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SPECIAL EDITION

Western Hog Journal

BANFF PORK SEMINAR 2009


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*Same auto sort barns – Same time frames – USA high health herd – Genesus females

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Western Hog Journal

Volume 30, Number 4 **BANFF PORK SEMINAR 2009** Date of Issue: March 2009

PREFACE

After a two year period that saw the number of Canadian pork producers fall by nearly 20% and the worst economic conditions ever to face the industry, it is hardly surprising that there were fewer delegates at this year's Banff Pork Seminar. The fact that the numbers were only down by about 70 is testament to the outstanding organizational abilities and enthusiasm of both the seminar committee and Ruth Ball of Crocus Conference Services. Also, choosing the topics for the event, which is done well in advance, must have been challenging amid such uncertain times. In this respect, the committee did a remarkable job and put on a program that addressed many of the key issues that the industry faces today.

The overall theme of "Bringing Back Profitability" was addressed at many levels, from the strategic to the practical. In the plenary sessions, a lot of valuable industry data was presented, including the Global Price and Production Forecast given by the ever popular Ron Plain. Breakout sessions included presentations on labour issues, reducing sow feed costs, tackling PRRS and hedging for profit.

The summaries of papers given at Banff presented in this special issue of Western Hog Journal are intended to bring you as much of the information as possible. However, the original papers are available in the proceedings, Advances in Pork Production, Volume 20. To order a copy, call the Banff Seminar office on 780-492-3651, fax 780-492-9130 or e-mail info@banffpork.ca.

I would like to acknowledge and thank those people that have helped me with summarizing the presentations for this issue: Cara Dary, Jodi Hesse and Charlotte Shipp of Alberta Pork and Marvin Salomons. Also, thanks to Terry Hockaday and his team at Meristem Land and Science for assistance with editorial and photographs.

COVER PHOTO

Just two minutes walk from the Banff Centre, venue for the Pork Seminar, is breathtaking mountain scenery

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• Chairman's Message

Banff offered great weather and the usual beautiful setting for the 2009 version of the Banff Pork Seminar. In spite of continuing industry challenges, over 600 delegates from various locations throughout Canada and the world took part in the conference.

The theme "Bringing Back Profitability" was foremost in everyone's mind as not a single sector in our industry has been unscathed by the continuing market pressures. Many delegates were impressed by speaker's presentations that showed a remarkable alignment of corn and crude oil prices. I think if we weren't convinced before that ethanol is a factor in our industry, we are now.

Delegates of all backgrounds were interested in the competitiveness of the industry to competing products, and the relative position of Canada within the industry.

I think the Banff Pork Seminar again lived up to its reputation of being a prime opportunity to get your batteries recharged, while at the same time, meeting old friends and making new ones.

Ron and Ruth Ball continued to meet the high expectations set by participants at Banff. Ron showed special skills this year as he arranged for Ruth's name to be drawn for a pig they both coveted!

While there are many unknowns ahead for our industry in 2009, we do know that we will again be able to gather in Banff, January 19-22 next year to talk about what will have happened and where we will go from there.

Regards,

Bryan Perkins
Chairman,
BPS organizing
committee

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

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Alberta industry leaders honoured at Spectra Awards

Two long-time supporters of the Alberta pork industry were recognized for their leadership at the annual Alberta Pork Spectra Awards. The awards were presented as part of the Alberta Pork Annual General Meeting held Dec. 10-11 in Calgary.

The Spectra Awards recognize leaders who have helped move Alberta's pork industry forward, says Herman Simons, Tees, Alberta pork producer and chairman of Alberta Pork.

"As the province's pork industry attempts to revitalize itself, there has arguably never been a greater need for leadership in the industry than there is today," says Simons. "The Spectra Awards honour those leaders who have recognized an opportunity to improve the industry and followed it up with action."

This year the awards are in two categories. The Lifetime Achievement Spectra Award honours those with 25 or more years of service in the pork industry, either as a producer or in another capacity. The Friend of the Industry Spectra Award is presented to a non-producer whose work has had a positive effect on the industry.

Marvin Salomons and his wife Shirley

Jack Moerman of Redwater received the Lifetime Achievement Spectra Award. After 35 years as a pork producer, Moerman continues to be a prominent ambassador for the Alberta pork industry. He has served in several positions in the policy and education sides of the pork industry, including chair of Alberta Pork and director and executive member of the Canadian Pork Council. He currently represents the Alberta pork industry on the Alberta Livestock Industry Development Fund, of which Alberta Pork is a founding member.

"Jack has consistently demonstrated that he is not just an observer, but a leader and a participant in the pork industry," says Simons. "His love for the industry has spanned more than three decades and he has been an advocate for pork producers in many settings, including a number of difficult years."

Marvin Salomons of Red Deer received the Friend of the Industry Spectra Award. Salomons' long and varied career in agriculture includes positions in international trade, farm extension and college-level training, with many of his efforts focused on the progress of the pork industry. In addition to participating in several trade missions promoting Alberta pork around the world, he has provided years of service on the Alberta Pork Congress Board of Directors and as a member of the Banff Pork Seminar organizing committee.

"In many ways, Marvin has been an emissary for Alberta Pork, both to government and the world," says Simons. "He is the true definition of a friend to the Alberta pork industry."

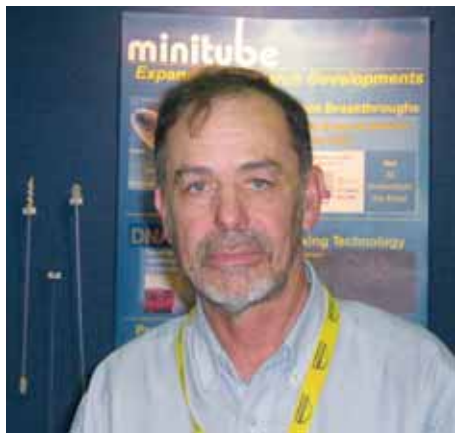
Minitube Canada using antioxidant to boost pig fertility

By Myron Love

We have been reading a lot lately about antioxidants - elements found in certain vitamins (A, C, and E), minerals (zinc and selenium) and found naturally in blueberries and other fruits – which protect against heart disease and cancer. It now turns out that antioxidants are also beneficial in increasing the fertility of boar semen.

"Sperm cells are continually dying off because of oxidation," noted Minitube Canada representative Jim Ward addressing an audience of Manitoba hog producers attending Hog and Poultry Days 2008 held in December at the Winnipeg Convention Centre. "If we can slow down the rate of cell death, the boar semen will be more fecund and more effective."

Ward told his audience about Minitube's results using antioxidant



Anti-oxidants can help improve the fertility of boar semen, says Jim Ward of Minitube

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compounds in the company's semen extenders. "There are up to 100 billion cells in a single ejaculation," he pointed out. "That is far more cells than a sow needs to become pregnant and produce a litter of piglets. We market extenders to dilute the boar's semen so that many sows can be inseminated by the same boar."

Minitube's newest extender - Apx2 - is the culmination of a series of tests using numerous substances to determine the most effective antioxidant in extending the longevity of sperm, thereby improving sperm viability during storage. "We tested motility with different antioxidant compounds under stressful environmental conditions and different temperatures to determine which compound was most effective," Ward reported. "We also did some field tests with a 5,000 sow commercial operation in the American Midwest," he said. "Our Apx2 produced the best results. The results with Apx2 were an increase of 0.46 in the number of piglets born per sow with Apx2 and a 5.9% increase in farrowing rates."

He reported that field tests are ongoing in Canada, the United States and Mexico. "We hope to gather a lot of data," Ward said. Minitube Canada also hopes in the next two to three years to be able to develop an extender that will influence the sex of piglets, get into embryo transfer and multiplication and experiment at some point with cloning, Ward noted.

Pigwatch system pinpoints exact time for insemination

By Myron Love

Conception Ro-Main, a Quebec-based supplier of technical equipment for the swine industry, is currently testing a new computerized sow management system that can help producers pinpoint the right time for insemination.

The Pigwatch Sow Insemination System (SIS) was developed by an Italian company, LPS Electronics. Conception Ro-Main representative Guy Denis (who was also representing Alberta-based Penner Farm Services) told hog producers attending his presentation at Hog and Poultry Days 2008 held in December at the Winnipeg Convention Centre. "We began testing the system at our farm in St. Bernard, Quebec," Denis said. "We have 3,000 sows divided between two sites on the farm."

Denis noted that the system is easy to install. The components consist of a cabinet powernet, SIS software, a magnetic stick, a number of infrared sensors situated over the sows and a PC. The sensors detect movement. When the sow becomes restless after weaning, indicating that the sow is in heat, that information is picked up by the cabinet and transferred to the PC.

"A panel allows you to check on all the sows and their status at any time by means of a colour coding system," Denis said. "You will know when each sow is in heat in real time and when to inseminate each sow for the best results. The system also provides data on each sow's location and her history."

Electronic feeding system most effective

By Myron Love

Electronic sow feeding systems are becoming the norm in Europe and North America, according to New Standard Ag Inc. representative Kees Van Ittersum. Speaking to an audience of hog producers at Hog and Poultry Days held at the Winnipeg Convention Centre last December, Van Ittersum noted that while trickle feed and self locking feeding stall systems used to be widespread in Europe ten years ago, only in Denmark is the latter method still popular. Most other European hog producers have switched to electronic sow feeding.

One of the major disadvantages of the self-locking feed system, Van Ittersum noted, is that you never know which sow will go into which stall so that you cannot adjust the feed to meet individual sow needs. He noted that the trickle feed system was used for very small sow operations. One problem with that is that in smaller groups, there is more aggressive behaviour. Also, he added, as with the self-lock system, you can't adjust feed to the needs of the individual sow.

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Van Ittersum recounted that the first electronic sow feeding system was introduced in 1982 by NEDAP AGRI. "There was a learning curve for the first few years," he said. Very significant in this first period was the transition from neck collar transponders to small ear tag transponders.

Heat detectors were added in 1992, PC windows software in 1997 and central separation units in 1998. Automatic separation on "lost ear tag" was introduced in 2005 and the Velos system the next year.

The major advantage to the electronic system is that you can program the amount of feed for each sow. This results in increased litter size and larger birth weights which in turn give piglets a better chance at survival. Van Ittersum reported that the electronic feeding system has been successfully in operation since 2002 at Plain Lake Colony (AB) with 1400 sows and – since 2005 - the Eaglesham Colony, also in Northern Alberta. A new installation has been in operation in Manitoba since June at Hilldale Colony, a 2,500 sow operation which is divided into 16 pens.

At the moment the system is being installed at a second location in Manitoba, Evergreen Colony which has 1000 sows. At Evergreen, sows are divided into groups of 250 which are fed in six feeding stations.

"Electronic sow feeder systems are durable, reliable, with few working parts and cost about the same or less than traditional systems," Van Ittersum said. "The electronic system can also include heat detection, sow tracking and, with cameras added, can give you a full account of everyone who comes into the barn."

The Hilldale Colony sow barns, he pointed out in a slide, have a lot of walls inside. "Sows like resting against walls," Van Ittersum said. "It gives them comfort. The walls also help separate the less dominant sows from the more dominant animals." He recommended building the divider walls out of concrete or strong plastic. Both substances are more durable and less likely to be damaged by the sows.

"I'm not a fan of straw in the barns," he said. "The consumer may think that straw looks nicer, but it requires at least an hour's additional cleaning every day for a 500 sow unit."

Sows housed on straw outperform those on slats

From Farmscape files

Research conducted by the University of Manitoba indicates, from an animal welfare perspective, sows housed in groups on straw tend to outperform those housed in conventional slatted floor systems. Research at the University of Manitoba's National Centre for Livestock and the Environment is comparing sows housed in conventional slated floor facilities to those housed in groups on straw. The two groups use the same genetics and are managed similarly.

Animal science professor Dr. Laurie Connor says scientists are tracking longevity, joint health, lameness and body condition scores as well as culling rates, litter sizes, piglets born alive and dead and weaning weights.

Dr. Connor says that litter size is slightly larger in sows that have been on straw for the whole of gestation and that weaning numbers and weights are also higher. "In terms of culling of the sows, in the conventional system more sows are culled within the same period of time, most often associated with leg problems, joint problems, not so much in terms of things like body condition," she says. "We're able to keep the animals in very similar condition in the two facilities."

"One of the problems, the most obvious from an economic standpoint, aside from having to replace more in the conventional barn, is that we have to medicate more of those animals, the sows in particular, very often again associated with leg injuries, things associated with the complete slat floors in groups."

Dr. Connor says the straw based system requires straw and additional labour but those costs may be offset by reduced medication and culling costs. She notes it is too early to make specific recommendations but further details of the work will be made public later in 2009.

Barn fire fatalities spur introduction of new building codes

By Myron Love

There are changes coming to building codes for Manitoban hog and other barns as a result of an eightfold increase in 2008 in hog fatalities in barn fires. The most recent such fire struck on Tuesday, December 30, when a barn undergoing renovations near Hadashville caught fire resulting in the deaths of 900 hogs. That brought the total number of hog fatalities from barn fires in the province to 30,559 for the year as compared to 3,700 in 2007. Last year was the worst year for fire-related losses of hogs since 1999, when the toll exceeded 38,000.

The losses this year came to more than $26 million (as compared to just over $4 million in 2007). The tremendous difference in the figures is not a reflection that there were many more fires in 2008 though. The seven fires were just one more than in 2007 - and one less than in 2006 when 7,387 hogs were burned.

"The difference is that with newer hog operations, the barns are a lot bigger," says Andrew Dickson, the Manitoba Pork Council's general manager. "Thus, a barn fire affects a lot more hogs." Chris Jones, Manitoba's deputy fire commissioner, notes that as things stand now, there are no building codes for barns and other farm buildings. Safety features such as sprinkler systems or smoke alarms are not required. "Barns and other farm buildings were exempted from the Building and Mobile Home Act that became law in 1978," he says.

As a result of the high 2008 death toll though, the Office of the Fire Commissioner has begun meetings with agricultural industry stakeholders about making changes to the building codes.

"The initial response has been positive," Jones says. "We are planning to hold public consultations in March and April." What the Office of the Fire Commissioner is recommending is that larger barns and other farm buildings -

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those that are more than 9,000 square feet - be classified under the Medium and Light Industry Occupancy under the building code.

"That would only affect new barns being built and major renovations," Jones says. "There wouldn't be any significant cost increases as a result," he adds. Andrew Dickson counters that new barns are already being built according to national farm building codes. Most barn fires are due to electrical problems, he says. He urges operators to check their buildings on a regular basis.

Brian Esau, the CEO of Red River Valley Mutual Insurance, a firm that underwrites policies for a large number of hog operations, reports that insurers will be analyzing the losses to determine whether or not individual policies will be increased.

Producers urged to plan for foreign animal disease

Canada will face a Foreign Animal Disease (FAD) outbreak in some form someday and a robust, tested and adequately resourced crisis management plan will be key to curbing its impact, says the veteran of two efforts to contain Foot and Mouth Disease (FMD) in the UK.

At a presentation at the Annual General Meeting of Alberta Pork, Dr. Charles Milne, Scotland's chief veterinary officer, outlined efforts to curb the FMD outbreaks in his country in 2001 and 2007 and the lessons learned in the process. "The bottom line is no amount of crisis planning will ever completely prepare you for an outbreak," he says. "However, planning is still well worthwhile in order to reduce the impact when it does arrive."

One thing Milne learned is that a good crisis management plan needs to be robust enough to handle a widespread outbreak. "It needs to be built on an awareness of existing resources and tested regularly in the field. We learned that desktop exercises are not enough. You have to develop a battle rhythm, and that's not something that comes without practice."

Good crisis planning also cannot ignore the human element, he says. "An FAD outbreak can take a huge psychological toll on everyone involved and can create deep rifts in a community that can carry on for generations. It's important to think ahead about how you're going to provide support for people as they deal with what can be an absolutely devastating crisis on a personal level."

The 2001 Foot and Mouth Disease outbreak in Scotland saw the destruction of nearly 750,000 animals and affected over 1,500 farms. The 2007 outbreak resulted in the slaughter of over 1,500 animals on eight infected premises, a difference Milne credits to improved response protocols.

The long-term consequences of an FAD outbreak can be far-reaching, he says. Methods used to contain the disease outbreak can unwittingly drive the introduction of new diseases. On the marketing front, loss of genetic material can create shortages in years to come. It can also be difficult to recapture markets for products once they have become associated with the disease.

Even seemingly-unrelated industries can be affected. Milne says a perception in Scotland that "the countryside was closed" on account of FMD hit tourism hard and kept spectators away from high-profile sporting events or shut them down entirely.

Combating an outbreak can take a huge toll on existing resources. "In the first three weeks of the 2001 outbreak there were over 9,000 jobs being handled by only 220 veterinarians," says Milne. "There were management, communications and logistical challenges we were not prepared for."

For these reasons and others, Milne says it's important to have good coordination with government and other organizations with the appropriate resources. "It's key to regard the outbreak as a crisis and engage the crisis machinery the government may offer," he says. "Government should not only utilize its wider crisis management capability but also the management structures of contractors and other service providers as they understand their own fields of expertise best."

Look past US for global opportunities for Canadian pork, says leading strategist

The Canadian pork industry needs to diversify its exports beyond the U.S. and manage increasing market uncertainty to get past its vulnerable stage, says the managing director of a leading international strategic consultancy and market research firm.

Canada is the single most vulnerable pigmeat country in the world because it is so heavily dependent on exports, particularly to the US, says Andrew Cookson, the managing director of Europe-based GIRA Consultancy & Research who recently spoke at the annual general meeting of Alberta Pork.

Rather than continuing to rely on one segment of a volatile world market, Cookson recommends that the Canadian pork industry recognize opportunities to enter growing markets, enhance farmer/processor relationships, become more cost competitive and export more pig meat than live pigs. As progress is being made in those areas, Cookson recommends the industry focus on differentiating Canada's pork product.

"The name of the game for the next 10 years is managing uncertainty," he says. "We're in a world without a floor. The granddaddy who knew what was best for the producer and the consumer has gone on holiday. There's no one there to help us, but the advantage is Canada can now help itself."

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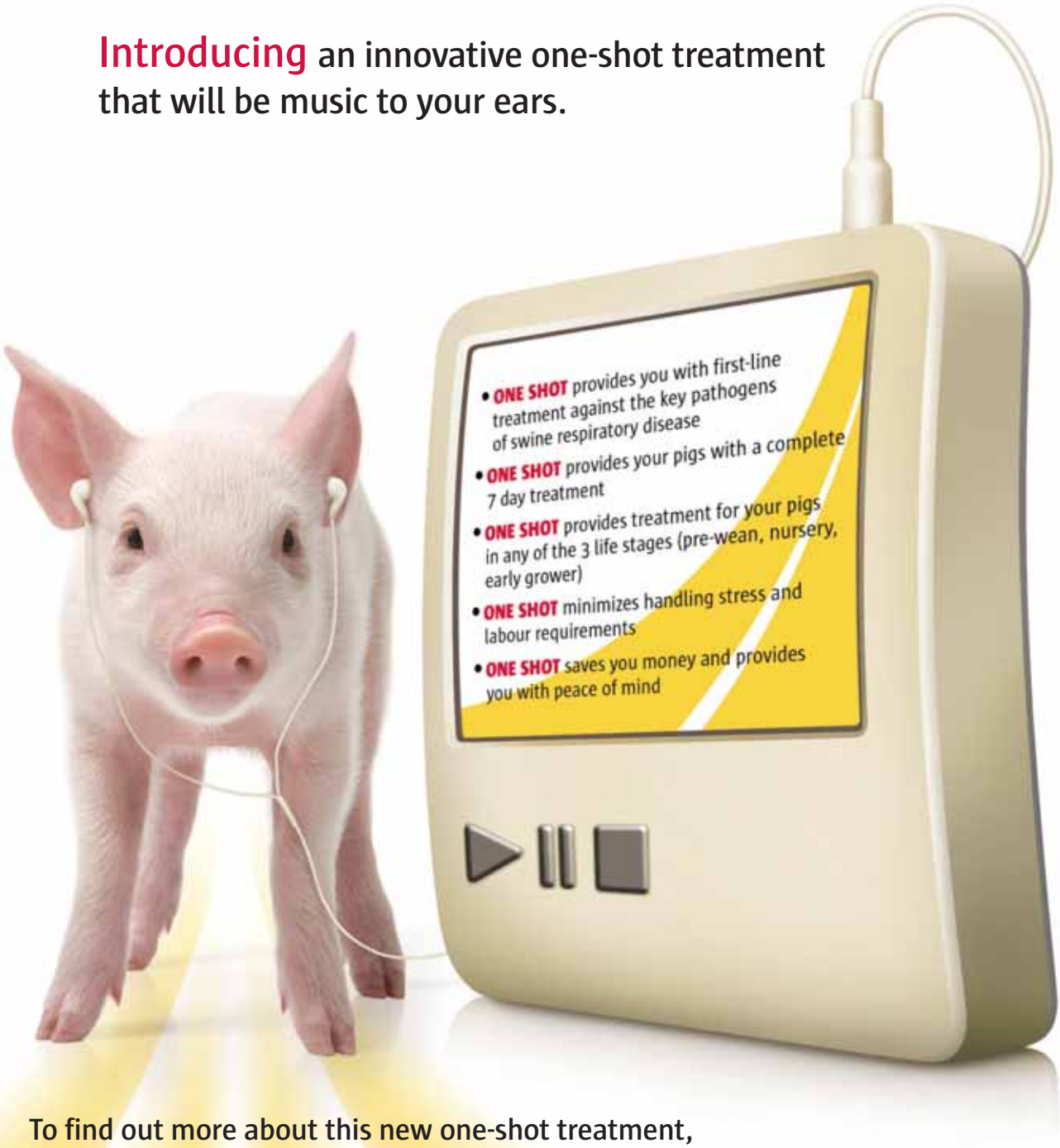

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Andrew Cookson, the managing director of Europe-based GIRA Consultancy & Research

Cookson recommends a three-step process for managing risk in today's market. The first step is to ensure lowest-cost competitiveness. "You have no choice but to maximize all measures to improve farm productivity and efficiency," he says.

