Pfizer Animal Health

Don McDermid, DVM

From the Vet

Watch for gaps in protection

Most swine herds are on a vaccination program to control the common diseases within their geographic area. It is effective insurance to help avoid the costly losses in performance and mortality that disease challenge adds to a swine operation. For many producers in Canada, vaccinating for *Mycoplasma hyopneumoniae* and Porcine Circovirus (PCV) are key components to their vaccination program.

Timing may have to trump convenience when it comes to vaccine use. To maximize herd health, it's most important to use the right vaccine at the right time. Vaccination choice and timing depends on a number of factors:

- expected timing of the disease challenge
- how long it takes the vaccine to begin working (onset of immunity)
- how long does vaccination protect the animal (duration of immunity)
- duration of maternal protection pigs receive from the sow's colostrum and does this maternal protection interfere with vaccination of the pig itself

Let's look a little closer at vaccination timing for *Mycoplasma hyopneumoniae* and PCV.

Mycoplasma hyopneumoniae

Pigs may become infected with *M. hyopneumoniae* in the farrowing crate by nose-to-nose contact with the sow if she is shedding during lactation. In mycoplasma positive herds, the odds of sow to pig transmission has increased as weaning age has increased resulting in longer contact time between the sow and her litter. A positive correlation has been observed between the prevalence of mycoplasma at weaning and respiratory disease at finishing.[1]

If the pigs are not infected from the sow in the farrowing crate, they may become infected in the nursery or grow-finish barn due to transmission of the organism between penmates. Ideally, *Mycoplasma hyopneumoniae* vaccination would be implemented prior to the pigs becoming infected. If pigs become infected prior to weaning while on the sow, this could create a dilemma as the majority of one dose mycoplasma vaccines are approved to be administered at 3 weeks of age or older. However, RespiSure-ONE® has recently been licensed for administration to pigs as young as 1 day-of-age. Research has shown that pigs are capable of responding to this vaccine at this early age and are protected from an experimental *M. hyopneumoniae* challenge administered 2 weeks later.

Porcine Circovirus

The vast majority of pigs in Canada receive a PCV vaccine to protect against the potentially devastating effects of porcine circovirus associated diseases (PCVAD). Most, if not all, PCV vaccines are labelled for pigs to be administered at 3 weeks of age or older including Pfizer's recently licensed PCV vaccine, Fostera™ PCV.

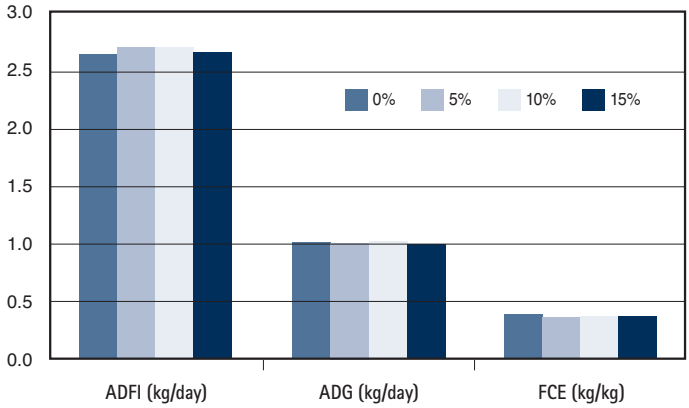
Again ideally, PCV vaccination would be implemented prior to the pigs being challenged by the virus. PCV vaccination at weaning or later is usually successful in protecting pigs from infection in the nursery or grow-finish unit. However, there may be situations where PCV viremia occurs sooner than expected and the herd veterinarian may have to customize the vaccination program for those herds.

Talk to your herd veterinarian about the timing of your vaccination program to protect your herd from these two common disease threats.

[1] Fano, Pijoan et al. (2005) Leman Swine Conference p. 109-113
[2] AASV Proceedings 2009

04/12-15339-03E-C

Figure 2: Performance data of pigs fed diets containing 0 to 15% green canola seed



95.7 kg and 78.4 to 77.8% respectively. Dressing percentage was likely reduced due to the increasing content of fibre in diets with increasing dietary level of GCS to maintain the content of net energy. However, increasing the inclusion of GCS in diets did not affect backfat thickness, loin depth, and carcass lean percentage.

Based on the growth performance data from the present study, growth rate was not affected by increasing inclusion of GCS. However, carcass weight was reduced slightly (0.06 kg per 1% inclusion of GCS) in diets formulated to equal net energy and SID amino acids. Thus, inclusion levels of GCS in swine diets should be based on desired carcass weight or pigs should be marketed slightly heavier to compensate for increasing dressing percentage.

Economics

At the time of the study, increasing the inclusion of GCS in swine diets from 0 to 15% decreased feed costs from $212.5 to $207.1 per tonne. However, income over feed costs (which considered all feed costs and carcass data) did not change as a result of increasing inclusion of GCS in diets, due to the decrease in carcass weight with an increase in the dietary inclusion of GCS.

Overall recommendations

Based on collected data, 15% GCS can be included into swine diets with marginal reductions in feed efficiency and carcass weight, but without affecting growth rate and income over feed costs. Thus, green canola seed should be considered in a feedstuff matrix for grower-finisher pigs. ■

Assessing lameness, productivity and longevity in sow housing systems

By F.C. Lang, J.A. Brown and H.W. Gonyou

The movement away from sow gestation stalls to group housing presents several challenges from the standpoint of facility design and sow management. In choosing the type of gestation housing to implement, it will be important to adopt systems that provide the greatest advantage in terms of their impact on sow welfare and longevity in the herd, as well as their impact on economic sustainability. Lameness in sows is one of the most important welfare issues. Studies indicate that lameness is the second major cause of culling after reproductive failure and represents between 8 and 15% of total culled sows. Lameness also accounts for up to 25% of culling reasons in gilts and is an important criterion in gilt selection.

Until now, qualitative visual scores of gait, standing posture or difficulty in lying down have been the main methods used to measure lameness in pigs. However, accuracy of these qualitative methods can vary significantly among observers. Therefore, there is a need for more objective quantitative methods to assess lameness in pigs. Several quantitative methods for assessing gait, such as kinematics and accelerometers, have been studied in dairy cattle and have recently been under investigation for use in sows. The use of these technologies in sows could lead to better early detection, quantification and understanding of sow lameness, and advance understanding of the relationship between housing, social factors, and lameness. The objective of this study is to determine the relationship among variables such as body weight, age, social rank, body condition and health status and degree of lameness on success within the different systems based on relative productivity, culling rate, health changes, aggression and injuries.

Once the relative importance of these variables has been evaluated, the information will be used to complement a group housed sow longevity model. The model will be subsequently validated and refined using data collected from each study site. The aim will be to develop a reliable model that can be used by producers to predict the economic outcome of different management practices related to longevity.

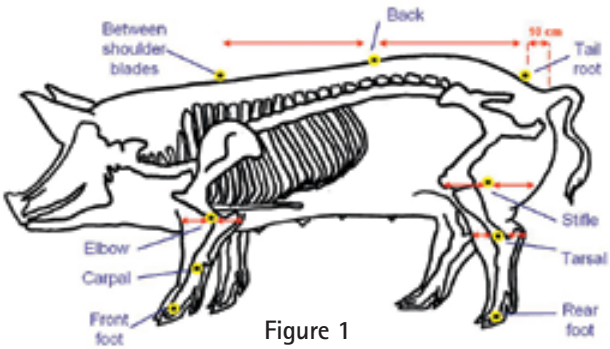


Figure 1

Assessing lameness

Complex gait scoring

All sows are gait scored over 2 parities using a standardized qualitative scale from 0 to 4 (simplified version of Main et al., 2000). Selected sows then go on to be gait scored and a more precise and detailed description of the gait is obtained.

Figure 2

Kinematics

Each selected sow is video recorded as she walks along a corridor lined with 4 ft high Plexiglas panels to ensure transparency and visibility of reflective markers by the camera. Fifteen reflective markers are placed in standardized locations on the sow's body (Figs. 1 and 2) in order to record her movement and speed. Recordings are being analyzed for gait characteristics including stride length, stance time, swing time, foot height, walking speed and angle variation of carpal and tarsal joints and back.

CONTINUED ON PAGE 44

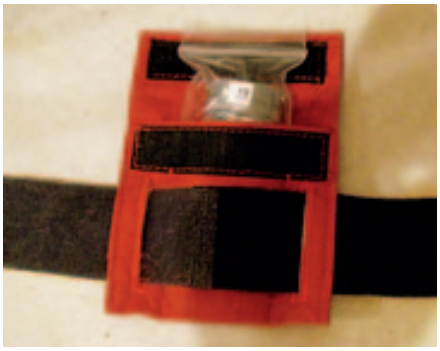


Figure 3

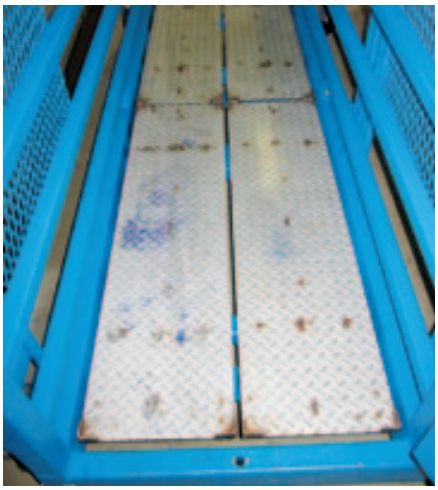


Figure 4

Accelerometers

An accelerometer (Hobo® data logger, Fig. 3) is placed on a rear leg of each selected sow for recording of posture and for evaluation of stepping behaviour at feeding time. The Hobo® device is safely protected inside a Velcro®-pocket and a Vet-Rap® covering. Data on posture is collected by recording the acceleration on the x-axis (at intervals of 5 seconds) over 24 hours. Data on stepping is collected by recording the acceleration only on the x-axis, for one hour at feeding time.

Force plate weigh scale

A weigh scale has been adapted for sows that use 4 separate platforms for measuring weight distribution on each limb (Fig. 4). In Phase 1, a validation study was completed to assess accuracy and precision of the scale. Phase 2 aims to identify indicators of lameness (eg. un-balanced weight distribution, weight shifting) and comparing measures obtained with the force plate to other lameness detection methods, including kinematics, accelerometers and visual scoring.

Temperament testing

Dominance and temperament traits are likely to affect the ability of sows to compete in group housing. Dominance is closely related to relative size, age and parity of animals in groups, while temperament is defined as relatively stable individual characteristics. Two major dimensions of temperament have been identified in pigs. These traits can be described as 'active-passive' and 'confident-fearful' dimensions, and they are expected to affect the ability of sows to compete for social rank within group systems and also the level of aggression displayed. Sow temperament will be measured by 4 tests: the Open Door Test (ODT), Pig Approaching Human (PAH), Human Approaching Pig (HAP) and Novel Object Test (NOT). Figure 5 shows the octagonal pen used in the PAH, HAP and NOT.

Figure 5

Longevity study

Data is collected regarding sow condition and lameness at 7, 16 and 20 weeks post-breeding, and production data are collected from on-farm records at the end of gestation. Sow data includes gait score, parity, weight, body condition score, and backfat. Production data includes breeding, farrowing and weaning dates, total piglets born, total piglets weaned and sow feed intake, as well as medical records and culling information.

Conclusion

The need to monitor and assess animal welfare standards on commercial farms is becoming an increasingly important issue as quality assurance schemes are expanded in response to consumer demands. Information from this project will provide tools for the accurate assessment of lameness, which is an important welfare measure that may be affected by changes to sow housing.

The findings will be of particular interest as many producers in North America will be converting to group housed systems in the near future.

Acknowledgements

Strategic program funding was provided by Sask Pork, Alberta Pork, Manitoba Pork Council, and the Saskatchewan Agricultural Development Fund. Specific project funding was provided by the Canadian Swine Research and Development Cluster (Swine Innovation Porc). ■


MAXI-GEN PLUS
NUCLEOTIDES
GLUCANS
MANNANS
BIO-PEPTIDES
B-VITAMINS
ONE STOP SHOP
CBS
cbs CANADIAN BIO-SYSTEMS
MAXI-GEN PLUS
Is a rich source of nucleotides, mannans, glucans and other bio-active compounds.
This comprehensive blend of yeast products makes Maxi-Gen Plus your One-Stop-Shop for nutritional essentials in all species.
Call 1.800.561.2474 to request an information package or visit maxigenplus.com

Gelatin in semen may extend storage life

The inclusion of gelatin in semen extender may improve storage life and sperm cell integrity, according to a recently published paper in the journal Livestock Science. In addition, adding gelatin reduced the volume of backflow during insemination.

