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Switch Over Complete – Sask Pork to Manage Pork Interpretive Gallery

Lee Whittington, MBA

In 1998 we met with industry stakeholders regarding formulating a plan for a new research barn that would capture the combined industry vision for research needs into the future. The meetings took place in several locations across western Canada, and included pork producers, their suppliers, and other researchers. We heard about expanding group size, concerns regarding gestation housing, alternative building materials, changing ventilation systems in larger barns, and of course manure management & odour. When the list was finished it represented the perspective of what the industry felt it needed to do work on to answer the need of pork producers as well as the general public.

One question came up each time that was not expected, "How can we get the public into this barn to see what we really do?" The concept of providing transparency to an industry which has strict biosecurity rules designed to limit access was a novel approach to dealing with criticisms and public angst directed at the industry. The preceding years had seen double digit growth in pork production in many areas of North America and, prior to the sharp decline in market prices in the fall of 1998, there was a certain optimism that expansion would be a long-term feature of the industry. Well the industry certainly did see change, expansion certainly did play a significant role until recently and many of the changes in production predicted did become common place and answers provided by research were and still are needed. One thing that did not change was the observation that the industry needed to provide more transparency to neighbours, and the public in general. Not that the pork industry was being singled out, a move requiring more information about the food we eat has been a trend that has gathered momentum since 1998. Just this year new label and packaging rules require manufacturers to declare more about their products including the nutritional content,

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The P.I.G. also informs students about pork production through events like the Western Canadian Livestock Expo

Visitors take an opportunity to view research first hand

Meeting facilities provide opportunities for seminars within the PIG

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whole isles of mainstream grocery stores have been reassigned to organic products only, and several agencies have cooperated in establishing welfare guidelines for their suppliers in the US market.

In the ensuing period since the concept of P.I.G. and its physical realization three years ago, there has been a great deal of industry excitement about this first 'living classroom' and its ability to speak to school-aged children as well as the general public and international visitors about what modern pork production is all about.

John Patience sums up the industry reaction, "Throughout the two years of development and fundraising, and the most recent three years of operating the Pork Interpretive Gallery (P.I.G.), I have never been involved with a project which achieved and sustained so much grass roots support. Pork producers speak of this project with great pride and keenness, matched only by the enthusiastic comments we continually receive from people who have toured the facility."

To date the Pork Interpretive Gallery has hosted over 4,500 people, half of which are school-aged children and teachers. Key messages delivered have included the facts about the environmental impact of pork production, the ability to put a human face back of modern agriculture, even promote careers for young people in the various aspects of the sector.

With financial and in-kind support from the pork industry, PSC has successfully operated the P.I.G. for the past three years. The gallery is a unique public communications vehicle and will now be an in-house project for Sask Pork. This will allow PSC to focus on its primary mandate of providing a Centre of Excellence in applied swine production research. "By transferring daily operating responsibilities for the P.I.G. to Sask Pork personnel there is a more appropriate link between organization mandate and the activities the organizations are involved with" notes Dr. Patience.

"The public's perception of the pork industry is fundamental to the growth and development of the pork sector in this province" notes Neil Ketilson, General Manager of the Saskatchewan Pork Development Board. "The Gallery complements Sask Pork's communications and agri-education programs. To support the project, we have added a new staff member, Jessica Podhordeski, who joins the organization as Agri-Education Coordinator. Her role will include the management and promotion of the Pork Interpretive Gallery to schools, international visitors and the public." The daily operations include hiring and training tour guides, hosting tours, funding and promoting and marketing the site to various target groups that the industry wants to communicate with, including youth, governments on all levels, and the general public.

The link between Prairie Swine Centre and the industry through Sask Pork has always been important for both organizations, this change only further strengthens that relationship and now that the P.I.G. has been established as a 'must see' science centre, the transfer of management to Sask Pork ensures that this valuable asset will continue to receive the attention it deserves as a uniquely effective approach to public awareness of the changing role or agriculture in the community and the province. The P.I.G. will still be the site for various industry training sessions sponsored by PSC, "where it makes sense to deliver practical and applied research results to the industry, we will be actively using the P.I.G. facilities" notes Dr. Patience, "The facility provides a unique perspective for pork producers, many of which seldom if ever see inside a barn other than the one they work in".

