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Impact of piglet birth weight and birth order on growth and the variability in growth

Denise Beaulieu and John Patience

Sow herd productivity has a major impact on the overall profitability of pork production and Canadian producers have been successful in their efforts over the past several years to increase average litter size. It is well known that piglets born into larger litters are on average smaller. However, it is not known if the variability in birth weight, that is the range between the heaviest and lightest pigs within each litter, increases as litter size increases. Additionally, recent work in Europe has shown that the fibre composition of the muscles differs between the very small birth weight piglets and their larger litter-mates. This could have an effect on the ultimate eating quality of the pork. We therefore, conducted a study with the overall objective of defining the relationship among birth weight and post-weaning growth on the eating quality of the pork. We determined also, the birth order of piglets however had no impact on birth weight or other variables, therefore the results are not presented. The effects of birth weight on carcass and pork quality will be discussed in a later edition of Centred on Swine. This article addresses the relationship of birth weight on growth and the variability in growth. Moreover within the experiment we were able to examine the role of litter size on these parameters.

> "Larger litters were no more variable than small litters and larger litters resulted in more pork produced per sow".

The protocol for this experiment required that data be collected from approximately 100 litters. This required the attendance at all farrowings for 5 consecutive weeks at PSC Elstow. During these weeks a technician was constantly present from 8:00 am Tuesday, until Saturday, 4:00 pm. Farrowing and piglet management, including cross-fostering,

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Assessment of a biological treatment process to reduce gaseous emissions from swine manure

B. Predicala, M. Nemati and C. Laguë

Background

A recent survey conducted by PSCI showed that 83% of barn workers may be exposed to potentially hazardous levels of gases, especially hydrogen sulphide (H_2S), generated during in-barn manure handling tasks. While exploring existing technologies from other fields that can be applied to the swine industry to address this issue, we investigated a biological treatment method developed in the oilfields to determine its applicability for controlling biogenic production of H_2S and other gaseous emissions from swine manure.

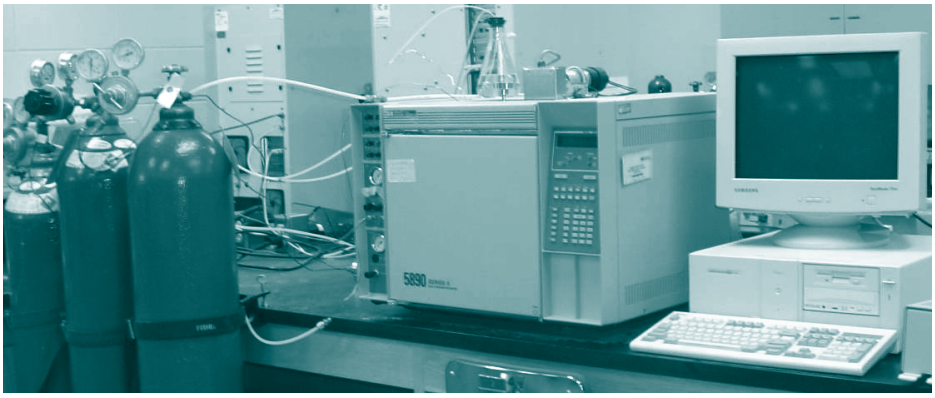
The biological treatment process we examined relies on two different mechanisms which are utilized simultaneously. First, the activity of microbial species that produce undesirable gases and odour precursor compounds in the manure, namely sulphate-reducing bacteria, are suppressed using a balanced mixture of specific chemical metabolic inhibitors. The second mechanism involved stimulation of the metabolic activity of specific bacterial species, namely sulphide-oxidizing bacteria, to oxidize sulphide into less harmful compounds. Indigenous bacterial species residing in the manure slurry were utilized. However, addition of cultured bacteria enriched from other environmental sources such as oil reservoirs was also considered.

Experimental approach

In order to prove the applicability of the treatment on swine manure, the main approach employed was to apply various combinations of treatments on manure slurry collected from swine rooms at PSCI in a series of tests at progressively increasing scale. We started with laboratory tests using 125-mL serum bottles, which allowed us to test a wide array of treatments applied with different chemical metabolic inhibitors at varying combinations, concentrations, applied volumes, and treatment durations. Tests were also conducted using microbial cultures derived from other sources and those isolated from manure slurry.