The second step is to optimize the current situation. On the production front, this means finishing and slaughtering more pigs in Canada, says Cookson. On the marketing front, it means diversifying the Canadian pork industry's customer base.

Key to this is recognizing opportunity when it presents itself. Cookson uses the example of China, which recently imported more pork during a period of internal disease outbreak. During that time, US pork marketings to China increased dramatically while Canada's did not. "Why were they so reactive to the shortage of pork in China and you guys didn't budge?"

On the other hand, Canada has a strong platform on which to build trade with such growing markets for pork as Russia, China and Mexico. "On an equivalent volume basis, you are just as good as the US at marketing to Russia, and Russia isn't easy to market to. That is an excellent platform on which to build."

Finally, the third step is to differentiate Canadian pork, especially against its US counterpart. Right now there is very little to differentiate Canadian pork from US pork, says Cookson. This is not helped by the fact that Canadian pork is priced based on the US market so consumers tend to buy on price rather than product identity.

Habits change after listeriosis outbreak

A majority of Canadians have changed their buying and consumption behaviour following the recall associated with listeria in ready-to-eat meats, according to a recent survey by University of Guelph researchers.

"The listeriosis outbreak was not only associated with the death of 20 people and the illness of many others, but it also contributed to economic loss in the food industry," said Prof. John Cranfield of the Department of Food, Agricultural and Resource Economics. "But the impact of the recall on consumer confidence in the food system and food consumption decisions was largely unknown."

So Cranfield and his colleague Prof. Spencer Henson used the Guelph Food Panel to survey consumers regarding their awareness, concerns and changes in consumption patterns following the outbreak. "Before the food recall, consumers did not consider the potential risks of ready-to-eat meats to be significant," Cranfield said.

Nearly everyone surveyed (96 per cent) knew about the recall and that it originated in Canada, and 92 per cent knew that listeria was the cause. Following the outbreak and recall, the proportion of consumers who said they never consume ready-to-eat meats at home jumped from six to 39 per cent. The percentage of people who said they never consume ready-to-eat meat products in fast-food outlets or restaurants increased from nine to 56 per cent.

Other behaviour-related findings include:

- 30 per cent have stopped buying ready-to-eat meats from Canada;
- 27 per cent now eat less often at restaurants and fast-food outlets;
- 52 per cent are paying more attention to food labels;
- 32 per cent are cooking more food at home; and
- 30 per cent are taking more time in food preparation.

Despite the changes in behaviour, however, most consumers remain confident in the safety of Canada's food system, the survey found. About 70 per cent of respondents said their perception of the safety of meat in general, of food products, and of food as a whole has not changed. In addition, 75 per cent said they consider ready-to-eat meats safe to eat.

"This suggests that consumers have not generalized the listeria food recall to their perception of food as a whole," Hensen said.

Interestingly, although overall confidence in food safety in Canada remains high, consumers' trust in food-chain stakeholders to protect them from listeria is only moderate, the researchers found. Farmers were judged to have the greatest ability to ensure the safety of food, whereas restaurants, grocery stores and the food-service sector were deemed to have the least ability.

PIC presents Camden Cup award

PIC Canada has awarded the 2008 Camden Cup to Eagle Creek Colony of Asquith, Saskatchewan. The Camden Cup award program began in 2004 and is awarded annually to the PIC full program herd that exhibits efficient production of high volumes of quality pork. Entries are benchmarked on pigs weaned per mated female per year and are verified by PigChamp. Eagle Creek achieved a figure of 29.7 pigs weaned per sow per year.

Pat Frith, PIC Account manager, presenting the 2008 Camden Cup to Frank Wurz from Eagle Creek Colony

Genetiporc announces strategic partnership in western Canada

Quebec based swine genetics company Genetiporc Inc. has announced a strategic partnership with Dynacrest Farms Inc. and Verus Animal Health Alliance Inc. to utilize, produce and promote Genetiporc's swine genetics in Western Canada. Dynacrest Farms and Genetiporc will operate a 3000 sow multiplication and gilt grow-out facilities that will supply Fertilis 25 replacement gilts to the 15,000 sows based under Verus Swine Health Management program as well as other retail clients. Verus Animal Health Alliance will also provide management, nutrition and animal health support to Genetiporc's other operations as well as actively market and promote Genetiporc throughout Western Canada. There are significant synergies from this strategic partnership that will serve all participants well says a joint news release.

Genetiporc specializes in the production, selection and distribution of breeding stock with superior genetic and health status, thereby ensuring consistent, high-volume supply from a single source. Verus Animal Health Alliance provides swine health management services to 15,000 sows including Dynacrest Farms as well as animal nutrition products and applied expertise to livestock producers and feed manufacturers in Western Canada. The company is based in Calgary, Alberta.

≡WHJ≡

• FX Aherne Prize Winner

Pork industry innovator honoured at 2009 Banff Pork Seminar

A Canadian pork industry innovator was recognized for his efforts to improve water conservation and reduce emissions from hog farms at the 2009 Banff Pork Seminar.

The FX Aherne Prize for Innovative Pork Production honours Canadian pork industry members who have developed either original solutions to pork production challenges or creative uses of known technology. The winner of this year's Prize is Ross Thurston of LWR Technologies, Inc. in Calgary, Alberta for his Swinewater livestock manure treatment system. The award was presented at the Banff Pork Seminar, a leading seminar for the pork industry.

"At a time when the pork industry is seeking new ways to compete in an increasingly volatile world market, it has never been more important to find practical new ways for pork producers to become more profitable on their individual operations," says Dr. Ruurd Zijlstra, chair of the FX Aherne Prize selection committee. "These awards represent an opportunity for the Canadian pork industry to recognize those individuals who have invested their time and effort into improving the pork production process."

By association, the awards also honour their namesake, the late Dr. Frank Aherne. Aherne who was a professor of swine nutrition and production at the University of Alberta in Edmonton and a driving force in the western Canadian pork industry for many years until his death in 2005. "A recurring theme of Frank's career was the development of valuable, applicable concepts and technologies," says Zijlstra. "The pork industry continues to benefit from many of these innovations today."

Dr. Ruurd Zijlstra, (left), Ross Thurston, (centre) Livestock Water Recycling Inc. and Gareth Jenkins (right) Livestock Water Recycling Inc.

The continuous loop Swinewater System conserves water for farming operations, filtering manure-rich wastewater to the point where it is available for re-use as wash water or livestock drinking water. It also removes solids from the water that are later converted into fertilizer. In the process, it helps reduce greenhouse gas emissions by decreasing the discharge of ammonia and phosphorus into the soil.

The process involves initial separation of the manure solids, which can then be used as a fertilizer or for composting. The next stage is fine solids separation using a specially-designed tank system, which enables efficient solids reduction within a very small footprint. Then, the liquid flows to a specialty media filter and on to a membrane system, which removes pathogens and ammonia.

"Setting up safe, clean manure management systems has become one of the biggest challenges facing the pork industry today," says Zijlstra. "Meanwhile, the conservation of water and soil and the reduction of greenhouse gas emissions have become key issues in the pork industry from an environmental, social, and even marketing perspective."

"Innovations such as Ross Thurston's Swinewater System help minimize the risk of potential water shortages in the livestock industry and help show consumers that pork producers are acting responsibly in their management practices." ≡WHJ≡

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Competing in the Canadian pork market

Jeff Kucharski

The competitive position of Alberta's livestock industry has deteriorated significantly over the last two years, due to the strength of the Canadian dollar, a loss of feed competitiveness and loss of access to markets, primarily due to BSE. The beef and pork industries can either downsize and focus on the domestic market or become international competitors with a high-quality, differentiated product, says Jeff Kucharski, CEO of the recently formed Alberta Livestock and Meat Agency. Downsizing would be an admission of defeat, he believes, while the second scenario is achievable but necessary changes would be required to realize it. It will involve a shift from a commodity orientation to one with a focus on high-value differentiated products, reduced dependency on US markets, improvements in branding and certification programs and the redirection and refocus of government-provided marketing funds.

ALMS framework – setting the vision

An internationally competitive and profitable livestock and meat industry

The Alberta Livestock and Meat Strategy (ALMS) is the framework that will help enable the industry to create and extract maximum value from the competitive environment, leaving specific initiatives on marketing strategy and business plans to industry. It includes eight priorities:

- A shared vision to achieve a global competitiveness advantage
- Strengthened foundation of animal health, food safety and public health
- Investing in information exchange in the livestock supply chain– the Livestock Identification System of Alberta (LISA)
- Support differentiation initiatives to specialize and customize products
- Improve marketing and diversification initiatives to increase recognition and branding
- Give leadership in environmental stewardship in the livestock sector
- Reduce cost and remove regulatory barriers by reviewing and determining where we can reduce the cost burden and time it takes to approve products and processes in order to produce safe healthy products. Veterinary drug approvals, feed grain competitiveness and price risk insurance are examples of areas we can improve, together with the Federal government.
- Support transition of the livestock industry, promote good governance amongst industry organizations and enhance effectiveness along the value chain.

ALMA – a catalyst for revitalization

The Alberta Livestock and Meat Agency (ALMA), working in partnership with Alberta Agriculture and Rural Development, will take a leadership role in implementing the ALMS.

Efforts will be focused on pursuit of desired industry outcomes, some of which include:

- ***Shared vision:*** A vision of livestock and meat industry direction and priorities that is shared across industry sectors and government.
- ***Profitability and competitiveness:*** The livestock and meat industry's profitability and international competitiveness will measurably improve.
- ***Self-reliance:*** The livestock and meat industry will operate primarily independently of government funding and will be sustainable within the context of the market place.
- ***Market diversification:*** Markets for Alberta livestock and meat will be expanded and diversified.
- ***Industry investment:*** Investment in the industry has measurably increased.
- ***Leadership:*** The Alberta livestock and meat industry will be recognized globally for providing competitive livestock and meat products that meet consumer needs through leadership in animal health, food safety, animal care and environmental management.

ALMA will act as a catalyst to help revitalize the industry. As industry continues to drive the business of producing livestock and processing meat, ALMA will direct funds and resources to programs and initiatives in support. To guide this process, an independent competency based board has been named by the Minister.

continued on page 20

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The four core businesses of ALMA include:

Market development

- Realign and enhance funding commitment to international market development.
- Develop and implement a dedicated Alberta advocacy strategy for dealing with other jurisdictions on matters of interest to Alberta.

Supply chain development

- Foster the creation and further development of customer focused value chains.
- Livestock Information System of Alberta – creates an "information highway" for the livestock and meat sector.
- Create the infrastructure required for certification and verification of processes and attributes

Innovation

- Establish and fund strategic innovation programs for livestock and meat, focusing on research and development, technology transfer, automation and commercialization.

Industry capacity and capability development

- Support skills and leadership development, new business models and business planning skills, and education and training.

ALMA is currently building support for the strategy, with communications being another key priority. International awareness of Alberta's strategy has also been initiated with the Minister leading a mission to Asia and in meetings with international customers and organizations.

Lessons from the Asian mission

ALMA has recognized the need to attract investment into Alberta, particularly from end-users overseas who may have an interest in further integrating their supply chain with a Canadian supply capability.

China is the biggest meat producer and consumer in the world. Pork is still the major red meat consumed by the Chinese, accounting for 60% of the total meat production in China. It is forecasted that the average Chinese will consume 75kg of meat per year by 2010. Over the recent few years, China has exhibited rising imports and falling exports. The first half of 2008 saw live hog inventories increase by 3.7% and sows by 12%. China has seen increased investments of private foreign capital in large-scale farms.

There are opportunities for Alberta in China for high quality pork, in both retail and food service. Ractopamine remains an official barrier, although recently this has not posed a barrier to imports and China seems to be turning a blind eye for now on this issue.

Meat sales in wet markets are decreasing while the sales in supermarkets are increasing due to good meat storage and attractive packaging. Demand for chilled meat is increasing.

In Japan, Canada has retained its market share (11% in both 2003 and 2007) making it Canada's second largest export market (after US). Seafood consumption is trending downward in Japan, beef is still restricted and relatively expensive and so this is creating opportunities for pork. The recent strength of the yen has also enhanced Japan's appetite for imported products.

Retailers and others are beginning to indicate a desire to develop source verification programs, including branded programs that associate the supply location with information on how the product was raised, fed and processed to increase consumer confidence and trust.

Japanese importers and end-users continue to value the distinctive characteristics of Canadian pork, in particular, barley feeding. These importers have made it very clear that Alberta should avoid moving away from a barley-fed product as this may impact future sales and disappoint the customer base. They also stress Alberta's inherent proximity to Japan as an advantage in shipping chilled product and highly value the efforts we are making to enhance traceability and food safety. Japanese buyers also consider Alberta/Canadian processors as being flexible and willing to process products for Japanese customers; this is a significant advantage in the marketplace.

With the current conditions in the hog industry, Japanese importers are concerned about the ability of our hog producers and processors to supply sufficient product on a consistent and reliable basis.

Alberta Pork Revitalization Strategy – the fit

ALMS has taken into account the Alberta Pork Revitalization Strategy (APRS) in its strategic implementation plan. ARPS identifies three core strategies which coincide with those of ALMA:

- Establish indisputable system integrity in production, processing and marketing of Alberta pork
- Create new marketing and business development capability
- Implement cost competitiveness strategies

Both ALMA and Alberta Pork recognize the need for an Alberta Quality platform and that opportunities can result from Alberta branding programs. These priorities can be achieved with the assistance of systems which connect and facilitate response to market signals. One key initiative which ALMA sees as a tool to help make this possible is the Livestock Information System of Alberta (LISA).

Information that may be contributed includes: history of the animal (illnesses, vaccinations and weaning dates), packer and feeding information such as grade and yield, traits, markers, quality attributes, production processes, feeding, performance, sales, and market and consumer information, as well as the age, premises, movement required through mandatory traceability. The enhanced flow of information will enable the industry to respond more quickly to market signals, enhance service levels and provide a potentially decisive advantage relative to global competitors. ≡WHJ≡

Roadmap for a competitive pork industry in USA

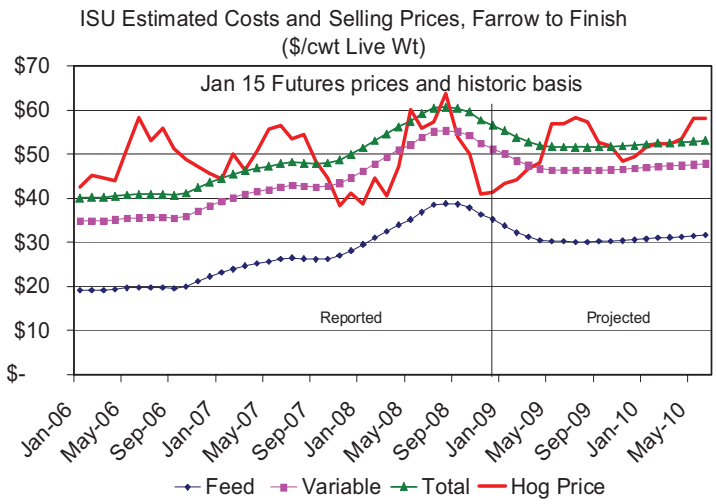
Dr. Dermot Hayes

The interesting thing about the current situation in the US pork industry is not that things are so bad but that they are not a lot worse, believes Dermot Hayes, Professor of Economics and Finance at Iowa State University. In a traditional economic analysis, he says, if one asked how an industry could ever pass along a 75% production cost increase, the answer would have been to expect a dramatic drop in production. Instead production has increased by about 13% since 2005. How is it that the industry is so close to profitability given this simultaneous increase in production and cost of production? Dr Hayes looks at the factors involved and how they will influence pork production in future.

Current situation

Figure 1 shows the recent historical relationship between prices and production costs. These data show that most hogs sold in 2007 were profitable and that with the exception of the late summer of 2008 most hogs sold in 2008 were sold at a loss. Futures prices suggest that producers will be profitable for at least the middle two quarters of 2009, Dr. Hayes noted.

Figure 1: January 15th, 2009 USA cost and price forecast



The causes of the current situation are well known says Hayes. "An enormous expansion in US ethanol production, coupled with strong export demand for all commodities - due to a low dollar and growth in India and China - had a dramatic impact on feed costs." According to Hayes' colleague John Lawrence, feed costs grew by approximately 250% since 2006 increasing total production costs by about 75% in the same period. At the same time, US pork production has grown for the past few years in response to a long period of profitability and the success of the PCV2 vaccine that increased sow productivity. (Table 1)

Table 1: Pork production (1000 MT CWE) for Canada and USA, 2005 – 2008

Country	2005	2006	2007	2008
Canada	1,920	1,898	1,850	1,790
United States	9,392	9,559	9,962	10,684

Forces driving profitability

Consumer demand

The pork industry did not have to face this huge production cost increase alone, Hayes explains. The costs and prices of almost all agricultural products have increased dramatically in the past few years. Consumers are remarkably stubborn about the total amount of calories that they consume and when the price of calories increases they simply shift between food products rather than reducing caloric consumption. "Consumers are spending more to buy pasta, chicken, beef, and even beer, and this means that demand for any product, such as pork, whose prices did not keep up has grown," he says. "Our calculations suggest that instead of a 35% production cutback, as would have been the case if pork was the only product to be impacted, the actual production cutback needed was only 5% to 7%."

Exports

Secondly, Hayes explains, US pork exports grew from about 14% of production in 2007 to about 25% of production in the summer of 2008. Exports to almost all countries grew, but the largest growth occurred in China and Hong Kong, two markets that now account for almost 6% of US production. China imports "Paylean" pork directly from one company in the US and it imports "Paylean" pork from all the other companies via Hong Kong. China lost enormous numbers of sows due to disease and to earthquake and this resulted in a potential scarcity just before the Olympics. As a result, the Central Government ordered enormous quantities of pork just prior to the Olympics. Russia and Mexico were also important growth markets in the first half of 2008. "Russia, although flush with new oil money, is also cutting back on imports because of general tensions with the US and the West," says Hayes. "It appears likely that the US will have exported approximately 20% of the pork produced in the fall of 2008, a substantial improvement over 2007."

Currency depreciation

Thirdly, the US dollar has fallen dramatically over the past five years, notes Hayes. This trend was responsible for the increase in crude oil and grain prices within the US and, therefore, contributed to the feed price problem but it also helped support US pork prices and US pork production.

Another positive factor associated with the weak US dollar is that it boosts the international competitiveness of the US pork industry. The first column of Figure 2 compares production costs in the US and Canada at a Canadian exchange rate of 1.2 to 1.

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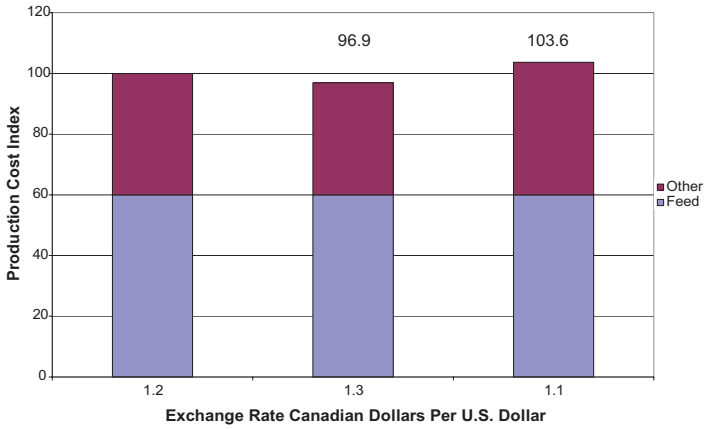
This column has been drawn to ensure that the production costs are equal at this exchange rate, the rate that existed from January 05 to January 07. Approximately 60% of the total costs are for feed and the rest of the costs are for labor and capital. The second column shows that same situation for an exchange rate of 1.3 to 1, this is the rate that was in place in 2004. "Note that the cost of feed is the same as in the first situation because feed is a tradable commodity and, therefore, subject to arbitrage, Hayes points out. "If feed prices in Canada did not change in a manner that exactly offset the exchange rate changes, then there would be an opportunity for arbitrage." Notice, however, that the apparent costs of non-tradables such as labour and capital have now changed because a weaker Canadian dollar effectively reduces the costs of labour and capital in Canada from the perspective of its international competitors. In this case, the Canadian pork industry gains a 3% production cost advantage. The final price comparison shows the current situation with an exchange rate of 1.1 to 1. Now the US has gained a competitive advantage because its labour and capital costs have fallen relative to its international competitors. "This simplified example shows that the US has gained a 6% to 7% production cost advantage over Canada since 2004 due simply to the depreciation of the US dollar," Hayes concludes. "This trend is also evident in other important pork producing countries and regions."

As a result of this production cost advantage, other countries have begun to reduce their breeding herd numbers. Hayes notes. "Since

Figure 2: Cost of production comparison at different exchange rates



2005, Canada and Denmark have both lost about 150,000 sows and the EU in total has reduced it sow numbers by 350,000" he says. "China has reduced its sow numbers by almost one million in the same period. These production cost cutbacks in the rest of the world effectively helped reduce the need for cutbacks in the US."