Visit the PIG website at porkinterpretivegallery.ca

Introducing Jessica Podhordeski

Jessica was the Technology Transfer summer student at PSC in 2006. Half of her job was adding to the Pork Insight information database, keeping the information up to date for pork producers seeking the most current information on production research. As a fourth year Animal Science student at the University of Saskatchewan, Jessica stood out in the interviews with her knowledge of pork production, and the fact her undergraduate thesis was on how nutrition effects boar reproduction.

The other half of Jessica's job this summer involved managing the tours, and facilities at the Pork Interpretive Gallery. Jessica quickly mastered the facts so she could not only book the tours but could also conduct tours during the busy spring season when schools typically make up a large percentage of visitors. Jessica excelled at her job and brought an enthusiasm that made her a natural to represent the industry to the public. When Sask Pork began their search to fill the new position of Agricultural Education Coordinator Jessica jumped at the opportunity to stay connected with the P.I.G. "I have always had a special interest in livestock and pigs in particular, I cant think of anything I will enjoy better than working with the public to help them better understand pigs, pork and the people who produce it".

Social Factors Affecting Injury Levels and Behaviour of Sows in a ESF System

M. L. Strawford, Y. Z. Li, and H. W. Gonyou

In the past research has found that how an Electronic Sow Feeding (ESF) system is managed, the sow's stage of gestation upon entering the ESF system and the sow's parity can all affect her productivity. However, there has been little research conducted as to how these factors, along with familiarity with the penmates, affects the behaviour of the sows. Therefore, this study examined how housing management, stage of gestation, familiarity and parity affect aggression, injuries, feeder entry order and space usage and farrowing productivity of gestating sows that are housed in an ESF system.

At the PSC Elstow Research Farm, the ESF system in employs two different management techniques, static or dynamic housing systems. The static system houses approximately 35 sows, and after the initial regrouping, no new sows are added into the group. The dynamic system houses approximately 100 sows. However, every five weeks a group of sows is removed for farrowing and the following day a new group of sows is regrouped into the dynamic system.

For this study within the static and dynamic housing systems, the effect that the stage of gestation at mixing, familiarity and parity had on the sows' behaviour was examined. The sows were either mixed pre- (~12 days post-breeding) or post (~46 days post-breeding) embryonic implantation. Familiarity was defined as being housed with a current pen mate during the previous gestation. The familiar gruop were housed with approximately 23%, and the unfamiliar group with 9% of their current group mates during the previous gestation. Finally, parity was divided into three categories. First parity sows were classified as young, the second and third parity sows were combined into an intermediate category, and any sows in their fourth parity or older was designated to the old category.

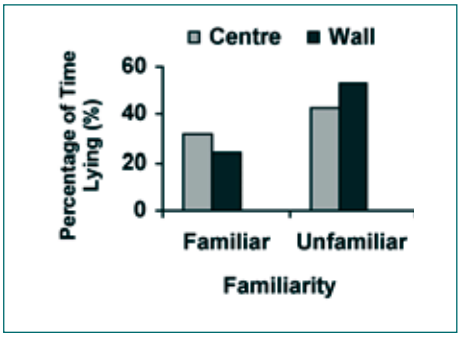

Figure 1a. Ho w familiarity affects the proportion of time sows spend lying against the wall and in the centre of the solid area of the pen.

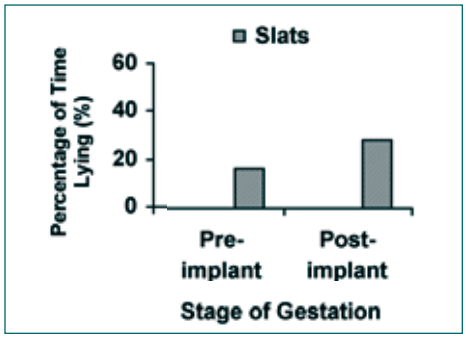

Figure 1b. How stage of grestation affects the proportion of time the sows spend lying on the slats.

Housing did not have a significant affect on the sows' behaviour. Familiarity did not have an effect on any of the behaviours observed except for the lying patterns. The familiar sows spent more time lying against the wall, while unfamiliar sows spent more time lying in the centre of the solid area of the pen (Figure 1a).