The chemical metabolic inhibitors we tested were nitrate, nitrite, and molybdate, which were selected based on results from published studies on similar applications. The effect of these metabolic inhibitors (applied alone or in combination) on emission of H_2S was assessed by addition of various quantities of the concentrated solution to serum bottles containing 30 mL of manure slurry. The bottles were capped and stored for the duration of the test (up to 30 to 45 days); periodically, headspace gas was extracted from each bottle and analyzed for H_2S levels. From the results of these tests, the most promising treatments were applied in larger volumes in the laboratory (using 1 L manure slurry in 4-L jugs), and subsequently in semi-pilot tests at the PSCI

Laboratory and pilot scale set up at PSC.



Gas chromatograph system used to determine the concentration of hydrogen sulphide in gas samples.

barn using 80 L of manure slurry in 200-L barrels.

In laboratory tests, the effectiveness of the treatments was assessed based on their impact on H_2S levels, while in the semi-pilot tests, odour and ammonia (NH_3) levels were also monitored in addition to H_2S. A gas chromatograph system was used to determine H_2S levels, while a gas analyzer was used to measure NH_3 concentrations. Odour in bagged samples collected from the barrels was analyzed at an olfactometry laboratory.

Molybdate Tests

Results from laboratory tests showed that addition of molybdate (Mo) even at the lowest concentration tested (0.25 millimole Mo) led to a sharp decrease in concentration of H_2S from an initial value of about 1450 ppm. However, the residual level of H_2S was dependent on the quantity of added molybdate; the concentration of H_2S remained at a low level only for 2 days. Following this period, H_2S concentration increased and reached a final value of about 1240 ppm in less than 10 days. Simultaneous addition of nitrite and molybdate (all tested concentrations) initially led to a sharp decrease in concentration of H_2S in the headspace gas. With addition of nitrite and molybdate at higher amount, a lower H_2S concentration fluctuating in the range 200 to 300 ppm was maintained over a period of 45 days. It must be noted that the test conditions were designed intentionally to create high levels of H_2S, thus, the treatment can be deemed effective if it was able to reduce these extremely high values and maintain low H_2S levels.

Sulphide-oxidizing Bacteria

In initial laboratory-scale tests, addition of a pure culture of sulphide-oxidizing bacteria from other environmental sources did not show significant activity regarding the removal of sulphide. Hence, a microbial culture was isolated from swine manure and enriched. The use of the isolated culture to treat 30 mL of swine manure slurry in serum bottle tests did not result in a significant decrease in sulphide concentration, possibly due to a small inoculation size, or the low concentration of biomass in the inoculant liquids. However, these preliminary results indicate the potential for isolation and enrichment of indigenous sulphide-oxidizing bacteria present in the manure. A more detailed study will be conducted to verify the possibility of enriching a sulphide-oxidizing culture from the manure and to assess the activity of the enriched culture in reducing the emission of sulphide from manure slurries.

The combination of treatments using metabolic inhibitors that reduced the concentration of H_2S in the headspace gas of the small serum bottles to less than 20 ppm H_2S were assessed in 4-L bottles. All combinations tested were effective and decreased the concentration of H_2S to a range between 0 to 25 ppm H_2S, which was maintained throughout the tests.

Based on the results of laboratory tests in small and large bottles, the most promising treatment combinations were applied in semi-pilot tests in the barn using 80 L of manure slurry in 200-L barrels. The profiles of H_2S concentration in the headspace gas for the barrels (averaged from 3 trials) are shown in Figure 1 (Panel A). For ease of comparison, the initial part of the H_2S concentration profiles is shown in Figure 1 (Panel B). As can be seen in the barrel with no treatment (Control) the concentration of H_2S remained in the range 350 to 550 ppm for the first 10 days

