and the costs of rearing her first litter to weaning. Thus their cash flow is much better. So a longer SPL not only makes better use of capital but also improves cash-flow substantially.

We advisors - and magazines - can all help the farmer to follow the protocols (some of which are not cheap) which I shall describe in my next article, by making him appreciate the financial advantage of lengthening the productive life of his sows - even though he may seem satisfied (and is being told by others) that his present achievement is 'on target'. It is high time the target is raised!

Herd age profile – an underused benchmark

Keeping a frequent eye on the herd age profile is important, as once the parities start to slip from the most efficient percentages of all sows present in the herd, then longevity immediately suffers. I give below the profile which I find, from long experience of correcting profiles which have gone astray, provides the best performance over periods of 5 years. This is because it ensures as many breeding females as possible are at the time of life when their natural immunity is highest and thus the chances of disease is minimized (Table1).

Thus it is in the producer's interest to ensure that he keeps a **monthly** herd age profile and consult it **every month** as enforced culling can change it quickly. Do you? Before my arrival on-farm I find only 10% of my clients kept a herd age profile at all and only half of them looked at it more frequently than twice a year. I give below my own ideal profile – at present there is some difference of opinion on parity numbering, and I prefer the upper definition which counts the period from the gilts first service to farrowing as Parity 0, but I also give below it the past and more

commonly quoted version where this first breeding episode is classified as parity 1.

Figure 1: Using the herd age profile correctly

<i>Percentage of sows in each parity</i>								
Parity	0	1	2	3	4	5	6	7+
(Or.....	1	2	3	4	5	6	7	8+)
Percent	18	17	15	14	13	10	8	5

I find that any herd with more than 22% in the first parity (0) and more than 17% in the second (1) is suffering from having to keep on sows too long due to economic constraints, or where the herd is expanding.

Three rules I give to my clients are....

- Target to secure 52% of the sows in the four 'high-immune status' mid-life/central parities (2 to 5).
- Check the profile every month and consult your veterinarian for preventive protocols if it slips outside the thresholds given above.
- Where the profile drops below a total of 52% high-status parities and/or has more than 35 % young sows in the first two parities (0 and 1), then special longer term induction periods with separate challenge and recuperation periods are needed with close veterinary advice on protective vaccinations/fenceline contact etc. in the challenge period. This is where a separate gilt pool is so useful.

Several experts are proposing the new 'Parity Segregation' idea, where the females in the first two parities and their progeny are considered as 'herd contaminants' (because due to their incomplete immune status they are disease shedders) and are kept away from and managed separately and differently from the older sows in the herd. The results look encouraging including a hike in SPL and other benefits.

Finally, a quick word on Parity Segregation

I hasten to say that I am in no way against the concept. It is very interesting, the results look to be impressive, and it could even be a breakthrough. Sure, let's continue to explore it. All the same it is costly to run 'a herd within a herd' and managementally it could be quite a hassle. I've had a stab at the likely extra costs and paybacks which I've published elsewhere – they don't look too bad.

Even so - let me be naughty and trail a coat on the subject! Could it be that the better results that are being obtained with parity segregation come from the out-of-date way the average Joe amongst us is breeding, managing and feeding the modern genetically improved gilt? I make this inflammatory remark because I know of several breeders who are really with it on gilt management and feeding and they are achieving just as long sow productive lives as the most successful parity segregators.

So in Part 2 of this survey I shall suggest a checklist of the 25 main measures the breeder should be taking to achieve a 5.5 litter SPL. **17 of them involve the gilt.** Some the average Joe has cottoned on to – but for many of them he has not, not yet anyway. Manage and feed the gilt to these new criteria and watch your SPLs rise!

So watch this (next) space - please!



Vietnamese update

By Stuart Lumb

The ILDEX Vietnam trade fair was held recently in May in Ho Chi Minh City and it attracted 15,000 visitors, 50% up on the 2006 show, with the 106 exhibitor stands occupying 50% more space than the 2006 event. The organisers also put on a comprehensive seminar programme with many international speakers giving papers.