Stage of gestation did not affect the aggression levels at mixing. However, the sows mixed pre-embryonic implantation initiated significantly more aggressive encounters at the feeder (Figure 2). There was no difference in the level of injuries sustained by the pre- and post-implant sows. The post-implant sows ate later in the daily feeding cycle (Figure 3) and spent more time lying on the slats than the pre-implant sows (Figure 1b).

The old sows were involved in more aggression at mixing, while the young sows were involved in fewer aggressive encounters at the feeder after

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> "Under certain management conditions the dynamic housing system as just as effective as a static housing system."

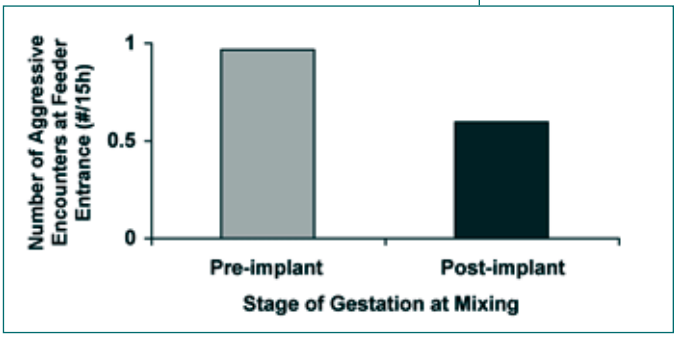

Figure 2. The number of aggressive encounters that pre- and post-implant sows initiated at the feeder entrance.

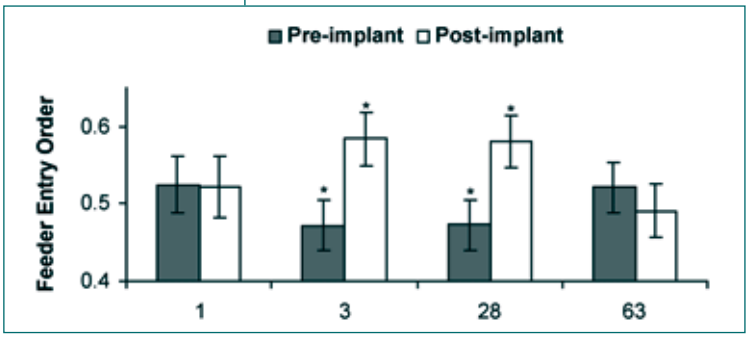

Figure 3. The feeder entry order of pre- and post-implant sows throughout gestation.

Using alternative ingredients: flaxseeds and lentils

Pascal Leterme, Ph.D.

The pork industry is continually seeking alternative ingredients for use in pig diets, either as a means of diversifying rations -and thus reducing cost- or to achieve a final pork product that meets certain specifications. Lentils and flaxseeds are among these ingredients.

Lentils are grown primarily in Western Canada for export and for human consumption. Each year, however, part of the production does not meet the grade for export and is used by the feed industry. The latter is attracted by the low price of the product. Lentils belong to the pulse crop family and have a chemical composition quite similar to that of peas, an ingrediant widely used in swine nutrition.

Flaxseed, for its part, possesses properties that make it unique as a feed ingredient, not the least of which is a highly desirable fatty acid profile in the lipid fraction. Possible future uses for flax include the production of omega-3 fatty acid-enriched pork, the development of alternatives to antimicrobial growth promoters and the enrichment of sow diets for essential fatty acids.

Since the use of these unconventional ingredients in swine nutrition is poorly documented, the Prairie Swine Centre carried out a series of experiments in order to determine the composition and nutritional value of lentils in pigs and to study the inclusion of flaxseed in the rations of growing pigs.

Lentils

Two lentil samples were considered for the study: a blend of brown, yellow and red lentils and frozen lentils. The two samples had similar composition, with an average of 27% of crude protein, 18% total dietary fibre and more than 40% starch. On the contrary, the ash and fat contents were very low, accounting for only 3 and 1% of the dry matter, respectively. The composition is comparable to that of peas, except that the crude protein content is higher (X% lentils vs. Y% peas) and starch (X% lentils vs. Y% peas). The amino acid profile is also typical of pulses with a high level in lysine (6.2% of the protein) and a low level in sulphur-containing amino acids (methionine and cysteine: 2%). The lysine level is lower than that of peas (17% lentils vs. 23% peas).