Assessment ... cont'd on page 4

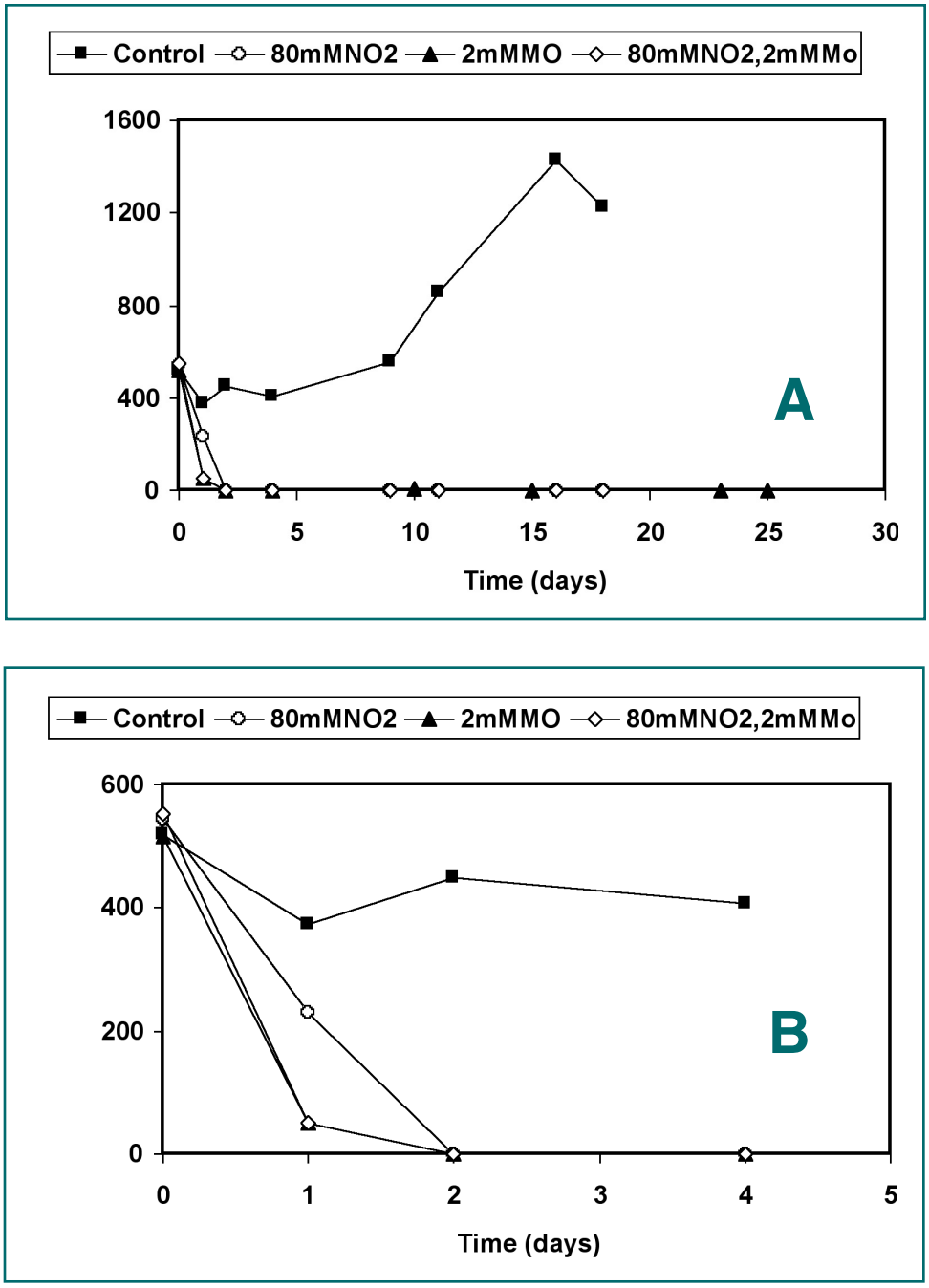


Figure 1. Profiles of average H2S concentration in the barrels treated with various combinations of nitrite and molybdate added simultaneously at the beginning of the test. Panel B shows the details of concentration levels during the first 4 days of the trials.