The study evaluated the inclusion of gelatin in a Beltsville Thawing Solution (BTS) type extender, which is commonly used in the pork industry as a short-term extender. In the first trial, semen was compared in extenders that included 0%, 1.5% or 3% gelatin. Sperm motility and morphology was evaluated over 72 hours after extension. In a second trial, semen was extended with either 0% or 1.5% gelatin and compared over 108 hours for sperm motility, normal sperm morphology and sperm membrane integrity. In the final part of the trial semen diluted with a BTS extender including 0 or 1.5% gelatin was inseminated into sows. Semen backflow was collected during and after insemination and farrowing rate and litter size born were recorded.

In the first part of the trial, sperm motility and sperm morphology was not different over the 72 hours evaluated regardless of the extender used. In the second part of the trial, extenders with 0% and 1.5% gelatin were compared and sperm was evaluated for a longer period of time and sperm membrane integrity was assessed. Over the 108 hour (4.5 days) time period, sperm motility was only slightly improved after 108 hours when sperm was extended with 1.5% gelatin compared to a BTS extender with no gelatin. However, normal sperm morphology was dramatically improved after 108 hours when kept in extender with 1.5 % gelatin. Semen extended in the BTS extender with 1.5% gelatin had approximately 7% greater motility than semen extended in BTS alone. The semen with 1.5% gelatin had approximately 200% greater membrane integrity after 108 hours compared to semen stored in BTS extender without gelatin.

> **"There was a tendency for total size born to be higher for the sows inseminated with the semen containing gelatin"**

In the third part of the trial, 26 sows were inseminated with semen extended in BTS extender or BTS extender with 1.5% gelatin. Sows were inseminated three times, 12 hours apart after detected in behavioral oestrus. Inseminations with semen extended in BTS took 1 minute longer compared to inseminations with semen extended in BTS with 1.5% gelatin (7.8 min. vs 6.8 min, respectively). In addition, the volume of backflow during and after inseminations with 1.5% gelatin in the extender averaged only 10.3 ml compared to 18.9 ml for insemi¬nations that did not have gelatin in the extender. Farrowing rates were high for sows inseminated with semen extended with either the 0% or 1.5% gelatin extender and did not differ (92.6% vs 88.5%, respectively). There was a tendency for total size born to be higher for the sows inseminated with the semen containing gelatin (13.2) than for semen without gelatin (12.0).

These trials show that the addition of 1.5% gelatin to semen extender, which is simple and cheap, may result in better storage life and improved sperm cell integrity. On the farm, the reduced amount of backflow would be of benefit in improving the quality of insemination, with possible benefits to litter size. ■

Would Alberta's pork industry benefit from immunocastrating boars?

By Christy Czapski, Amy Kachurowski, Erin Kolodziej, and Natalie May

A University of Alberta Animal Science Capstone Project

Project objective

The objective of this University capstone course project was to learn the views of Western and Central Canadian pork packers and main producer groups relating to immunocastration technology. Potential implementation and benefits for the Alberta pork industry were investigated.

What is boar taint?

Boar taint is primarily caused by two compounds, androstenone and skatole. These compounds accumulate in pork fat and become detectable by consumers when cooking and eating pork. Androstenone is a testicular steroid that concentrates in the salivary glands of boars as a sex pheromone. Testicular androstenone production responds to pituitary luteinizing hormone (LH), which in turn is controlled by the hypothalamic gonadotrophin-releasing hormone (GnRH) starting at puberty. Skatole is a by-product of tryptophan metabolism by bacteria in the hindgut. Skatole can be absorbed through the skin into subcutaneous fat depots when boars, barrows or gilts lie in manure. Boars are less efficient at breaking down skatole than gilts or barrows.

Alternatives to physical castration

The most common method of controlling boar taint is physical castration of male pigs soon after birth. Due to consumer concerns regarding surgical castration without pain control, alternatives to reduce boar taint are being explored. Immunocastration is a 2-dose vaccine that triggers the pig's immune system to produce GnRH-targeting antibodies that stop testicular development and androstenone production:

- The first injection is given to boars between 30 and 60 kg. It primes antibody production.
- The second injection is given to boars 4 - 6 weeks prior to slaughter. It abruptly neutralizes production of GnRH.
- Boars are considered immunocastrates within 10 days of the second injection.
- Males thus grow as boars, benefiting from the natural anabolic effects of testicular hormones until the second injection.

Immunocastration of boars improves feed efficiency by approximately 8%, increases leanness in carcasses by 4.6%

CONTINUED ON PAGE 48

and reduces greenhouse gas production by 6% compared to raising barrows.

Industry concerns

Although already approved for use in European Union countries, Australia, Mexico, Central and South America, and recently (2011) in Canada, immunocastration is not being implemented by the Alberta pork industry. The recent trend of consumer demand towards less lean, fatter marbled pork is viewed as the main deterrence. Setup of new procedures and quality assurance programs on-farm and at slaughter plants would also complicate implementation of this technology.

Consumer markets

More than one-half of Alberta's pork goes into export markets. Therefore, foreign consumer wants and perceptions are key determinants of our industry trends. Before new technologies such as immunocastration can be implemented, consumer demands and preferences must be considered. Not only market drive, but also producer, packer and retailer economic benefits must be present for immunocastration to be implemented successfully.

Marbling, and less lean preferences

The preferences of both international and domestic consumers have shifted towards pork with greater levels of fat marbling due to the perceived taste benefits. Processing techniques such as hot-skinning also require a certain level of subcutaneous fat to preserve the surface integrity of primal cuts. Immunocastration yielding a leaner carcass and pork with less fat is therefore contrary to Alberta's current market and consumer trends.

Injections and needles

Consumers have a negative perception of injections in animals producing their meat products. With immunocastration requiring two neck injections, there may be consumer hesitancies regarding product safety and wholesomeness. Finding broken needle(s) in pork of immunocastrates could have a greater detrimental effect than the experience of boar taint. Product safety and quality are paramount to consumers and to preserve Canada's global reputation.

Welfare, labour and procedures

Current Asian consumer preferences focus on product safety, quality and cost. Surgical castration remains acceptable as long as certain levels of welfare are maintained and the procedure is performed as quickly as possible. Injecting large pigs twice results in stress to pigs and workers, additional farm and abattoir labour, setup and implementation of procedures and verification audits. Consumer welfare concerns are currently not the primary driver to justify the vaccine cost, additional labour and procedures needed to assure proper immunocastration procedures.

Global competitiveness

No competitive edge is currently evident from countries where immunocastration technology has been approved for some time. A change towards leaner pork or preferential value for a superior welfare-derived product would be required for immunocastration technology to have potential for adoption by the Alberta pork industry. Even adoption of this technology by countries currently slaughtering young intact boars would not likely affect Alberta's foreign markets that prefer pork with greater fat marbling. The evolution of consumer demands in foreign markets will dictate if implementation of immunocastration would increase Alberta's global competiveness in pork production.

Lack of economic benefit to packers and producers

The recent change in consumer preference for pork with greater fat marbling implies that currently there is no benefit to having leaner and slightly heavier carcasses from immunocastrates. Even if line speed is not affected, there would be the added cost of a few more personnel on the line, plant QC procedures, occasional boar taint testing of suspects and QA audits. Producers would not benefit either, despite a claimed 8% improvement in feed conversion. The cost of the vaccine, implementing new on-farm procedures, personnel training and audits are unknown, but likely would exceed possible economic gains. There would be reduced dressing percentage (2%) due to removal of the male internal glands and testis at evisceration. On the current settlement grid, producers are paid less for carcasses with superior lean yield (2 index points) above the centre

of the core. Reduced barrow mortality (1.5%) from surgical castration, reduced incidence of boar taint from cryptorchid (0.5%) and intersex (0.3%) animals and reduced revenue from slightly less manure produced from immunocastrates compared to barrows are too small to tally in favour of immunocastration. Therefore, without consumer drivers, there is currently no economic benefit to Alberta packers or producers in implementing the immunocastration technology.

Implementation considerations

On-farm

- Injecting boars twice, especially near market weight, would increase animal stress, labour, worker hazards, barn handling space and equipment requirements.
- Procedures would have to be developed, records kept, training provided and external audits passed to assure packers of correct vaccination and that suspects were identified, kept and re-vaccinated.
- Individual animal tagging and carcass tattooing would aid traceability.
- Restricted timeline to ship to slaughter as immunocastrates eventually revert back to boars.

Visual screening at lairage and on-line

- Lairage personnel should have similar training as farm personnel to identify and segregate animals exhibiting boar-like aggression or mature-sized testes.
- CFIA personnel would inspect not just the lot, but also individual animals.
- At evisceration, the size of testes and accessory sex gland must be examined. Carcasses of suspect animals would end on the hold rail for tagging and laboratory testing.

Rapid, objective testing for boar taint

- Rapid, objective testing (i.e., NIRS, ELISA) for boar taint of suspect carcasses needs to be developed, implemented and verified. Fat boiling and smelling is subjective testing and too slow for plants with high speed lines.

Conclusions

- Given that consumers now want fresh pork with greater fat marbling to enhance sensory attributes, it appears that the window of opportunity for implementing the immunocastration technology resulting in leaner pork has passed.
- Packers perceive declining consumer demand for leaner fresh pork so their current carcass settlement grids reflect this fact. Pork producers are being paid less for carcasses with less backfat and superior lean yield. Producers also face lower dressing percentage due to removal of sexual glands. Despite an improvement in feed conversion for producers, the cost of the vaccine, developing new on-farm procedures, training and audits is unknown.
- Current Asian consumer preferences focus on product safety, quality and cost. Surgical castration remains acceptable to them as long as certain levels of welfare are maintained. Thus, given that costs of production and implementation outweigh the profit return, and that consumers are not willing to pay for leaner pork but want greater fat marbling, implementation of immunocastration technology is unlikely to move forward in Alberta's swine industry at this time.

Acknowledgements

We would like to thank the industry representatives that we contacted for their time, generosity, and for their willingness to share their insight about the immunocastration technology. Their ability to think hypothetically when given scenarios was critical in assessing the potential of this technology given that the current status of implementation is doubtful. We would also like to thank our mentor, Eduardo Beltranena, for his dedication and support. ■

Happiness and the pig

By Dennis Robles, Swine Health Professionals, Steinbach, Manitoba

Did you know that being happy reduces your risk of dying by 35%? Yes, true story! This was published in the journal *Proceedings of the National Academy of Sciences Oct.31, 2011*.

Happiness boosts immunity, promotes better health, increases success in life and relationships and does more good for the family, community and the world!

You are probably thinking "What does this have to do with stockmanship and how I raise my pigs?" Well, it has everything to do with it and your business. You may be an independent swine owner/producer, health and care provider, scientist, production expert, technician or somebody directly or indirectly connected with the swine industry, you have got to pay attention to this topic of happiness. Why, you may ask? Because the business we are in involves people. The success of any enterprise depends on happy, satisfied and fulfilled individuals working together to reach specific goals on career, production performance and/or profit. So let us all go through this path and learn about being happy.

The pursuit of happiness

"I just want to be happy" is a common answer when people are asked about their life goals. This is mostly just an excuse for not giving goals serious thought but there is a practical approach to happiness according to Dr. Maxwell Maltz in his book *The New Psycho-Cybernetics*. Defining happiness from a medical standpoint as "A state of mind in which our thinking is pleasant a good share of the time" is a very good and practical way to look at happiness. When we are happy, we think better, feel better and are healthier according to Russian psychologist K. Kekcheyev. And even our physical sense organs – seeing, taste, smell and hearing, work well when we are thinking pleasant thoughts.

Pursuing happiness is like chasing a rainbow. The faster we go, the harder we try, the farther off it becomes. However, I learned that happiness is not a pursuit, it's a choice! Happiness is a state of mind, obtainable at any time in any moment of our choosing. Unfortunately, our beliefs about what will make us happy are heavily influenced by other people, environment, our idols in movies/sports and commercial media. But by seeing happiness as internal and coming from within us, we will not be dependent on external factors to uplift our spirit.

> **"Fulfilment is not a fleeting emotion but a state of mind that requires appreciation for what we already have now"**

If we pursue fulfillment, purpose and significance instead of short term pleasures like excessive entertainment, eating, drinking alcohol and sex, we will find a more lasting and meaningful life. Fulfillment is not a fleeting emotion but a state of mind that requires appreciation for what we already have now. Happiness lies in the present, not in the future. Most of us live our lives in a deferred payment plan thinking that we will be happy when we get the promotion, the best hog contract, 40psy, when the children are through college or having the house paid for. These are noble goals but let us not focus so much that we forget to take pleasure in the present, like enjoying the company of our co-workers, enjoying a sunset or making someone smile.