According to Thanh Trinh, Asia Pacific manager for French Company Omix, "Vietnam has 4 million sows with 75% still owned by backyard producers. Last year the industry was hit by PRRS and FMD which reduced the pig supply substantially," Thanh added "PRRS is an ongoing problem which is not good."

Michel Guillaume is feed company Vitalac's Asia Pacific manager and is also based in Ho Chi Minh City. According to Guillaume much of this disease has spread from the north of Vietnam. "Asia must learn to apply biosecurity techniques just like Europe has done. Here in Vietnam we are now seeing problems with resistance to antibiotics and so farmers must start to adopt better management techniques to control disease, as happened in Europe as far as Wasting Syndrome was concerned".

Vietnam is something of a paradox – whilst technically still a communist country, commercial businesses are allowed to flourish, many operating as joint ventures. Pig, poultry and fish farming are all expanding rapidly in Vietnam and not surprisingly so is the feed supply industry. GreenFeed was started in 2003 as a joint venture and by May 2005 was manufacturing 1,500 tons of feeds per month. The company now has 3 mills manufacturing 25,000 tons of pig and poultry feed and 14,000 tons of fish feed per month. In terms of raw materials GreenFeed sources most of its corn from Vietnam plus imports from India and Cambodia. Mycotoxins are an increasing problem these days and so a mycotoxin inhibitor MTox Plus is used to treat raw materials as an insurance against these fungae. Soya is imported from Brazil, Argentina and India. Meat and bone meal is imported from Australia and the USA, whilst fishmeal is sourced locally and from Peru. DDGS is imported from the USA. Rice bran also features as a useful ingredient. Energy levels are boosted by the inclusion of fish and palm oil. Antibiotics are allowed in feeds but hormones are illegal. Zinc oxide is added to starter feeds.

Don Hiep pig farm is located near Ho Chi Minh City and is run as a Joint Venture. The farm has a total of 2500 sows and is managed by Mr Ton Van Tan who has been manager for 14 years. Staffing figures make interesting reading. The farm business has a total labour force of 67 employees. Fifty-one men and 16 women work directly with the pigs. Disease levels should be low as that staff figure includes 13 vets. As the author left the farm he passed a large coach which was being boarded by farm staff. It transpired that the farm had originally been located 50km away from its present location. Because of creeping urbanisation the pig farm was re-located in a more rural site – so even pig farming in Vietnam has to face up to



Don Hiep pig farm, located near Ho Chi Minh City, Vietnam

environmental issues! Most of the staff had worked at the original site and lived close by and were reluctant to move, so bussing the staff in every day turned out to be the best compromise.

Dong Hiep is totally closed as far as breeding stock replacements are concerned and this is a big bonus as far as disease is concerned. GGP and GP females are maintained to produce a traditional Yorkshire / Landrace FI female hybrid. Duroc semen is used on the F1 sows to produce a slaughter pig carrying 50% Duroc genes. All boars are performance tested using French ACEMO test stations.

Most of the pigs are fed automatically, letting staff use their time more profitably managing the pigs. All the feed is purchased in pelleted form and stored in a complex of 30-ton feed bins. From here the feed is delivered by the farm's feed truck to individual silos located outside each piggery. Much of the feed equipment was supplied by Danish company Daltec and in fact Mr Tan spent 2 months working in Denmark getting familiar with how the equipment operated. Sows are farrowed weekly and sows are fed automatically twice per day although in hot weather this increases to three times: 8am, 2pm and 6pm, with sows receiving up to a daily maximum of 6kg per day of a 17% CP feed. Many of the buildings are of typical Vietnamese design – open sided with cutains, high