The impact of ethanol on corn prices

Ethanol plants in the US currently have a capacity of 10.5 billion gallons per year. A further 2.6 billion gallons of capacity

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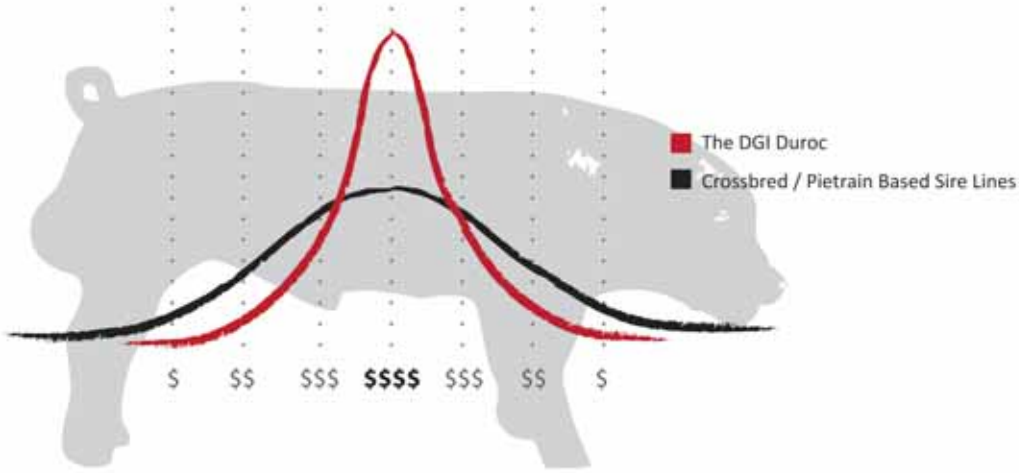

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under construction or in expansion will give a total capacity of 13.1 billion gallons per year. Ethanol production is taking an increasing amount of the corn crop and during the 2006-7 marketing year, 2.2 million bushels were used. This is expected to increase to 3.1 million bushels for 2007-8 and 4.8 million bushels when existing plants are completed.

This increasing use of corn for energy production means that the price of corn has now become directly related to the price of energy, Hayes points out. Therefore, if you want to know the likely price of corn, you should look at crude oil futures (Figure 3). The price of ethanol is directly related to the price of gasoline and the economics of ethanol production are driven by the ethanol price, therefore when prices are high, ethanol producers can pay more for corn. With the US government mandate on ethanol production and the subsidies provided, this situation is unlikely to change. However, Hayes predicts, the increase in ethanol production from corn will slow down considerably in future as other methods of production such as cellulosic biofuels increase.

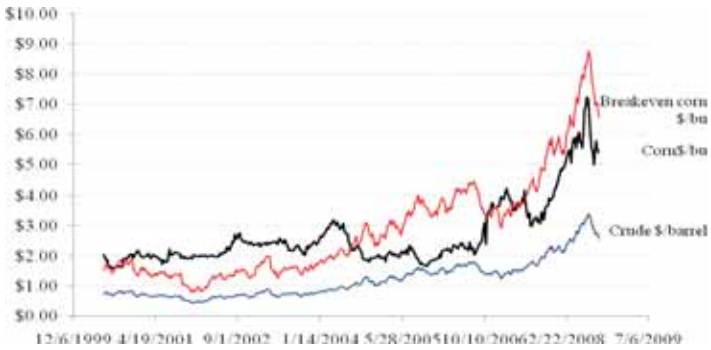
Also, he suggests, soybean prices increase when the price of corn goes up, while at the same time there are proportional feed cost increases in Canada.

Conclusions

Hayes notes that domestic demand for pork held up extremely well during 2008 because increases in the prices for beef, chicken, pasta, cheese and all other proteins made pork look cheap. In addition, exports 'saved' the industry in the summer of 2008 and helped the industry for the rest of the year, he says. "The increased exports were assisted by a weak US dollar and a long-run competitive position relative to the EU and possibly Canada." However, he says, exports in 2009 are not on a pace to match 2008 numbers because China has reduced imports and because of the worldwide slowdown. In future, export volumes will respond to the relative value of the dollar, which Hayes predicted will weaken.

"High feed prices are here to stay, but the US herd does not need to cut back by much to get prices back to break even," Hayes concludes. "This is true because the prices of other proteins also respond to higher feed prices and because Canada and the EU have cut back production." WHJ

Figure 3: Crude oil and corn prices



Roadmap for a competitive pork industry in Canada

Jerry Bouma

The Canadian pork industry has been in crisis for much of the past two years, with producers, processors and industry suppliers all losing money. The current crisis is due to a rapid rise in input costs, coupled with the higher value of the Canadian dollar, increased competition from the USA and an uncompetitive processing sector. However, says Jerry Bouma of Toma and Bouma Management Consultants, Canada has several fundamental advantages that are inherent to a competitive livestock industry, including a large land base coupled with a low human population, a favourable climate for both the production of crops and livestock and the capacity to produce an abundance of feed grains. And it has relative proximity to the largest and fastest growing pork consumption market in the world, namely China. Building a competitive pork industry will require a dramatic overhaul of the entire industry if there is to be any probability of success, he believes. It will require new value chain relationships, a focus on adding value to the product and a reduction in the cost of production.

Causal factors

A high Canadian dollar results in both a reduction in the price paid to producers and increased competition from the US. Feed costs have been higher due to competition from the biofuels industry and the relative rise in costs has been higher in Alberta partly because feed grains are tied to food grain demand, whereas US corn is grown as a feed grain. Canada (and particularly Alberta) is now a high cost pork producing region in North America compared to 1998 when it was the lowest.

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Over the past 20 years, the US pork industry has restructured in dramatic fashion. Most of this change has been led by the emergence, and now dominance, of large scale integrated pork production systems. Indeed, the changes have transformed the US to become one of the most competitive pork industries in the world and its pork exports have steadily increased for 20 consecutive years.

The major constraint facing most Canadian processors is the lack of regional critical mass (hog supply) to enable double shifting – the common practice with major US processors. Consequently, Canadian processors are at a cost disadvantage to their US counterparts in a market where price is determined by the US market. Thus the Canadian industry faces a double jeopardy – a higher cost structure and a discounted price. We estimate this cost disadvantage to be as high as $12 per hog.

A recent USDA study determined that production contracts can effectively reduce costs by as much as 23% compared to independent producers. The Canadian hog industry by comparison continues to operate largely as a set of independent producers working with processors on the basis of delivery contracts.

As a consequence of all of these factors, the Canadian pork industry has found itself in an extremely uncompetitive situation.

Opportunities for Canada

Despite the problems it faces, there are opportunities for Canada to expand its pork exports. Demand for pork is predicted to grow annually between 1.6% and 1.9% per year for the next 10 years. Furthermore, the international trade for pork is expected to grow by over 20% in the next 10 years (over 6.1 million metric tonnes). China will be the biggest growth market. Overall demand is expected to grow by 17.1 million metric tonnes. Other potential growth markets include Russia, Korea and Mexico.

In terms of the industry structure, there are many value chain models. These include Danish Crown, which is an example of a total industry sector strategy built on a cooperative model with a long history in Denmark. At the opposite end of the ownership spectrum is Smithfield Foods, the highly integrated industry model that has redefined efficiency and cost competitiveness within the US. Seaboard-Triumph is an example of a contractual model in which six large scale production groups built a large scale plant (Triumph) and contracted all product marketing to an established food marketer (Seaboard). These and others around the world are examples of well-organized and systematic approaches to production, processing and marketing.

Implications for the Canadian pork industry

The Canadian pork sector finds itself in an extremely difficult situation. It operates in a market where price is determined by its major competitor (who is also the low-cost supplier); it is now a high cost production region within North America; it is loosely organized as an industry; and it depends upon a processing sector that is structurally uncompetitive.

However, Canada at large has several fundamental advantages that are inherent to a competitive livestock industry, including a large land base coupled with a low human population, a favourable climate for both the production of crops and livestock and the capacity to produce an abundance of feed grains. It is also in relative proximity to the largest and fastest growing pork consumption market in the world, namely China.

Thus one can argue, with the exception of currency appreciation, that re-building a competitive pork industry is largely a management, organizational and financing challenge, not simply an economic challenge. It will require a dramatic overhaul of the entire industry if there is to be any probability of success.

It is clear that the revitalization strategy must be founded on four core principles. These are:

1. The necessity of establishing new marketing capability built on product quality, supply assurance and customer focused strategies that are long term and of mutual interest. Canada cannot, nor should it, compete as a low cost supplier.
2. The need to organize and build a highly connected industry that links customers to processors and processors to producers. The Canadian pork industry must build a production-processing-marketing system that captures maximum value and drives out unnecessary system and hidden costs.
3. The ability to secure cost competitive inputs, most notably feed grains and labour, over the long term. Western Canada in particular must pro-actively establish a feed grain sector that can compete with US corn.
4. The need to operate within a favourable business and political environment that facilitates market access, regulatory reform and long term financing. The Canadian pork industry cannot go it alone. It must have the long-term strategic support of both federal and provincial governments to make the transition necessary to become competitive.

The Alberta Revitalization Strategy

In 2008, the Alberta pork industry under the leadership of Alberta Pork undertook to review the entire industry in response to serious concerns about long-term competitiveness. Its vision is:

A highly connected pork industry capable of delivering differentiated high quality, safe pork products in a sustained manner and with flexibility to respond to continuously changing markets and market conditions.

The Revitalization Strategy is built on market principles and begins with the establishment of a clear marketing platform that will guide and direct the development of the industry. The immediate focus (1 to 3 years) of this platform will be to:

- Begin by further building on the Quality, Health, CQA, Animal Care and existing Environment Stewardship platform as defined by already established standards and programs. Alberta in particular has a 'geographic' advantage to further substantiate and 'brand' this quality position in view of its location in the western prairie and adjacency to the Rocky Mountains;
- Simultaneously, begin building a new marketing, sales and business-to-business capacity to deliver 'unique' customer

specifications to a targeted selection of existing customers and new customers.

Once this platform is established and validated, the strategy calls for a process of continuous improvement by strengthening existing attributes and/or adding new dimensions.

Strategic initiatives

The vision will be achieved by the implementation of five strategic initiatives. The first four initiatives are immediate (within 1 to 3 years) and need to be addressed simultaneously. They are:

1. Establish system integrity (highly connected sector) – the design of pro-actively managed supply chain (or chains) between the processing sector and producers.
2. Develop new marketing capability – the establishment of new business-to- business skill sets that develop long term supply relationships with a set of targeted markets and customers.
3. Address cost challenges – develop new strategies to address the two major cost items facing pork production: feed grains and labour.
4. Facilitate a favourable business environment – ensuring that the Alberta pork industry has the necessary public and private services, tools and instruments to effectively compete in the global meat industry.

The fifth initiative is long-term in nature (within 3 to 5 years). This is to:

5. Further build the Alberta Brand on a market driven platform that adds value to Alberta pork based on attributes such as environmental sustainability. This can be achieved once system integrity is established and the market signals specific to this rapidly emerging area become clearer.

Conclusions

The major challenges set out in the Revitalization Strategy are to 'package' or systematize the marketing platform and to build the marketing capability which links production, processing and marketing in a highly connected manner.

This is not easy. Indeed it requires a set of industry investment strategies that create new business structures between producers and processors. However, the alternative is the continuation of a system that is clearly not functioning well in the present and certainly is not positioned to compete with well organized systems in other countries around the world.

If the fundamental challenges within the Canadian pork industry are not addressed, the conditions that have created the distress which is currently at play will only re-emerge in the future. At best, the Canadian industry may continue to supply the domestic market but lose its export markets. At worst, it may be unable to compete at all and Canadian consumers will rely totally on pork products that are imported. ≡WHJ≡

Summarized by Bernie Peet

Cost of production forecast – US vs. Canada comparison

Grant Lazaruk

Introduction

The cost of production is a key driver for the success of a commodity business, says Grant Lazaruk, Chief Operating Officer of Manitoba-based integrated pork production company Hytek. He examines the business of pork production in order to identify competitive advantages and disadvantages of Canadian production compared to the US systems. The ideal production system optimizes revenue with cost effective manufacturing at both the farms and the processing plants, Lazaruk says.

The ideal pork production system

Hog production

Feed represents 60% of the hog production cost and 40% of the total cost of final pork products. Three pounds of feed are required to produce a pound of meat. Location of the mill should be near the feed source and location of the farm should be near the mill. Transporting meat to market is more cost efficient than hauling ingredients to feed mills or hauling feed to barns.

Breeding/gestation/farrowing barns, nursery barns and finishing barns should be clustered as near to each other as possible to minimize transportation costs of live hogs.

Barns should be in an area with a strong labour force. Production efficiency is a key driver for keeping unit costs down.

The ideal pork production system includes facilities located in an area that is not too densely populated with hogs as this provides the ability to maintain a healthy herd.

Manure is a valuable resource that is utilized effectively for crop production. Ideally hog production is in a sustainable environment where these nutrients can be managed in a cost effective manner.

Processing

Processing plants need to be located in the area of the pig production to minimize transportation costs of the live pigs. Transportation of live pigs is a most inefficient use of transportation resources and the distance needs to be kept to a minimum. Transporting meat to market is more cost efficient than hauling live pigs to the processing plant.

Processing plants should be located in an area with a strong labour force. Having the sufficient number of employees is important but more important is having access to qualified employees because production efficiency is a key driver for keeping per unit costs down.

An operationally efficient plant is one that has the ability to customize products to the customer's specifications while capable of harvesting the entire hog. There is an appropriate market for every part of the hog and waste should be minimal.

Processing plants that deal with the variability of the pigs allow "all-in/all-out" hog barns to be emptied, thus eliminating pig selection with a narrow weight window at barn level and maximizing the size of the pig to its genetic and economic capabilities.

Asset utilization is maximized with a large-scale double shift plant that utilizes economies of scale and processes for the majority of the day.

Marketing, warehousing and transportation

Ideal marketing, warehousing and transportation is recognizing and having access to the market with the best return for each part of the hog. This includes domestic and international markets for maximizing your sales returns. Effective distribution facilities and an expedient transportation network to your customer are essential. This means access by truck, train, or ocean vessel as necessary to deliver product to the customer in a timely manner.

Key areas to success and the challenges we face

Feed costs

Feed is the single largest cost in pork production. The most influential factor in the success or failure of a pork production system is the availability of feed at competitive pricing. Include the rising cost of fuel and feed becomes expensive; production facilities must be located near a feed source. Bio-fuel companies

continued on page 32

are competing with the swine industry for corn and have caused corn prices to reach an all-time high. The price of feed has pushed our overall production costs to levels of negative margins; with demand steady, the only solution is a reduction in the hog supply. This liquidation has been seen worldwide. We estimate that if our cost structure increases by 30% then the price of pork would need to increase by 30%, which will require a reduction in supply of approximately 7-10%.

Transportation and fuel

Hog production requires a lot of fuel. Transportation is an influencing expense. Ingredients are delivered to the feed mills, feed is delivered to the barns, pigs are transported from barn to barn, pigs are delivered to a processing plant and the pork is delivered to the customer. Minimizing transportation costs is crucial to an efficient pork production system.

Labour

The largest influence on overall productivity is labour. Labour costs represent approximately 15% of the total cost structure for pork production. While rates affect cost, overall productivity is the larger contributing factor. Take into consideration the number of pigs per sow; two less pigs per sow increase your total cost by $2.70 per pig. A 0.1 increase in feed conversion will increase your costs by $2.60 per pig. A decrease in yield at the plant of 1% will decrease your revenue by $2.00 per hog. These are affected not by the wage of the employee but the quality of the employee. Experienced staff directly impacts the cost per pig.

Asset utilization

Pork production is very asset intensive and it is crucial to insure every asset is being used to its maximum capability. For bio-security purposes it is common in North America to operate three site hog production. While this nurtures a healthy barn environment it lowers utilization of barn assets. There is the additional expense of washing time in nursery and finisher barns and unutilized space in the finish barn during the period of marketing. We estimate that 12-15% of hog production assets are underutilized. Processing facilities are being underutilized if they function only during a single shift, even with down time for cleanup and repairs a processing plant can be in operation for 16 hours a day.

Conclusion

Competitive advantages - Canada vs. US

Category	Superior Canada	Superior USA	Advantage
Hog Production			
Sow production	X		Productivity and health
Grow finish		X	Facility costs, asset utilization, bigger pigs
Grow finish	X		Feed, health
Genetic	–	–	Neutral
Processing			
Labour		X	Hispanic work force
Labour	X		Canadian immigration policy
Asset utilization		X	More double shifts
Economies of scale		X	Bigger plants
Customer focus	X		Smaller plants; able to provide customized product
Marketing			
Market access		X	Larger domestic market
Market access	X		Strong international reputation
Transportation		X	Box cars, larger world consumer

WHJ

Global price and production forecast

Dr. Ron Plain

The main driving forces of pork industry profitability are oil prices, biofuels policy and the economy, suggests Dr. Ron Plain, Professor of Agricultural Economics at the University of Missouri-Columbia. A strong economy led to high gasoline prices, high ethanol prices, high corn prices and red ink for the hog industry, but now a weak economy is doing the same in reverse, he says. While the average hog price for 2008 was $2.60/cwt above the 13-year average, production cost was $13.85 above the 13-year average. With ethanol production underpinning the price of corn, hog prices must find a new equilibrium. Over time, the price of a commodity must equal the cost of production, Plain points out. Forecasts of a 1.6% reduction in pork production in the USA suggest that prices will rise to new levels, however a reduction in domestic demand fuelled by the recession mean that prices in 2009 and 2010 may not be as high as producers would like

Feed prices

Other than the price of hogs, the single most important commodity price for pork producers is corn. Historically, corn prices have been driven mostly by weather-related yield fluctuations and demand from livestock for feed. The ethanol industry has now linked corn prices to gasoline prices. Corn prices have been on a roller coaster ride for the last 48 months. Omaha, Nebraska corn prices were under $2/bushel in early September 2006. Corn was under $3/bushel in early October 2007, but above $7/bushel in late June and early July 2008. Yet, by mid October, corn was back under $4/bushel in Omaha. Ethanol prices have become the key driver of corn prices (Figure 1).

The rapidly expanding ethanol industry has more than doubled corn prices and driven up the cost of producing slaughter hogs by 50%. The

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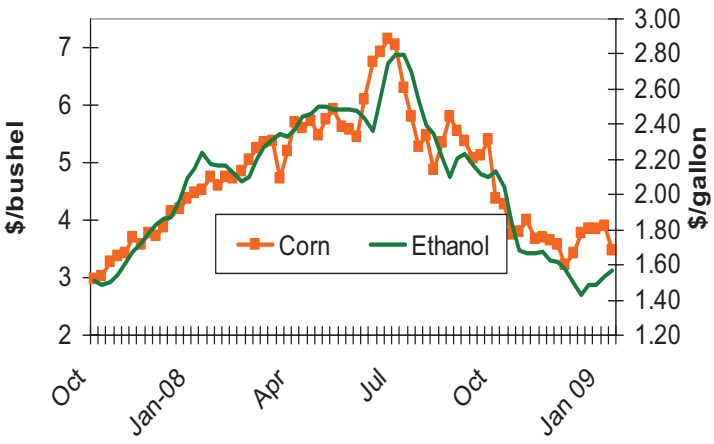
Figure 1: Weekly corn and ethanol prices 2007-9



era of $40/cwt breakevens for U.S. hogs has been replaced by $60/cwt cost of production. If crude oil prices stay well under $100/barrel, then ethanol prices should stay low enough to keep corn under $5 per bushel. The breakeven price for US slaughter hogs in 2009 is likely to average close to 55 cents per pound of live weight or 72 cents per pound of carcass. Because of high feed costs, market weights for slaughter hogs have been lower than last year causing the 2008 increase in pork production to be slightly smaller than the increase in hog slaughter. Hog slaughter weights in 2009 should be slightly higher than 2008's level.

Exchange rates

Since international trade in both pork and live hogs is extremely important to US and Canadian producers, what happens to exchange rates has a major impact on profitability. In 2007-8 the strong Canadian dollar devalued hog and pork exports and created a hardship for Canadian producers. Conversely, the weak US dollar has been beneficial for US producers. In late 2008, the US dollar was very weak relative to the Japanese Yen. Historically, a strong Yen has been good for US pork exports.

International trade

Both the US and Canada hold very strong positions in world pork trade. The US is the world's largest pork exporter followed by the 27-member European Union, then Canada and Brazil. Over the last five years, US pork exports have increased by 200%, EU exports are up 23%, Canadian exports have increased by 10% and Brazil has increased its pork exports by 12%.

Pork trade was a surprising gift to US hog producers in 2008. Although US pork exports had increased for 17 straight years, last year's exports were way up. With U.S. hog slaughter up 7% from 2007, one should have expected 2008 hog prices to be 14% or so lower than in 2007. However, 2008 US hog prices were higher than in 2007. During the first eight months of 2008, US pork imports were down 16% and pork exports were up 69%. This combination meant that although January-August pork production was up 8.8%, the supply of pork on the domestic market was down 1.4%. Because of a growing US population, per capita supply was actually down over 2%.

The year's big increase in US pork exports was due, in general, to a weak US dollar and, in particular to strong demand from China. The weak dollar has made US pork prices very competitive with other exporting countries. US pork exports were a billion pounds higher during the first half of 2008 than the same six months last year. Half of the increase in pork exports went to China or Hong Kong. Both Russia and Japan bought over 100 million pounds more US pork in the first half of 2008 than during the same period in 2007.

Based on preliminary data for 2008, it appears the US exported about 22% of its pork production.

USDA estimates 2008 Canadian pork production at 1.845 million metric tons (carcass weight equivalent) of which 1.075 million (58.3%) was exported. USDA estimates 2009 Canadian pork production at 1.77 million metric tons (carcass weight equivalent) of which 1.08 million (61.0%) will be exported. Currency exchange rates are difficult to predict but will have a big influence on exports.