The digestible energy value reached 3,715 kcal DE/kg DM in both cases, which is slightly lower than the value obtained for peas (3,850 kcal/kg DM) but comparable to that of faba beans (3,750 kcal). The digestibility of the protein, measured at the end of the small intestine (ileum) reached 62% on average, which is in agreement with other studies carried out on pulses. For the frozen lentils, no definitive value of protein digestibility could be obtained, for problems encountered during the study but, according to our observations, the value was markedly lower than that obtained for the blend of lentils, which indicates that freezing conditions affect the digestibility of the proteins.

As a conclusion, lentils constitute an appreciable ingredient for the pig, with a nutritional value slightly lower than that of peas, which means that the rate of inclusion in the diet of growing-finishing pigs will probably not exceed 20% of the diet.

Table 1. Composition and nutritional value of lentils in pigs

	Blend	Frozen
Composition, g/kg DM		
Dry matter, g/kg	892	887
Ash	29	30
Crude protein	273	269
Lysine	16.7	17.0
Methionine-cysteine	5.4	5.2
Threonine	11.0	11.5
Fat	11	11
Starch	406	409
Neutral Detergent Fibre	140	145
Total dietary fibre	168	190
Digestible energy, Mcal/kg	3,718	3,712
Ileal protein digestibility (%)	62.5	-

Table 2. Average feed intake, daily gain and feed efficiency in pigs receiving increasing levels of flaxseeds and canola oil

Treatment Description	Average daily gain (g/d)	Average feed intake (g/d)	Feed-to-gain ratio
basal diet	1038	2314	2.22
5 % flaxseed	1088	2384	2.16
10 % flaxseed	1034	2173	2.10
15 % flaxseed	1029	2226	2.15
20 % flaxseed	1001	2302	2.27
1.7 % canola oil	1069	2304	2.14
3.3 % canola oil	1067	2177	2.04
5.0 % canola oil	1110	2324	2.08
6.7 % canola oil	1012	2035	1.96

Protein 27% lentils vs. 22% peas
Startch 40% lentils vs. 50% peas

PRAIRIE SWINE CENTRE

PorkInsight @ www.prairieswine.ca

WATER INTAKE

Recommended Flow Rate and Height of Nipple Drinkers

Phase	Weight (kg)	Intake (L/day)[1]	Nipple Drinkers		
			Flow (L/min)	Height (cm, 45⁰)	Height (cm, 90⁰)
Gestation		Variable	0.5 to 1.0	90cm (35″)	75cm (30″)
Lactation		12-20	1.0 to 2.0	90cm (35″)	75cm (30″)
Piglets		Variable	0.5 to 0.7	15cm (6″)	10cm (4″)
Nursery	5	1.0 - 2.0	0.5 to 1.0	30cm (12″)	25cm (10″)
Nursery	7	1.5 - 2.5	0.5 to 1.0	35cm (14″)	30cm (12″)
Nursery	15	2.5 - 3.5	0.5 to 1.0	45cm (18″)	35cm (14″)

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Looking for Ways to Reduce Your Cost of Production?

- We would like to take this opportunity to introduce **PorkInsight**, Prairieswine.ca new searchable database that allows you to find what you want, when you want it. Formerly known as the Livestock Issues Resource Centre, **PorkInsight** has the type of information that will help your operation improve its bottom line.

Nursery	20	3.0 - 4.0	0.5 to 1.0	50cm (20″)	40cm (16″)
Growout	25	3.0 - 4.0	0.5 to 1.0	55cm (22″)	45cm (18″)
Growout	50	5.0 - 7.0	0.5 to 1.0	65cm (26″)	55cm (22″)
Growout	75	5.0 - 7.0	0.5 to 1.0	75cm (30″)	65cm (26″)
Growout	100	5.0 - 7.0	0.5 to 1.0	80cm (32″)	70cm (28″)

TIPS FOR SAVING WATER

- Nipple drinkers mounted at 90^0, nipples should be set at **SHOULDER HEIGHT** based on the height of the smallest pig in the pen
- Nipple drinkers mounted downwards at 45^0, nipples should be set at **5cm OR 2 inches ABOVE** the back of the pig, based on the height of the smallest pig in the pen
- Check flow rates. Flow rates determine time spent at the nipple, water intake and water wastage
- Repair or replace leaky drinkers and water lines
- Keep barn temperature within the pig's temperature comfort zone as much as possible