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ridges and large fans mounted just below ridge level. A shift system is operated in the farrowing houses – 7am to 4pm and 4pm to 10pm. This obviously works very well as pre-weaning mortality is an excellent 5%. Heat lamps are used at farrowing. In addition Mr Tan likes using Mistral powder as it helps dry off the piglets and gets them suckling quicker, contributing to the piglets' excellent liveability. Cross fostering is practised to even up litters. Piglets are teathed, tailed and iron injected at 3 days and castrated at 7 days of age. A 20% CP feed is given to piglets from 7-10 days. Litters are weaned each Thursday, at 26 days, with piglets averaging 7kg. Weaned sows are moved to individual stalls and served 3 times am/pm/am using a spiral catheter. The sows are kept in part slatted stalls for 28 days to allow for time to check for the first return and then are housed in groups of 40. Mr Tan is a man of tradition and still prefers to use a boar to check for returns as opposed to a Doppler pregnancy tester or scanner.

Post weaning pigs are all kept on slatted floors. Antibiotics and zinc oxide are used to control post-weaning enteric infection. This policy obviously works well as the post-weaning mortality runs at between just 1 and 3%. CP levels start at 19% and gradually reduce to a 15% finisher. The majority of pigs are sold when they weigh 18-30 kg. The remainder are slaughtered at 165 days weighing 90 kg. As with many Asian pig farms the slurry lagoons are used to rear fish and at Dong Hiep a variety of catfish described as "walking" catfish is reared in lagoons containing slurry from which the solids have been removed.



Sows are kept in part slatted stalls for 28 days after breeding

Mr Tan is extremely proud of the health status of Dong Hiep. Pigs are vaccinated against Hog Cholera, FMD, Mycoplasma, Parvo and Aujeszky's, with the farm being certified free of Hog Cholera, FMD, Leptospirosis and Brucellosis by the Vietnamese Dept. of Animal Health. Furthermore, Dong Hiep achieved ISO 9001:2000 status in April 2008, certified by the UK's British Standards Institute. Mr Tan proudly announced that this year Dong Hiep has been selected by the Institute of Agriculture Sciences of South Vietnam as a nominated supplier of healthy and safe pork.

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Premium stakes in Britain's pork market

The future of Britain's pig industry lies at the top end of the market, says journalist Jane Jordan. Consumers are taking ethical considerations into account when purchasing food and British pigmeat does tick many of their boxes.

The UK pig industry, like that of Canada's, is shrinking fast. Forced into severe rationalization by global market pressures, rising feed costs, increasing competition from imports and ever demanding consumers, there is massive uncertainty and many producers are quitting the business. However, those that are hanging on believe they do have a positive future - one with premium values, in a market where provenance will take precedence and hopefully save their bacon.

During the past twelve months a strong realization that British pork products could gain prominence as a prime quality, specialty product has emerged. Some say that in time, British pigmeat could achieve its own distinct identity, and that 'British' branding is a real possibility.

Naming game

Last year I asked the UK's National Pig Association (NPA) and British Pig Executive (BPEX) chairman Stuart Houston if British produced pork and bacon could eventually be credited with an 'Appellation Contrôlée' - an official status awarded to products such as Stilton cheese, champagne and recently Leicestershire's Melton Mowbray Pork Pies. "We haven't thought that far along the line, but it may be possible in the future; I'd like to think so," he answered.

In my opinion this is a realistic target, and my belief is fuelled by our industry's independent drive for its own set of production standards. Key factors include its unilateral commitment to farm assurance - a quality standard producers deem necessary to sell pigs; its own regulated and self-funded pig health scheme that now encompasses EU salmonella surveillance criteria; our industry also operates its own professional register and independently regulated training scheme (PIPR). It is also bound to far-reaching legislation governing animal welfare and environmental controls, regulations that exceed those enforced by other EU countries or other pig producing nations.

I believe that Britain's pig industry has responded to the market and embraced the challenges set by its customers. Its production chain provides full traceability and offers food safety, high health and welfare standards and it's an industry striving to minimize its environmental impact and promote sustainability. The addition of the Pig Industry Professional Register (PIPR), a continual career development program, launched last year to rejuvenate work-based learning, further cements the British pig sector's serious



Free range and organic pork is becoming more popular in Britain and this farm shop capitalizes on the demand

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Unfortunately, price rises have not matched our industry's massive investments in these areas - although the multiple retailers have gained the benefits from its responsive approach. However, organisations such as BPEX and the NPA are on the case and continue to lobby for recognition both on the label and in the pay cheque.