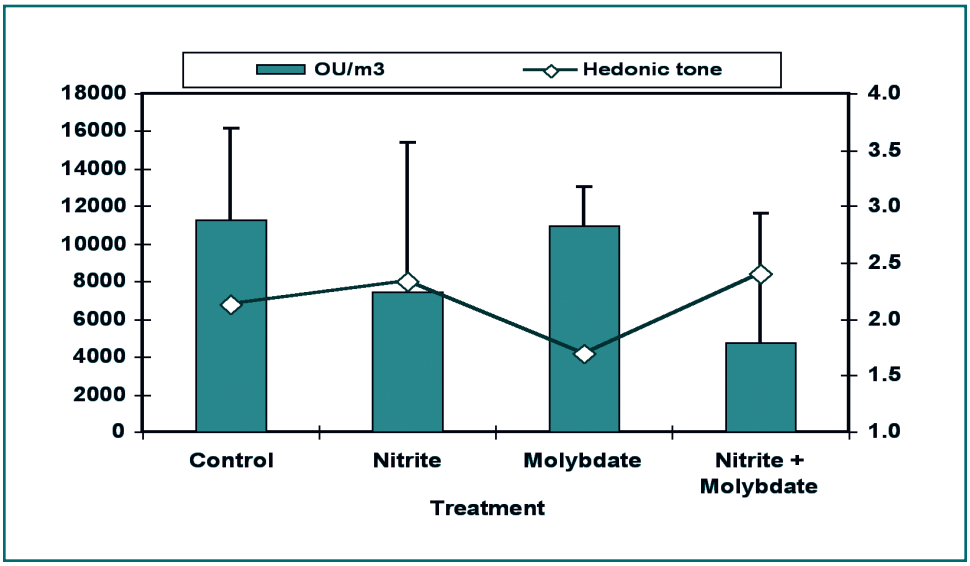


Figure 2. Profiles of average odour concentration and hedonic tone scores in the manure slurry barrels treated with various combinations of nitrite and molybdate.

Assessment ... cont'd from page 3

and increased sharply over the next 8 days to a value ranging from 1200 to 1450 ppm H_2S. The addition of nitrite, molybdate, and a combination of nitrite and molybdate led to a sharp decrease in H_2S concentration in the treated barrels, with the fastest decrease observed when nitrite or a combination of nitrite and molybdate were applied. In all three cases, the residual concentrations of H_2S were very low, with the observed values toward the end of experiments (up to 25 days) ranging from not detectable to about 25 ppm H_2S.

Ammonia

Overall, the NH_3 levels measured from all barrels throughout the tests ranged from 10 to 100 ppm. No apparent impact of the treatment on the NH_3 levels was readily evident since the levels in the untreated barrels (Control) were not significantly different from those in the treated barrels, especially in the initial days of the trials. However, the trend observed in the latter part of the trials, in which the NH_3 levels in the control barrels were rising above those in the treated barrels, was a possible indication that longer time was needed for the treatment to exhibit its impact; hence, further trials at longer durations could be worth pursuing to assess the impact of the treatment on NH_3 levels.

Odour

Odour levels were determined from bagged samples collected from each barrel at the end of each of the 3 trials. Overall, the odour concentration levels measured from all barrels were extremely high, which was expected because the barrels were completely sealed to intentionally generate high initial levels of target gases. Although the number of samples was very limited, it was evident that the mean odour concentration levels were lower for the barrel treated with combined nitrate and molybdate (Figure 2). This was consistent with the results from previous laboratory-scale tests, in which the combination of adding both nitrite and molybdate was consistently able to reduce H_2S levels and keep the levels down throughout the trials. Furthermore, the hedonic tone score for the samples from the barrels with the combined nitrite and molybdate treatment was slightly higher than the score for the other samples. The hedonic tone score is a measure of the pleasantness of the odour using a 9-point scale, which ranges from '9 – Like extremely' down to '1 – Dislike extremely'. Generally, higher scores indicate that the odour was deemed more pleasant (or less unpleasant) compared to odours with lower scores. As this work was generally a proof-of-concept effort to assess the applicability of the biotreatment approach for controlling odour emissions from swine manure slurry, these results even though from limited samples, clearly indicate the potential effectiveness of the technique for reducing odour levels and thus merit further evaluation.

> "Preliminary work on isolation and enrichment of sulphide-oxidizing bacteria from manure showed promising results "

The Bottom Line

The combined application of selected metabolic inhibitors tended to reduce the odour concentration from gas samples in semi-pilot scale tests, but the impact on ammonia levels was not evident during the length of the treatment test considered. Preliminary work on isolation and enrichment of sulphide-oxidizing bacteria from manure showed promising results, but further study is needed to verify the possibility of enriching a sulphide-oxidizing culture from swine manure and to assess the activity of the enriched culture in reducing the emission of sulphides from manure slurries. An on-going study is currently examining various factors affecting the microbial culture aspects of this treatment approach and to implement the treatment in controlled room-scale tests in the barn. It is anticipated that further development and successful application of this treatment process in swine barns will reduce worker exposure to potential gaseous hazards (especially hydrogen sulphide) and improve the overall work environment in swine barns, thereby leading to better health and productivity of workers and animals.