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Flaxseed

Flaxseed is a grain with high levels of oil (35%) and crude protein (25%). The high oil content makes flaxseed a major energy source for the pig (4,650 kcal/kg DM). However, the main interest lies in the oil composition. The oil is mainly composed of linolenic acid, which belongs to the omega-3 group. Pork producers want to know if it is possible to produce omega-3 enriched pork by supplementing the diets with flaxseed. Before any conclusion could be drawn on the quality of the end-product, it was necessary to evaluate the response of pigs to flax in their diet, to confirm the nutrient profile previously developed, and to determine if the feeding of relatively high levels of flaxseed causes changes in performance not predicted by the nutrient profile.

Therefore, a growth experiment was carried out with growing pigs fed with diets containing 0, 5, 10, 15 or 20% of flaxseed, at the expense of a control diet composed of barley, wheat and soybean meal. In order to distinguish between the effect of flaxseed and that of the oil level in the diet, four other diets were supplemented with canola oil, in order to match the amounts of oil in the flaxseed diets. The diets contained, respectively 2.2% oil (control diet), 3.5%, 5.0%, 6.7% and 8.5 oil.

There was no adverse impact of flaxseed inclusion on average daily gain, up to 15% inclusion. The highest level of flaxseed inclusion tended to reduce growth rate, something also observed at the highest canola oil inclusion. The highest level of canola oil inclusion significantly reduced daily feed intake; this was probably due to the fact that the canola oil was not completely absorbed from the diet. Intake of the high flax diet was greater than that on the high canola oil diet. There tended to be an increase in feed efficiency at the lower levels of oil inclusion, whether from flaxseed or canola oil; however, only the canola oil diets sustained this improvement at the highest levels of inclusion.

No relationship (r = 0.03) was found between digestible energy intake and average daily gain (Figure 1). This illustrates the fact that the inclusion of up to 15 % flaxseed in the diet does not affect the pig's performance.

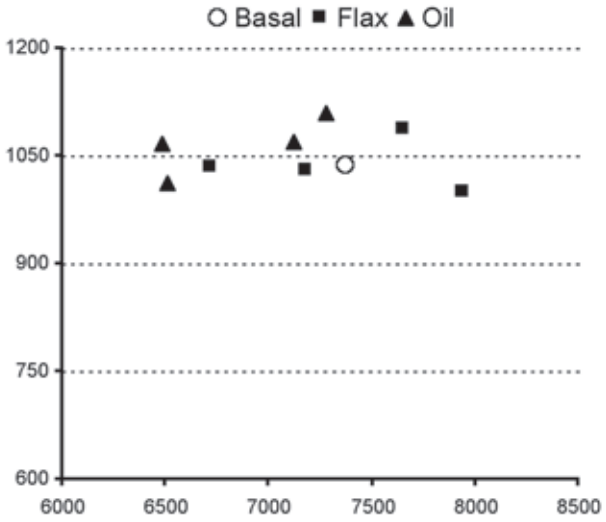

Figure 1. Relationship between average daily gain and digestible energy intake in pigs fed diets with increasing levels of flaxseed or canola oil

The Bottom Line

It can be concluded that balanced diets containing up to 15 % flaxseed will not adversely affect the average daily gain, feed intake or feed efficiency of growing pigs and that growing pigs tolerate high levels (~ 7 %) of fat in the form of flaxseed better than equivalent levels of canola oil.

Table 1. The effect of parity on the aggression at mixing, scratch score, feeder entry order and proportion of time lying against the wall and on the slats.

Behaviour	Young	Intermediate	Old
Number of Aggressive Encounters at Mixing	2.9	2.42	4.60
Scratch Score	4.01	3.61	3.55
Feeder Entry Order	0.644	0.477	0.445
Cortisol (ng/mL)	9.08	7.46	9.15
Lying Patterns (%)			
Wall	19.2	21.3	44.2
Slat	33.1	24.1	10.9
Farrowing Rate (%)	83.8	88.2	86.1

Continued from page 3

the new feeding cycle has begun, which is a key time for aggression at the feeder. There was a tendency for the young sows to receive more scratches than the intermediate and old sows. The young sows ate significantly later in the feeding cycle and rested on the slats a greater percentage of the time than the intermediate and old sows. While the old sows laid against the wall, the more preferable area, more than the intermediate and young sows. All the data pertaining to parity is outlined in Table 1.