Provenance and potential

The arena of 'Provenance' is a tough one. Consumer demands can be fickle and are mostly determined by price. However, as food prices continue to rise, and an increasing percentage of household incomes are allocated to groceries, there are clear signals that shoppers are becoming more choosy about what they buy.

Food safety and quality are primary concerns and a preference to spend their hard-earned cash on higher-value, quality assured, safe food products is emerging. Consumers are honing a new set of values and provenance is high on their agenda.



Sales of premium range pork sausages have soared over the past 10 years

For many, food is not just a fuel, it's an experience to savour and enjoy.

This trend is backed up by a recent report 'The Future of Premiumisation', produced by BPEX and it says that Britain's pig industry is well placed to satisfy the demands of this new breed of consumer.

The market research, carried out during 2007, shows that consumers fall into two distinct categories:

Fuelies - those that regard food as a basic need, where buying decisions are based mostly on price and value is viewed as the volume gained per £ spent.

Foodies - those that are more discerning; who want to know about how the food is produced. This group understands fair trade and supports it; it also demands a certain level of quality and is prepared to pay a premium to get it.

Although food prices have increased substantially since the investigation, the UK retail price of pork has remained fairly static, with sales increasing steadily. Speaking at the UK Pig and Poultry Fair earlier this year Mick Sloyan, BPEX Chief Executive, said that retail pigmeat sales were six per cent higher in April 2008 than they were in April 2007. Consumers are supporting the British trade and there is

compelling evidence that demonstrates they are willing to pay extra for British meat because they regard it as safe, wholesome and produced in an acceptable manner.

More consumers are expressing ethical considerations when purchasing food and factors such as animal welfare, fair trade, local origin and/or an organic/green status, are important. These elements, alongside price, are now an integral part of the value-for-money equation, says BPEX's report.

Its research found that while only eight per cent of the population fall into the 'foodie' category, these shoppers accounted for 15 per cent of all food purchased. Also, as individuals, these people spend the highest amount of money on food products. They are a very significant group as they are seeking additional quality attributes and wider values from their product choices - and British pigmeat is well placed to satisfy most, if not all, of their desires. Gaining patronage from this set of consumers could bring Britain's pig industry major advantages.

Stuart Houston, BPEX and NPA chairman agrees. He says that the developments seen in Britain's pig sector in recent years parallel the trends outlined in the premiumisation report. "This report draws an insight and analysis of the wider values that motivate consumers



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and influence purchasing decisions. It gives greater direction to producers, processors and retailers to develop the market and exploit the growing premium tiers," he said.

The industry has also worked hard to improve its image and promote the facts. It has invested in product quality, healthy eating and innovative meal solutions and has made pork products more accessible. It has also championed the importance of accurate labelling with meaningful country of origin information - factors which consumers are well aware of.

Real support, not sentiment

I was part of a national rally during Spring 2008, which took the plight of the UK pig industry directly to the public.

Alongside a group of Suffolk-based pig producers, I spoke to Ipswich's townsfolk about how paying a little bit extra for British pork, bacon and sausages guaranteed them full traceability, food safety and quality assurance and would secure the future of the British industry. To my amazement 90 per cent of the people I talked to understood my argument and were already seeking 'GB' labelled products. They were prepared to pay more for home-produced meat; they were well informed and extremely concerned about how their food was produced. They wanted to buy British food now and in the future.

The comments aired at this rally, and at



Outdoor production is common in Britain and creates opportunity for adding value


other venues across the UK, echoed many of BPEX's findings. Its premiumisation report says that 70 per cent of consumers are prepared to pay more for quality ingredients. And British origin is very important.