Acknowledgements

The financial support provided by the Alberta Livestock Industry Development Fund and the Natural Science and Engineering Research Council of Canada is gratefully acknowledged. The authors would like to thank Robert Fengler, Erin Cortus, and Sarah Stade for their technical assistance. Authors would also like to acknowledge Sask Pork, Alberta Pork, Manitoba Pork Council, and Saskatchewan Agriculture and Food for the strategic funding provided to the research program at Prairie Swine Centre Inc.

Table 1. The effect of birth weight on body weight, growth and days to market[1]

		Birth weight, kg					
Parameter		**0.80-1.20**	**1.25 -1.45**	**1.50-1.70**	**1.75-2.50**	**SEM**	**P value**
n, born alive		212	225	209	136		
Weight, kg	Day 0	1.04^{d}	1.35^{c}	1.59^{b}	1.93^{a}	0.008	<0.001
	Weaning	5.48^{d}	6.30^{c}	7.04^{b}	7.68^{a}	0.09	<0.001
	5 wks	9.92^{d}	21.95^{c}	23.56^{b}	24.63^{a}	0.30	<0.001
	7 wks	29.60^{d}	31.78^{c}	33.77^{b}	34.74^{a}	0.32	<0.001
	1st pull	92.18^{d}	96.81^{c}	99.74^{b}	101.82^{a}	0.79	<0.001
	Shipping	119.31	119.23	119.68	119.47	0.39	0.78
ADG, kg/d	Day 0-wean	0.23^{d}	0.26^{c}	0.29^{b}	0.30^{a}	0.005	<0.001
	Wean–5 wks	0.42^{d}	0.45^{c}	0.47^{b}	0.49^{a}	0.006	<0.001
	5 wks–7 wks	0.68^{b}	0.71^{ab}	0.73^{a}	0.73^{a}	0.01	0.002
	7wks–market	1.01^{c}	1.04^{b}	1.05^{ab}	1.07^{a}	0.008	< 0.001
Days to market	Mean	159.3^{d}	154.9^{c}	152.3^{b}	149.6^{a}	0.8	<0.001
	Range	139-203	138-195	137-194	137-181		
	n[3]	181	225	209	136		

1 Includes pigs selected for shipment to Lacombe. Pigs weighing less than 800 g at birth excluded from the data set.
2 BW at weaning expressed as $BW^{0.75}$
3 Number of pigs included in data set.
a,b,c,d Within a row, numbers with different superscripts differ, P < 0.05.

Table 2. The effect of litter size on growth, variability in growth and the days to market[1]

		Pigs per litter				
		< = 10	>10 < = 13	> 13	SEM	P values
n born alive	Day 0	9.3^{c}	12.9^{b}	15.0^{a}	0.66	<0.001
	Wean	7.3^{c}	10.1^{b}	13.0^{a}	0.48	<0.001
	5 wks	7.2^{c}	9.9^{b}	13.0^{a}	0.47	<0.001
	7 wks	7.1^{c}	9.9^{b}	12.8^{a}	0.48	<0.001
	1 pull	6.9^{c}	9.7^{b}	12.2^{a}	0.46	<0.001
Average BW, kg	Day 0	1.58^{b}	1.40^{a}	1.32^{a}	0.04	<0.001
	Wean	6.81	6.48	6.52	0.19	<0.22
	5 wks	22.88	22.05	22.77	0.51	0.26
	7 wks	32.82	31.76	33.00	0.59	0.13
	1 pull	97.55	96.68	98.53	1.31	0.51
n below 800 g	Day 0	0.37	0.49	1.05	0.27	0.12
SD of BW, kg	Day 0	0.25	0.23	0.25	0.01	0.65
	Wean	1.28	1.03	1.18	0.11	0.11
	5 wks	3.23	2.80	3.00	0.23	0.21
	7 wks	4.16	3.55	4.04	0.30	0.14
	1 pull	8.99	8.76	10.05	0.78	0.40
Total litter BW, kg	Day 0	12.90^{c}	16.14^{b}	19.30^{a}	0.69	<0.001
	Wean	49.32^{c}	65.3^{b}	84.04^{a}	3.51	<0.001
	5 wks	162.80^{c}	219.05^{b}	293.35^{a}	11.22	<0.001
	7 wks	232.26^{c}	315.80^{b}	420.45^{a}	16.05	<0.001
	Shipped	792.27^{c}	1073.13^{b}	1384.20^{a}	57.5	0.001
Days to market	Average	154.3	158.1	153.4	1.3	0.55

1 Except for the "n below 800 category" the data does not include pigs who weighed less than 800 g at birth.
a,b,c Numbers within a row with different superscript differ (P < 0.05).