Of course a major concern is how do these factors examined affect the farrowing productivity of the sows. There were no statistical differences in farrowing rates between age groups. However, numerically there were some notable differences. There was a 6% higher farrowing rate in the dynamic housing system (static 83.6% versus dynamic 89.1%).The sows mixed post-implantation had a 6% higher farrowing rate (pre-implant 83.6% versus post-implant 89.95%). There was slight variation in the farrowing rates based upon parity (Table 1). Familiarity did not affect the farrowing rate (familiar 87.3% versus unfamiliar 85.2%).

The Bottom Line

Under certain management conditions [large group size(>80 sows), sufficient time between regroupings, minimal mixing during embryonic implantation] the dynamic housing system is just as effective as a static housing system in regards to the sows' productivity.

Secondly, it is best to mix sows after embryonic implantation, as the sows are more docile, thus reducing the negative consequences associated with housing sows in groups.

At low levels, familiarity does not affect the behaviour of the sow.

The parity distribution within a group of sows can influence the behaviour. The older sows underwent higher social stress due to the defending their dominant position within the hierarchy, which resulted in them having the best access to resources within the pen. While the young sows underwent more social stress due to their inability to obtain access to the resources, which relates to their subordinate position within the dominance hierarchy.

Acknowledgements

Strategic program funding provide by Sask Pork, Alberta Pork, Manitoba Pork and ADF. Additional project funding provided by Ontario Pork, NSERC and AAFC.

Evaluation of an innovative in-barn manure handling system with a belt conveyor to separate faeces and urine: impact on odour and gaseous emissions

Bernardo Predicala, Stéphane Lemay, Claude Laguë, Scott Cortus, Robert Fengler

Environmental concerns arising from handling large volumes of manure from livestock operations have led to a critical re-examination of current manure management practices and to exploration of new and innovative strategies to be able to manage manure in an economical and environment-friendly manner. One approach, solid-liquid separation of manure, was found to offer the following advantages: ease of handling and transport, reduced loading rates on liquid-based treatment systems, and expanded options for handling and managing the liquid and solid manure components. Furthermore, by keeping the solid faeces and the liquid urine components from mixing, additional benefits can be achieved such as the reduction of manure nutrient imbalance by effectively partitioning phosphorus in the solids and the nitrogen in the liquid components, the potential reduction in the risk of pathogen transmission and water contamination, and the creation of significant opportunities for reducing odour and gaseous emissions.

Project objectives

The goal of this project is to develop a manure handling system that can facilitate the management and handling of manure nutrients, specifically phosphorus and nitrogen, while reducing odour emissions. A new pen design was conceptualized in which the slatted portion of the pen is replaced with a tilted belt conveyor (BC) system. Using only gravity, the system can effectively separate the urine from the faeces immediately after excretion. By operating the belt conveyor at pre-determined intervals, the solid faeces can be removed from the pen frequently and kept intact in a separate storage structure.

The first part of the project involved actual implementation of the BC pen design concept and the assessment of efficiency of separation of the solid and liquid components. For this phase, an experimental set-up with the BC pen design system was designed and installed at the Research and Development Institute for the Agri-environment (IRDA) facilities in Quebec and tests confirmed the effectiveness of the BC system in partitioning the manure components as well as the nutrients of concern.

The second phase, conducted at PSC, involved the assessment of the impact of the BC system on odour and gaseous emissions. Two environmental chambers at PSC which represent typical swine rooms were retrofitted; one room was configured with a conventional manure system (partially slatted floor with underfloor manure pit) while the other incorporated the BC system in place of the floor slats (shown in Figure 1). The BC had a slope of 10% towards the solid floor area and operated at a speed of 0.85 m/min for 3 min at 30-min intervals to move the manure solids to a collection tub under the higher end of the belt. Urine and other liquids deposited on the belt surface were drained continuously toward the lower end of the belt and collected into an enclosed container. A washing unit with a cylindrical brush placed under the middle of the belt was used to clean the underside of the belt when the BC system was activated.

Figure 1. Completed pen with BC system in place of slats; the solids collection tub, washing unit, and urine collection tub under the BC are shown during construction.