Overall, most consumers choose to buy British food, with the strongest preference being for standard quality range products. BPEX's research found that seven out of ten consumers were prepared to pay more for meat labelled as 'British' or 'English'.

Just over a third of consumers buy standard range quality most of the time, compared with eight per cent who buy premium products most of the time. However, when you combine these

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premium preference shoppers with those that choose to buy premium products some of the time, this amounts to 63 per cent share of the market. It's a significant number of consumers and they regard meat as their first choice premium food purchase.

Changing Values

When purchases are made from premium ranges, meat is by far the most popular choice. Around 60 per cent of consumers who make regular purchases of premium products choose to buy beef. Around 48 per cent of this group buy just bacon with 46 per cent buying premium bacon and fresh pork products.

In the UK, meals featuring premium quality red meat have tripled in the past three years - growing from 30 million meal occasions in 2004 to just under 100 million in 2007. Increasing affluence has pushed this trend, as has the increasing variety of products now gracing our retail shelves. However, these products have to satisfy much more than core benefits. They must be seen to offer greater convenience than the standard range, be better or offer specific health benefits and be of a higher quality in terms of their ingredients or provenance. They must also satisfy a variety of environmental/welfare considerations. British pigmeat fares well here because of its intrinsic health, welfare and quality assurance features.

In contrast, the BPEX report confirms that the pigmeat market, in terms of volume sales, continues to be driven by price. Most pork and pigmeat products are purchased by 'fuellies'. These households spend more money on pigmeat annually (£164.87/year) than 'foodies' and are also the most frequent purchasers of pigmeat across the entire product sector (fresh, cured and processed.) However, this group is more likely to purchase value brands and/or cheaper imported products. They tend to have lower incomes and are also more malleable to the 'buy-one-get-one-free' or 'BOGOF' culture - a retail mechanism used to shift volume and not usually targeted at premium brands.

This observation clearly demonstrates that price will always be the key driver, but what it also underlines is that the British pig sector is not really playing in this league. Britain's pig producers cannot compete within the 'pile-it-high-sell-it-cheap' rat race of the value market. In spite of improved efficiency, their input costs - namely feed and labour - remain high.



The bacon sandwich is a staple food in Britain and yet 80% of bacon is imported

"There is no question that the British industry should be aiming for the premium market - we have no option. We need to stay away from the discount sector and strive for higher value end of the market," says BPEX's Mick Sloyan.

However, he says that the current problem is that UK pigmeat only takes a 50 per cent market share and in some sectors, such as bacon, just 20 per cent. We need to improve this, as volume sales of premium products are currently low, but expanding. "We need to secure more of the standard market, then build on securing the standard plus, and then premium sectors. It's the way forward," says Mr Sloyan.

And I agree. Our industry does need to secure more of the home market. However, it must pitch its stall at the top-end and the discerning 'foodie' culture as this is the route to a fairer deal, better prices and long-term consumer loyalty. British pigmeat is a premium product; it's meat made with a conscience - whether its fresh, cured or processed - and a large sector of the public will buy into that and support it.

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Glimmer of hope Down Under

By John Riley, IAS Management Services, Queensland

Australian pig producers have suffered the same problems as their Canadian counterparts, with low hog prices and high feed costs, says consultant John Riley. But now, a weakening of the Aussie dollar and a downward trend in feed costs has resulted in optimism that the worst is over. However, producers need a sustained period of profitability to regain confidence and invest in new technology, he believes.

The number of pigs slaughtered in Australia in June 2008 fell by around 14 % compared with the same period in 2007. The pigs slaughtered totalled just 406,000, the lowest monthly number for well over a decade. The low number of pigs forward has resulted in prices increasing to \$2.80 per kilogram for a 75 kg carcass. With an anticipated drop in the national sow breeding herd from 286,000 in June 2007 to approximately 250,000 in June 2008, the industry is hopeful that improved prices will continue through to early in 2009.