The US imported a record 10 million Canadian hogs in 2007. Roughly two-thirds were feeder pigs and one-third were slaughter hogs. Imports of Canadian hogs started 2008 strong, but dropped rapidly, especially slaughter hog imports. It appears that 2008 imports from Canada were close to 9 million head of hogs and pigs. I expect 2009 shipments of live hogs to the US to be close to 8 million head.

USDA estimates the 2008 Canadian pig crop at 30 million head with 9.07 million (30.23%) exported. USDA estimates the 2009 Canadian pig crop at 29 million head with 7.8 million (26.90%) exported.

Inventory surveys

The reduction in the US breeding herd has begun. US sow slaughter has been consistently above year-ago levels since mid 2007. Through October, 2008 US sow slaughter was up nearly 8% compared to the same 10 months in 2007. Gilt slaughter

data collected by my colleague, Glenn Grimes, indicates fewer gilts are being retained for breeding than are needed to hold sow numbers constant.

USDA's Hogs and Pigs report indicates the swine breeding herd on September 1 was 2.6% below year-earlier levels. The Canadian sow herd was 8.1% below year-earlier levels on October 1, 2008. The combined data on US and Canadian farrowing intentions indicate that third quarter litters farrowed were 2.0% below last year (down 1.8% in the US and down 3.0% in Canada) and fourth quarter 2008 farrowings were 6.0% lower than a year earlier (down 5.5% in the US and down 8.0% in Canada). However, given the trend to larger litter size, the decline in the pig crop will be significantly smaller than the decline in litters farrowed.

Pork demand

Last year was not a good one for domestic pork demand in the US. Both deflated retail pork prices and per capita pork consumption were lower than in 2007. My 2008 pork demand index was down nearly 4% compared to the year before. Domestic pork demand is expected to stay weak for a while. Slow economic growth and high energy prices have left U.S. consumers with fewer dollars to buy food. Declining oil prices are good news for the economy, consumers and pork producers.

USDA is forecasting an across the board decline in meat production next year. They expect 2009 pork production to be down 1.6%, beef production to be down 0.2%, broiler production to be off 1.1%, and turkey production to be 2.4% lower than in 2008. If this happens, it will be the first year since 1973 that production of each of these four meats has been down.

Forecast for 2009

USDA's Foreign Ag Service in October forecast that world pork production in 2009 will be 1.2% higher than in 2008 with China increasing their production by 3.2% and the rest of the world reducing production by 0.5%. The European Union, United States and Canada are expected to account for most of the reduction.

My forecast for 2009 has a slightly larger cutback in US pork production and a slightly smaller cutback in Canada. Canada will produce fewer pigs in 2009, but I expect this to have a bigger impact on live hog exports than on domestic hog slaughter.

With reduced hog slaughter, 2009 hog prices should be higher than in 2008. However, if the weakness in the world's economy leads to a sharp decline in meat demand, then price improvement may not be as high as previously forecast (Table 1).

Table 1. Forecasted US and Canadian prices

Year	Qtr	Iowa barrow & gilt prices US $/cwt carcass wt.	Index 100 hog prices C$/cwt-dressed Manitoba
2008	1	52.49	45.09
2008	2	70.43	59.76
2008	3	75.67	66.86
2008	4	55.60	50.00
2008	**Year**	**63.58**	**55.43**
2009	1*	54 - 59	50 - 54
2009	2*	65 - 70	63 - 67
2009	3*	71 - 76	66 - 70
2009	4*	56- 61	54 - 59
2009	**Year***	**61 - 66**	**59 - 63**

*forecast

Conclusion

Financial losses, due in large part to high feed prices, have caused both US and Canadian hog producers to reduce the number of litters they are producing. This has led to an expected 2.5% decline in combined US and Canadian hog slaughter during 2009. Reduced hog slaughter should lift 2009 hog prices closer to breakeven levels. The biggest uncertainty is the impact on meat demand of the developing global economic recession. ≡WHJ≡

Hedging for profit

Presented by Ben Woolley and Daniel Bluntzer
Summarized by Cara Dary, Alberta Pork

What is hedging?

Hedging is a method of mitigating cost fluctuations (input and output costs) by locking into a potential future price. It is designed to minimize a producer's exposure to risks such as sharp contraction in demand for ones inventory while still allowing the business to profit from producing and maintaining that inventory (Wikipedia).

The strategy

The goal of hedging is to mitigate costs and give the hedger an 'edge' by attempting to buy low and sell high; this can be achieved through playing the commodity market. Purchase your raw materials at the lowest price possible and try to sell your finished product at the highest price possible. All of this must be done in an environment where prices rise and fall on an hourly basis.

Ben Woolley recommends spreading the risk by watching the price of all ingredients and locking in prices whenever possible. Do not hedge 100% on any given day, spread your risk. Be sure to watch the price of 'other' ingredients such as your micro ingredients. Put micros out to bid every six months or so.

Keep up to date with market conditions / cost fluctuations and the various cycles that they move through. You may consider hiring a broker to monitor this for you. Be aware of external influence factors on market conditions such as the price of oil.

Approaches for hedgers

Daniel Bluntzer from Frontier Risk Management gives some tips on marketing approaches for hedgers:

- There is no right or wrong way to hedge – there is only profit and loss
- Keep in mind that you will sell too early and buy too late and vice versa
- The goal is to make the best decision at the time and concentrate on the overall profit and loss

The order of importance in hedging is to:

1. Stay in business
2. Minimize downside (losses)
3. Maximize upside (profits)

A marketing approach for hedgers

- Have a line of credit (there will be losses at times, a line of credit will allow you to continue hedging)
- Margin calls are 'routine' and simply a part of doing business
- Understand where the market is historically, cyclically, seasonally and economically
- Organize your information sources
- Develop an overall style and game plan
- Have an exit strategy (this should be based on accomplishment of goals, changes in information, changes in overall game plan)

The exit strategy

Bluntzer talks of the importance of exit strategies: every producer involved in hedging must have an exit strategy. The strategy should be based on: accomplishments, changes in information, and changes in overall game plan. Exit strategy game plans should be firmly implemented and should not be based on emotion (fear or greed), concern about missing the top or bottom or the risk of margin calls.

Responsibilities

In general, the hedging management team should agree on a game plan to avoid second guessing. Develop a plan and stick to it. The best time to analyze performance and 'think' is after trading hours, this will prevent you from making emotional or rushed decisions.

Both the hedger and a broker can have a role in the strategy. The hedger must decide on a strategy and make the decisions while the broker is there for advice and placing orders.

Hedging is not about bragging rights at the local coffee shop, you are not guaranteed to hit the highs or the lows but in trying to do so, what you will do is mitigate your risk.

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COOL vs. 'Choose Canadian'

Presented by Ron Plain and Roy Kruse
Summarized by Jodi Hesse, Alberta Pork

Dr. Ron Plain

The widespread publicity surrounding recent food safety breaches, like the presence of melamine in food products originating from China, has increased consumer awareness about food safety and has raised concerns over imported foods. In turn, the demand for locally produced foods is rising and consumers are asking for the ability to identify where their food is produced from.

To enable the consumer to differentiate home grown products from imports, two different strategies can be examined to differentiate locally produced meats from imported meats. Dr. Ron Plain, University of Missouri-Columbia and Roy Kruse, Manager of Pork Marketing Canada (PMC) presented both of these strategies at the 2009 Banff Pork Seminar: COOL vs 'Choose Canadian.' Country of Origin Labelling (COOL) is a US mandatory product labelling program implemented through regulations where as the 'Choose Canadian' program allows retailers to participate in a voluntary labelling program.

The 2002 Farm Bill introduced a controversial provision mandating COOL for red meats, fish, shellfish, peanuts, and perishable agricultural commodities. This labelling law applies to U.S. retailers, covered under the *Perishable Agricultural Commodities Act,* and requires retailers to provide country of origin information for the covered commodities. With Congress delaying the implementation until September 30, 2008, significant changes were made to COOL in the 2008 U.S. Farm Bill. One amendment includes the expansion of the definition of covered commodities to include "muscle cuts" of beef, lamb, chicken, goat, and pork, as well as ground beef, ground lamb, ground chicken, ground goat, and ground pork.

Because mandatory COOL is limited to retail sales, products sold at foodservice establishments are exempt. Thus, meat products sold at restaurants or other food service institutions need not bear COOL. The law also exempts from COOL a product, that otherwise would be subject to labelling, if it "is an ingredient in a processed food item." The rule treats all cooked items (e.g., cooked sausages, cooked roast beef) and breaded products (breaded veal) as processed food items; therefore, they are not subject to COOL. Also exempt are products that have been cured, smoked, or restructured (e.g., emulsified, extruded, compressed into blocks and cut into portions). Thus, sausages (cooked or fresh), meatballs in tomato sauce, breaded veal, teriyaki flavoured pork tenderloin, smoked ham, fabricated steak, corned beef, etc. are not classified as covered commodities.

The four label categories within COOL are: US origin only; multiple countries of origin; imported for direct slaughter; and imported meat. A product may bear the US only declaration if the meat is from animals born, raised and slaughtered in the US. Meat from animals born in more than one country should list each country plus any others where it is processed such as Product of the United States and Country X. If imported directly for slaughter, the label shall list the countries where the animal was imported from first, thus Product of Country X and the United States. Imported meat will list only the country that produced the product.

The Farm Bill prohibits the US Department of Agriculture from implementing a mandatory identification system to verify the country of origin; therefore, retailers will have to rely on industry tracking systems for verification. Producers are required to make information available to the buyer (ie processor) about the country(s) of origin including business records, national animal identification system, import certificate and a producer affidavit statement. All records are to be kept for one year past date of retail sale. The cost of tracking and verifying may be costly to the producer.

COOL requirements are still under debate even as Dr. Plain presented to the audience in Banff. Although the US Department of Agriculture issued the final rule for COOL on January 15, 2009, with implementation scheduled to begin 60 days later, the Obama government requested agency heads to consider extending for 60 days the effective date of regulations which have been published in the Federal Register but have not yet taken effect. This request included COOL and allowed for another review of the law, policy and regulations. Agencies were additionally directed to immediately reopen the notice and comment period for 30 days as well.

Originally, COOL was pushed by some US livestock producers who felt that this type of law would enhance the price of US livestock due to consumer's preference to buy local. However, COOL has become a consumer issue especially with the heightened awareness around food safety standards of imported food products following the melamine scares.

Consequently, consumer interests largely have taken control of COOL away from agricultural groups.

COOL benefits will vary as some consumers don't care about product origin and some care a great deal. Although most US consumers have no objection to Canadian meat, the minority who want US only may determine the outcome. Dr. Plain predicts that fewer Canadian hogs and more Canadian pork will be coming south in the future as it appears that US packers are moving towards the US only label as it is the easiest option to implement.

So where does that leave Canadian pork? Roy Kruse, Manager of Pork marketing Canada (PMC), explains that the 'Choose Canadian' program was created to target the domestic Canadian market and give consumers the opportunity to make a choice. The new label is currently featured on fresh pork products at participating grocery stores across Canada.

Provincial pork organizations, through PMC, have worked together to create a consumer awareness program encouraging Canadians to support domestic pork farmers and the Canadian economy by buying Canadian pork. The voluntary program is available to all retailers and processors, but primarily targets large retailers whose pork supply comes from across Canada.

According to the consumer surveys, if given the choice, Canadian consumers will choose Canadian products over

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COOL VS. 'CHOOSE CANADIAN' CONTINUED

imports as they feel that Canada has better production practices and standards with more rules and regulations than other countries. The 'Choose Canadian' labels clearly identify fresh pork produced in Canada, providing consumers with peace of mind and confidence.

Besides meeting a consumer need, supporting local pork production makes a significant contribution to the nation's trade balance. The pork industry's 2007 farm gate income totalled $3.32 billion and estimates show this accounted for 100,000 jobs.

The Canadian live pig exports in 2008 were 9.1 million head; this was negatively impacted by COOL. Canadian imports of US pork amount to over 20 percent of Canadian consumption. With the label now in use at participating grocery stores across Canada, if consumers can't find fresh pork with the 'Choose Canadian' label, they are urged to ask the meat manager or butcher where the pork is coming from.

Whereas the mandatory COOL program demands compliance, PMC's approach is voluntary and has developed a print and television consumer awareness campaign to promote fresh pork to consumers, driving the consumer to look for the 'Choose Canadian' label.

It is still too early to tell the ultimate results of either COOL or 'Choose Canadian' campaign. The Canadian pork industry is carefully monitoring both programs and specifically the

Roy Kruse

impact of COOL on Canadian producers. Overall, the effects of COOL in Canada will depend on how US packers, retailers and consumers respond to this new labelling law and how Canadian consumers respond to the 'Choose Canadian' campaign.

To measure the consumer response to the 'Choose Canadian' program, the national firm Ipsos Forward Research has been commissioned. Three waves of research will be conducted and are designed to measure the campaign effectiveness with the goal assisting pork organizations to better meet consumer needs. To achieve this,

research is conducted: prior to the launch of the campaign to form a baseline/control for comparison; mid way through the campaign; and at the conclusion of the campaign in spring of 2009.

Preliminary research shows that more than half of Canadian consumers "always" or "often" look for the country of origin when shopping for pork, beef or chicken. Among those consumers who regularly looked for country of origin for pork, 72 percent said they have actively done so for more than one year. When it comes to consumption, pork was included in approximately 22 percent of meals including meat and meals prepared at home. Pork ranked third behind chicken (33 percent) and beef (31 percent) but significantly ahead of other meats such as turkey, veal and lamb.

Pork in the store with the Canadian Pork label

The fundamental efforts to brand Canadian pork in the domestic market voluntarily can become a permanent effort, like the US COOL law. In fact, the 'Choose Canadian' program is an integral part of PMC's business plan as an industry-driven initiative. Partnerships will be key in this and the fact that pork organizations are working together to streamline and enhance their efforts a major factor of success.

Both mandatory COOL and the voluntary 'Choose Canadian' program offer the consumer a choice by differentiating product based on country of origin. Potential niche markets for certain meats may pose benefits as consumers may find they prefer to buy Canadian labelled pork even at US retail locations. Time will tell.

≡WHJ≡

Equipping your staff for the next cycle

Summarized by Marvin Salomons

Attracting and retaining labour is a continual struggle in the agri-food industry and especially in the pork sector where jobs are not easy to fill and workers are often attracted away to easier, higher-paying work. The pork production sector has been proactive in dealing with the issues and is now recognized as a leading industry in promoting its pork technician and barn manager jobs as attractive and rewarding career options.

A major part in solving labour shortages at the farm level has been targeting skilled foreign workers from all parts of the globe. The pork industry advocates Canada's pork industry as a great opportunity to work and a potentially great place to live. This breakout session highlighted the experiences foreign workers and pig production employers had in the overall process of recruitment and settlement into a job as well as into the community. Participants heard first-hand about the challenges from a company human resource specialist and from new foreign workers. Speakers talked about how the experience could be improved for both the worker and the employer.

Success starts with best practices in recruitment

Carol Martens, Human Resources Manager for Hytek Ltd based out of La Broquerie, Manitoba, opened the breakout session expounding on the successes her company has achieved in recruiting and retaining staff. Martens, who worked her way from Hytek's barns to the front office over the last eighteen years, is currently responsible for over 500 of Hytek's employees working in transportation, barns, offices and feed mills. Her career path with Hytek enabled her to speak about recruitment and retention from someone who has been an employee, a manager and an employer.

Martens says that over the years Hytek has come to understand the recruiting obstacles. Worker shortages, workers leaving for higher paying jobs in other industries and difficulties in finding experienced people are all contributors to the problem. She says that employees need to hear about your company's job opportunities and that the work is not "just a job" but can be a rewarding career choice. Finding good people has Martens using every media outlet available. Word of mouth has been her best resource where eighty percent of the contacts come, but attention-getting tactics for radio and newspaper ads, Internet ads, job fairs, etc are also used to grab the attention of job seekers. Detailed job descriptions are standard and new recruits are told at the outset that they will have opportunities for advancement in all areas of the company.

Martens is a strong believer in 'teamwork" and has worked with Hytek employees to develop the company's vision, core values and mission statement which she says is posted at every worksite. "We do what we say and say what we do and this keeps our staff happy and outsiders eager to join our team". Hytek has also implemented a foreign recruitment program to bring in needed workers. Using Manitoba's "Employer Direct Provincial Nominee Program" Martens has been able to bring in skilled foreign workers often with families who become part of the company's team and future. "We are proud of our employees and we highlight everyone on our wall of fame" (see Figure 1). Martens knows this

Figure 1: Hytek's "Wall of Fame" where every employee's picture gets posted.

appeals to new hires who see a career where they are supported and part of a team environment.

Retention is the other half of the battle

Retaining employees is often as difficult as recruiting. There are many reasons people leave a job but it may not always be due to finding a better job down the road. Employees who feel undervalued, see no chance for advancement, have unclear performance goals or find the job is not what they expected will often leave the job sooner or later. Martens ensures her job advertisements are detailed and honest. "It's critical that recruits know what the job is and what is expected. Doing it that way ensures there are no surprises for the employee or the company." New hires are given guided tours before beginning a new job and told to take time at home before accepting the position. Martens gets her new staff to shadow her trainers in the barn who get the new hires exposed to all the required daily tasks "including the crappy jobs". Workers need to understand what the whole job is about.

Martens says it is important not to micro-manage unless performance issues arise. Hytek provides employee handbooks with detailed instruction applicable to the department the worker is placed in. Opportunities for training (such as language or supervisor courses) are important as well as having scheduled performance reviews. Performance reviews provide clarity to the employee as well as the company. Marten's company tries firstly to promote from within but always considers the dynamics of the team when advancing an insider or bringing in an outsider.

Wages and benefits can play a big role in recruitment and retention. Although it is rarely about the money Martens says it can be about the money. She strives to be competitive within the industry and community by providing wages and benefit packages at par or better. It is important to build on the perks and benefits and by putting employees first has made her company successful at recruiting and retaining its workers.

Challenges faced by foreign workers

Employers finding it difficult to hire low-skilled or skilled employees locally have turned to recruiting candidates from foreign countries. In Alberta many of the pork production operations have worked individually or in partnership with government and their associations to bring in barn workers and managers from various source countries such as the Philippines, Mexico, Germany, Netherlands, Denmark, UK and Russia. On many Alberta farms foreign workers now make up over half of the staff.

For many foreign workers the pork industry in western Canada is viewed as a great opportunity to build a career as well as earn more than they could staying in their home country. Coming to a job on a hog farm in rural Canada may sound like a dream come true but it is often faced with some real challenges. Two other presenters in this breakout session were swine industry foreign workers who highlighted the challenges they faced as they uprooted themselves from overseas locations and moved to rural Alberta farms. Thomas Jacob from Germany and Vitaly Sergeev from Russia had built their swine experience working on European farms and in industry jobs but both yearned for the opportunity to work overseas to gain new experiences. Sergeev scanned the internet while Jacob networked to find a job. Both quickly landed jobs in Alberta, Jacob managing Sunterra's boar stud unit while Sergeev got work as a farrowing technician in Alberta Pig Company's (APC) Poundmaker unit. Although excited about the job prospects, both young men left familiar surroundings that provided services close-by to areas in rural Alberta where they would soon face some challenges.

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Finding the job was the easiest part say both Jacob and Sergeev. Their new employers were experienced in recruiting foreign workers and assisted them in submitting the labour market opinions, job contracts, and other documents needed to get their required work permits. The permitting process took one and a half to two months with Jacob applying through the Canada Embassy in Berlin while Sergeev's documents were approved by the Embassy in Moscow. Both workers had different experiences getting approvals, noting employers recruiting foreign workers need to be aware of differences in processes depending on the originating country and Embassy used.

One of the first issues for Sergeev was coming up with cash to buy his plane ticket to Alberta. This is a challenge faced by many foreign workers who often don't make or save enough money in their home country and perhaps are too shy to ask for a salary advance. In Sergeev's case, APC stepped up to the plate and loaned him the money so he could quickly get on the job.

Once in Alberta the new foreign workers found they faced other challenges. These included finding affordable accommodation, opening up a bank account and getting a Canadian driver's license. Again, both employers assisted in lining up accommodation, getting health care coverage, social insurance numbers, bank accounts, mail service and other necessities. As Alberta has a reciprocal agreement with Germany, Jacob had no problem getting an Alberta driver's license. Having never owned a car or had a license Sergeev was not as lucky and had to settle for a learner's driving permit. "The lack of credit history," Sergeev said "prevents workers from getting housing or even car loans." For both the lack of a car proved to be a problem because getting to the job and shopping in rural Alberta was not easy. Both workers cautioned employers to make sure the workers being recruited are aware of driving license requirements and the impact of not having accessible transportation in rural areas. Workers should be encouraged to get an international driver's license and collect all previous driving record details while they wait for their work permit approvals.

Both Sergeev and Jacob knew about weather conditions in rural Alberta and had mentally prepared themselves. Once in Alberta they adapted readily by getting involved in winter sport activities, a strategy they would encourage others to do. Still, both were not totally prepared for the travelling distances to get essential services such as doctors, dentists and shopping and found these were some of the major issues where they had to seek the help of their new employers. Keeping in touch with family and friends back home is important and although email can be limited or even expensive, high speed internet access is not always available in rural Alberta. To keep in touch with his family back home Sergeev found the local library to be useful in providing free internet access. Other affordable means of communications he recommends are getting workers long distance calling cards, getting them into affordable long distance landline plans, or getting them familiar with "Skype" using high speed internet.

Both Jacob and Sergeev experienced no significant cultural issues but encouraged employers who hire foreign workers to look at language training programs which are often available right in the local community. Without the help of employers the transition into a new job on a farm in Western Canada can be hard. If foreign workers are not comfortable on the job or in their new home they may not stay. Recruitment is only one part of the process of getting a foreign worker. Paying attention to the settlement of the worker into the new job and community will ensure that worker feels comfortable with you and energetic about what they have agreed to do. Retaining that worker as a key part of your future workforce depends on how well and how soon they feel this is their home.