CONTINUED ON PAGE 52

GEA

Performance, reliability and durability;

That is what has built the well-known reputation of our liquid manure spreaders over the years. Increase the resistance of your spreader against corrosion by choosing our new tanks made of stainless steel. Available on the EL48 and EL54 Series.

Agi-Pompe

Super Pump

Powerfull and made to suit all types of installations

The power take-off Agi-Pompe and Super Pump are available in 6 versions:

- Stationary
- Tilting 3-Point Hitch
- Sliding 3-Point Hitch
- Trailer mounted for in-ground storage tanks and lagoons
- For Aboveground Tank
- Trailer for Aboveground Tank

GEA Farm Technologies

Catons Ltd.
Lethbridge — 1.866.327.0115
Lacombe — 1.800.662.7137

Dairyland Agro Supply Ltd.
Emerald Park — 306.721.6844
Saskatoon — 306.242.5850

Kneller's Sales & Services Ltd.
Leduc — 780.986.5600

Penner Farm Services
Blumenort — 204.326.3781
1.800.461.9333
Brandon Division
Brandon — 204.728.7563

GEA Farm Equipment I **Houle**

GEA Farm Technologies Canada Inc.
Division GEA Houle
Tel.: 819.477.7444 / Fax.: 819.477.0486
www.geahoule.com

GEA Farm Technologies - The right choice.

GEAHoule_SSSpbPTO_WestHogJournal_2012-01

Rewards of happiness

Social scientists have studied happiness for decades and came to the following conclusion:

- We can control how cheery we feel
- The happier we are, the healthier we are
- The healthier we are, the longer we live
- In addition to longer lives, we pass on these happy attitudes to our children
- Happier people tend to make more money
- Satisfied individuals have more harmonious marriages and are less likely to get divorced
- Being happy isn't just more fun for you; it's good for the community and the world at large
- Focusing on well-being in the workplace pays off, too

Happiness is an evolutionary advantage as a human being according to Dr. Ed Diener, author of *Happiness: Unlocking the Mysteries of Psychological Wealth*. He further said that "we are such a social species that happy people do well." But remember, we do need negative emotions too (anger, afraid, ashamed or guilty etc) as being happy all the time could be harmful.

Happy ever after

Believe it or not, there is a formula for being happy (Dr. Martin Seligman, *Authentic Happiness 2002*):

H = S + C + V

The "S" is a persons' set point, inherited range of happiness feeling; "C" is the circumstances of a person's life; and "V" stands for the person's voluntary choices or actions. Cool isn't it? All we need to do is add all three to make up the "H", overall happiness. Not exactly. We have to work on all these factors to achieve our desired "H". They said that the set point is determined in the early years of life (about 3-4 years old) and is influenced by other people/parents.

> **"When we draw upon our strengths, we can find pleasure in the moment and overall satisfaction"**

This is what determines a persons' emotional intelligence and influences 50% of happiness experience. Yes it's big but it is not set in stone. You can change this by self awareness, meditation and self analysis (Dr. Depak Chopra). The condition or circumstances in a person's life is 10% of the happiness experience and there is nothing much we can do as things happen to all of us – good or bad. The only thing we can do is how we react to these conditions. The next factor, voluntary control is the most challenging one as "we as humans are bad at knowing what will make us happy". We must strive really hard to know what makes us happy, according to our own terms and no one else's. They found that it is not a job position, or money or having kids or moving to a warmer climate or even being young. The path to true well-being, the scientists believe, lies in cultivating ones' character strengths rather than fixing weaknesses. These "signature strengths" may include critical thinking, open-mindedness, ingenuity, street smarts, diligence, generosity, leadership, modesty or 16 other positive traits which are chosen for their value not for what they produce but by their own sake.

We are in the swine industry and finding our core strength wherever we are in the production chain of the business is important to find happiness and fulfillment. When we draw

upon our strengths, we can find pleasure in the moment and overall satisfaction.

How to be happy

Social connection is key to happiness, all experts agree. The quantity and quality of our relationships with friends, family and acquaintances determine our spirits. See that person across from you at the barn or office? Smile and talk to her. The best way to be happy is to make someone else happy!

Gratitude is another predictor of contentment. Finding the time to think of all the good things happening for us and appreciating them is a sure boost for our positive disposition. Saying "thank you" is not just polite. Research shows that people who are consistently grateful tend to be more forgiving, less materialistic and are more helpful. Oh, thank you for reading up to this point by the way...

Optimism is another trait that can be a learned state of mind. Okay, so you're a glass-half-empty kind of person, you can look at it as less empty than before! Tip: look on the bright side (there always a bright side to everything!) So a sow is in the pit. At least its only one sow instead of 2!

Getting in the happy zone or flow by learning a new skill or being challenged or tackling a new role can result in a smile on your face. It should be just enough that you achieve results and not cause frustration.

Running! (Or Exercise). Have you ever heard of "runners' high"? Believe me, this works! I have tried it and that rush of endorphins from continuous cardiovascular exertion produce a feeling of euphoria leaving me grinning from ear-to-ear!

Fake it 'til you make it! Philosophers advise us that "pretending to feel happy, or more energetic, or more confident, or more – whatever, you can actually make yourself be that way." Try this, look in the mirror and say "Eeeeeee....." for as long as you can. See, you're happy now!

Knowing all this, let us go back to the pig and the business of pig production. When we are happy, fulfilled and satisfied there is a corresponding positive effect in what we do. We work better, exert extra effort and produce extraordinary results in the barn or in the office. Simple but important tasks such as washing and preparing the rooms, breeding sows, attending farrowing sows, giving special care and attention to all animals and providing individual pig care, all seems easy and logical. Planning and implementation of production protocols for the swine business will be more relevant and applicable when done in a positive mood. The pig in turn will be happier, healthier and provide us with more meat and profit. So let us be happy and make money! ■

Managing manure phosphorus

By Clay Sawka and Petra Loro, Manitoba Agriculture, Food and Rural Initiatives

In Manitoba the Livestock Manure and Mortalities Management Regulation (LMMMR) governs how livestock producers manage manure on the farm. The underlying principle of the regulation is "Thou shalt not pollute". The LMMMR covers confined livestock areas, manure storage structures, land base requirements, manure management plans, land application of manure and more.

In 2013, new phosphorus (P) regulations related to the land application of manure come into effect. Why is P so important now? Phosphorus has been shown to be the limiting nutrient in freshwater systems like Lake Winnipeg. It takes as little as 0.03 ppm P in the water to cause algal blooms to flourish. Agricultural land is one of the many sources of the P in Lake Winnipeg. Due to this, it was decided that soil test P (STP) levels should be regulated.

Manure is traditionally land-applied based on the nitrogen (N) requirements of the crop. Crops generally require much more N than P, in the region of 3 or 4 times more. In manure, the N:P ratio is much lower at 1.5 to 2:1. This means that when manure is applied based on the N requirements of the crop, more P is applied than the crop will use. The excess results in a build-up of soil P which increases the risk of P entering surface water through runoff.

Table 1: Maximum P application based on soil P level

STP	Maximum rate of manure application
0-59 ppm Olsen P	Apply manure based on **N** requirements of the crop
60-119 ppm Olsen P	Apply up to **2x* crop P205 removal** or N requirement of the crop, whichever is lower
120-179 ppm Olsen P	Apply P up to **1x* crop P205 removal** or N requirement of the crop, whichever is lower
> than 180 ppm Olsen P	No further P application (manure or synthetic fertilizer)

** Multi-year P_2O_5 applications are permitted. Up to 5 years worth of P_2O_5 can be applied in the first year of the rotation provided that no additional manure is applied for the remaining 4 years. The multi-year application rate cannot exceed the annual N requirement of the crop.*

Under the new rules, producers must change the way they manage manure based on STP levels using the Olsen P soil test. As STP levels increase, the amount of manure P that can be applied to land decreases as shown in Table 1.

The above thresholds can severely restrict the amount of manure that can be applied to a field and, as a result, can mean that a farmer has to find significantly more land for the manure. Livestock producers should begin implementing management strategies as soon as possible that bring the farm into P balance to avoid reaching the P thresholds. A valuable and useful tool that has been developed for Manitoba to assess on-farm P balance is a P-budget calculator. Using the calculator, a producer can sit down with an agronomist or with a MAFRI nutrient management specialist and can go through the entire operation to see if there is a P surplus.

A P-budget is a lengthy but relatively simple calculation where all of the P entering and leaving the operation is considered to determine if the farm is in P balance, as shown in Table 2.

If the operation is in balance but some fields are increasing in STP, then it may be simply a matter of changing the way manure is managed on the farm. Whether a manure management plan is required or not, soil and manure samples and analysis should be done every year. It is incredibly difficult to know what an appropriate rate of application is when existing soil levels are not known and when manure nutrients are estimated from book values. Differences in barn management can have significant impacts on manure nutrients. The amount of P in the feed has a huge influence on the amount of P in the manure, and the amount of water used in the barn can change the manure nutrient concentrations. Without knowing what is in the manure, nutrients can be easily over or under-applied. If soil tests indicate that P levels are approaching the thresholds, rotating the fields and leaving 2-3 years between manure applications allows the crops to use the P that is available from the soil reserves.

If there is a surplus of P on the operation, the producer needs to reduce the amount of P being imported onto the farm in feed and fertilizer, increase the amount of P being exported in crops or obtain more land for manure application. The first

step is to look at how much synthetic P fertilizer is being brought onto the farm. If we have STP levels that are above the agronomically optimal range of 15-20 ppm then the probability of getting a response to additional P, beyond starter P, is low. We can save the farm money by not purchasing and applying unnecessary synthetic P fertilizer, such as 11-52-0 (MAP).

The next step is to minimize the P coming on to the farm in the pig feed. Significant volumes of feed are brought on to the farm every year. For example on a 3000 sow farrow to 5 kg barn (750 Animal Units), approximately 3600 tonnes (3968 tons) of feed is fed to the pigs in a year. If the total P in the feeds is on average 0.8% for lactation, 0.7% for gestation, 0.65% for boar and 0.8% for creep, then 60,078 kg P2O5 (132,172 lbs P2O5) has been imported onto the farm. Some of this P is retained by the weanlings and the sows but most of it is excreted in the manure. After we account for pig growth approximately 57,373 kg of P2O5 (126,221 lbs P2O5) ends up in the manure that is then applied to land for crop production. To put it in perspective, this is equivalent to 242,732 lbs of MAP. If the crop rotation on this farm is 50% wheat (40 bu/ac yield) and 50% canola (35 bu/ac yield) then the average removal is approximately 32 lbs of P2O5/acre. Under this management scenario, 3,987 acres of land is needed to balance the P in the pig manure with the P removed by crops over the long term. This is approximately 4 times more land

Table 2: Phosphorus budget calculation

Imported P		Retained P		Exported P		Result
Feed and minerals Bedding Fertilizer Manure (from different operations)	-	Livestock through weight gain	-	Livestock products (eggs, meat, milk,) Mortalities Crop products Manure that is given away or sold	=	(+) indicates surplus (-) Indicates deficit

CONTINUED ON PAGE 56

than is needed to manage the N in the manure. An operation of this size typically needs about 1000 acres annually to manage all of the manure based on N. By reducing the amount of total P in all of the feeds to 0.65% for lactation, 0.6% for gestation, 0.55% for boar, 0.7% for creep, the land required decreases by 646 acres to 3341 acres.

To further reduce the land required for manure application, the possibility of increasing crop removal through a change in crop rotation should be explored. This may not be as easy as reducing the total P in the pig rations because market conditions often dictate crop choices and different specialized seeding and harvesting equipment may be required. However, introducing crops that remove more P from the field, such as corn or alfalfa, further reduces the required acres. For example, a high yielding (100 bu/acre) corn crop removes up to 44 lbs P_2O_5 /acre. By changing the crop rotation to include 25% wheat, 25% grain corn and 50% canola, the land base requirement drops an additional 463 acres to 2878 acres.

Feed, fertilizer and cropping changes may not be enough to bring some operations into P balance. This may be the case for operations where crop P removal is very low. For example, operations that use pig manure to fertilize pasture have very low P removal rates. Grazing removes only 5 lbs P_2O_5 per acre compared to mechanically harvesting and removing grass hay (30 lb P_2O_5/acre with 3 ton/ac yield). Any operation that has a P surplus after implementing all possible feed, fertilizer and cropping solutions will need more land.