The record grain sorghum harvest in Queensland and NSW and promising planting conditions for wheat and barley in the southern states and Western Australia has resulted in feed costs easing downwards slightly. With the northern hemisphere

harvest well advanced, producers are hoping that the downward trend in feed prices will continue. If the Australian industry is to avoid further contraction a significant period of profitable production is essential.

Over the last twelve months or so most businesses have increased their liabilities to remain in production and there is a real concern that, as the economic climate improves, financial institutions will put pressure on businesses to reduce their debt load resulting in more producers exiting the industry.

By Australian standards, 2008 has been a long cold winter. On many units, pig accommodation is designed to meet high summer temperatures not low winter temperatures. Most sheds are fitted with cooling systems but not heating systems and in the last quarter improvements in income in the market place and the marginal reduction in the price of feed have been eaten up by poorer feed conversion efficiency in the grower herd and increased pre-weaning piglet mortality.

The fall in the value of the Australian dollar from 98 cents US earlier in the year to currently around 86 cents has had limited

continued on page 74



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effect on the level of processed pig meat reaching Australia. The level of imports from both your country and Denmark have fallen significantly, imports from Canada have fallen by some 6% shipped weight. The expected market opportunities for Australian pig meat have not materialised as the USA have increased their volume landed in Australia by nearly 8% year on year to over 31,000 tonnes shipped weight. The level of exports fell as the Australia dollar almost reached parity with the US dollar. With the fall in the value of our dollar, industry is hoping that export volumes to both Singapore and Japan will increase. It will, however, be a slow process recapturing market share lost to our competitors.

On the home front, the sale of the Hyfarm breeding company's interests have been finalised and the breeding company in which UK-based JSR Health Bred were a major partner has exited the industry. At the same time as Hyfarm left the industry PIC Australia has purchased a 7,000 sow, farrow to finish unit from Nippon Meat Packers Australia Pty Ltd. The Japanese company, which has a substantial interest in the beef feed lot industry, developed the state of the art piggery in 2000 to supply both the domestic and export market. PIC Australia is owned by the CHM Alliance, whose members also have interests in the poultry industry and cotton production. The acquisition of the Nippon unit at Tong Park in Queensland makes them one of the largest operators in Australia after the 40,000 sow QAF holdings in New South Wales and Victoria.

Australia, as an island, albeit a very large island, is very protective of its animal health status and applies stringent bio-security protocols. There has been no importation of porcine genetic material since about 1990. In the opinion of some experts the policy has resulted in a lack of heterosis in the national pig breeding herd. The average number of pigs weaned per sow in a small sample of herds recorded with the industry's pork organisation Australian Pork Ltd (APL) is 20.73. On a visit to Holland in July, I had the opportunity to meet with a

representative of the international breeding organisation Topigs and visit several of their client's production units. Arjan Neerhof, the Breeding Program Manager at Topigs, claimed (and his client's production records confirmed) that commercial units using the Topigs 20 line were averaging 26.8 pigs weaned per sow per year with the top 10% achieving 29.8 pigs weaned compared with an average of 23.5 for the top 10% in the APL sample.

	Topig 20 sample	APL sample
No of herds	430	31
Pigs weaned per litter	11.3	9.16
Litters per sow per year	2.38	2.26
Pigs weaned per sow per year	26.8	20.73

The Dutch industry is producing six more weaned pigs per sow per year than Australian producers with the same level of feed usage. If Australia is to compete successfully on the world market, the experts referred to earlier argue that the importation of genetics is a high priority providing our stringent bio-security regulations can be met.

The Australian industry takes great pride in its green and clean image but earlier this year a supply of zinc oxide from China imported on an out of date certificate of analysis, caused a major residue alert in Western Australia. The zinc oxide contained high levels of lead contamination (>85,000 ppm). Tests on pigs fed diets containing the zinc oxide were found to have high levels of lead in red offal which was disposed of, at considerable expense, before it entered the food supply chain.

After months of despondency the rise in pig meat price and the marginal fall in feed price provide a glimmer of hope for the Australian industry. For the industry to regain confidence and invest in new technologies, a lengthy period of profitability is essential.