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Reducing sow feed costs

Dr. Ron Ball (right) and Andrew Jackson, the two speakers in the session

There is potential to significantly reduce the cost of sow feeding, say University of Alberta researchers Soenke Moehn, Crystal Levesque, Ryan Samuel and Ron Ball. However, they suggest, current nutrient recommendations need improvement. Phase feeding, using separate diets for early/mid gestation and late gestation, may save up to $5.00 per sow per gestation. Using a single diet for gestation, but feeding it at a higher level in late gestation, may save up to $3.00 per sow per gestation. During late gestation and lactation, addition of free amino acids can reduce feed cost. These improvements may also increase sow productivity and increase sow longevity.

Gestation feeding

Current recommendations for nutrient and energy intake involve feeding the same amount throughout gestation. However, practical experience has shown that feed and nutrient intake must be increased during late gestation to maintain performance and sow longevity. Increasing nutrient intake in late gestation allows sows to maintain and improve their body condition prior to farrowing, while meeting the needs of the growing fetuses.

Applying a single phase feeding program will lead to overfeeding during early gestation and underfeeding during late gestation. Overfeeding in early gestation results in a waste of feed and money, while underfeeding in late gestation leads to sows entering lactation in a catabolic state.

Amino acid requirements for sows

Recent German recommendations (GfE) suggest that amino acid requirements in late gestation are greater than in early gestation. They proposed a change of diets on day 85 of gestation to accommodate the greater amino acid requirement caused by increased fetal growth. Estimates of threonine requirements for early, mid and late gestation have been made by the U of A researchers and these are similar for early and mid-gestation to the GfE figures but are markedly lower than NRC recommendations. However, the threonine intake required for maximum protein synthesis in late gestation is more than double that required during early gestation, and considerably exceeds the recommendation of both NRC and GfE. A large degree of uncertainty exists in the magnitude of amino acid requirements and the optimal ratios among the amino acids.

Dietary amino acid availability for sows

It has been shown that the standardized ileal digestibility of lysine and threonine in corn and soybean meal is significantly greater for gestating sows than for growing pigs. Using the correct digestibility values for gestating sows will lead to cheaper gestation diets and must be known to accurately formulate diets using our new requirement values. For example, if the amino acid digestibility of common ingredients is about 5% greater for sows than for growing-finishing pigs this would reduce diet cost by approximately $1.00/tonne.

Energy requirements during gestation and lactation

Similar to amino acids, energy requirement during gestation can be expected to increase as pregnancy progresses, predominantly because of the exponential growth of fetuses.

Recent work at the U of A (Samuel et al. 2008a) has calculated daily energy requirements, as shown in Table 1 and compared to NRC (1998) and GfE (2008) recommendations.

Table 1: Estimated energy requirements[1] of gestating sows according to NRC (1998), GfE (2008) and Samuel et al. (2008a,b).

	NRC (1998)		GfE (2008)		Samuel et al. (2008a,b)	
	MJ ME/d	Feed kg/d[2]	MJ ME/d	Feed kg/d[2]	MJ ME/d[3]	Feed kg/d[2]
Early gestation (day 1 to 85)	36.2	2.63	32.0	2.32	31.0	2.25
Late gestation (day 85 to 115)	36.2	2.63	40.0	2.90	38.5	2.79
Mean for gestation	36.2	2.63	33.8	2.45	33.0	2.39

[1] based on second parity sow: 185 kg body weight at service, expected litter size: 13 piglets, 40 kg maternal gain

[2] corn-soy diet (13.8 MJ ME/kg)

[3] calculated as (heat production − maintenance energy)/0.3 + maintenance energy. Maintenance energy was estimated as 507 kJ/kg$^{0.75}$ maternal body weight, 0.3 denotes the heat associated with energy deposition (1 − efficiency of energy utilization of 0.70)

A greater total amount of feed is needed according to NRC compared to Samuel et al, (2008a,b) and GfE (2008) because of the unnecessary overfeeding in early and mid gestation. Feeding according to NRC results in the excess nutrient intake being deposited as body fat and protein, and then mobilized in late gestation when energy and protein intake is insufficient, which is energetically inefficient. Feeding sows according to their changing energy needs in gestation can save at least 20 kg of feed per sow per gestation, or $5.00 at a diet cost of $250/tonne. Assuming 2.5 gestation cycles per year – this is a saving of $12.50 per sow per year.

A further benefit of increased feed allowance during late gestation is to reduce backfat loss during lactation reducing the need for additional feed in the next pregnancy.

Dietary net energy for sows

Net Energy (NE) in feedstuffs and complete diets for sows can be extrapolated from NE values for growing pigs, which have been used to derive almost all the data on nutrient digestibility.

Correction factors range from 1 to 5% higher than for growing pigs. Better NE data will allow more accurate formulation according to the sow's needs in gestation this will lead to a reduction in feed allowance of 2% and will amount to approximately 5 kg during gestation, or $1.25 per sow at a cost of $250/tonne.

A new sow feeding program

The above information has been used to develop a revised feeding program for gestating sows:

- Lower energy and lower protein intake for early gestation from day 1 to 84
- Higher energy and higher protein diet for late gestation from day 85 to 112

Implementing a phase feeding strategy is calculated to reduce feed cost/sow for both corn/soy and barley/canola-based diets. For both types of diet, the phase feeding strategies lead to reduced diet cost and feed allowance in early and mid gestation, but increased feed allowance and feed cost in late gestation. Phase feeding can be expected to save as much as $5.00 per sow per gestation. Even where it is not practically possible to feed two different diets, phase feeding with a single diet and feeding less in early/mid gestation may still save $2 to $3 compared to feeding according to the NRC recommendations.

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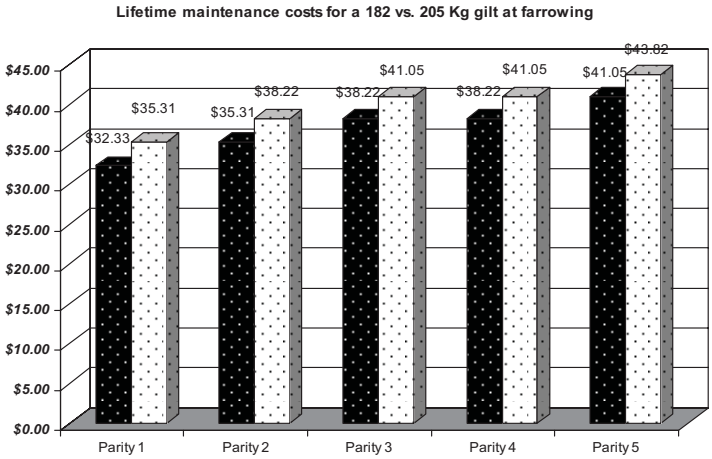
PRACTICAL CONTROL OF SOW FEED COSTS

Many aspects of practical management of the gilt and sow on farm have an impact on feed efficiency and attention to these can help to control sow feed costs, says Andrew Jackson, with PIC. Breeding gilts at 240 days rather than 210 days can cost up to $24 per gilt extra or nearly 50 cents per pig produced over the sow's lifetime, he points out. Also, heavier gilts incur higher body maintenance costs over their productive lifetime. Correct feeding in gestation is vital, he stresses, because it has such a big effect on productivity, so it is worth employing a feed budget to monitor and control feed intake. He gives some practical suggestions as to how best to control sow feed usage while maximizing productivity.

Gilt development

Preparing the gilt for first service is critical to her lifetime performance and there are many studies that provide us with guidance in terms of targets for age, weight and back-fat at first service. From a feed usage perspective we can calculate the cost of not hitting these targets in respect to days on farm before first service. For example first service at 240 rather than 210 days of age requires 30 days more feed which can easily cost $24 a gilt (feed price of $266/tonne and 3kg/day consumption) or (with 55 piglets per sow lifetime) $0.43 a piglet in feed costs. So, it is important to know what your breeding company recommends, to know what you are achieving and to minimize the potential empty days. We have to consider isolation and acclimatization of incoming gilts all in the context of growth rate and hitting those first breeding target windows.

Figure 1: 1Lifetime maintenance costs for a 182 vs. 205 kg gilt at farrowing



Weight at first mating

We also need to consider the impact of weight at breeding on lifetime feed costs per sow because breeding a gilt too heavy can impact feed usage for the rest of her life. It is estimated that for each 23kg of extra weight at first breeding an additional 0.15kg

of feed is needed per day in gestation (Figure 1). On a lifetime basis of 6 gestations and $266/tonne of feed that is an additional $27.77 per sow or $0.50 per piglet produced at 55 piglets per sow lifetime.

Gestation feed usage

On many farms, gestation feed management is a neglected task that is often done in a haphazard way. Both over and under feeding the sow in gestation are likely to lead to lower lactation feed intake and lower weaning weights, higher pre-wean mortality, poorer reproductive performance and higher sow mortality. Therefore, getting it right is essential if we are to manage feed intake and achieve good productivity.

We know that back-fat at farrowing influences both lactation feed intake and subsequent total born such that we can aim at some specific targets for a sow about to farrow. The objectives of gestation feed management are to help us achieve those farrowing goals with the lowest possible use of feed in gestation. We might consider the following:

a) The goal of an effective gestation feeding program is to have 85%-90% of the gestating sows in "normal" condition by week 5 of gestation. "Normal" needs to be defined to some extent by genotype but your breeding stock supplier should know the targets for their stock. Let us assume here that normal is a body score of 2.5-3.5 and between 14 and 16mm of P2 back-fat.
b) We need to avoid fat sows because of the impact on feed intake in lactation
c) We should be able to set a goal for annual gestation diet usage depending on the lactation length of the farm and nutritional content of the diet. This will provide us with a whole farm feed budget.

We then need to establish a process that allows us to manage the individual sows to our targets. Body condition scoring is still the most widely used method but taping, weighing and/or back-fat measurements can also be used. Whatever the system, it needs to be easy, reliable and clearly defined. Starting seven days post-service, the body condition should be reviewed about every five weeks and feed levels altered where necessary. We can use individual sow cards to monitor individual feed intake and the changes applied at condition scoring and also use total usage of gestation feed and lactation feed as an indication of correct usage.

Table 1 shows a feed budget for gestation and lacatation. Lactation feed use as a percentage of gestation use can be compared to the budget on a monthly basis. A lactation percentage disappearance less than budget could mean overfeeding in gestation. Overfeeding by 50g per day in gestation equates to about 5.8kg of overfeeding per sow per gestation at $266 per tonne which is $3.70 per sow per year for each 50g overfed.

Table 1: Gestation and lactation diet usage

Avg lactation length	**15**	**17**	**19**	**21**	**23**
Days before farrowing	3	3	3	3	3
Lactation days per cycle	18	20	22	24	26
Litters per sow per year	2.5	2.5	2.5	2.5	2.5
Total days lactation/sow/year	45	50	55	60	65
Days on gestation diet	320	315	310	305	300
Total gestation usage kg/sow/year	**698**	**687**	**676**	**665**	**654**
Total days lactation/sow/year	45	50	55	60	65
Total lactation usage, kg/each lactation	88	108	131	154	180
Total lactation usage kg/sow/year	**264**	**318**	**379**	**441**	**508**
True lactation intake, kg	80	108	123	146	172
Avg daily intake, kg/day	**5.0**	**5.55**	**6.14**	**6.64**	**7.18**

We need to ask - Are we feeding what we think we are feeding? What is the density of the ration fed and are our feed boxes calibrated such that we know what weight/quantity of feed we are placing in front of the sows?

Feed boxes are designed to work at a particular angle. If they are no longer set at that correct angle a small change can impact feed levels by easily 10% per feed drop. This means that on a 1.8kg drop the inaccuracy can be as much as 180g per drop. We have already noted that 50g of overfeeding can cost about $3.70 a sow per year. A 180g over-feed would be costing $13.32 per sow! On a sow lifetime that's about $33 or approximately $0.60 a piglet produced.

We also need to consider the impact of changes to our sow ration that affect the density of the ration because drop boxes assume a volume to weight relationship. Calibration should be

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Gestation feeders should be calibrated regularly to ensure accuracy, says Andrew Jackson

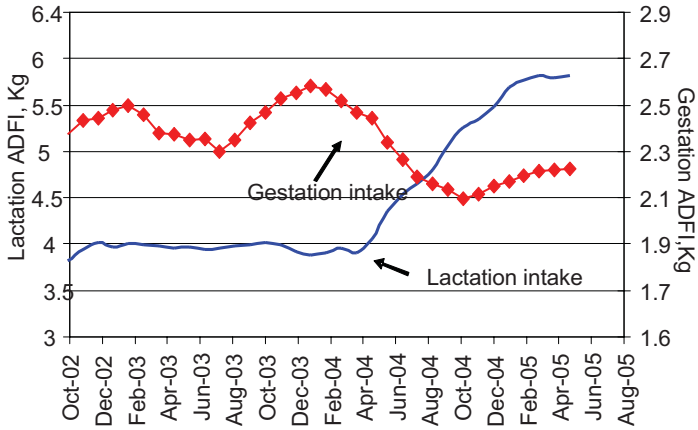
done as regularly as possible and adjustments made to feed levels are necessary.

Lactation feeding

We know that maximizing feed intake in lactation has major impacts on litter weaning weight, wean to estrus interval and subsequent litter size. Also, gestation feeding can have a direct impact on lactation feed intake (Figure 2). Our first priority must be to get gestation feeding right so we can maximize lactation feed intake.Our objective now is to maximize piglet weaning weight whilst at the same time minimizing sow weight loss during lactation. Sows that lose body mass in lactation are less likely to rebreed and have lower number born in subsequent litters. The difference between 0 and 10% weight loss can be as much as 0.12 of a piglet born in the next litter and over 2 days in wean to estrus interval.

Many other impacts on feed intake also need to be considered during lactation such as temperature, ventilation, water, feed micron size, etc. But if we have failed in gestation these factors become compounding elements to the overall problem.

Figure 2: Tracking gestation and lactation feed intake (6 month rolling average)



Take Home Messages

- Watch body condition closely
- Avoid fat and thin sows
- Calibrate feed boxes
- Maximize feed intake in lactation
- Don't forget about the environment

WHJ

Rebuilding consumer confidence

Presented by Rory McAlpine and Dr. Suzanne Duquette
Summarized by Charlotte Shipp, Alberta Pork

In August of 2008 the bacteria Listeria monocytogenes was a part of everyone's vocabulary as Maple Leaf Foods had recalled 191 processed products and suspended operations at its Bartor Road processing facility. With 20 deaths and 53 illnesses Maple Leaf's disaster was front page material for media across North America. Now, in the eyes of the consumer, Maple Leaf products would always carry the stigma of Listeria. But how did this happen? Can Maple Leaf recover? Rory McAlpine, Vice-President, Government & Industry Relations, Maple Leaf Foods Inc. talks about the Listeria recall and how it resonated with Maple Leaf and Dr. Suzanne Duquette, National Specialist, Meat Processing, Canadian Food Inspection Agency (CFIA), reviews proposed changes to Listeria Inspection Strategies.

The outbreak

On August 23, 2008 a recent death from Listeriosis was linked to processed product from Maple Leaf Foods. Maple Leaf immediately initiated a voluntary recall of the contaminated product and launched a comprehensive internal investigation. Deep sanitization of the Bartor Road facility was initiated and the search for the source of the contamination began. By September 5, the likely source of contamination was identified and food safety enhancements were implemented. On September 17, the plant reopened resuming its full production under enhanced protocols. Positive findings on October 8 temporarily suspended distribution; however, the Bartor Road plant now meets all food safety protocols and the CFIA is reducing testing requirements as testing continues to yield negative results.

The Listeria outbreak thrust Maple Leaf Foods into an intense media spotlight making headlines across North America. Ten days after the outbreak Maple Leaf had already been the centre of 408 print stories, 1,959 broadcast stories and 233 online features. By day 30, coverage had increased to 1,011 print stories, 3, 198 broadcast stories and 443 online features.

McAlpine emphasized that being prepared for a crisis is essential for its successful management. Always anticipate a crisis will happen, set-up a Recall/Crisis Preparedness Plan and engage in mock simulations to define roles, responsibilities, tools and the actions required.

Responding to the crisis

How did Maple Leaf respond to this pending crisis? McAlpine explains that Maple Leaf's approach was simple; to 'demonstrate the highest level of responsibility possible'. This meant that Maple Leaf had to: be accountable; put public health and consumer interests first; lead open and fact based communication; and, implement a decisive action plan.

"Taking accountability and putting the customer first in the ultimate test of a corporation's values", explains McAlpine. This required Maple Leaf to do what was right and be completely transparent to the media. Chief Executive Officer (CEO), Michael McCain issued an immediate public apology and commitment to fix the problem, assuring customers that Maple Leaf was prepared to put consumer interests ahead of the financial and legal interests.

It was critical that Maple Leaf have an open and fact-based communication team. Led by McCain, the team executed a 'do not over-think strategy' for all messaging. The goal was to simply use the facts to fill the information void, quickly and accurately putting the risk in context. A wide variety of mediums were used to communicate with the general public: press conferences; news releases; print and TV; YouTube; web-site; investor calls and technical briefings. At the same time, Maple Leaf also implemented an internal communications strategy to empower employees to encourage dialogue about the outbreak in their daily lives.

Immediately, Maple Leaf Foods appointed a Recall Team. This team was directly accountable for all ensuing actions and included: the CEO; Chief Financial Officer; senior business leaders; Quality Assurance/Food Safety, Communications, Regulatory and Sales Departments. Testing protocols and daily test results from the Bartor Road facility and all packaged meat plants were continually reviewed by the Recall Team. Additionally, the team mapped and tracked all daily activities to successfully put the *Listeriosis monocytogenes* outbreak under control.

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Rebuilding consumer confidence

The path forward for Maple Leaf Foods encompasses the challenge of re-building consumer confidence. The focus of Maple Leaf's recovery effort is simply answering the consumer's questions:

Is the contaminated product gone?
Has the cause been found?
Has the problem been fixed?
Are things back to normal?
How will you assure me?

To answer these questions Maple Leaf Foods has implemented a strict food safety program that is the best practice in North America. A Chief Food Safety Officer has been appointed and is establishing a Food Safety Advisory Council. Furthermore, Maple Leaf has engaged all 23,500 employees to amplify the "all clear" food safety messaging and is facilitating public education on food safety. The next course of action for Maple Leaf is advocating enhanced food safety standards across the industry.

As *Listeria* is pervasive in the environment the only control measures are through responsible risk management, not eradication. Therefore, control is achieved through "built in" risk management strategies which employ multiple approaches such as process lethality, growth inhibitors and sanitation. Maple Leaf Foods will place a greater focus effective environmental management program for *Listeria* as well.

Striving for *Listeria spp.* risk eradication is potentially dangerous. If the goal is risk eradication then environmental testing is discouraged which undercuts accountability and the need for continual improvement. Companies need to focus testing on all *Listeria* species not just *Listeria monocytogenes.* Testing for *Listeria monocytogenes* is only necessary where a health risk assessment suggests product contamination and real human health risk. Maple Leaf Foods has incorporated these notions into its revised food safety protocols. As positive results allow potential sources of contamination to be found and solved, Maple Leaf Food is fostering a corporate culture of 'celebrating positive results'.

Maple Leaf's Listeria outbreak has clearly shown that the future of food-safety standards in Canada must be raised to a higher standard. Government of Canada is charged with establishing a balance between standard setting, program audit and inspection while accommodating science and commercial behaviour. Dr. Suzanne Duquette outlines the CFIA's proposed changes to the existing Listeria Inspection strategies.

The proposed changes centre on testing requirements for Food Contact Surfaces (FCS) and non-FCS as follows:

Operator environmental sampling

Processing facilities will be subject to mandatory testing of FCS with the CFIA strongly recommending that facilities additionally test non-FCS. Testing can be for *Listeria spp.* or *Listeria monocytogenes* and is to be completed at specific minimum frequencies for all FCS.

Risk-based sampling of the product

Establishment of a risk-based sampling and analysis has also been proposed for all federally registered establishments producing post-lethality exposed Ready To Eat (RTE) meat products. CFIA emphasized that it is important to conduct trend analysis on these results to ensure any patterns or potential sources of contamination are detected.

Mandatory operator notification of CFIA

In the event of a positive test result, the CFIA must be notified by the operator. Notification should occur through the plant's Inspector in Charge (IIC) and all results must be made available to the IIC. Additionally, in the event of unsatisfactory results for a product or FCS the IIC must again be notified.

Regulatory environmental sampling

For 2009-2010 testing frequency will be adjusted to 6 times per year, per establishment. Only FCS will be tested at this frequency for *Listeria monocytogenes.* Additionally, environmental sampling will be completed on the same day and the same line that the product sample is collected from.

Regulatory product sampling

Also proposed, is that the frequency of product sampling be increased to 6 times per year, per establishment. Product testing must be completed for *E. coli, Salmonella, Staphylococcus aureus* and *Listeria monocytogenes.*

Laboratory methods and procedures applicable to operator testing

The CFIA has also proposed that it should specify the methodologies for FCS and product testing. Additional changes to the existing testing protocols are that the product must be tested for *Listeria monocytogenes.* All samples (FCS and product) must be analyzed in a CFIA accredited laboratory and all sampling must be conducted under CFIA supervision. All test results must be provided to the CFIA at the same time they are provided to the operator.

All of the proposed regulatory changes are still in their draft form and were open for industry comment until January 15, 2009. It is anticipated that the final proposals will be mandated by April 1, 2009 with the CFIA conducting a pilot trial of the regulations prior to April 1, 2009.