If additional land for manure application is not available nearby, manure may have to be transported considerable distances. Since liquid pig manure is mostly water, transportation can be very expensive. The P in manure is concentrated in the solids. By treating the manure to separate the solids from the liquids we can create a low P liquid manure to apply close to the barn and a high P solids which can be transported more economically to lands that are further away.

The capital and operating costs associated with manure treatment can be extremely high. Centrifuge systems can cost from $400-700k by the time the building, agitation tanks and centrifuge are installed. Before considering a treatment system for P management, producers should first explore fertilizer, feed and cropping solutions and then analyze the economics of hauling liquid manure versus treating manure and managing the solid and liquid streams produced.

Managing soil P can be a challenge, the key is to first understand what is happening at the farm level and then at the field level. By understanding the flow of nutrients on the farm, long term manure and soil management plans can be developed so that nutrient use is optimized to benefit the farm and the environment. ■

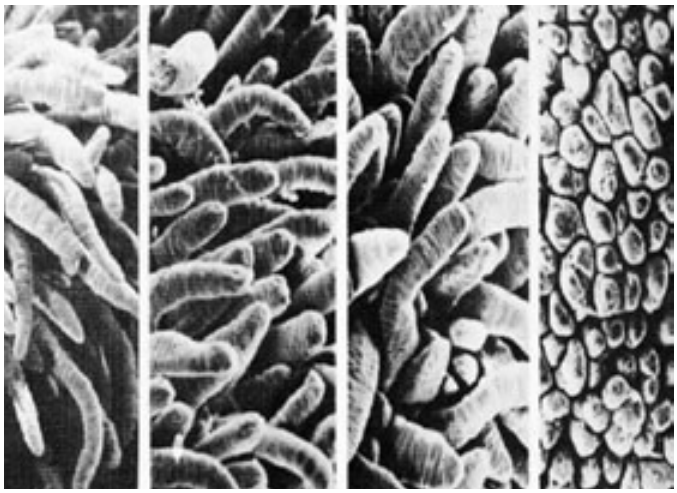
Nutrient disruption: A performance and animal welfare issue

By Brent Ratliff, Swine Nutritionist and Denny McKilligan, Director of Technical Services – Swine, TechMix LLC, Stewart, MN

"Nutrient disruption" is a bigger issue in today's modern hog production than many producers imagine. Unfortunately, nutrient disruption does happen and more often than you might think. Sometimes it's due to mechanical or system failures. But sometimes it is because we don't accommodate the pigs' needs and behaviour as we should.

What is nutrient disruption and why is it so important? Let's start with proper gut function. This depends on a regular flow of nutrients being ingested orally. If the flow of nutrients is interrupted, the villous architecture of the gut deteriorates, often in a matter of days (Figure 1).

Figure 1: Scan of intestinal villous structure showing serious deterioration three days post weaning (Cera et al, 1998)



When this happens, the gut cannot absorb nutrients as effectively. This can lead to a portion of the undigested nutrients entering the lower gut, which makes it easier for negative micro-flora to develop. The gut will become permeable and more susceptible to pathogens and enteric challenges. Since the gut represents about 80% of a pig's immune system, it is important to give it every opportunity to stay healthy.

Disruption at weaning

There are four common times and events when nutrient disruption can occur: weaning, transition from nursery to finishers, out-of-feed events and disease challenges. The focus of this article is the weaning event. In commercial systems, weaning the pig is an abrupt process that happens all at once. In nature, this process would happen gradually and allow the pigs to transition in a low-stress fashion. As an industry, we have trended toward a slightly older pig at weaning, however 21- to 24-day old pigs are still very immature.

Prior to weaning, the pig receives feeding cues from its mother, drinks all of its meals and eats as part of a group. When pigs are weaned into a nursery, or wean-to-finish barn, they receive no feeding cues, are no longer with littermates, and must adapt to drinking water and eating dry feed. Because of this abrupt weaning event, pigs struggle to appropriately regulate dry feed and water intake. Often, piglets will not consume dry feed during the first 12 to 24 hours following weaning. This nutrient disruption is far greater than any the pig has experienced up to this point in its life. In looking into pig behaviour post-weaning, what's apparent is high water intake and low dry feed intake. This should be no surprise since piglets are used to receiving their meals in the liquid form. Additionally, research in 2003 by PH Brooks and CA Tsourgiannis provided further understanding of not only the low feed intakes, but the significant variation in the individual feed intakes during the first week post weaning (Figure 2).

CONTINUED ON PAGE 58

How does significant nutrient disruption at the time of weaning ultimately affect pigs? Are they able to simply deal with it and go on or are there long-term ramifications? Dr. Adam Moeser and his team at North Carolina State University have focused on the impact of early life stress on intestinal barrier health and permeability in early weaned piglets compared to their un-weaned littermates.

Dr. Moeser's studies (1) revealed that early weaning caused the intestines of piglets to become more permeable, indicating a compromised intestinal barrier. Time-course studies showed that barrier disturbances in early weaned pigs persisted as far as nine weeks after weaning. This suggests that stress which occurs early in life results in permanent defects in the gastrointestinal barrier. Dr. Moeser additionally observed that when early weaned pigs faced a mild social stress later in life, they were more sensitive to the stress as measured by high blood levels of stress mediators (corticotrophin releasing factor (CRF) and cortisol) and increases in intestinal permeability compared with late weaned, control pigs. This is similar to the emerging paradigm of stress-related disorders in humans in which previous history of early life stress (childhood trauma, abuse) predisposes individuals to stress-related intestinal disorders in later life.

Stress upon stress

Nutrient disruption often happens at the same time pigs are experiencing "additive stressors". Normally, pigs can cope with one stress event; and maybe two events specifically when they have time to rest and recover between those stresses. There are events such as weaning, however, when there are four, five, or even more stressors stacked on top of one another. These multiple stressors hitting at one time impair the pigs' ability to cope in a reasonable way.

Setting the right environment

Understanding what a pig goes through at weaning can help you minimize the adverse effects. Start before the pig is weaned. The farrowing house gives the pig a fairly protected environment. This is a great time to prepare the pig for coming events. Creep feeding is a way to help pigs experience the future and start training them to eat. You may not see significant benefit in weaning weight, but there are subsequent benefits seen in nursery feed intake when pigs become eaters.

At the nursery or wean-to-finish barn, everything should be predicated on pig comfort. The environment should be warm and dry. Pigs sleep a considerable amount of time after weaning and you can tell when they are comfortable. If they are spread out evenly and are resting well they will be more likely to explore their environment when awake and find food.

Whether pigs are on a truck for a long period of time, or in a nursery after a short haul, they won't eat much dry feed in the first 24 hours after weaning. Individual feed intake is actually erratic for a full week after weaning. Therefore everything possible should be done to keep nutrient flow into the pig even if it is only a portion of their maintenance needs.

Enriching the water

Sudden removal of sow milk results in transient starvation. Piglets literally don't know what or how to eat. Enriching the water is a fairly new concept that has been shown to reduce nutrient disruption. Pigs will drink immediately after weaning and enriching the water can provide a base level of nutrients to the pig until normal dry feed consumption occurs. Options for enriching the water include plasma-based products, glucose or lactose based energy products, or combinations of energy, dry fed microbials and electrolytes.

From a behaviour standpoint, it's important to cue the pig to eat as much as possible. Temporary round feeders such as Rotecna pans can be very helpful. Since pigs are used to eating as a group, accessible feeder space for the first few

days is important. Fresh feed in small amounts in standard feeders, or beginning with mat feeding, is much better than dumping large quantities of feed into the automated feeder. The more you can interact with pigs and teach them to eat, the better pigs will transition to dry feed. Once pigs have been in the barn for a few days, you need to start identifying non-eaters. This is a bigger problem than most producers realize. Non-eaters can be large or small. They generally show up about 3 to 4 days into the nursery period, and may continue to show up for as many as 14 days. Walk the pens and look at the top of the pigs. Look at the flank and see if they are gaunt or drawn in. You may also want to pick up a questionable pig and feel its stomach to tell if it has been eating. Pigs that you identify as non-eaters should be separated and put in a pen where they can be given special care. They should be treated as though they are freshly weaned and everything possible should be done to encourage nutrient intake.

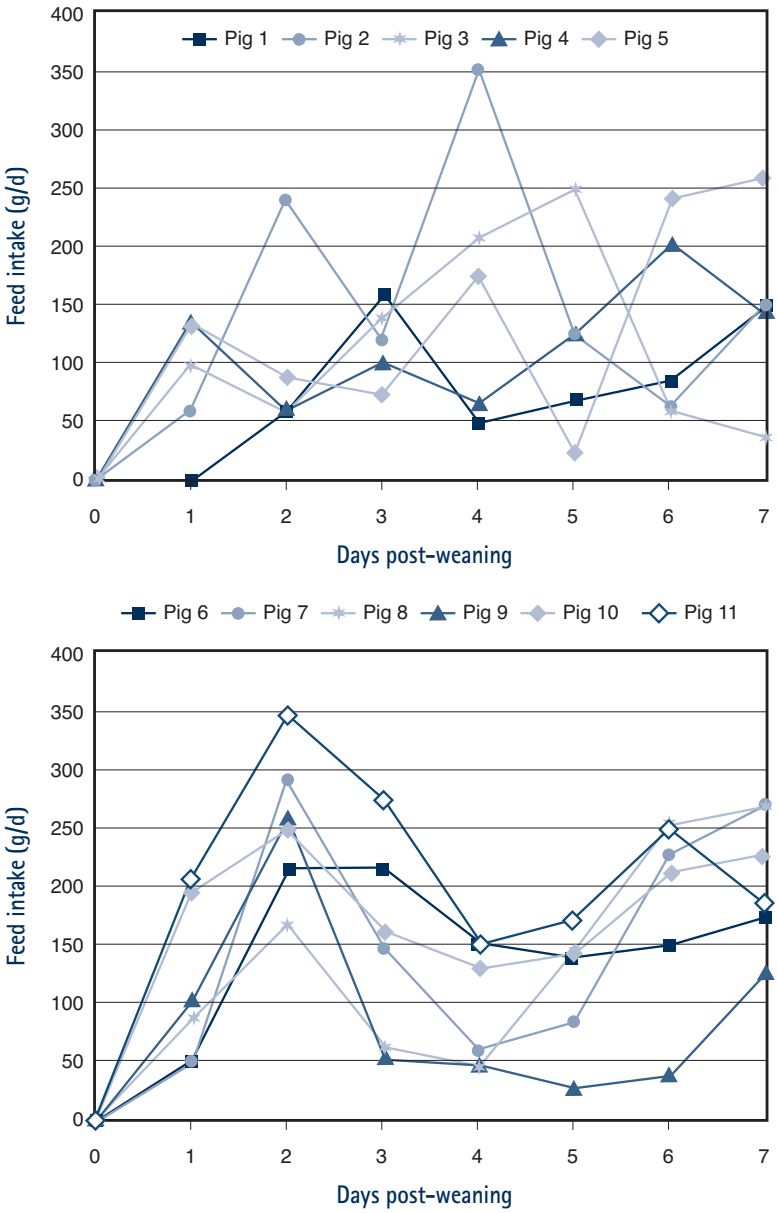
Easing the transition

Weaning pigs in a commercial environment often has adverse effects on everything from growth to gut health to behaviour. The more you can do to make weaning more like a natural event, the easier your pigs will adapt to their new environment. You'll help reduce stress and nutritional disruption and put pigs on track for a healthy and productive future.

For more information, call Brent Ratcliff or Denny McKilligan at 800-422-3649 573-819-0480 or send an email to info@techmixglobal.com.

Reference: 1. Stress and Intestinal Disease by Dr. Adam Moeser PhD, DVM ■

Figure 2: Individual pig feed intake post weaning (Brooks and Tsourgiannis, 2003)

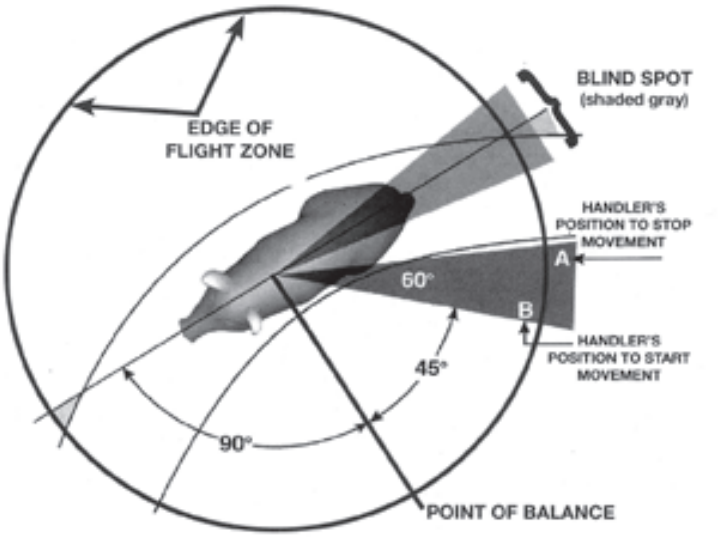


Low stress pig handling: Understanding the principles

Moving or loading pigs is often one of the most stressful and frustrating jobs on the farm - for both pigs and their handlers. Poor handling can not only compromise pig welfare, but impact performance and carcass quality. Understanding pig behaviour and the way pigs respond to the handler's presence and position can help to make movement smoother, quicker and calmer. In the first of a series of articles for WHJ, pig handling specialist Nancy Lidster explains the principles that need to be understood in order to improve the process of moving pigs.