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• Events Diary



October

20-22nd	VIV China 2008	Beijing, China	www.viv.net Contact: +31 30 295 2772
22nd	Swine Technology Workshop	Red Deer, Alberta	Contact: Kate or Kyla (403) 244-7821

November

10th	Alberta Pork Regional Meeting	Grande Prairie, Alberta	www.albertapork.com Contact: Charlotte Shipp (780) 491-3525
12th	Alberta Pork Regional Meeting	Lethbridge, Alberta	www.albertapork.com Contact: Charlotte Shipp (780) 491-3525
13th	Alberta Pork Regional Meeting	Red Deer, Alberta	www.albertapork.com Contact: Charlotte Shipp (780) 491-3525
14th	Alberta Pork Regional Meeting	Fort Saskatchewan, Alberta	www.albertapork.com Contact: Charlotte Shipp (780) 491-3525
11-14th	EuroTier	Hanover, Germany	www.eurotier.de
19th	Saskatchewan Pork Industry Symposium	Saskatoon, SK	Contact: (306) 244-7752
23-28th	World Conference on Animal Production	Cape Town, S.A	www.wcap2008.co Contact: (+27) 21880-2248
25-29th	Agromek	Herning, Denmark	www.agromek.dk Contact: (+45) 8675 4545

December

3-4th	Hog and Poultry Days	Winnipeg, Manitoba	www.hogandpoultrydays.com
10-11th	Alberta Pork Annual General Meeting	Calgary, Alberta	www.albertapork.com Contact: Charlotte Shipp (780) 491-3525

2009

January

15-17th	Manitoba Ag Days	Brandon, Manitoba	www.aipc.mb.ca Contact: Johanne Ross 1-866-487-4029
20-23rd	Banff Pork Seminar	Banff, Alberta	www.banffpork.ca Contact: Ruth Ball (780) 492-3651
30-31st	Manitoba Swine Seminar	Winnipeg, Manitoba	www.gov.mb.ca/agriculture/livestock/swineseminar Contact: (204) 475-8585

March

7-10th	American Association of Swine Veterinarians 2009 Annual Meeting	Dallas, Texas	www.aasv.org Contact: (515) 465-5255
11-13th	VIV Asia	Bangkok, Thailand	www.viv.net Contact: +31 30 295 2772
18-19th	Alberta Pork Congress	Red Deer, Alberta	www.albertaporkcongress.com Contact: (403) 244-7821

April

1-2nd	London Swine Conference	London, Ontario	www.londonwineconference.ca Contact: (519) 482-3333
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May

31-June 4th	2009 International Conference on Pig Reproduction	Banff, Alberta	www.ICPR2009.com Contact: Sue Charlton (780) 492-0063
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September

19-22nd	Allan D Leman Swine Conference	Minnesota, USA	www.cvm.umn.edu Contact: (800) 380-8636 or (612) 624-3434
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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



A World of Information

Saskatchewan Pork Industry SYMPOSIUM 2008



November 19th, 2008
Saskatoon Inn
Saskatoon, SK



Sask Pork presents its annual Saskatchewan Pork Industry Symposium, "Moving on in a New Business Era". Local and international speakers will present information on issues, challenges and opportunities in the pork industry. Some of the topics for this year include: Balancing the Pig and the Dollar; Where Feed Markets are Headed; Global Protein Markets – Who's our Real Competitor?; Canada's Pork Processing Sector; and Keys to Recruiting and Retaining a Dynamic Workforce.

Symposium 2008 will be a one-day conference for this year and feature both the stockperson's and general industry topics on the same day along with the banquet and Silent & Live Auction.

Join us Wednesday, November 19 in Saskatoon! For details regarding programming, registration and sponsorship opportunities, contact Jessica Podhordeski, Symposium Coordinator, by phone at (306) 244-7752, by fax (306) 244-1712 or by email at jpodhordeski@saskpork.com



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