Results from completed trials

Trials lasting for four weeks each were conducted, in which 8 female pigs weighing about 20 to 25 kg were brought into each chamber, and odour and gaseous emissions were monitored weekly. Performance indicators for the pigs were also recorded (Table 1). Overall, the pigs in both chambers showed average growth, and no major growth advantage for either chamber was

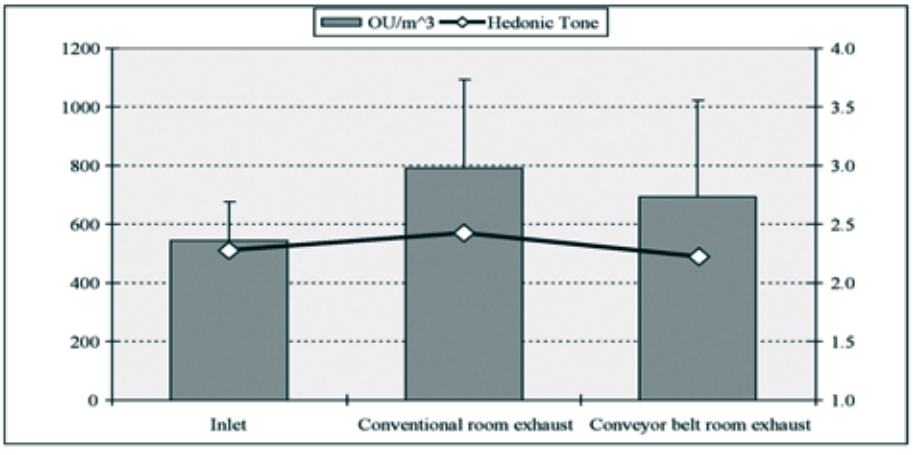

Figure 2. Mean odour concentrations (in OU/m³) and hedonic tone scores for samples collected at inlet and exhaust of the chambers during the trials (n = 6).

observed in terms of daily gain and feed intake during the two completed trials. Two additional trials will be conducted.

Manure production and water use

Manure production in both chambers were monitored weekly and summarized in Table 1. The combined solids and liquids in the BC room was about 60% (or about 34 kg) higher than the mixed slurry collected in the conventional room during Trial 1, but this subsequently went down to 24% (15 kg) in Trial 2. In most weeks, the collected urine (liquid) from the BC room by itself was more than the collected slurry mixture in the conventional room. No immediate explanation for this observation was readily evident, but similar trends were also observed in Phase 1 trials conducted at IRDA. One possible explanation is the relatively higher water use in the BC room compared to the conventional room, and the transfer of water from the washing unit to the urine collection tub as the belt was cleaned.

Table 1. Mean values for the parameters monitored during the two completed trials.

Parameter		Trial#1				Trial#2			
		Conventional		Belt conveyor		Conventional		Belt conveyor	
Pig performance									
Avg. pig weight (kg) (Number)	Start	29.0	(8.0)	28.8	(8.0)	19.4	(8.0)	19.5	(8.0)
	End	53.9	(7.0)	51.0	(7.0)	43.4	(8.0)	44.3	(8.0)
ADG (kg/day) (SD)		0.88	(0.13)	0.79	(0.17)	0.83	(0.10)	0.86	(0.09)
Total feed consumption (kg)		377.2		367.2		334.1		341.5	
ADFI (kg/day)		1.71		1.68		1.44		1.47	
Total manure production (kg)									
Slurry		231.3		--		247.7		--	
Urine		--		286.5		--		246.9	
Solids		--		82.5		--		60.5	
Combined (solids and urine)		--		369.0		--		307.4	
Weekly avg diff. bet. 2 chambers	(kg)	34.4				14.9			
	(%)	60.9				24.4			
Weekly average gas concentrations									
Ammonia concentration (ppm) (SD)	Inlet	--		7.6	(1.3)	--		8.5	(1.4)
	Exhaust	--		9.0	(1.5)	--		9.8	(1.4)
	Exhaust	9.3	(1.5)	--		9.9	(1.5)	--	
Carbon dioxide concentration									
(ppm) (SD)	Inlet	--		430.2	(35.4)	--		469.0	(40.3)
	Exhaust	--		522.0	(42.6)	--		522.1	(44.1)
	Exhaust	540.1	(43.0)	--		533.5	(45.2)	--	

> "At this midpoint in the series of trials separation of solid and liquid portions in manure has been successful and has no effect on pig performance."