I start every Low Stress Pig Handling course or presentation with the diagram in Figure 1 (source: TQA Version 3 handbook). It shows that pigs have a flight zone, point of balance, and blind spot. It is widely used in training programs such as Trucker Quality Assurance – TQA and Certified Livestock Transporter – CLT and elsewhere throughout the pork industry. The diagram is clear, simple and easy to understand. Moreover, it conforms to most people's expectations: that when they pressure towards a pig the pig will move away.

Figure 1: A pig's flight zone, point of balance and blind spot



A Pig's Flight Zone, Point of Balance and Blind Spot

Figure 1 is a valuable tool but it is often misapplied. A hammer is useful for driving nails but not for changing light bulbs or polishing crystal. Problems arise when we try to impose the principles described in Figure 1 on situations where they don't apply.

Descriptions that accompany Figure 1 typically tell handlers to use the flight zone and point of balance to make pigs move and to expect pigs to move away from them. It is often implied that this approach will work effectively in all pig handling situations. It is this notion that one approach will work effectively in all situations that is a problem. There are in fact many pig handling situations where the handler position and flight zone / point of balance approach taught with Figure 1 either will not work or won't be our best option. To understand why, we need to look at the origin of Figure 1.

My earliest sample of this diagram is in a paper written and presented by Dr. Temple Grandin in 1979. Figure 2 is from Dr. Grandin's website. The earlier version is similar to Figure 2 except the original cow has no spots, the point of balance is present but not labelled, and no blind spot is shown. Most significantly, the original diagram's caption says, "This diagram illustrates the correct positions for the handler when a single animal is being moved through a curved chute..."

Figure 2:

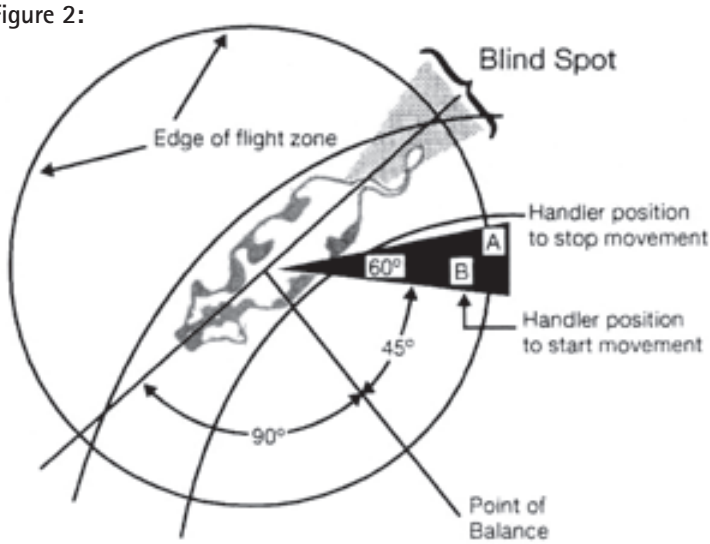


Figure 1 simply replaces the cow in Figure 2 with a pig.

The context of the diagram is critical. Figures 1 relates to a very specific set of assumptions: cow=pig: single handler:

single pig: single file chute: handler working at the edge of the pig's flight zone: pig able to move away from the handler's pressure.

A very small fraction of pig moving events occur within this specific set of conditions. We frequently move groups of pigs, have additional people around, don't contain pigs in a chute, work inside their flight zones, and pigs are often limited in their ability to move away from their handlers. All of these changes affect pig behaviour. When we move away from the conditions specified in Figure 1, we cannot rely on the point of balance to determine handler position or pigs to move away from additional pressure.

> **"The flight zone is what the pig perceives as a safe distance from a threat and that perception of safety influences the mental and emotional state of the pig"**

Rather than presenting Figure 1 as a universal prescription for how to move pigs, we can use it as starting point to discuss how the flight zone and blind spot interact with other variables to influence pigs' responses and to help people contrast their expectations with actual pig responses.

The flight zone isn't just a physical space we can use to shove against the physical pig to make it move. The flight zone is what the pig perceives as a safe distance from a threat and that perception of safety influences the mental and emotional state of the pig. The pig's ability to maintain a safe distance from its handler influences its fear level, herd behaviour, what it pays attention to, whether and where it wants to move. In order for the pig in Figure 1 to move away from the handler, it must be able to move away and it must be *allowed* to move away. People often miss this point.

Many pig handling events occur in spaces that are small enough that handlers have no choice but to work inside pigs' flight zones at least part of the time. Other pigs may block a pig from moving away. Even when space isn't limited, many handlers crowd the pigs they are moving, working inside pigs' flight zones when they don't have to.

Understanding pig behaviour and how the pig responds to the handler can save time and frustration, says pig handling specialist Nancy Lidster

When pigs can't move to get handlers out of their flight zones they get scared or defensive and their behaviour changes. They pay closer attention to their handlers. They are more likely to pile or turn to face and circle past their handler or shut down and refuse to move. Scared pigs are more likely to show bunching herd behaviour and are less likely to flow.

Descriptions that accompany Figure 1 tend to focus on pressure: using the flight zone and point of balance to make pigs move away. Additional pressure when we are already inside pigs' flight zones simply makes them more scared, defensive, and resistant.

CONTINUED ON PAGE 62

The handler positions "A" and "B" in Figure 1 suggest that if the handler quits pressuring, the pig will quit moving: that you must follow directly when the animal starts to move. In fact moving right with the pig will stop it. When we start an animal moving we need to give it release from our pressure: let it take a step or two before we follow. We have to give pigs release to make it safe for them to move away from us in crowded spaces. We have to give pigs release so they can shift their attention away from us to join a flow of other pigs. We have to give pigs release from our pressure at the first sign of rising fear and excitement.

> **"Flowing herd behaviour is our most powerful tool for moving pigs"**

The flight zone matters as a mental and emotional space and to be effective, handlers have to attend to the mental and emotional state of pigs they are moving and adjust their own actions accordingly.

The blind spot: According to TQA, "This blind spot means that a handler cannot rely on a visual reaction to get a pig to move when standing directly behind it". In fact, pigs will do what they can to keep handlers out of their blind spots. When we pressure pigs they shift and orient their bodies to keep watching us. If they can't shift to watch us they'll listen to track us. The more scared or threatened pigs get the more closely they track us. When pigs are scared or when we are working in tight spaces, our position and activity draw pigs' attention rather than sending them away.

Single file chutes are used for a small fraction of pig moving events. Without a chute, pigs have space to turn around and handlers have greater freedom in where they work. Pigs in groups are influenced by other pigs around them.

Herd behaviour draws pigs to the group for safety: flowing with the herd if the herd is moving: bunching and staying together if the herd is stopped. Flowing herd behaviour is our most powerful tool for moving pigs. To flow, pigs need to be calm, free to move, and free to keep their attention on moving with the herd. A chase approach draws pigs' attention away from herd flow.

Bunching herd behaviour is a fear or defensive response. Anything that scares, stops, crowds, or confuses pigs encourages them to bunch together. Trying to chase pigs out of a bunch encourages them to bunch more tightly and to stay in a bunch close to a handler rather than to leave the safety of the bunch to escape.

We get some form of herd behaviour any time we work with groups of pigs. Our greatest potential to improve pig handling is to teach handlers how to recognize and respond to pigs' fear responses and how to manage pigs' herd behaviour: capitalize on flowing: minimize bunching: and position ourselves to take circling pigs in the right direction.

If more than one person is present, pigs try to orient themselves to keep track of all of them. Extra people tend to make things more complicated and confusing for pigs and makes moving pigs more difficult.

Summary

Figure 1 can be used to link the flight zone, blind spot, pigs' fear responses, pig handling problems, pigs' attention, herd behaviour, extra people, the way we use our tools, etc. Figure 1 can help handlers see the discrepancies between what they expect and how pigs actually respond in different handling situations. Figure 1 is a valuable tool but we need to use it in ways that are appropriate to the handling situations we're dealing with. ■

How do you like your ribs? *Actinobacillus suis* and chest adhesions

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

Who doesn't look forward to barbeque season? After a long winter of frozen peas and shrimp cocktail followed by the slow transition into spring with a little snow here and a lot of brown there, the welcome smells coming off of your favourite grill is a herald to summer's arrival. Whatever your fancy might be, pork, chicken, or beef, a little barbeque sauce goes a long way to making all of us kings of the grill. One of my great favorites is ribs. Who can argue with their allure, dripping with flavour, rich with aroma, the ribs hot to your fingers touch? But wait, what is that so firmly held to the gentle curve of those succulent little ribs? No way, that looks like an unfortunate bit of lung. As I drop my great metaphor to summer's herald back down upon the plate and reach for the drumstick, I wonder; where did that come from?

Chest adhesions, what are they, where do they come from, and why do they have to mess with my baby back ribs? There are a variety of pathogens that affect the finisher pig that can result in the formation of chest adhesions or fibrinous pleuritis. This formation is the culmination of a series of unfortunate events that leads to an undesirable attachment of the outer surface of the lung to the inner surface of the rib cage. To understand and address the challenges that lead to the formation of these attachments and lesions we need to recognize that disease is more than one of those little bugs your veterinarian is often expounding on. Yes, the pathogen is important, but most often these bugs are present in a herd and we see very little adhesion development associated with lung and or pleural disease. Looking beyond the bug and exploring the environment, the management of sick pigs and the pigs' immune status is pivotal to a positive resolution and outcome.

So, when was the last time you had a good look at your adhesion rate from the processor of your product? It is rare to have the complete absence of adhesions when you review your sheets. Oftentimes the numbers affected can be very low. That being said, this doesn't mean you shouldn't be vigilant. Constantly watching and reviewing your numbers and maintaining good dialogue with your purchaser is an important part of the prevention strategy. A chest adhesion speaks to the presence of chronic and longer term challenges.

CONTINUED ON PAGE 64

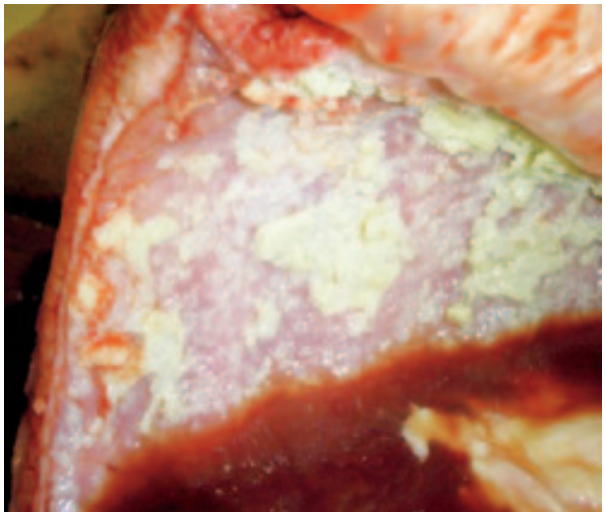


Figure 1: Inside of ribcage with chronic severe diffuse pleuritis associated with Actinobacillus suis

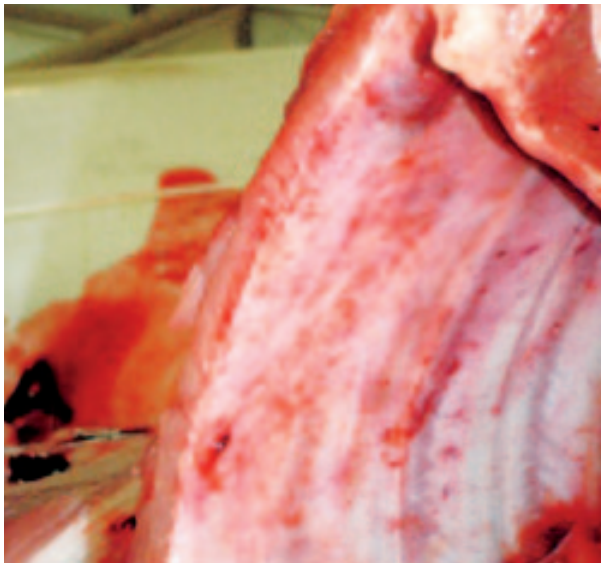


Figure 2: Inside of ribcage with sub-acute moderate locally extensive pleuritis associated with Actinobacillus suis

Unlike your mother in law, they don't just pop up. It takes a lot of time for them to begin, form, and organize themselves into the nasty little ribcage party that you see in Figure 1. High numbers of chest adhesions tell me that there are chronic concerns ongoing in your herd leading to decreased health.