Impact of piglet birth weight ... cont'd from page 1

iron injections, castration and tail clipping followed normal barn procedures. At birth, the piglets were divided into one of 4 birth weight quartiles (Table 1). Piglets weighing less than 800 grams at birth were excluded from the experiment.

Table 1 describes the effect of birth weight on performance. The "large" birth weight piglets were almost 900 grams heavier than the "small" birth weight piglets at birth. This translated into a difference of 2.2 kg at weaning and 9.6 kg at 1st pull. Or, to put it another way, at birth, the "small" birth weight piglets weighed about 54% of the "large" birth weight piglets, but 90% at 1st pull. Thus, there is some "catch-up" by the lighter pigs. As intended, shipping weights were similar however days to market increased as birth weight decreased ($P < 0.001$; Table 1). "Large" piglets had a higher rate of gain throughout, ($P < 0.002$), but, the relative difference in the rate of gain became less as the pigs grew.

Table 2 describes the effect of litter size on numbers weaned, growth and variability. Variability is represented as the standard deviation of the mean. The definition of litter size categories of small, medium and large was arbitrary; we wanted approximately an equal number of pigs per grouping. We had an average of 9, 13 and 15 pigs born alive in the litters defined as small, medium and large, respectively. As expected, average birth weight decreased as litter size increased ($P < 0.001$) and the number of pigs weighing less than 800 grams tended to increase as litter size increased ($P = 0.12$). This difference in average body weight was no longer evident at weaning or later as the pigs grew ($P > 0.20$). The variability in body weight (SD) within a litter was not affected by litter size at any of the time points examined ($P > 0.10$). Average days to market was unaffected by litter size ($P = 0.55$) and the total kg shipped per litter increased by 200 to 300 kg as litter size increased from small to medium to large ($P < 0.001$).

The Bottom Line

Light birth weight piglets never completely catch up. While increasing litter size resulted in a decreased mean birth weight; by 5 wks post-weaning, the average body weight was similar among litter sizes. Our data does not support the hypothesis that larger litters result in more within litter variation. Larger litters were no more variable than small litters and larger litters resulted in more pork produced per sow.

Gestation Housing Alternatives: Sows in a Deep-Bedded Cafeteria-Fed System

Harold W. Gonyou, Prairie Swine Centre

In collaboration with the following Australian researchers:
Paul Hemsworth, Univ. of Melbourne
G. Marcus Karlen, Dept. Primary Industries Victoria
Bronwyn Stevens, Univ. of Melbourne
David Strom, CSIRO Australia
John Barnett, Dept. Primary Industries Victoria
Rob Smits, QAF Meat Industries
Rebecca Morrison, QAF Meat Industries

As part of our ongoing research on alternative sow housing systems, I spent several months working with members of the Animal Welfare Science Centre at the University of Melbourne on a collaborative project with QAF Meat Industries, the largest pig production company in Australia. The project consisted of two studies in which we compared the performance and welfare of sows in either conventional stalls or a large group, deep-bedded cafeteria-fed system.

The experiments:

The alternative sow housing system used in the study consisted of a series of fabric covered metal structures called 'Ecosheds', similar to hoop structures used on some Canadian operations. Each of the eight Ecosheds housed two groups of approximately 85 sows each, in 9 x 22.5 m pens approximately 2.38 square metres (25.6 square feet)/sow. Pens were bedded to a depth of 30 cm with rice hulls. An additional Ecoshed was equipped with 100 lock-in feeding stalls, through which the groups were rotated each day. The distance between the sow groups and the cafeteria feeding shed was approximately 50 m. Sows were given approximately 20-30 min to consume their feed before being moved back to their home pen. The stall housing used in the study was part of an adjoining farm unit with 24 banks of 215 stalls.