Odour and gas concentrations

Gas concentrations were monitored continuously in the two chambers; the average of weekly values for NH_3 and CO_2 over the two trials are shown in Table 1. The inlet values were deemed similar for both chambers since there was only one main supply duct which branches towards the inlet opening of each chamber. Overall, average NH_3 and CO_2 values were only slightly higher for the conventional room compared to the BC room. However, the incoming air had significant levels of NH_3, possibly due to gases exhausted from ventilation fans of adjacent swine production rooms being recirculated into the supply air intake for the two chambers.

Day-long monitoring of H_2S levels in each chamber was also conducted every week using Draeger PacIII monitors. Results showed that H_2S levels in both chambers were below the detection limit (<1 ppm H_2S) of the H_2S monitors. However, measurements from two 80-L tubs (one filled with 10-L sample of slurry from the conventional room and the other with urine/liquids from the BC room every week) taken after Week 4 showed peak H_2S levels in the slurry tub at 68 ppm and 14 ppm from the urine/liquids tub (both undisturbed). Both slurry and urine/liquids tubs were agitated for 1 min and measurements taken afterwards showed peak H_2S levels of 22 ppm and 13 ppm, respectively.

Duplicate odour samples were collected from the inlet to account for the background odour concentration of the incoming air, and from the exhaust of each chamber to quantify the odour in the airstream leaving each chamber. The average odour concentration, expressed in terms of Odour Units per m^3 of sampled air, at the conventional room exhaust was about 12% higher than the BC room exhaust (see Figure 2). Additionally, the average hedonic tone scores from both chambers were low (i.e., below 5 on a 9-point scale), indicating that the odour was deemed unpleasant. After all the tests are done and the data set is complete, then appropriate statistical analysis procedures will be performed to make a definitive determination of the impact of this manure handling system on odour and gas emissions.

The Bottom line

The available data at this time indicates that the new pen design concept has:

- effectively separated the solid and liquid components of manure at the pen level, but the combined total mass of the separated streams was higher than the total slurry from a conventional partially slatted pen
- no adverse effect on the growth performance of the pigs
- resulted in reduced H_2S levels from stored separated liquid compared to the mixed slurry, but has apparent slight effect on reducing ammonia and odour levels.

These observations will be verified after all trials are completed and appropriate statistical tests are conducted.

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Personal Profile

Daisy Asis

Daisy is our newest graduate student. Living in the Philippines, a predominantly agricultural country, she wanted to be more acquainted with the farming industry and so she decided to take up Agricultural Engineering at the University of the Philippines Los Baños (UPLB). During her studies, she worked as a student assistant at the Agricultural Machinery Testing and Evaluation Center (AMTEC), where she gained experience in testing agricultural machinery. After obtaining her degree, she obtained a full-time job at AMTEC where she worked for five years, mainly on development of agricultural engineering standards. She was involved in the preparation of several national standards on various aspects including performance requirements and methods to test agricultural machinery, and on construction of livestock structures, waste management facilities, crops and livestock processing facilities. During this time, she also worked on her master's degree in business management.

Later, Daisy worked as a Science Research Specialist in the Department of Science and Technology in the Philippines, where she was responsible for the screening and assessment, with major emphasis in engineering, marketing and economic aspects of technologies under consideration for the development into commercial packages.

After having worked with research and government institutions, she took the challenge of working in an academic institution. Back in UPLB, she took up the position of an Instructor at the Agricultural Machinery Division and an affiliate instructor at the Engineering Science Department and U.P. Rural High School, where she taught Benchwork and Forging, Fundamentals of Agricultural Engineering, Statics of Rigid Bodies, and Agricultural Science and Technology to 3rd-year engineering students and 4th-year high school students.

Always looking for opportunities for growth, she applied for admission to the Master of Science program at the Department of Agricultural and Bioresource Engineering, University of Saskatchewan and was accepted, along with a graduate research assistantship from the Prairie Swine Centre. Currently, she is doing research to investigate potential applications of nanotechnology on mitigating emissions from swine operations, under the supervision of Dr. Bernardo Predicala.

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