In this I would like to focus on a little known friend of ours, *Actinobacillus suis*. When we discuss adhesions we classically think of bugs like *Mycoplasma hyopneumoniae*, APP, and Glassers to just name a few. *Actinobacillus suis* is a gram-negative bacteria that is of increasing concern and prevalence within our western herds. In the classic text books of swine diseases it is often only briefly mentioned and rarely to any great degree. In recent times we have seen an increase in its presence and under stress this bacteria can lead to severe septicemic disease that can mimic many other diseases such as APP (Figure 4), erysipelas and *Streptococcus suis*. The result is A. suis outbreaks that can often lead to extremely high chest adhesions.

Clinically A. suis disease looks like many other bacterial diseases that affect grower and finisher pigs. Pigs will appear depressed and anorexic. You will see an increased respiratory effort and rate and there may be a cough depending on various factors such as concurrent diseases such as *Mycoplasma hyopneumoniae* or others that lead to airway disturbance. Dead pigs are not uncommon in the acute stages of the disease and in some circumstances you may also note some pigs with neurological symptoms.

Treatment should always begin with proper diagnostics and follow-up at the barn level as well as at the slaughterhouse. In outbreak situations in-feed medication will unlikely be sufficient to resolve the challenge in a timely manner. In-water medication and individual pig treatment will be critical to a positive outcome. It is not uncommon to see herd-level chest adhesion rates approach 50%. Determination of the onset of infection will help with formulating intervention strategies. No two farms, or sites, will be alike and how you approach a resolution will depend on your health status, management style and the immune status of the pigs.

Preventative measures are always your first line of defence. Good ribs are positively correlated to good health planning. There are no commercial vaccines available for this disease but there are for many of the other diseases that can lead to its clinical expression within

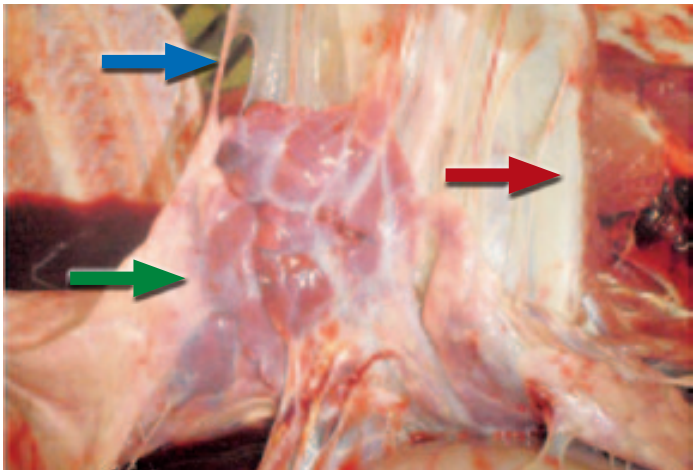


Figure 3: Lung (green arrow) attached to the inside of ribcage (red arrow) with chronic locally extensive pleuritis associated with Actinobacillus suis. Note all of the attachments (blue arrow) between the lung and rib cage

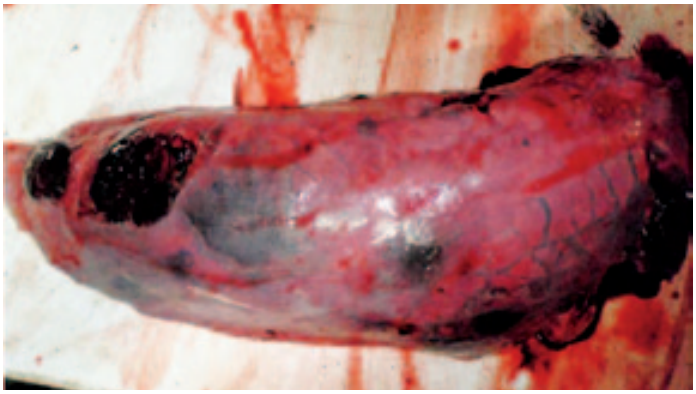


Figure 4: Lung affected with Actinobacillus suis, these lesions (fibrino-necrotic pleuritis) closely resemble those created by Actinobacillus pleuropneumoniae

your herd. Many of our common bugs such as circovirus and PRRS virus severely inhibit the pigs' immune system. Controlling these diseases is often part of a long term strategy that may include strategic medication, ventilation management, pig flow management and individual pig care training. As this disease continues to increase in prevalence we have begun to look at the manufacturing of autogenous vaccines that are farm specific and tailored to known challenges. These interventions can be very successful but we often reserve them for those situations where we have not been able to resolve the primary concerns around management.

This weekend you and millions of our customers will be enjoying their very own secret baby back rib recipe. It is our job as producers and veterinary medical professionals to ensure that they have the best experience that they can possibly have. Market access is often maintained and grown through the delivery of a consistently high quality product. This week, take a close look at your health sheets and make sure you are working for the industry to ensure those great barbeque memories continue for many years to come. ■

International Round-up

Powder disinfectant scores in PRRS tests

A powder disinfectant appears to have a number of advantages over liquid disinfectants in preventing the spread of PRRS virus, according to a recently published paper in the proceedings of the American Association of Swine Veterinarians Annual Meeting. Many hog operations utilize liquid disinfectant boot baths as a part of biosecurity protocols aimed at minimizing the spread of PRRSv. "Several problems arise from the current use of liquid disinfectant boot baths including their effectiveness following contamination with fecal matter and in freezing temperatures," note the authors. "The objective of this study was to test Stalosan® F, a powder disinfectant, as an alternative to a liquid disinfectant boot bath, for the deactivation of PRRSv under various temperatures and in the presence or absence of fecal matter."

Clean rubber boots inoculated with PRRS virus were placed in a treatment bath containing either the powder disinfectant or the liquid disinfectant. In addition, boots contaminated with fecal matter mixed with a PRRS vaccine were placed in the bath at temperatures of both 85°F or 8°F. Testing for the presence of PRRS virus was a carried out at 1, 3 and 5 minutes after the treatment. "Neither of the products tested resulted in 100% PRRSv PCR negative results under all conditions, neither did increasing the exposure time improve the effectiveness of either disinfectant," note the researchers. "The presence of fecal matter significantly reduced the effectiveness of the liquid disinfectant but had no significant effect on Stalosan F. In the absence of fecal matter, the liquid disinfectant appeared to be more effective compared to Stalosan F."

At 8°F and 85°F Stalosan F showed no significant difference in effectiveness, with or without fecal matter, with an average of 95.8% and 86.2% PCR negative samples respectively. The liquid disinfectant was frozen at 8°F making it ineffective at deactivating PRRSv. At 85°F the liquid disinfectant generated an average of 28% and 97.3% PCR negative samples with and without fecal matter present respectively. "Stalosan F showed effectiveness in real nursery conditions in the presence of vaccine virus infection and shedding," concluded the authors.

British project uses isotopes to track pork

Tracing pork from a carcass in the plant to the dinner table is fraught with problems and well nigh impossible with conventional tracking methods. Producer funded body, the British Pig Executive (BPEX) has been trialling a new technique based on the use of isotope analysis. The method relies on the existence of more than one isotopic form of the same element. The ratio of the different isotopic forms of an element can give useful information related to the route by which that element was accumulated in a particular plant or animal tissue and therefore its geographical origin. The BPEX research project was aimed at comprehensively evaluating stable isotope analysis for the origin verification of pork and pork products and establishing a reference database as the benchmark against which future test samples can be compared for origin verification.

Samples were taken from pork and pork products in England, Scotland, Ireland and some other European countries. It was found that there was good separation of the samples from Britain against those from other countries. Samples from Ireland were difficult to separate, partly because it was impossible to clearly separate the isotopic signatures from Northern and Southern Ireland, but also because Irish pork shows a greater similarity with pork from continental Europe than does British pork. This is probably due to feed imports to Ireland from Europe.

It was also possible to identify cured products such as bacon and ham, but sausages proved more difficult due to the inclusion of non-meat ingredients. BPEX therefore recommended that this approach is only used for products that have a declared meat content of 90% or greater.

The trial report concluded that isotope analysis against a known database is a very useful tool to use alongside more traditional supply chain auditing techniques to provide increased confidence to customers that the correct information is on the label. The aim in future is to use the technology for verification and it offers considerable potential for supplementing and strengthening elements of the British Quality Assured Pigs paper trail audit with the latest technology.

Chinese herbs improve nursery pig health

Scientists in Taiwan have shown that supplementing the diet of nursery pigs with a mix of medicinal herbs improves gut health and reduces the incidence of scours. They evaluated the effects of the herbs on the performance, intestinal tract morphology and immune activity in weanling pigs.

Two hundred and forty weaned pigs were assigned randomly to four dietary groups. These included a negative control (basal diet), 0.1% Chinese Medicinal Herbs (CMH), 0.3% CMH and 0.114% of an antibiotic complex, used in a 28-day feeding trial.

The results indicated that both CMH supplementation groups had a better daily gain and feed/gain than the control group during the first two weeks of the experimental period. The 0.3% CMH also resulted in a significant decrease in the diarrhoea score in first 10 days of experimental period when compared with other groups. The CMH supplementation groups had greater villous height in the small intestine, increased lactobacilli counts and decreased coliform counts in the colon compared with CT. The immune responses, measured in several ways, were significantly enhanced in CMH supplementation groups at day 7 of the experimental period. The CMH and antibiotic supplementations all increased nutrient digestibility, including dietary dry matter, crude protein and gross energy in weanling pigs.

Research evaluates whey co-products for weaned pigs

Recent research carried out at the University of Illinois has shed light on the nutritional value of whey powder and whey permeate as a lactose source for pigs. The objective was to determine the energy concentration and digestibility of phosphorus in whey powder, conventional whey permeate and low-ash whey permeate because these values had not been measured.

Skim milk powder has been used to meet the requirement for lactose by weanling pigs, but it is costly and usually uneconomical to use in commercial production. Whey powder, a co-product of the cheese industry, contains lactose and protein and is more economical. "Some companies take the protein out of whey powder because they sell it for the human food market," explains Dr. Hans H. Stein, a U of I professor of animal sciences. "When they take the protein out, they are left with whey permeate, which contains mainly lactose and ash."

In their study, the scientists used conventional whey powder, containing 66% lactose, 13.2% crude protein, and 15.8 % ash, and two permeate products. One of the permeates was a conventional whey permeate that contained approximately 76% lactose and 9% ash. Most of the ash had been removed from the other permeate product, which was approximately 89% lactose and only 1.7% ash.

"Removal of protein from whey powder resulted in a reduced concentration of metabolizable energy in the whey permeate. If ash is also removed, the resulting high-lactose, low-ash whey permeate has a concentration of metabolizable energy that is slightly greater than that in whey powder," Stein notes.

The concentration of phosphorus in whey powder, conventional whey permeate, and low-ash whey permeate was 0.63, 0.57, and 0.10 percent, respectively. The standardized total tract digestibility of phosphorus was similar in all three products, at around 92%. "These data clearly indicate that phosphorus from all three ingredients is well digested by weanling pigs," comments Stein.

These results make it possible to include whey powder, whey permeate, or low-ash whey permeate in diets for weanling pigs that are formulated on the basis of metabolizable energy and the standardized total tract digestibility of phosphorus, say the researchers. ■

View from Europe

Are rescue decks too expensive?

By John Gadd

I'm very much in favour of the rescue deck concept as both a present and future tool to get more piglets weaned and on to slaughter. However there seems to be some 'sales resistance' to them on capital cost grounds. However in terms of payback they seem to be one of the best ways of spending money in existence. If you read on you will see why.

Let me hasten to say that I am not paid to say this by the manufacturers, the advertisers or anybody else – I am just convinced that the concept is a very promising one and that every breeder should have a go with a deck or two to see the difference they can make.