Both industry and the CFIA have learned many lessons from the Maple Leaf Foods *Listeria* outbreak. Perhaps the most critical of these is that industry must be able to work directly with CFIA and their customers to readily react, contain and minimize the public health risk from such an outbreak. ≡WHJ≡

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Hog production costs – what is needed to stay competitive?

Summarized by Bernie Peet

Canadian producers must lower their production costs in order to stay competitive and profitable, says Aïcha L. Coulibaly, of the Centre de développement du porc du Québec Inc.(CDPQ). To achieve this, they must monitor their costs of production and understand factors that impact it. Coulibaly's comparative analysis reveals that US producers have an advantage over Canadian producers for hog finishing operations. Although Canadian producers have better productivity in terms of feed conversion ratio and barn turnover, they need to improve their labour productivity, she suggests. Larger farm size, production concentration and specialization of hog finishing operations enable producers to benefit from economies of scale. This gives cost advantages to producers in Western Canada and the US. A combination of many factors impact production costs and producer competitiveness, therefore improving costs of production requires addressing all these factors simultaneously, Coulibaly says

Introduction

Quebec hog producers undertook a comparison of their production costs to their main competitors across North America, i.e. Ontario, Manitoba, Iowa and Minnesota, in the light of their reduced competitiveness with other areas of North America, especially the US.

This was done in order to understand where any comparative advantages lie and where efforts need to be made to lower costs against the competitors' ones. The cost items compared were: the feeder pig, feed, labour, heating, electricity and fuel, buildings and equipment. In 2007, the proportion of these costs in the total cost of production varied between 80% and 95% depending on the region. The analysis focuses on the hog finishing stage because the degree of efficiency of upstream stages from hog finishing is factored into the feeder pig price.

In addition to the input cost data, some of the main indicators of productivity (feed conversion ratio, labour productivity, barn turnover) were also compared. Other key elements that influence costs, namely concentration of production, degree of specialization and farm size, were analyzed.

Comparative analysis of production costs

In 2007, Manitoba represented 33% of national production, followed by Ontario at 24% and Quebec with 23%. In the US, Iowa and Minnesota represented 44% of national market hog inventory. Therefore, these five regions play a key role in North American hog production.

Cost items are expressed as CA$/kg of weight gain (liveweight basis). This unit facilitates comparison across regions while highlighting the notion of economic efficiency (which is the long-run average cost). This unit is, therefore, an economic indicator of input use efficiency.

Table 1 shows selected costs in these regions, indicating that Minnesota is the most competitive, with the average cost per kilo of gain at $1.06 compared to Quebec where it is $1.47. In Iowa, Ontario and Manitoba, total cost is $1.24, $1.39 and $1.44 respectively. The cost breakdown reveals that the Minnesota feeder pig cost is the lowest at $0.48 while it is the highest in Quebec at $0.64. Feed cost is higher in Quebec ($0.72) than in Minnesota ($0.55). Manitoba labour cost is the highest ($0.05) whereas Minnesota has the lowest cost ($0.01). Energy cost is highest in Iowa ($0.04) compared to Minnesota where it is least, $0.01. Investment in farm buildings and equipment is higher in Quebec, Ontario and Iowa, where it reaches $0.05 compared to Minnesota where it is only $0.01.

Table 1: Cost in Canadian dollars per kg weight gain for feeder pig, feed, labour, energy and interest (bldgs & equip.) in 2007.

Region	Feeder pig	Feed costs	Labour	Energy	Interest (bldg & equip)	Total
Quebec	0.64	0.72	0.03	0.03	0.05	1.47
Ontario	0.59	0.68	0.04	0.02	0.05	1.39
Manitoba	0.59	0.75	0.05	0.03	0.03	1.44
Iowa	0.58	0.57	0.03	0.04	0.05	1.27
Minnesota	0.48	0.55	0.01	0.01	0.01	1.06

The costs presented above result from the combination of both input prices and efficiency of input use. Input availability, exchange rate, interest rate, transport costs, climate and policy are also factors that have an influence on input price and they can explain the comparative advantage of one region compared to another.

In Quebec and Ontario, the supply of corn is lower than demand for both animal feed and ethanol production, so these provinces must import corn from the US, while Manitoba imports wheat from the US. The grain price will be lower in Manitoba and Ontario because they are closer to the border than in Quebec. Minnesota and Iowa benefit from a comparative advantage because farms are located in the Corn Belt area.

In Quebec, Ontario and Manitoba, the feeder pig price is mostly based on market hog price which is based on the US price adjusted by local market conditions and exchange rate fluctuations. Wage rates seem to be higher in Ontario and Manitoba compared to other regions and are influenced by labour availability and the economic boom in Alberta. As regards energy costs, the oil price contributed to the increase in fuel and by-product prices, however some producers in Minnesota can reduce this cost by using crop residues to heat barns.

Costs are also impacted by efficiency of input use which is measured, in this analysis, by feed conversion, labour productivity ratio and barn turnover (Table 2). Iowa and Minnesota have higher feed conversion ratios than Canadian regions, except

Manitoba. Iowa and Minnesota have an advantage in labour productivity over Canadian regions. Within Canada, Quebec is the least productive followed by Manitoba. Barn turnover rate, or throughput, is higher in Quebec and Manitoba than in Ontario.

Table 2: Indicators of productivity

Regions	Feed conversion ratio	Labour Productivity (hr/hog sold)	Turnover
Quebec	2.80	0.47	3.1
Ontario	2.85	0.28	3
Manitoba	3.02	0.29	3.09
Iowa	3.02	0.20	nd
Minnesota	2.91	0.21	nd

The US regions benefit from a comparative advantage (especially for grain price) over the Canadian provinces resulting in lower production costs and the cost to increase weight gain by one kilogram is therefore much lower. An improvement in productivity, especially labour productivity, can help reduce the gap but this is not the only factor Canadian regions should focus on. Indeed, despite lower feed conversion ratio and higher barn throughput, Quebec, Manitoba and Ontario are lagging behind Iowa and Minnesota.

Hog market structure across North America

Market structure impacts indirectly on production costs, mainly in terms of farm size, concentration, and specialized operations.

Hog production in Manitoba is dominated by larger operations compared to Quebec and Ontario where average unit size is smaller. In Iowa and Minnesota, operations with 5,000 head and more dominate, representing more than 45% of hog and pig inventory. The US hog market structure is also characterized by an increase in specialized hog-finishing operations. These factors have led to the preponderance of contract production. Specialization of hog finishing operations and of contract production has also increased in the main hog producing regions of Canada, albeit, in a relatively lesser percentage.

Conclusions

Canadian producers must lower their production costs in order to stay competitive and profitable. To achieve this, they must monitor their costs of production and understand factors that impact it. A combination of factors impact production costs and producer competitiveness, therefore improving costs of production requires addressing all these factors simultaneously.

PROFIT SENSITIVITIES TO FEED PRICE AND PIG PRICE WITH VARYING PRODUCTION LEVELS

Conventional wisdom suggests that increasing throughput of a pig production facility will result in improved margins, or at least reduced losses. However, this is not always the case, say Don Lidster of DNL Farms Ltd, Rocky Morrill of Sunrise Pork Producers and Miles Beaudin of Manitoba Pork. Depending on the type of production, the hog price, feed costs, other variable costs and fixed costs, achieving more throughput may actually hurt the bottom line. Wise decisions can only be made by understanding costs in relation to productivity and revenue,

Rocky Morrill

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they suggest, noting that the optimum management strategies when raising pigs for a profit are substantially different than when raising pigs for a loss. They demonstrate a spreadsheet, unique to the hog industry, to illustrate the effect of four different economic scenarios for a farrow to 23kg system, finishing only and farrow to finish.

Introduction

In the last two and a half years, it has proved difficult, if not impossible, to derive any significant profit from hog farming in Canada. Many Canadian producers maintained high levels of production in an attempt to reduce the pressures of high costs. However, the strategy of promoting high levels of production when variable costs are very high may not provide the best answer for maximized profit.

Many industry stakeholders that influence producer thinking promote the point of view that improvement in production practices, specifically output, will drive down costs. The problem is that this train of thought may only hold true under certain economic conditions, under certain levels of feed costs, under certain hog prices or for certain hog production farms, levels and types.

Case study

We have used a spreadsheet that is capable of creating sensitivities to costs and revenues such as variable and fixed costs, volume of animals produced in a time period, pig price and the effects of those relationships on profit. The goal is to show that under severe economic strain or that of better conditions, management of costing structures is not as straightforward as some industry representatives suggest, and that expending resources to improve volume of pigs produced may not always be the best approach for profit under severely depressed economic conditions.

By varying costs, volume of pigs produced and revenue per pig, this spreadsheet will derive sensitivities to profit in a farrow to 23kg operation and a farrow to finish operation. By analyzing the effects of sensitivities to profit, a farm manager is able to make sound business decisions that can either minimize losses or maximize profits.

In this context, some of the key words that need to be understood are:

Fixed costs - A fixed cost remains the same regardless of the amount of pigs produced or level of production the farm has. An example of fixed costs is sow feed (if sow inventory remains the same), labour and insurance.

Variable costs - A variable cost changes proportionally with the volume of pigs or levels of production. For example, nursery and feeder pig feed is a variable cost.

Profit sensitivities to feed price and pig price with varying production levels

Scenario #1: Feed price high - pig price low

Scenario parameters		Production pigs/sow/y	Profit/loss, $/month 23	25	27
Market price, $/kg	0.90	Farrow to 23 kg	- 56,469	- 54,031	- 51,594
Nursery feed, $/pig	20	23 kg to finish	- 85,544	- 92,983	- 100,421
Finisher feed, $/pig	80	Farrow to finish	- 142,013	- 147,014	- 152,015

Comments: When feed prices are very high and pig prices are very low it is best not to have high production output or expend resources to chase high levels of production in a farrow to finish operation. In this situation, losses are minimized by having lower levels of production. Strategies that minimize losses could include the elimination of costly practices or inputs aimed at improving higher levels of production output. However, under a farrow to 23 kg model, where fixed costs have a higher percentage of total costs, it is still advantageous to maintain high production levels.

Scenario #2: Feed price high - pig price high

Scenario parameters		Production pigs/sow/y	Profit/loss, $/month 23	25	27
Market price, $/kg	1.80	Farrow to 23 kg	10,806	19,094	27,381
Nursery feed, $/pig	20	23 kg to finish	20,225	21,983	23,742
Finisher feed, $/pig	80	Farrow to finish	31,031	41,077	51,123

Comments: When feed prices are high and pig prices are high, profit is maximized when the farm maintains high levels of production in both types of production models.

Scenario #3: Feed price low - pig price high

Scenario parameters		Production pigs/sow/y	Profit/loss, $/month 23	25	27
Market price, $/kg	1.80	Farrow to 23 kg	22,019.	31,281.	40,544.
Nursery feed, $/pig	14	23 kg to finish	65,775.	71,495.	77,214.
Finisher feed, $/pig	55	Farrow to finish	87,794.	102,776.	117,758.

Comments: When feed prices are low and pig prices are high, profit is maximized with high production levels.

Scenario #4: Feed price low - pig price low

Scenario parameters		Production pigs/sow/y	Profit/loss, $/month 23	25	27
Market price, $/kg	0.90	Farrow to 23 kg	- 45,256.	- 41,844.	- 38,431.
Nursery feed, $/pig	14	23 kg to finish	- 39,994.	- 43,471.	- 46,949.
Finisher feed, $/pig	55	Farrow to finish	- 85,250.	- 85,315.	- 85,380.

Comments: When feed prices are low and pig prices are low, losses in a farrow to 23 kg are minimized with high production. However, there is no difference in the amount of losses incurred from any levels of production within a farrow to finish operation. This suggests that chasing high production levels has no benefit when both feed and pig prices are low in a farrow to finish operation. In a farrow to 23kg operation, profitability is always enhanced from high production output.

Conclusions

Levels of production in a farrow to finish operation have significant impact on the bottom line under two of the four scenarios we have analyzed. From our observations, we have demonstrated that when the revenue per hog is below that of a variable cost structure, the advantages of chasing reduced fixed cost are eliminated. When revenue does not cover variable costs, the advantages gained in fixed cost savings through high output are quickly eroded, and this situation promotes financial losses. This would suggest that maintaining high pig production levels during any combination of feed cost level or any type of pig price level is not always the best option for the bottom line. Our model has shown that there are significant disadvantages to maintaining constant high production during periods of low pig prices/high feed costs and low pig prices/low feed costs in a farrow to finish operation.

For too long our philosophy of raising pigs has been weighted way too much towards the idea of opportunity profit derived from throughput, leaving the understanding of costs in the shadows. We need to understand our cost in relationship to productivity and revenue, and only then can we make wise decisions. The optimum management strategies when raising pigs for a profit are substantially different than when raising pigs for a loss. ≡WHJ≡

Labour – what every employer must know

Summarized by Marvin Salomons

This breakout session dealt with labour standards and the legal requirements for employers and workers at the farm level. Two experts in this area Marcel Hacault, Executive Director for the Canadian Agricultural Safety Association (CASA) in Winnipeg and Trisha Gain a labour / employment lawyer with McLennan Ross LLP in Calgary discussed where the industry is headed on labour standards as well as what employers need to do to ensure workers are aware of occupational health and safety procedures.

The state of safety regulations

Agriculture workers across Canada are largely exempt from employment standards. Although some variation exists from Province to Province the concepts and principles are largely the same. There is a trend towards implementing and enforcing tougher occupational and health regulations in agricultural workplaces. "We are seeing agriculture workers pushing to gain more protection in the workplace at the farm level," says Gain. She sees the exemption for agriculture as a big risk, making it vulnerable to being sued under a "common law" system where judgments in Canada are largely made on the basis of previous cases or precedents. Hacault agreed, saying enforcement agencies are generally called into action as a result of employer-employee confrontations and that hog operations and mushroom farms often are the ones being targeted.

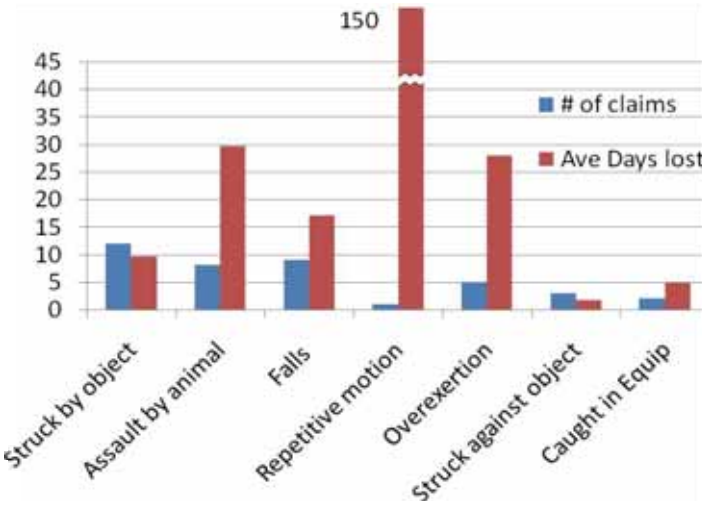
Marcel Hacault's organization (CASA) is funded by federal dollars and was established in 1993 in response to an identified need for a national farm safety networking and coordinating agency to address problems of illness, injuries and accidental death in farmers, their families and agricultural workers. Since then, CASA has worked to improve the health and safety conditions of those who live and work on Canadian farms. CASA's vision is to have a Canada where no one is hurt farming.

Educating employers and employees on the hazards in the workplace is one of CASA's jobs. A study by Farm Credit Canada, supported by CASA and released in mid January 2009, shows there is a big gap between what people say and what they want to do. The study showed 83% of the respondents said they were safe on the farm while only 15% said they had any type of safety plan in place. "Eighty percent of people told us they do some type of training on the farm," said Hacault, but he sees that to be mostly courses like First-Aid.

Hacault pointed out that temporary foreign workers are covered by labour legislation and have the same rights as Canadian workers. About 90% of the occupations are provincially/territorially regulated and labour and employment standards for those occupations are the responsibility of the respective provincial governments. The other 10% are regulated federally with the standards falling under the Canada Labour Code. Depending on where you do your business Hacault recommends that you check with your Provincial ministry responsible for labour and employment standards. All the information is generally available on government websites.

Hacault feels there are essentially no accidents on-farm and prefers to call them incidents, which in many cases are preventable. It is important to identify the hazards that lead to potential incidents and put controls in place. Management and employee buy-in is critical to success. Hacault says labour is critical to swine production, hard to find and hard to keep. "Many new workers want to see you have a plan in place before they sign up. Having a plan in place can also reduce your insurance and WCB costs. In addition, incidents can cost your business lost

Figure 1: Causes of major types of injuries and days of lost time.



production, lost time and wages, reduce employee morale and can affect your company's reputation as being a safe place to work."

Pig farms can be a dangerous place to work. CASA's research shows that about 84% of fatalities on hog farms are attributed to hydrogen sulphide (H_2S) gas poisonings while the remaining deaths are split equally between being struck by an object or an animal. Still, Hacault notes that a lot of lost production and wages can be attributed to other factors with repetitive motion work having the highest number of claims (see Figure 1). Ontario data shows the highest number of claims originate in the pig industry.

Hacault took breakout session participants through a case study where H_2S resulted in a serious incident. "It's important to reconstruct the incident, document everything and then make necessary changes in work procedures or engineering design to ensure it can never happen again". Hacault summarized the following recommendations:

- Include safety and heath procedures in job descriptions
- Include safety and health in CQA duties
- Implement a near-miss reporting system to prevent future incidents
- Implement hazard identification and sign-off as part of employee training
- Rotate job duties to alleviate repetitive injuries

The legal side of the issue

Trisha Gain, an Associate with a major Calgary law firm, has seen a lot of issues raised around worker health and safety. She regularly represents workers in front of labour investigation commissions where incidents that have occurred in the workplace result in legal claims against employers. "Many agriculture operations do not pay into insurance schemes so if there is an

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incident often the company or manager gets sued," says Gain. Although exempt from employment standards she recommends employers familiarize themselves with the *Occupational and Health Safety Act (OHSA)*. The responsibilities imposed under "common law" will be guided by the *OHSA* so there is a possibility that the exemption could be removed and liability imposed regardless. "Ontario is already making some moves in that direction," says Gain. "We could see more protection for workers on farms."

Gain knows many larger farms are moving towards improving standards and coverage for their workers and their businesses but the calls to introduce legislation for tougher farm work standards will be difficult. She sees it hard to determine what constitutes a family farm and an industrial farm and how the rules will be applied to family members. Like farming exemptions in the *Employment Standards Code,* farming operations are also exempt from the *Occupational Health and Safety Act* and the *Workers' Compensation Act*. This offers some freedom from regulation to pork farm employers, but also increases exposure to lawsuits resulting from workplace accidents, perhaps even suits from family members.

Rights of employers and employees

Gain told breakout participants that all parties in the workplace have responsibilities and duties that need to be followed. Every employer must ensure reasonable health and safety for all workers on its worksite that includes:

- informing workers of their responsibilities and protections
- implementing and ensuring compliance with safe work practices
- making employees aware of workplace hazards and precautions
- providing first-aid services and supplies
- always acting reasonably in providing a safe work environment
- and finally, practicing "due diligence" which involves training workers, removing potential hazards, investigating incidents and generally taking all the appropriate steps to prevent or avoid incidents from happening

On the other side employees also have duties that include:

- taking reasonable care to protect themselves and others
- cooperating with employer objectives
- and, exercising their right to refuse an unsafe workplace

Employer defenses against liability

Offenses under the *OHSA (Act)* are strict liability offenses. Gain says employers need to know that liability can arise even where there was no intention to cause any harm or create a risk of harm. In any case "due diligence" is a valuable defense. Employers have to demonstrate they took reasonable care to avoid a breach of the standard, that is doing what any reasonable person would do. Often an employer will argue "blissful ignorance". This is often difficult to prove and Gain cautioned that the courts typically don't like these kinds of arguments. Usually the first piece of evidence in court is the employee training records and then the employer's safety history. Gain says the courts like to look at the employer's overall safety attitude and courts have been impressed by employers who have safety procedures in place prior to an incident occurring. Doing this not only prevents an incident but also limits your exposure if there is one.

Investigating safety incidents

Pork operations that have health or safety incidents arise should commence investigations as soon as possible following the incident. This needs to include taking photographs, measurements, and gathering any other evidence available. At least two members of the management team should together conduct interviews, with the suspected wrongdoer interviewed last. Finally, implement any changes arising from the investigation immediately. A recent Federal Bill *(C-45, 2008)* has made an amendment to the criminal code that has created an avenue where criminal liability can be attributed to higher people in the company organization. Even though owners, directors and managers may not be anywhere near or aware of the incident they ultimately could be held liable.

Health and safety issues are important for any business. Although farming operations like pork units may be largely exempt, the importance of this to pork operations may be even greater due to the potential for lawsuits. ≡WHJ≡

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Keeping PRRS out

Summarized by Bernie Peet

Biosecurity procedures at a farm, regional and national level are important not only to keep out diseases such as Foot and Mouth Disease and Classical Swine Fever, but to control the spread of production diseases such as PRRS, Swine Influenza, Salmonella and Mycoplasma between herds. However, despite its importance, many producers do not observe basic biosecurity procedures such as washing hands prior to entering the unit, say Marie-Ève Lambert and Sylvie D'Allaire from the Faculty of Veterinary Medicine at Montreal University. Their survey of biosecurity practices on farms in two regions of Quebec showed a wide variation in the measures producers employ.