In the first study all sows were placed into breeding stalls at weaning. Following the second mating, sows were moved into either a section of stalls for implantation (Stall), or into the group pens (Group 0). Each group pen was filled in two days over a single week, with similar numbers of sows being placed in stalls over the same period. The sows in stalls were pregnancy checked at approximately 35 days post-mating, and then moved into a bank of gestation stalls. Sows were moved from their group pen or gestation stall to farrowing crates a few days prior to their expected delivery. In the second study an additional treatment was applied within the group system. Half of the groups were formed at 35 days post-mating rather than immediately following the second mating (Group 35). Approximately 1,800 sows were used in the two studies.

In the first study we assessed skin lesions on 21 regions of each sow's body. Fresh lesions were categorized as scratches, abrasions, skin ulcers and cuts. Lesions were scored for both treatments pre-mating, and during weeks 1, 9 and 15 of gestation. We also assessed locomotion pre-mating, and during weeks 9 and 15. To do so we exercised the animals over a 30 m distance, and then observed the animals while they were driven a further 50 m along a concrete walkway. We used a 4 point scale with 0 representing an animal that could stand and move, and whose movements were symmetrical. A score of 1 represented compromised movement; 2, their ability to stand was reduced; and, 3 represented very restricted ability to stand and move. Each group of animals was observed for aggression for 40 minutes during weeks 1 and 9 of gestation. Salivary cortisol (as indicator of stress) was measured during day 5 and week 9 of treatment.

> "We found that stage of gestation affected the level of aggression at grouping, with sows grouped 35 days after breeding having lower levels of fighting at the time of mixing than those grouped shortly after breeding"

*Table 1. Summary of injuries, locomotion scores, aggression, haematology and productivity results for two studies involving conventional gestation stalls vs. group housed sows from breeding (Group 0) or group housed sows from day 35 post breeding (Group 35) in a deep bedded cafeteria fed group system**

Measurement	Stall	Group 0	SED	Measurement	Stall	Group 0	Group 35	SED
Injuries				Injuries				
Scratches (Week 1)	3.3 [b]	25.0 [a]	0.162	Scratches (day 7)	1.54 [b]	2.61 [a]	2.23 [a]	0.352
Scratches (Week 15)	1.1 [b]	7.6 [a]	0.505	Scratches (day 42)	2.13 [a]	1.09 [b]	2.67 [a]	0.352
Abrasions (Week 1 to 15)	0.91 [a]	0.01 [b]	0.056	Abrasions (day 91)	2.36 [a]	0.09 [b]	0.29 [b]	0.258
Movement				Aggression				
Locomotion score (Week 9)	0.711 [a]	0.156 [b]	0.100	Bouts/sow (at mixing)	N/A	1.42 [a]	0.96 [b]	0.207
Locomotion score (Week 15)	0.645 [a]	0.174 [b]	0.085	Bouts/ sow (7 days post-mixing)	N/A	0.77	0.60	0.207
Haematology				Haematology				
Neu/Lymph ratio (Week 15)	1.22 [a]	0.939 [b]	0.111	Neu/Lymph ratio (Week 15)	1.62	1.24	1.46	0.221
Productivity				Productivity				
Piglets born alive	10.14	10.22	0.339	Piglets born alive	11.34	11.56	11.15	0.332
Piglets born alive per sow mated	8.3 [a]	6.38 [b]	0.363	Piglets born alive per sow mated	9.87	8.60	9.38	0.848

* For all variables except productivity, lower values are considered desirable

Blood samples were taken at week 15 of gestaton and analysed for basic haematology (cell counts). Farrowing rate and litter size were determined in the farrowing unit.

Similar measures, with the exception of locomotion, were made in the second study. However, these measures were made on specific days, including days 35 and 42, when the second group treatment was moved into the ecosheds and one week later. This also represented the time when stalled animals were moved from implantation stalls to gestation stalls.

The Results:

The variables yielding significant differences among the treatments are summarized in Table 1. In both studies the sows introduced to group housing shortly after breeding had higher scratch scores than did the stalled animals during the first week. In the first study, in which additional scoring was performed at 15 wk into the study, we saw the difference in scratches persist, although both treatments had fewer scratches than during the first week. In the second study we re-examined scratches at day 42, just after sows in the Group 35 treatment had been introduced to groups and after Stall animals had moved to their final gestation stalls. In this case, the recently moved sows, in both the group and stall systems, had higher scratch scores than those that had been moved to groups 35 days earlier (Group 0). Abrasions, due to rubbing on walls or stall components, were always higher in stalled sows than in the group treatments.