> **"To date, the benefit from adopting decks seems to be 1.3 more piglets weaned per sow"**

I'm not going to take up valuable space by explaining what they do – I assume you are aware of this – but I want to put some figures before you which should make you sit up straight. As far as I am aware there has only been one well-carried out piece of econometric examination, (see the reference below). Even so, it stopped short of bringing the findings to a full cost-effective conclusion. In comparison, my approach is to examine how effectively the seemingly high capital investment (of providing one deck per farrowing room of 10 to 12 places) uses the outlay. How hard do rescue decks work for your money in this way? It often looks as if rescue decks are better than many other ways of spending capital due to their frequent use and re-use over a given period.

So what about the problem of unit cost?

In the UK it is about £1,525 ($2440) per deck, including support materials and delivery. Enough to make some people think in these tough times.

Table 1 shows the likely cost of adopting the advised number of decks per room based in Euros from actual clients records.

Table1: Projected extra cost of running a rescue deck concept in Euros per farrowing room

Assumptions: Farrowing room occupied for 35 days (28 day weaning plus 7 day turnaround). Thus the room is filled up 10.4 times per year. Mortality to weaning good at 6%, and to slaughter another 3%. Prices in Europe January 2012.

12 farrowings	1 deck per 12 places
Depreciation on capital required over 5 years	16.64
More expensive special food for decked piglets	100.00
Heating the deck	5.00
Water for drinking and cleaning	0.24
Cleaning materials	2.16
Labour	23.00
Total	**€147.54 About $191**

Sources. Users' records and manufacturer's advice.

At present there are 1.3 C$ to the Euro and the price of a deck could be higher or lower in Canada than for ourselves, also your interest on borrowings could be different, so I leave the conversions to you, but €147 ($191) up-and-running costs per farrowing room of 10 to 12 crates room won't be too far adrift, I guess.

Decks used properly have two main uses

1. For any breeder who wishes to save those - usually last-born - weaker members of the litter normally needing fostering

and fussing over to prosper. Fostering, by the way, is a sure way to spread infections, PMWS taught us that – I'm not against it but we need to keep this hazard in mind. Having a rescue deck in the room takes the pressure off fostering. The average breeder producing around 10 to 11 pigs born alive has been struggling to break the 12% mortality to weaning barrier for decades – it is the one benchmark which has infuriatingly just not improved over time. Yet there are those who achieve 6% and less, not all due to decks by any means, but they will help. To date, the benefit from adopting decks seems to be 1.3 more piglets weaned per sow.

2. There are breeders, now an encouragingly growing band, who are getting 13 born alive and even more - the future for many of us. These hyperprolific sows cannot rear them and need the burden lifted off them, which is where the rescue deck scores, not only in those weaklings saved and then brought up to speed by weaning time, but also in better subsequent reproductive performance from their less lactationally-punished dams. This latter effect has not yet been measured to my knowledge, but I am collecting data.

Slaughter weight not weaning weight!

So far most of the evidence suggesting the value from buying into decks has been the benefit at weaning. So far so good - but not far enough! We don't sell weaner pigs – or most of us don't – we sell slaughter pigs. The benefits from decks stretch far beyond weaning – look at Table 2.

Table 2: Extra income and reduced costs to slaughter

Extra income per room	
Piglets saved per sow	1.33*
Piglets saved per room of 12 sows	16*
Extra slaughter live weight per room at105 kg/pig	15.5 kg
Value per room (€)	1,550
Reduced costs per room.	
Faster growth to slaughter from, all pigs in the room	Four days less*
Thus food saved per room at slaughter (€)	33
Plus overheads saved per room at slaughter (€)	16
Total advantage per room (€)	1,599

* From various farm reports 2011

From these two tables it is easy to calculate a return on the extra outlay (REO) required.

CONTINUED ON PAGE 70

Rescue decks are one of the best investments that can be made in the breeding unit, says British consultant John Gadd

Table 4: Estimated AiV for rescue decks. Breeding unit with 250 sows needing 60 farrowing crates (Figures in Euros)

Borrowings required per farrowing room for one year.	
Fixed capital required per room every 35 day.	540*
Working capital needed per room every 35 days (Table 1)	147.54
Total, plus interest on the capital required (estimate)	800
(a) Extra income expected from slaughter pigs within a year, per room = 1.599**	
(b) Divided by the financing needed for that year, in this case a factor of 1.999 (say 2.0)	
(c) Multiplied by the number of times the investment is used per year (10.4)	
An AIV of 20.8	

*From manufacturer's advice. ** From Table 2.

Table 3: Expected return secured on the extra outlay spent from using one deck per room

Benefits per room at slaughter weight (€)	1,599
Divided by the extra costs per room (€)	147.54
REO is therefore	10.4:1

The payback of over ten to one is excellent – for example the REO on a popular and well tested antibiotic growth enhancer when we were allowed to use them, was 6:1. The lowest advantage reported to me (every single user I've contacted said that he has never failed to obtain more weaners) has been 0.5 more pigs weaned per sow. In such a case the REO was 4.2:1 - still good.

Rescue decks can have one of the highest AIVs in the current pig business

An AIV (Annual Investment Value) is an essential calculation which reveals how hard your investment is working for you. It is the way bank managers and other lenders rank the likely value of the many applicants asking for their money to finance their projects. Not only how much profit might the loan engender (ie. its REO) but also how often is that REO turned over in the usual loan period of one year. The best risk is the project which, from the evidence provided (the 'track record'), turns over the capital fastest.

Because the rescue deck is used ten times in the loan period, its AIV is exceptionally high at around 21 (Table 4). Anything over 8 today gladdens the lender's eye.

Conclusion

Providing the right questions are asked and the evidence is there, everything has an AIV. The highest AIV backed up by a healthy REO is the project to consider first. The comparisons between AIVs can be right across the board - for example comparing a new feed, to replacing equipment, to adopting new systems, to starting vaccination and so on, as well as comparing very different unit costs per tonne, per bag, per drum, per dose. REO plus its satellite AIV distinguish the 'men from the boys' among the hundreds of spending options pig producers are being asked to consider in these increasingly commercial days. It makes decision-taking easier and more confident - as well as providing a sound reason for sending some salespeople packing!

And Rescue Decks, managed skilfully, can come high on the AIV list.

Reference: "Effect of Rescue Decks on pre-weaning mortality in a prolific sow herd" BPEX (UK) report December 2011. ■

The UK has been housing sows in groups since 1999, mainly in straw bedded systems like this

Pigs and politics

By Stuart Lumb

Welfare is a huge issue in Europe and the EU is spending substantial amounts of Euros on welfare research, which is hardly surprising when it transpires that the number one topic that Euro MPs get mail about is that of animal welfare. In the UK, bizarrely, animal charities receive more donations than charities that care for disadvantaged young children. Compassion in World Farming is always at the forefront of welfare issues, as is PETA. Welfare activists back in the 1990s made the British public aware of sow stalls and tethers and as a result legislation was passed in 1999 completely prohibiting sow stalls and tethers during pregnancy. Many UK pig farmers went out of business, unable to afford the loose housing required by this new law.

Over the last few years the UK's National Pig Association (NPA) has used this legislation to differentiate UK produced pigmeat from imports, with successful publicity campaigns promoting "High Welfare" UK pigmeat. Denmark has always been a major exporter of pigmeat to the UK, since Victorian times, but farmers there have had to loose house their pregnant sows and gilts right from service and also leave their finishing pigs entire in order that their pigmeat exports could classed as being produced to British welfare standards.

Twelve years ago the EU passed legislation which stated that pregnant sows and gilts had, from January 1, 2013, to be loose housed in groups. However, farming groups successfully argued that mixing sows from service onwards would result in poor implantation of the fertilized eggs in the uterus at around day 14 and consequently poor litter size. As a result - and much to the annoyance of UK producers - the EU stall ban is just a partial one, as EU producers can legally keep their sows in stalls for 4 weeks after service. Having said that, seemingly many Dutch producers are scrapping sow stalls altogether and will be the same as the UK. Furthermore, the Dutch are concerned about free access stalls as they have a bolting mechanism at the rear, "to retain sows *just* for insemination or vaccination."

What the NPA is concerned about is that European sows will be kept in nearly the same way as UK ones and so the UK's "Welfare Differential" will be eroded.

The EU banned battery cages for laying hens from January 1 2012. Producers in many different countries didn't change in time or simply went out of business. The net result was a shortage of eggs and of course a price surge – fine for those still in business of course! A similar situation will occur in the pig industry, namely that many pig farmers will not be compliant by January 1 2013. Those that are not compliant will still be selling pigs though, although this pigmeat will be technically illegal. But how will it be identified? Where will it be sold? Exported to non EU countries?

"Pork prices will go up in 2013 due to a shortage of pigs, but the consumer will have to contribute to animal welfare"

Mr. Pekka Pesonen is Finnish and is the Secretary General of European farmers' union COPA/ COGECA. He is a straight talking man and made some very good points at a recent meeting held in Brussels. He commented that pork prices will go up in 2013 due to a shortage of pigs, but the consumer will have to contribute to animal welfare by paying higher prices for pigmeat products. EU pig producer organizations naturally want to see higher pig prices but imports would increase supply and bring prices down. They want the WTO to ban third country imports into the EU but, critically, the WTO cannot ban imports purely on welfare grounds.

Mr. Pesonen closed by listing three possible scenarios regarding the partial sow stall ban:

CONTINUED ON PAGE 72

1. Farms which are 100% compliant i.e. all sows are loose housed after 4 weeks.
2. Farms which have permits in place and have started to build new gestation sow housing
3. Farms which have done nothing.

The EU can impose fines on non compliant farms but in actual practice, cases can take years to come to court. If pig prices rocket after January 1 2013, a non compliant farmer might take a gamble and deliberately carry on producing pigs and simply hope the extra profit covers the cost of the fine! Then again if the farmer has his permit he may simply just completely de-stock the farm and restock once the new loose housing has been completed.

Having the permits is one thing – having the finance is another. Southern Irish farmers can get building grants from the Irish government, but the problem is that the banks won't lend the money and no doubt banks in other EU countries will take a similar strong line as in Ireland.

Recently a top level British delegation went to Brussels to lobby MEPs at a breakfast meeting at which was served traditional bacon and eggs – naturally both British. Stewart Houston, representing the NPA, opened his speech by saying that many southern EU countries were still pleading for a derogation, despite the fact that the pending ban had been made law many years ago. Ironically the Irish have now asked for a derogation, along with the French pig farmers' union, but the Commission has steadfastly said repeatedly that there will be no derogation.

Houston said he was happy to see that pigs would be in short supply "as this should push prices up and give UK producers a decent return". The NPA is meeting with the big UK supermarkets to discuss the issue of imports from non EU countries . If EU pigs go up in price then supermarkets will be tempted to ship in cheaper pigmeat from low welfare countries. UK supermarkets have always promoted high welfare product and they must not change their stance and import low welfare product just to keep prices down, which will be very tempting given the ferocious price battles currently taking place between the big UK supermarket giants. Labelling showing country of origin is vital. What is much more difficult is controlling pork that goes into the catering trade – sandwiches, pizzas etc, as this is not generally given a label of origin.

At the same meeting Andrea Gavinelli, who is the EU Animal Welfare commissioner, gave an update and an explanation as to how the EU would police this partial sow stall ban. The EU commission just has a watching brief, but implementing the ban is down to each individual member country. Only 12 countries will be 100% compliant by Dec 31, another 12 roughly 90%, but three countries will be zero compliant. In most countries the State Veterinary Service will be responsible for policing the ban, although in Denmark this task is actually the responsibility of the police. The commission will be holding six training sessions for State Vets, in order that they are aware of the legislation and will be fully trained to enforce it on January 1 2013.

January 1 2013 is going to be an extremely significant date in the history of the EU pig industry – time will tell as to what effect this partial stall ban will have on the future shape and size of the EU pig industry. ■

Pioneering IMF technology boosts profit in pork

By Jane Jordan

Ground-breaking new technology is being used by British pig breeding company JSR Genetics to enhance the flavour of pork by reintroducing more marbling into the meat, without adding back fat to the carcase. Image analysis software, called BioSoft Toolbox® II, allows operators to analyse ultrasound scans from live animals to determine intra muscular fat (IMF) levels. This trait determines not only flavour, but also tenderness and succulence.

"As IMF levels increase you get more loin marbling and better flavour. However, for many years, the trend has been for leaner back fat, which has, in turn, reduced loin marbling," explains Stephen Waite, JSR Genetics' Head of Science. "Now, with consumers seeking better eating quality, the aim is to regain more acceptable levels of fat within the muscle – but without putting on excessive back fat which would penalize producers."