Biosecurity can be defined as procedures, efforts and programs established to reduce the risk of disease introduction into pig populations. Moreover, it can slow down the transmission of endemic pathogens (viruses, bacteria, parasites and fungi) thus limiting the spread of disease at the herd, region or country level. Good herd biosecurity is therefore essential to protect herd health status but it is also important when implementing a program for control or eradication of diseases at a regional level.

Biosecurity measures

Humans: The priority should be to restrict entrance of people. Only authorized personnel should be allowed inside the unit. Keeping the doors locked is a simple way to restrict movement. Adding a doorbell increases awareness of an entrance protocol and allows the operator to inform visitors of the rules and to supervise their application. At the very least, the entrance protocol should include washing hands and changing boots/clothes between facilities. Too few producers surveyed required washing hands, an inexpensive and simple rule. A "Danish entrance" would be better but was not very frequent. It should consist of 3 different zones:

- a so-called contaminated area where shoes or boots are left,
- an intermediate one and
- a clean zone where farm coveralls and boots are provided.

This type of entry room helps considerably to reduce mechanical transmission of several infectious agents such as PRRS. Alternatively, a shower has significant deterrent effect on people wanting to enter the facilities, but more infrastructures are needed. Requiring downtime would have a similar effect on the transmission of pathogens but may be difficult to implement. Producers should be aware of the potential risk of employee's movement between production sites. Ideally, employees should not have access to other pig sites, pig transport vehicles or the slaughterhouse.

Animals: Good rodent control is also important to limit area spread especially in high pig density areas. Birds, dogs and cats should be kept outside the units as well. Bird-proofed wire screens should be installed in air inlets whether the ventilation is mechanical or natural. Feed must also be protected from bird droppings. Surprisingly, some producers surveyed were still allowing domestic animals in the facility, often arguing that cats are good pest exterminators.

Mechanical transmission: Vehicles circulating on the site may carry pathogens on their wheels and can also contribute to aerosol transmission if allowed too close to the unit when loaded with pigs. They should stay as far as possible from the facilities and should be washed and disinfected before their entrance on the site. This procedure is more easily applied for contract companies that often have installations for washing, disinfecting and drying trucks between runs. Furthermore, the longer the distance between the public road and the facility, the safer is the site.

Animal transportation can be a source of several other biosecurity lapses. It is really important to prevent pigs re-entering the unit from the vehicles. Although aware of the risk, some producers do not always control this aspect.

Semen and feed delivery is also critical as it involves not only the vehicle but also a driver. Access within the barn should not be authorized and all the materials and supplies should be left outside or delivered off site. From our survey, semen delivery people were entering into the barn on nearly 25% of the farrowing operations. Similarly, bills should be left outside the unit (mailbox) and producers should pay more attention to feed bags.

Dead pig disposal: Dead pig disposal is a daily concern for producers. Off-site management involves vehicles such as

rendering trucks which can contaminate the herd's site and convey infectious agents over long distances. Managing dead pigs directly on the site by incinerating, burying or composting lowers the risk of disease introduction by limiting access to the site. A variety of methods was used in Quebec to manage herd mortality: approximately 32% of producers disposed of dead pigs on the site.

Whatever the method used, wild and domestic animals should never have access to carcasses which are a significant source of pathogens. Broken and open rendering containers or a pile of pigs near the farm leaves access to animals and therefore contributes to area spread, a situation unfortunately too common (34% of the sites). Although it is well recognized that the rendering truck should never be allowed on the site, the reality is often different.

Conclusions

Most producers were concerned by biosecurity, but others, although well aware of the consequences of a lack of biosecurity, did not comply or applied the rules only partially, varying in time or between facilities within a site. These non-compliant producers may increase the risk of contamination of surroundings farms and may represent a real threat, especially in a high pig density area. Therefore, each producer should be encouraged to pay attention to biosecurity and realize that it is a collective responsibility.

APPLICATION OF AIR FILTRATION SYSTEMS IN SWINE OPERATIONS

There is a significant economic advantage to maintaining a PRRS negative herd, whether it is a boar stud, sow farm, or nursery-grow-finish. Aerosol transmission of PRRS, Swine Influenza, and Mycoplasma can be drastically reduced by the application of air filtration in the barn, according to Dr. Darwin Reicks from the Swine Vet Center, St. Peter, MN. His practice has been involved in the installation of 33 systems, many of them in boar studs where freedom from PRRS justifies the cost of the equipment. Despite some practical problems, the success rate has been high, he says.

How does it work?

The true HEPA filters are normally rated at 99.99% efficient down to 0.3 micron particle size. This means that when they are new, they will filter 99.99% of particulates that are 0.3 micron in diameter. The efficiency percentage increases for larger particles and decreases for smaller particles, but as the particle size becomes extremely small, the efficiency actually increases again. As the filter becomes "used" it actually becomes more efficient, as trapped particles help to filter an even higher percentage of small particles. Although the viruses that cause disease are smaller than 0.3 microns, they are carried on particles larger than this which are removed by the filter.

PARTIAL FILTRATION

Many sites simply put a filter above each of the ceiling inlets. If one filter was placed above the inlet, the air flow is adequate until the outside temperatures generally reach 65˚-70˚ F. After that

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point, there is too much restriction and they must either remove the filters or utilize air coming through a cool cell in tunnel mode ventilation. In tunnel mode, all air comes in a through an opening at one of the building and exits at the other end. With partial filtration, air is not filtered in hot weather conditions, which increases the risks, but during such conditions, the risk of aerosol introduction of PRRS is reduced anyway.

100% filtration

100% filtration for a barn that uses tunnel ventilation in the summer involves the construction of a filter bank in front of the cool cell, which adds construction cost. In addition, these facilities normally pull air through ceiling inlets in the winter so filters need to be mounted on top of each inlet box. The cost of implementation of a filtration system for these facilities, including cost of construction for the filter banks, has been $180-$200 per animal. Some facilities pull air through inlets year round so just need filters mounted in front of each inlet. The cost of implementing filtration with this type of building design has generally been $80-90 per boar.

Air conditioning systems greatly reduce the number of filters needed (because extra summer time ventilation needs don't exist anymore). Because the air comes in cool year round, the ventilation needs are more similar to winter time.

Dealing with high temperatures

In order to handle the large volume of air needed through a cool cell during summertime ventilation, a filter bank needs to be about three times the size of the cool cell pad or the air going through the filter bank must be pressurized. Both of these can be quite costly options. An alternative to either of these systems is to stop filtering once the outside temperature gets hot, above 27∞C (80∞F) for example. Another application of this option is in farms where all of the air comes through ceiling inlets year-round. An extra row of inlets can be put in at a fairly minimal cost. If these inlets are actuated, they can also be tied to the ventilation system to provide an option during the higher temperatures. These unfiltered inlets would open up when the outside temperature rises above 27∞C (80∞F) for example, and then are pulled shut as the temperature decreases.

Costs

The costs of implementing an air conditioning system with filtration have varied widely. We have seen a range of $300-$600 per animal. Operating costs have run around $20-30 per animal more for the warm weather season.

Results

A total of 33 farms have installed filters in our practice since 2005. Eighteen of these farms have 100% filtration; the rest have partial filtration. Since implementation of air filtration, we have had three PRRS breaks on farms using partial filtration. All three were infected when the air was not being filtered. We have had one PRRS break on a farm with 100% filtration, although we believe that was the result of a transportation biosecurity breach or the result of having a number of heavily damaged filters in use. We have had two Swine Influenza breaks on 100% filtered farms. We have not had any Mycoplasma breaks on any of the filtered farms, although most are vaccinated.

An important consideration for us from the start has been that we shouldn't expect to never have a PRRS break just because we installed air filtration. However, if we can reduce the incidence of PRRS breaks significantly, it would be good return on the investment. This has proven to be the case, in our experience. Most of the farms that have filtration had a previous history of multiple PRRS breaks.

For boar studs, filtration has now become the standard, except for studs with no history of PRRS and located five miles or more from other pigs.

A NEW FILTERING KIT DEVELOPED IN QUEBEC

A new Canadian-made air filter has recently been evaluated by Dr. Laura Batista from the Faculté de médecine vétérinaire de l'Université de Montréal (FMV) and the team of the Centre de développement du porc du Québec inc. (CDPQ; Quebec Swine Development Centre). It is not only efficient at stopping the entry of PRRS virus, but is more cost effective than existing systems, she says.

Noveko Inc., a Canadian company specialized in research, design, manufacturing and distribution of patented air filtration products recently developed an innovative filter combination which integrates a viricide, bactericide and fungicide at the molecular level in the fiber of the filter material. The initial evaluation of this filter was done by Dr. Laura Batista, and the team of the Centre de développement du porc du Québec inc. (CDPQ; Quebec Swine Development Centre). During the project to evaluate the products a new combination of viricide, bactericide and fungicide was developed and also tested (filter B).

Compared to other filters on the market, this filter is very flexible in its use and installation (it comes in rolls of a very flexible, washable and easy to maintain material), and not only does it block the passage of bio-aerosols due to its filtering effect, but it also has the ability to neutralize pathogens as they come in

The 3-stage Noveko filter, which has proved very effective at preventing the entry of PRRS viruses

contact with the antimicrobial agents embedded in the filter fibre.

After the development and testing phase, a commercial kit was developed by CDPQ and Noveko's team to practically implement filter combination B into swine farms. The filtration system kit is contained in a convenient frame having three levels of filtration: level 1 (insect screen) removes large particles and is easy to clean. Level 2 has three layers of the patented filter material containing viricide, bactericide and fungicide cocktail. This level removes fine dust particles and initiates the filtration and neutralization process and reduces the number of times level 3 needs to be cleaned. Finally, level 3 contains 7 layers of the filtering and neutralizing material. The cost per inventoried sow per year over a period of 10 years is around 26- 27 $CAN.

Applying air filtering technology in the field

Air filtration is not the magic bullet; it is one more gadget in our biosecurity toolbox. Before thinking of investing in air filtration you definitely have to have "basic" biosecurity in place.

Some of the past challenges of available filtering systems were the restriction of the filter on airflow or that at hot temperatures, it produced too much restriction, therefore filters needed to be removed or cool cell tunnel ventilation needed to be installed; in other cases costly retrofitting was required. However, more flexible filtering options are now available, when used wisely in conjunction with other strategies, these make air filtration an extremely useful tool to impede or diminish aerosol transmission of PRRSV. This was first shown several years ago by the French and confirmed by recent USA and Canadian experiences. These approaches offer a higher success rate for control and future eradication PRRSV and other pathogens. ≡WHJ≡

Preventing antibiotic resistant disease

By Bob Friendship, Scott McEwen, and Doug MacDougald
Summarized by Charlotte Shipp, Alberta Pork

The discovery of penicillin in 1926 and its subsequent usage led to the surprising discovery of penicillin resistance. By 1950 modern science had developed methicillin to treat penicillin resistant infections and by 1961 methicillin resistance was reported. Since then, resistance to every class of antibiotics has occurred and antibiotic resistance has become the global human health risk known as the 'superbug'. In this seminar Dr. Bob Friendship, Ontario Veterinary College, takes an in depth look at the 'superbug' in both humans and pigs and Dr. Scott A McEwen, University of Guelph, expands the discussion to look at the global community and extract lessons from their attempts to eradicate it. "Antibiotics are very useful in managing bacterial infections of pigs, but the emergence of antibiotic resistance and calls for action to contain resistance are changing the availability of these drugs and our views of how they should be used," he says. Doug MacDougald, MacDougald & Associates, takes a look at preventing antibiotic resistance from an economic perspective and explains how any budget can be trimmed by searching for animal health opportunity costs.

What is the 'superbug'?

In the media, we are continually affronted with the term 'superbug', but what is it? The 'superbug' is Methicillin Resistant *Staphylococcus aureus* (MRSA); a serious human health issue evolving from a problem localized to hospitals to one of community and public concern. Several factors converged in the mid-1990s to create a crisis in human medicine concerning antibiotic resistance:

- A reduction in the number of new antibiotics available
- The emergence of "superbug" infections
- Presence of resistance to relatively new antibiotics (fluoroquinolones)

By the 1970s MRSA had emerged as a serious problem in some hospitals in the USA and by the 1990s MRSA in hospitals was a worldwide problem. A recent study in the USA estimated that, in 2005, over 94,000 invasive MRSA infections occurred in the USA resulting in over 18,000 deaths. Recently, MRSA has been identified in people who have had no association with hospitals and is classified as having Community Acquired (CA)-MRSA as opposed to Hospital Acquired (HA)-MRSA. MRSA strains are spreading outside the hospital setting, becoming a concern for public health workers and increasingly so for pig farmers.

Source of human MRSA

The research community has identified animals and pets as one source of CA-MRSA. Owners and their pets can cycle infections from owner to pet and vice versa. The first report of CA-MRSA colonization in pigs occurred in the Netherlands where pigs were identified as the source of a human MRSA infection. In this scenario 23% of pig farmers in the region were carrying CA-MRSA when colonization rates were less than 0.1%. This phenomenon is not exclusive to the Netherlands as Canadian scientists have found pigs in France, Denmark, Singapore, Canada and the USA which are positive for CA-MRSA. Amongst other strains, CA-MRSA was found on-farm in 45% of the farms studied in Canada and 25% of the pig population carried CA-MRSA. This suggests that CA-MRSA moves from humans to pigs as well as pigs to humans.

Currently, there has only been one report of MRSA causing disease in pigs. This particular infection resembled "greasy pig disease". However, as there is a high instance of MRSA in pigs internationally and very few reports of any clinical symptoms in pigs. it is unlikely that MRSA is the cause of disease in pigs.

Control of MRSA on pig farms

It is not known whether MRSA eradication is possible or necessary on-farm. Eradication of MRSA is unlikely due to the large percentage of carriers and the absence of clinical symptoms. However, by studying the transmission and infection of MRSA, potential avenues for its reduction and control may be developed.

The first response to MRSA in pig populations is to blame the use of antibiotics and call for the ban of the use of growth promoters. In fact, MRSA is a classic example why a ban on growth promoters is not the solution. MRSA thrives on farms that do not use antibiotics where the introduction of MRSA can be attributed to both breeding-stock and human carriers. One potential avenue to minimize MRSA transmission is to consider it when developing on-farm biosecurity and monitoring protocols. More research is required into how housing or barn management factors may reduce the MRSA prevalence in a herd.

International trends in managing resistance

Both the World Health Organization (WHO) and World Organization for Animal Health (OIE) are addressing the antibiotic resistance crisis. The general conclusion is that antibiotic resistance is a serious problem caused by a multiplicity of complex issues, two of which are antibiotic use and abuse. Several recommendations were made to slow the development of resistance and to prolong the life of existing antibiotics. Most recommendations applied to human medicine; however, some recommendations did apply to agriculture.

Following these recommendations some countries have taken action. The international response has ranged from increased surveillance and tighter controls to an outright ban on antibiotic growth promoters. The USA has implemented a regulatory program that requires human health risk assessment of resistance prior to new antibiotic approval and use of certain antibiotics (fluoroquinolones) is restricted in agriculture. Canada has implemented only a few changes to curtail resistance which focus on prudent use and detailed surveillance through Canadian Integrated Program for Antimicrobial Resistance (CIPARS).

Many countries have categorized antibiotics with respect to their importance. Category I includes the most important antibiotics (fluoroquinolones) with categories II and III being on a sliding scale of importance down to category IV which includes the least important antibiotics (sulfonamides). Table 1 demonstrates the frequency of antibiotic resistance found in three different strains of bacteria.

Table 1: Frequency of antibiotic resistance in *E. coli* and *Salmonella* from pigs and *E. coli* from pig farm residents in Canada.

Category of Importance to Human Health	Antibiotics	Percent resistant (number of isolates) *E.coli* from Finisher Pigs (1322) [1]	*Salmonella* from Finisher Pigs (922) [2]	*E.coli* from Pig Farm Families (555) [3]
I	Amoxicillin/ Clavulanic acid	0.7	0	ND[4]
	Ceftiofur	0	0	0
	Ceftriaxone	0	0	0
	Ciprofloxacin	0	0	0
II	Ampicillin	30.6	6.1	15.9
	Amikacin	0	0	ND
	Cefoxitin	0.7	0	ND
	Cephalothin	ND	0	2.2
	Gentamicin	1.1	0.5	1.3
	Kanamycin	10	14.4	4.1
	Streptomycin	49.6	26.5	9.6
	Trimethoprim/ Sulphamethoxazole	6.4	0.2	ND
III	Chloramphenicol	17.6	4.5	2.5
	Sulphonamide	49.9	21.9	17.3
	Tetracycline	78.9	43.4	23.6

[1] Varga et. al. (2008a)
[2] Varga et. al. (2008b)
[3] Akwar, H. (2003)
[4] ND – not determined

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Growth promoters

Antibiotic growth promoters have received the most attention from international authorities due to their close relation to human antibiotics. Other reasons for concern are the large quantities used at low doses over long periods of time. McEwan highlighted the use of Avoparcin (a growth promoter used in Europe and other parts of the world) which is related to vancomycin (used for the treatment of multiple-drug resistant infections). When used in both pigs and poultry a strong correlation to vancomycin resistance in humans has been found.

Looking at the use of growth promoters on-farm brings forth two pertinent questions:

- Is it justifiable to use antibiotics to simply enhance feed efficiency?
- Should growth promoters be used in mainstream production?

Denmark and Europe were the first to take action and ban the use of growth promoters. The ban resulted in increased instances of diarrhea in weaned pigs resulting in an increase in therapeutic treatment with other classes of antibiotics. No detectable effects were identified in finishers. There is good evidence that reductions in the use of growth promoters in finisher pigs would have few adverse outcomes, but reductions in weaned pigs should be accompanied by alternate methods to deal with diarrhea. Critically important antibiotics should be reserved for therapeutic use of serious bacterial infections in pigs and group treatments with these drugs should be discouraged.

Moving forward, a balance must be struck to allow the prudent use of antibiotics in ways that maximize therapeutic efficacy and minimize resistance. Fortunately, the voluntary approach Canada has embraced leaves veterinarians and producers the option of using an antibiotic when justified.

REDUCING ANIMAL HEALTH COSTS

In today's global economy and state of the industry, a farm's survival in an economic downturn can determine a producer's success in the industry. Survival depends on the farm's ability to reduce input costs, generate return on investment (ROI). In his presentation, Dr. Doug MacDougald explains how to achieve a ROI for animal health products and how to develop a long-term health management strategy, which delivers lowered input costs with corresponding improved performance. He presents five cost saving strategies.

1. Measure, analyze and make decisions based on opportunity cost

Opportunity costs are defined as the potential benefit that is forgone from not following the best financial course of action. Table 1 shows a production system analysis for finisher groups over five years comparing the opportunity cost of one week filled finisher sites versus multi-week finisher sites. Overall, the multi-week filled groups have $3 per pig poorer opportunity cost.

Savings can often be made by changes to sow vaccination protocols, says Ontario vet Doug MacDougald

Table 1: Production system analysis for finisher groups

5 Year average	Single week fill	Multi-week fill
FCR	2.64	2.67
ADG, (g/day)	910	860
Mortality, lights & culls (%)	7.1	10.9
Net opportunity cost ($/pig)	-1.56	-4.59

2. Be critical of product technical information

Be critical of marketing, product results and the manufacturer's ROI analysis. Individual herds vary considerably in disease status, prevalence of disease (as opposed to the prevalence of the pathogen), disease stressors and need for animal health product "insurance". Ask yourself; 'will this product benefit my barn?" Some cost-saving examples are:

- Use ELP (erysipelas, leptospira, parvovirus) vaccines in gilts only
- Stop *E.coli* vaccines (or if required use in gilts only)
- De-worm gilts only
- Implement a monitoring program to ensure parvovirus seroconversion and effective parasite control

Table 2: Potential cost savings of altered animal health program

Action	Savings
Removal of ELP to sows at weaning	-11¢
Removal of E. coli vaccine pre-farrow sows	-10¢
No deworming	-8¢
Monitoring – parvovirus serology/fecal flotation 3 X per year	+1¢
Total savings per pig weaned	**28¢**

3. Focus on the primary pathogens; the big bugs, not the little bugs

Work closely with your veterinarian to achieve accurate and timely diagnosis. Remember animal health is dynamic and can never be viewed in a 'black or white' context. Intervening with antibiotics and/or vaccines for nursery "suicide" bugs without addressing PRRS circulation is a band-aid not a long-term health strategy.

4. Monitor product usage

Take an inventory and monitor product usage. Some typical errors on-farm occur in the product ordered, dosage of vaccine and through accidental changes to treatment or vaccine protocols. Some easy strategies to prevent these errors are:

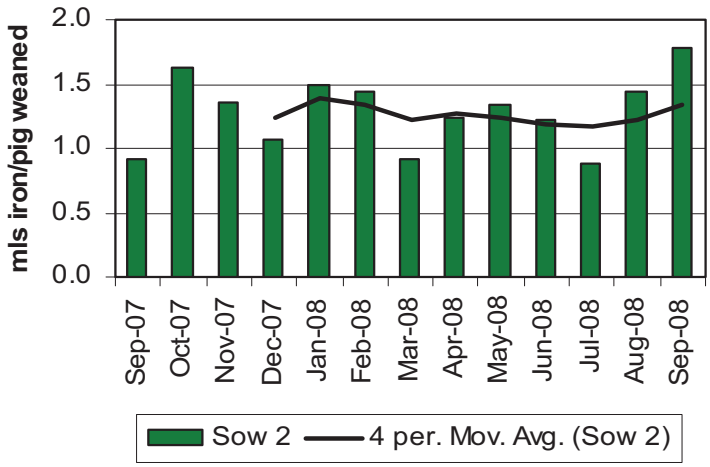
- Complete a pharmacy cost analysis by month. This works well to highlight changes in product usage or inventory errors as well as track trends and actual animal health costs.
- Reconcile key products on a per pig basis. This will confirm that the right dosage is being administered. In Figure 3 inconsistencies in iron dosage are readily seen in the months of March and July.