We addressed two important questions concerning aggression in large groups of sows. We found that stage of gestation affected the level of aggression at grouping, with sows grouped 35 days after breeding having lower levels of fighting at the time of mixing than those grouped shortly after breeding (Group 0). We also found that aggression was considerably reduced after one week, regardless of stage of gestation.

Locomotion scoring was conducted under specific test conditions, rather than within the sows' housing. Under these conditions the sows from stalls evidenced more difficulty walking, and in fact we had a much higher culling rate (4%) due to lameness in stalls than in the group system (0.5%).

The neutrophil/lymphocyte ratio was assessed late in each study. This measure is seen as indicative of long term (chronic) rather than short term (acute) stressors. In the first study the sows in stalls had a higher ratio (undesirable), and this trend was also evident, although not significant, in the second study.

The first study was conducted during a particularly hot summer and productivity was lower than normal. In neither study did housing system affect the number of pigs born alive/litter. However, in the first study there was a significant reduction in live born piglets per sow mated. This reduction could be attributed to a lower farrowing rate. Although no significant differences in productivity were found in the second study, a trend to lower farrowing rates in sows grouped shortly after mating (Group 0) compared to those grouped 35 days later (Group 35), or that remained in stalls, was present. This is in agreement with results from our studies on sows in ESF systems at the Prairie Swine Centre.

The Bottom Line

Housing sows in large groups, in a deep-bedded cafeteria-fed system had both advantages and disadvantages compared to stall housing. Grouped sows fought at the time of mixing, more so if grouped shortly after mating, but aggression dropped off within a week. Scratches were more frequent when animals were grouped, but also increased when sows were moved to new stalls. Abrasions were more common in stalled sows. Stalled sows also had a higher incidence of locomotion problems, including lameness requiring culling, than did sows on the deep litter. Stalled sows evidenced physiological changes indicative of long term stress. Productivity was affected only if sows were grouped within a few days of mating. In general, group housing resulted in acute, short lived welfare problems, while the results from stall housing were indicative of long term, chronic stress.

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Personal Profile

Eleonor Navia

Eleonor Navia joined the Prairie Swine Centre in September 2006 as a graduate student in the Engineering program under the supervision of Dr. Bernardo Z. Predicala. Eleonor obtained her B.S. degree in Agricultural Engineering in the University of the Philippines Los Baños (UPLB) in 1999.

In 2000, Eleonor worked at the Agricultural Machinery Testing and Evaluation Centre in UPLB as a University Research Associate. She was involved with the development of national standards for design and specification of agricultural production machinery. In 2001, she started on her Masters degree in Business Management in the same University.

Prior to coming to Saskatoon, Eleonor has worked with a consultancy group which conducted a technical and economic feasibility of establishing swine facility and corn production in one province in the Philippines.

At PSCI, Eleonor's research project deals with finding ways to reduce energy use in swine operations. This involves gathering benchmark information on current energy consumption in different types of swine production facilities in Saskatchewan. Presently, she is monitoring the actual energy use in a number of selected barns, which will be conducted over summer and winter seasons.

Coming Events

Manitoba Swine Seminar
January 30-31, 2008
Winnipeg, Manitoba

Alberta Pork Congress
March 12-13, 2008
Red Deer, Alberta

Western Canadian Livestock Expo
April 16-17, 2008
Saskatoon, Saskatchewan

Hydrogen Sulphide Awareness Workshop

TRAINING

IMPORTANT INFORMATION AND EDUCATION FOR ANYONE WHO WORKS WITH OR TRANSPORTS LIQUID MANURE

THE 4-HOUR WORKSHOP INCLUDES INSTRUCTION IN:

- Properties of H_2S
- Exposure limits
- Effects that H_2S may have on humans
- Demonstration of H_2S monitor detection and safety equipment
- Critical manure management
- Importance of Standard Operating Procedures (SOPs) and a hands on approach to writing a procedure
- Response techniques
- Rescue Strategies
- Importance of implementing an emergency response

YOU WILL LEARN

- H_2S Awareness
- How to be Prepared
- How to Work Towards a Safer Workplace

Shannon LaRoche delivers this Hydrogen Sulphide (H_2S) workshop on contract through the Prairie Swine Centre

Participants receive a wallet certificate and training certificate upon the completion of the course.

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