> **"Our taste panels have shown that ideally a value of 5% gives the fuller flavour and succulence that really appeals"**

The new scanner software, developed by Biotronics Inc. of Iowa in conjunction with Iowa State University, uses innovative 'texture analysis' technology enabling it to accurately measure IMF in the loin muscle of living animals.

While ultrasound itself has countless proven human applications, the BioSoft® Toolbox II software is specifically developed for animal use. It has been installed at JSR's Canadian nucleus in Saskatoon, Saskatchewan and at its flagship Newbottle Sireline Nucleus Unit in the UK. It is used to analyse both boars and gilts for IMF traits.

"In genetic terms, being able to scan live animals, and therefore actively select for IMF without excess back fat, is far quicker than having to wait until slaughter to score animals. It means boars go into our AI studs with IMF measurement on both them and their relatives," said Dr Grant Walling, JSR's Managing Director.

Cultural traits

While the pork industry may be undergoing a period of re-evaluation, the preference for fattier meat can also be cultural. In Western pork industries, IMF levels average one to three per cent, whereas in areas like Asia, where IMF levels are scored at slaughter, values are higher. In Korea for example, pork averages five to six per cent IMF.

Caroline Mitchell, JSR's Meat Scientist, who leads JSR's Food Quality Centre, believes higher levels of IMF are really appreciated. "Although many pigs in the UK have an IMF level of one per cent, it is above two per cent where the consumer really start to appreciate the difference. Our taste panels have shown that ideally a value of 5% gives the fuller flavour and succulence that really appeals," she explains. The food quality centre uses a consumer taste panel of 12 -16 trained members of the public, that have been specially selected for their ability to assess flavours, scents, textures and colours in meat.

New applications for Biotronic's pioneering IMF software are also being investigated and developments are already underway looking at how this IMF software can be integrated into the slaughterhouse line. "By quickly identifying specific levels of loin marbling in carcasses, the scanner will enable carcasses to be directed towards high meat eating quality lines. That way both processors and producers will benefit from the sale of higher quality pigs," says Stephen Waite. ■

Increasing intramuscular fat levels will give pork more consumer appeal, says Caroline Mitchell, Meat Scientist at JSR Genetics

FOR SALE

2500 SOW FARROW TO WEAN UNIT

Large modern hog farrowing and nursery operation for sale, located near Saskatoon Saskatchewan. This 2 site hog unit was built in 1998 and consists of a 2500 sow farrowing barn with house and 4 – 2200 head nursery barns on a separate site. These barns have been out of production for three years, the operating permits are in place and water is supplied by a rural pipeline.

For more information Contact

John Guliker
at 604 798 0033
johnnyguliker@yahoo.ca

$700,000

Pigs Down Under

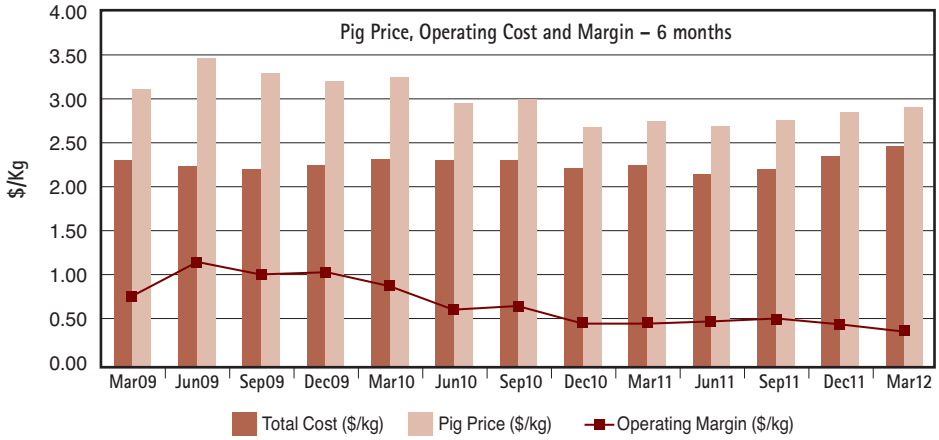
Slim margins and sow housing key issues for Aussie producers

By John Riley, IAS Management Services

In May, Australian pig industry identities gathered at the Gold Coast Convention Centre in Queensland for the Pan Pacific Pork Expo. The Expo program combined two days of seminars with a Trade Fair and social events.

The key issues discussed during the event included the move from stalls to group housing, product labelling and labour availability. However, uppermost in producer's minds was the lack of profitability in the industry. Figure 1 illustrates the movement in KPIs for a group of Queensland producers during the period March 2009 to March 2012. The data illustrated shows that over the last three years pig meat price has been falling which has resulted in a reduction in operating margin per kilogram of pig meat produced.

Figure 1: Six month rolling average for selected Key Performance Indicators March '09 – March '12



The Australian industry has made a commitment for a voluntary move to group housing by 2017 and one leading retailer has announced that they will not accept pork from producers using stalls from 2014 onwards.

Due to a lack of confidence in the industry where profit margins do not encourage investment, very few producers have built new dry sow housing. Several producers have, however, modified existing building and moved to group housing. In some instances floor feeding has been adopted to minimize costs. Interestingly, when stalls were introduced in the 1960s the reason was to move away from floor feeding to

CONTINUED ON PAGE 76

ensure that sows could be fed individually according to their needs. It appears welfare has gone through 360 degrees.

Several Australian producers who are committed to feeding their sows according to their individual needs have installed Electronic Sow Feeders in existing buildings. After visiting a Hutterite Colony in Alberta, one Queensland producer has taken out stalls and installed 10 Nedap ESFs. In one area, 13.4m by 26.5m, three ESFs serve 140 selected and mated gilts. The other seven feeders are in an area 13m by 62m and holding 340 sows. The dynamic group system provides about 2.4 m^2 floor space per head.

The Mannebeck Fitmix electronic sow feeder is popular in Australia as it takes up very little space

The compactness of the Fitmix feeder, manufactured by Mannebeck, is popular with producers converting existing buildings. The system allows sows to be fed a mash through a tube according to their programmed allowance. However, sows are not protected from the attention of group mates when feeding.

Both types of electronic feeders dictate that staff as well as sows and gilts need training to the system. One problem experience in Australia is damage by rats which are attracted to air lines and hoses.

With limited confidence in investing capital, the main interest is small groups fed in troughs or on the floor protected from the rest of the group by shoulder stalls. In many instances the existing sow stalls are recycled to provide the shoulder stalls and little modification to floor profile is required. To reduce aggression at feeding time the feeding system previously used with stalls is modified so that the down pipe is extended to within a short distance of the trough or floor so that sows have to work for their allowance and get no benefit from moving from feeder space to feeder space. The feed dispensing arrangement is a crude but effective form of trickle feeding.

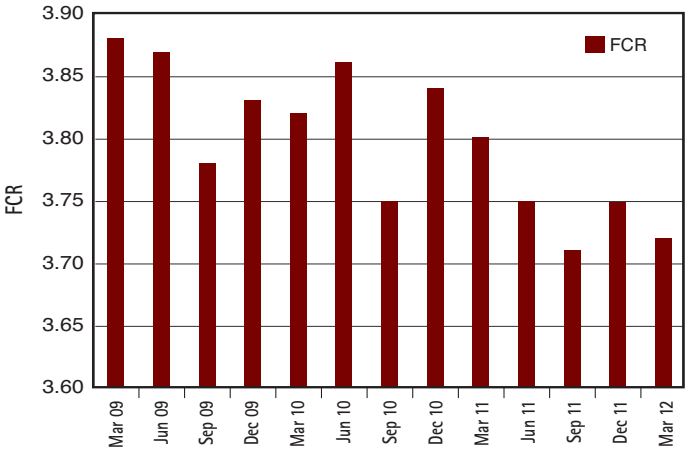
At the event the Porkscan machine was launched. This machine displays the use of a series of algorithims to process the scan and measure back fat depth and eye muscle depth. The development was funded by major processors, the federal government and Australian Pork Ltd. The introduction will enable producers of quality pigs to be rewarded for lean meat rather than just absence of fat as in the past.

Dr Roger Campbell, who will be well known to Canadian readers, launched the Pork CRC Bio-energy Support Program at the Expo. The program marks the first step of an internationally acclaimed commitment by the CRC for High Integrity Australian Pork to reduce the carbon footprint of Australia's pork producers to one kilogram of carbon dioxide per one kilogram of meat.

An Australian Pork Limited life cycle assessment carried out by FSA Consulting has indicated that more than two thirds of greenhouse gas emissions (GHG) were generated from piggery effluent ponds (lagoons). With more than 90 per cent of Australia's pork production utilizing ponds to manage effluent, a significant opportunity existed for industry to capture emissions for mitigation or utilisation.

The capture of methane and its utilization as an energy source or simply flaring would be some of the most effective steps in realising the CRC's carbon target. Again lack of confidence in

Figure 2: Average rolling12 month Herd FCR (carcass weight) recorded during the project



This 150lb feral pig did a lot of damage to Queensland farmer John Hohn's truck

future profit is limiting the adoption of new technologies.

Sara Willis, a consultant with DAFF (formerly DEEDI) Queensland, and the author have demonstrated the reduction in GHG emissions achieved by commercial producers when they have reduced feed wastage and improved herd dead weight feed conversion ratio (FCR). In a Federal Government Department of Agriculture Fisheries and Forestry project "Family farmers facing the challenge of climate change" they targeted feed, water and energy wastage over a three year program.

During the project the weighted average herd Dead Weight FCR for the group producing an 80.3 kg carcase improved as illustrated in Figure 2.

A decrease in the FCR had an effect on contributions from manure and feed rations to GHG emissions and energy consumption. Greenhouse gas emission estimation from manure management relies on the prediction of specific manure properties; excreted volatile solids (VS) and nitrogen (N) and it uses DCCEE and IPCC emission factors. The percentage change in GHG emissions per kilogram of hot standard carcase weight of pig for five of the cooperating production units is listed in table 1.

Table 1: GHG emissions (kg CO2-e) per kg HSCW for piggery units

GHG Emissions	2009	2011/ 2012	% decrease over time
Unit 1	5.80	5.41	-7%
Unit 5-2	5.83	5.60	-4%
Unit 7	8.64	8.39	-3%
Unit 8a	6.82	6.46	-5%
Unit 8b	7.00	6.62	-5%

The lack of confidence of the Australian producers is in part due to imports. The total Australian production in the 12 months ending January 2012 was 364,000 tonnes. In the same period 36,000 tonnes of pig meat was exported but 138,000 tonnes of processed pig meat was imported.

During the 12 month period ending in January 2012 imports of pig meat from Canada totalled 29,000 tonnes shipped weight valued at $95 million. Compared with the previous 12 months imports from Canada fell by 27%. USA landed 60,500 tonnes of pig meat in the same period, an increase of 21% on the previous 12 months.

Country of origin labelling (COOL) is a subject that stimulates discussion whenever producers meet in any country anywhere in the world. The feeling amongst some producers and marketers is that the consumer is not influenced greatly by country of origin labelling and that greater return on the promotional dollar might be achieved by promoting regional or state products. As a regular visitor to the UK, I have been impressed by the emphasis on regional product promotion by the major retailers and the loyalty of the consumer in purchasing their local product. Perhaps the way forward in Australia is regional labelling.

The export of pig meat totals $106 million and, in addition, the export value of feral pigs totals close to $20 million per annum. In Australia feral pigs are a problem because they are are a bio-security threat particularly to outdoor herds. They do considerable damage to crops, soil structure and in the case of John Hohn, a Darling Downs, Queensland crop farmer to his truck by the 150 kg specimen shown in the photo. ■

Ad Index

THE RESOURCES YOU NEED. THE SUPPORT YOU WANT. THE RESULTS YOU DESERVE.

Your veterinarian is committed to helping you optimize your herd's reproductive performance. So are we.

That's why we created **ReproPig**, a program that provides the widest possible range of products, tools and services to help you – with your veterinarian's guidance and assistance – reach the reproductive goals you've set for your operation.

Make the most of these valuable resources: consult your veterinarian.

ReproPig

MERCK Animal Health

The Science of Healthier Animals

4 TON SOW™

Genesus 4 TON SOW -BECAUSE- 30.58 hogs sold per sow x 276 lbs per market hog = 8,440 lbs sold a sow. 1.85 A.D.G. wean to finish - 2.489 feed conversion. Genesus global leader in total lbs and profit produced per sow per year.

THE TOTAL PACKAGE

The First Power In Genetics

GENESUS

www.genesus.com

Genesus produces more pigs, better pigs and more profit for you.

*Genesus customer record on file – Genesus Duroc bred to Genesus F1 females