5. Management of lightweight pigs

Focus on lightweight pigs. This will significantly influence weight gain and mortality variation leading to more cost effective animal health product decisions, better opportunity costs and a long-term health management strategy. Note that sow herd pathogen stability is a piece of the lightweight, compromised pig puzzle that is often overlooked.

Almost all farms can benefit from MacDougald's ROI analysis of animal health products. Make sure to remember a solid financial analysis is required to identify and monitor areas where opportunity costs exist. ≡WHJ≡

Figure 3: Example of monitoring iron usage per pig weaned



CAREful pig production

Presentation by Tina Widowski, Catherine Scovil, and Susan Church
Summarized by Cara Dary, Alberta Pork

Animal welfare assessments are based not only on science, but on subjective analysis involving a wide array of factors including gathering the facts, weighing choices, and calculating economic implications, according to Tina Widowski, Professor of Animal Welfare at the University of Guelph. This means that both science and personal values play a role in their determination. As Fraser (2003) describes: "When faced with decisions, we humans often expect clear-cut answers and similarly we want 'science-based' decisions about animal welfare. But science is only part of the process. Science provides an empirical method for obtaining knowledge; it gives us the facts about how different aspects of housing or management can affect a pig's health, physiology or behaviour. The next step in decision making involves assessment – integrating all of the current knowledge, weighing its importance and interpreting it in terms of animal welfare."

Tina Widowski, Catherine Scovil from the Canadian Pork Council and Susan Church of Alberta Farm Animal Care describe how science-based factors accompanied with assessment by producers, industry and stakeholders can motivate an industry to become proactive in dealing with animal care issues.

Group housing has the potential to improve welfare for sows

Different viewpoints = different scientific approaches

Both Tina Widowski and Susan Church refer to common overlapping viewpoints developed by Fraser that are expressed relative to animal welfare. These overlapping viewpoints are the basis for studying and assessing animal welfare and they have the ability to shape the way in which scientific experiments are developed. The three distinct viewpoints are:

1. Functioning Well (refers to satisfactory health, growth, normal physiological functions and behaviours - measured by biological rates of illness, injury, mortality, body condition, and productivity). Animal-based on-farm welfare assessments examine this through stress response – heart rate, hormone level.
2. Feeling Well (animals should be housed in a way that prevents negative feelings such as pain, fear and frustration). Animal-based on-farm welfare assessments examine through vocalization.
3. Natural Living (animals should be able to lead relatively natural lives or behave in ways that are consistent with the nature of their species). There are few scientific approaches for assessing this.

Each viewpoint can be assessed by a variety of methods; some assessments give a clear indication of positive versus negative impacts on animal well-being while others are subject to interpretation, which will vary from person to person depending ones ethics and values.

Integrating viewpoints and approaches

Science and the sow stall debate

The difficulty with a science-based approach in the sow stall debate is that no two systems are alike. Various types of group

housing and the various types of stalls exist; how can they be directly compared? Research has consistently demonstrated that group housing has the potential to provide better welfare for sows compared to gestation stalls; however a higher level of management is also required, therefore, group housing also has the potential to result in poor welfare.

Science and the castration and piglet processing debate

Science has demonstrated, through the intensity of piglet vocalization and the increase in tremors after conducting the procedure, that acute pain results from castration, tail docking and teeth clipping.

Human – animal interaction

Low stress animal handling in the barn reduces stress in pigs and affects end product quality. Science can measure cortisol levels in animals to determine the amount of stress hormone. Walking the pens on a weekly basis is positive animal handling and reduces the stress of handling at slaughter. Through these studies, both scientific information and interpretive information form the basis of what is best for animal well being.

The responsibility

It is the responsibility of the animal's owner to provide for the animal's basic needs in addition to following what is required by federal *(Prevention of Cruelty to Animals Act, Human Handling and Slaughter of Food Animals, Humane Transportation of Animals)* and provincial legislation (*Animal Protection Act* and the industry standards *Recommended Codes of Practice*). Industry groups have been proactive in addressing animal welfare issues through producer-run animal care response line called ALERT.

The global situation

In order for Canada to predict the future of animal welfare issues, we can learn from worldwide trends. Catherine Scovil outlines the current global situation.

The European Union (EU) has responded to heavy pressures from animal welfare activists over the years by enacting regulations which has resulted in sow stalls being banned by 2013. Australia and New Zealand both issued new Codes of Practice for Pigs that included minimum standards with regulatory bases and educational elements. Both include phasing out sow stalls.

The United States has faced much pressure on animal welfare issues from the foodservice industry. As a response, the National Pork Board developed a Swine Welfare Assurance program, which in 2007 was replaced with Pork Quality Assurance Plus (PQA) Plus, an integrated on-farm food safety and animal welfare auditable program. Of late, states such as Florida, Arizona, Oregon, Colorado, and most recently California, have banned sow stalls.

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In 2005, the Canadian Pork Council along with a team of researchers, producers and government took a proactive approach to animal welfare by developing the Animal Care Assessment tool (ACA). This tool is an auditable on-farm program designed to assess animal care allowing producers to demonstrate what they are doing on-farm through documentation, protocols and audits.

Being proactive versus reactive – the Animal Care Assessment tool

The ACA tool was developed in response to questions from Canadian retailers and foodservice providers expressing interest in the care animals received. At one time these questions were answered by statements that producers follow Recommended Codes of Practice (though these codes are now over twenty years old and there is nothing to demonstrate they are being used). Therefore, the need for an externally reviewed program arose. It is loosely based on the Hazard Analysis Critical Control Points (HACCP), a common approach to food safety where critical control points are identified and controls are placed to prevent incident. The ACA works to ensure animal-based (looking at the animal, body scoring, examining for cuts or bruises), design-based (looking just at the environment in which the animals live, for example, space) and process-based (ensuring basic protocols are in place to address animal care issues, such as euthanasia and handling sick pigs) protocols and scoring is in place on-farm. ACA is modeled after the Canadian Quality Assurance (CQA) program–the Canadian pork industries HACCP-based on-farm food safety program.

The ACA was released in 2005; the tool exists and is available for use today for all producers enrolled on the CQA program. However, due to the challenges faced by the pork industry, up-take of the ACA has been low and priority has been shifted to economics. Scovil states that producers are currently burdened by a multitude of programming though have not seen a direct financial gain. By linking financial gain to the program, it would be an easier sell for producers, she says.

Continued importance

Animal Care issues will not disappear; this has been demonstrated through global trends.

Producers need to participate and to participate they need to see a benefit.

Industry needs to find solutions to problems and to identify the most affordable management practices that address those concerns. Decisions based on animal care practices will be based on balancing scientific knowledge with professional judgment and social values, Widowski believes. Through proactive approaches like the ACA tool, response groups like Alberta Farm Animal Care ALERT line industry can work toward moving forward on animal care initiatives.

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Reducing feed costs for grow-finish

Summarized by Bernie Peet

REGAINING COMPETITIVENESS: ALTERNATIVE FEEDSTUFFS FOR SWINE

Although feed grain prices have dropped since their recent record levels, large opportunities exist to develop more cost-effective feeding programs using alternative feedstuffs, say Drs. Ruurd Zijlstra from the University of Alberta and Eduardo Beltranena from Alberta Agriculture and Rural Development. The key to managing the risk of using alternative feedstuffs to maintain growth performance is feed formulation using modern evaluation systems such as net energy (NE) and standardized ileal digestible (SID) amino acids, they suggest. A strategy to include multiple alternative feedstuffs in diets will likely be most effective. Their paper summarizes recent research findings that can help the western Canadian pork industry to regain its feed cost competitiveness.

Alternative feedstuffs in nursery diets

Wheat can be replaced successfully in nursery diets with cereals such as triticale. Soybean meal can be successfully replaced with ground legume seeds such as zero-tannin faba bean. Protein feedstuffs tend to be more expensive and so opportunities exist to include specialty protein sources such as faba bean and field pea protein concentrates into nursery diets.

Crude glycerol, a by-product from the bio-diesel industry may provide opportunities as a replacement of 4 to 8% cereal grain, assuming approval by regulatory bodies. Legume starch tends to be digested less well by young pigs. Starch concentrates, a co-product of fractionated legume seeds, can however be extruded and thereby become an attractive feedstuff for young pigs.

In addition to using modern feed evaluation and formulation systems, the risk of including high-fibre feedstuffs in nursery diets (a reduction in voluntary feed intake) can also be partially managed by including fibre-degrading enzymes into the diet. Ameliorating these effects should provide a direct stimulus for energy intake and thus growth.

Alternative feedstuffs in grower-finisher pig diets

Crops for production in Western Canada such as zero-tannin faba bean continue to be developed and require assessment of nutrient profile. Crops that independently are difficult to process into feed, such as flax seed, can be combined with other crops such as field pea and co-extruded prior to mixing into swine diets. Co-extrusion may also enhance digestible nutrient profile, especially for nursery and grower pigs with a reduced appetite.

New feedstuffs, such as corn and wheat DDGS, have become available via the development of the biofuel sector. Wheat DDGS is higher in fibre and lower in fat than corn DDGS and the digestible nutrient profile of wheat DDGS is therefore lower than corn DDGS. Expeller-press canola meal has a more attractive digestible nutrient profile than regular solvent-extracted canola meal. Variability of digestible nutrient profile is the main concern with co-products from the biofuel industry.

The local flour industry offers possibilities to obtain co-products such as millrun. These feedstuffs are high in fibre and fibre-degrading enzymes offer potential to improve digestible nutrient profile.

Fractionation of legume seeds allows for partial separation of protein and starch fractions. For example, field pea and faba bean can be air classified quickly and and economically thereby achieving a nutrient digestibility as high as soy protein concentrate and corn starch, respectively. As such, an additional market for legume seed has been provided and an alternative, cost-competitive local feedstuff has been created.

Validation

To convince the industry to adopt a new feedstuff, feed formulation, or feed processing techniques, validation is required to establish if performance and carcass quality can be maintained or specific targets achieved.

The effects of including an individual alternative feedstuff have generally been tested, which has usually resulted in limited differences in growth performance. However, the inclusion of multiple feedstuffs is a more interesting approach to reduce feed cost. Using such an approach, the content of cereal grain in the

diets was reduced from 82 to 43% in, for example, the third phase, whereas co-product inclusion increased concurrently. Even though growth performance was reduced using increasing levels of co-product (Table 1), the economic performance of pigs fed high levels of co-products in the diet was superior. These combined data indicate that simply looking into maintaining growth performance may not result in the most competitive swine production system.

Table 1: Growth and economic performance of grower-finisher pigs fed diets containing low, medium, and high levels of co-products[1]

	Co-product level				
Variable	Low	Medium	High	SEM	*P* value
ADG, kg/d	1.00[a]	0.93[b]	0.92[b]	0.01	0.01
ADFI, kg/d	2.87[a]	2.71[b]	2.66[b]	0.04	0.01
G:F	0.35	0.34	0.35	0.03	0.52
Feed cost, $/kg gain	0.842[a]	0.788[b]	0.747[c]	0.01	0.01
Income over feed, $/pig	39.5[a]	39.9[a]	42.4[b]	0.97	0.01

[1] Adapted from Zijlstra et al. (2009).

Conclusions

The pork industry in western Canada remains under severe competitive pressure, in part due to high feed costs. The current situation dictates that the risk of using increasing amounts of alternative feedstuffs, if available, should be taken. The use of even more complex feeds globally indicates that further reductions in feed costs can be achieved.

FORMULATING WITH OPPORTUNITY INGREDIENTS

Opportunity ingredients can offer significant diet and feed cost savings if formulated correctly into diets, say Neil Campbell, Chad Hastad, Darcy MacDonald and Malachy Young of Gowans Feed Consulting. However, they note, there are risks associated with using them. These can be mitigated by acquiring as much information on the ingredient as possible prior to their use, such as its nutrient content, impact on diet palatability and diet handling characteristics. As the demand for traditional feed ingredients increases, we will be forced to use more opportunity ingredients in diets and optimize the use of current ingredients if we are to control feed costs and remain competitive.

Opportunity ingredients are those ingredients that may not have been commonly used in pig diets in the past due to availability, or may have been used, but at limited quantity due to previous anti-nutritional factors (ANF) or cost. New ingredients pose a bigger challenge and potentially greater risks because a lot less is known about their nutrient content and availability of those nutrients, the impact they may have on feed intake and whether they contain ANF.

Risks associated with using them

When assessing the use of new ingredients or modifying maximum inclusion levels of an existing ingredient in diets, we need to consider the following points:

- How much information is available on the nutrient composition of the ingredient and variation in its nutrient content within and between suppliers?
- Is accurate nutrient digestibility information available and is it representative of the source you will be using?
- Are there any concerns the ingredient may impact diet palatability and feed intake.
- Does the ingredient contain anti-nutritional factors (ANF) or mycotoxins?
- Will animal performance and pork quality be impacted, and if so how, and by how much?
- Will the ingredient increase feed handling costs (bulk density) or affect feed flow in feed bins and inside the barn?
- How much of the ingredient is available and does it warrant its inclusion in diets?

The higher the risk with using opportunity ingredients the greater the return has to be to justify their use and associated risk. The degree of risk and the likely impact of these factors on pig

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performance must be assessed in detail in order to make informed decisions on if/how to use the ingredients.

Diet formulation

When we formulate diets we best cost, as opposed to least cost, formulate diets, because there are distinct differences in achieving our end result of predictable performance with optimal return. There are a number of considerations when deciding inclusion level of opportunity ingredients in diets.

Nutrients

Pigs have requirements for nutrients such as energy and amino acids and not for specific ingredients. Thus when we formulate diets for different stages of growth we formulate to specific nutrient levels, net energy (NE), digestible amino acids, available phosphorous, etc.

Ingredient analysis

A clearly defined quality control program for ingredient analysis should be in place to best estimate/predict the key nutrients in specific ingredients. Ingredients that tend to have greater variability in nutrient content, such as DDGS, require more frequent analysis.

Palatability

We need to understand the impact ingredients can have on diet palatability and feed intake as this will directly impact growth rate and barn throughput. It is also important to have continuity between diets in terms of ingredient inclusion levels and to avoid large swings in diet composition between phases because this may negatively impact feed intake.

Pellet quality/feed flowability

When formulating diets, we must consider the impact that ingredients have on final diet quality such as feed flow and pellet quality. The benefits of lower ingredient costs will be negated if reduced flowability results in out-of-feed events or if poor pellet quality leads to reduced feed intake.

Formulate for maximum margin over feed facility cost (MOFFC)

In the past diets were formulated for maximum growth because diet costs were low and barn space was limited. This resulted in the highest margin over feed costs. Because diet energy costs have increased dramatically, increases in diet energy level have become much more expensive, so that lower energy diets that result in slower growth and reduced feed efficiency are more economic.

The use of opportunity ingredients offers the potential for cost savings in grow/finish diets

Ingredient procurement/purchasing

Evaluating the different sources of ingredients in terms of available supply, nutrient content and variation, are key components in determining their true value. For example, there are vast differences in proximate analysis (moisture, protein, fibre, fat), total and available nutrient content between sources of corn DDGS. It is important to realize that all sources of ingredients are not equal and this becomes more important when dealing with co-products that undergo heat treatment. Building a database of ingredient nutrient content over time allows one to understand the variation associated with specific ingredients and sources.

Periodic value analysis should be conducted to determine the on-going value that new ingredients offer to diets. Typically we like to see a minimum return of $0.30/pig with a new opportunity ingredient to warrant its use. For ingredients that have greater variation in nutrient content, and thus pose greater risk to animal performance, the minimum net return required to justify their use will be greater.

Optimizing use of current ingredients

In addition to diet formulation and ingredient changes, better management of your current ingredients and diet formulation also presents an opportunity. With the high cost of ingredients,

each incremental improvement in feed efficiency will reduce total feed required and cost to feed a pig to market. A wide range of factors including genetics, environment, feed wastage, and health impact feed efficiency. Other factors such as particle size and grain moisture content also affect FCE and feed cost per pig.

INGREDIENT SOURCING BY THE LIQUID FEEDER

Liquid feeding systems and the use of by-product ingredients offer opportunities to reduce feed costs, but also require a pro-active approach to managing the risk of ingredient variability, says Gilbert Vanden Heuvel, a producer from Ontario, where liquid feeding is much more common than in western Canada.

While liquid feeding has a great deal of potential, varied quality and consistency of ingredients may reduce pig growth, he warns. It also requires more labour to manage more products, incurs increased energy usage to pump and agitate and involves more complex ration designs. He provides a guide to the benefits and pitfalls of this feeding method and how to use dry and liquid by-product ingredients.

By-products and the CFIA

The CFIA now define what were previously called by-products or Edible Residual Material (ERM) as Recycled Food Product (RFP) and these are governed by the requirements of the Feeds Regulations. If the RFP meets the packaging and labelling requirements of the regulations, it can be sold and used as a single ingredient for pig feed. However, if there are any concerns with product safety or effectiveness, then the RFP must be registered with the CFIA. Registration forms must be filled out and approval granted by the CFIA

The regulations deal with what is not allowed, such as post-consumer products and meat products, spoiled products, etc. It is now required of the manufacturer of the RFP to disclose all aspects of the manufacturing process that lead up to this final feed product.

The other aspect of liquid feeding involving the CFIA is the use of medications in your feed. If you are using medications in your liquid feed, you need a prescription from a veterinarian. This is different from dry feed regulations because these medications were not tested in liquid feed when registered.

Quality control measures

No matter how cheap the product is, or how much feed cost savings there might be, if the product is below the expected quality or is variable in quality you will not reach the potential feed savings since the pigs will eat less and/or grow less. Therefore it is important to regularly monitor both dry matter and nutritional content. Aspects such as colour, smell, taste and pH should be checked.

Accurate sampling of products and regular analysis is essential. Making decisions from inaccurate samples is worse than making no decision at all. Results of analyses can be used to keep the supplier accountable.

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Mixing liquid ingredients in storage and mixing tanks

Inadequate mixing may be identified by varied amounts of solids on bottom of storage tank when it goes empty, a change in colour of product in the storage tank as it empties or the oil/fat component of by-products floating on top of the mix. To avoid variation, good agitation is essential. The best agitation is done with mixing paddles, but high speed jet streams can also work well.

Understand the risks of your co-product

When deciding whether to use a product, the cost advantage of the product (worst and best case scenario) must be weighed with the risks of using the product. A stable whey or dry product may have low risks and be easy to handle and feed but a product that needs to be fermented, settles easily or changes in DM often needs to have a risk "de-value" attached to it. Including products in your rations and not assessing any risk value to them is naive.

Two common ingredients: DDGS and CDS

Dried distillers' grains plus solubles (DDGS) and corn distillers' solubles (CDS) are good products that can reduce your feed cost per pig if managed well. DDGS is dry product so anyone can put it in their feed. I would suggest a maximum inclusion rate of 20%. CDS is a liquid product and monitoring its dry matter content is important. Some plants can deliver a specified dry matter that matches your system. Agitation is also important as it slowly settles out and oil separates and you can end up feeding varied amounts of fat and dry matter as the tank empties. CDS is high in fat and phosphorus but the protein is of low quality so it needs to be managed with this in mind. Maximum inclusion rate is 10%.

Swine Liquid Feeding Association

The Swine Liquid Feeding Association (SLFA) was formed in 2001 by a group of pork industry stakeholders to promote liquid feeding technology and research within the Ontario pork industry. The directors of the SLFA represent a cross-section of pork producers and industry personnel. The mandate of the SLFA is to facilitate the transfer of current information and future developments in swine liquid feeding technology to those interested in pork production. For more information and for results of the research barn trials conducted at the University of Guelph, visit our website - www.slfa.ca

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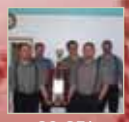
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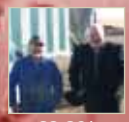
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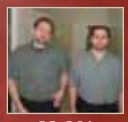
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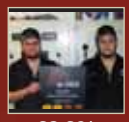
28.67*
NEW HAVEN S.


28.20*
BLUEGRASS


28.18*
EVERGREEN


28.10*
BRENTWOOD W.


28.04*
SUNCREST


27.70*
BRENTWOOD E.


27.60*
GADSBY N.


27.50*
SEVILLE

27.40*
LITTLE BOW


27.40*
HARTLAND


27.40*
GLIDDEN


27.20*
SUNSET


26.90*
ROSEDALE


26.82*
MILLERDALE W.


26.80*
PARKVIEW


26.61*
HILLSIDE


26.50*
SAGE CREEK


26.47*
FAIRVIEW


26.46*
MIDWAY


26.42*
WILLOWCREEK E.


26.41*
SHADYLANE

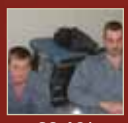

26.40*
TWIN HILLS


26.40*
MARTIN FARMS


26.40*
GADSBY S.


26.28*
VALLEY CENTRE


26.24*
SUNDALE


26.10*
CYPRESS


26.05*
LAKEVIEW


26.01*
DECKER NORTH ACRES


26.00*
CLEARWATER


25.89*
GRASS RIVER


25.87*
SPRINGFIELD


25.77*
WILLOW CREEK W.


25.70*
GOOD HOPE


25.70*
EL TIGRE


25.70*
CLEARFIELD


25.65*
BERESFORD


25.51*
GRAND COLONY


25.40*
WIKNER


25.40*
BACON ACRES


25.27*
HURON


25.27*
FAIRHOLME


25.22*
MILLERDALE E.


25.20*
ROYAL PORK


25.20*
CASCADE


25.10*
SPRINGDALE


25.07*
O.K.


25.03*
BRANTWOOD

* 2007 pigs weaned per mated female per year

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26.76*
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