A better outcome for sick & compromised pigs

Final Report
APL Project 2010/4451

April 2011

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Contents

Strategies for the early detection of sick and injured gestating sows

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Abstract

Sufficient knowledge concerning the health status of individual sows on pig farms is needed to ensure that appropriate treatment may be instituted early to minimize the number of premature culls. The objective of this study was to identify the most sensitive detection method for identifying sick or injured gestating sows housed in stalls and groups on a commercial pig farm. Nine observation methods were utilised over a four-day period. Of the 3017 sows inspected, 304 (10.1%) were identified as having at least one clinical abnormality. Low body condition score (less than 3) and lameness were the most frequently-observed abnormalities in stall-housed and group-housed sows, respectively. The highest proportion of abnormalities (22% of sows) were detected in group-housed sows by walking through their pens at the end of the feeding period and encouraging all sows to stand. The highest proportion (13% of sows) of abnormalities were observed in stall-housed when examining them from the back aisle during feeding time.

Introduction

Average sow replacement rates of 60.6% have been reported in pig herds in Australia.[1] Although replacements of sows can be planned management decisions, a great concern is sows which are prematurely culled due to the occurrence of illness or injury. Sufficient knowledge concerning the health status of individual sows is needed to reduce the number of unplanned culls. It is important that the method of examining pregnant sows maximises the sensitivity of detecting illness or injury, to ensure that appropriate treatment may be instituted early. Any examination method must also be cost-effective in terms of labour requirements.

There is increasing pressure for the pig industry to abolish individual housing of sows in stalls. [9] Monitoring of the individual sow in group housing can be difficult. As herd sizes increase, there may be reduced time available to monitor the health of individual animals unless increased labour is provided.[2] There is little information in the scientific literature comparing the detection sensitivity of different methods used to identify illness or injury in gestating sows. The objective of this study was to develop a strategy that maximises the sensitivity of detecting illness or injury among gestating sows. A second objective was to record the time taken to carry out the different observation techniques, as a guide as to the labour requirements of each.

Materials and Methods

Study site

This experiment was conducted in October 2010 on a commercial 1000-sow, breed-to-finish farm mating approximately 60 gilts and sows each week. Weaned sows were housed in groups within the mating area and mated three times by artificial insemination. Sows were moved post-mating to

individual stalls (2.3 m x 0.6 m) for the first six weeks of gestation. The flooring in the stalled area consisted of solid concrete for the front two thirds with slats for the back third. Sows were transferred at approximately 6 weeks gestation to a separate shed and housed in groups of 12 in pens (4.0 m wide x 5.8 m deep; 1.9m^2/sow) according to week-mated. The flooring in the pens was a cement slab, with the last 1.5-2 m as slats, allowing waste removal. Group-housed sows were returned to the stalls for the final 2-3 weeks of gestation prior to being transferred to the farrowing shed. Sows detected as sick and/or injured in group-housing were transferred to stalls prior to being moved into farrowing accommodation. All sheds housing pregnant sows were naturally-ventilated.
Pregnant sows were fed approximately 2.7 kg of a dry sow diet (13 MJDE, 15.4% protein) daily around 7am. Stall-housed sows were fed in a trough at the front of the stall which was utilised for both food and water (the water was drained prior to feeding and re-filled approximately 1 hour after feeding). Group-housed sows were fed on the floor, with water provided via two nipple drinkers located either side at the back of the pen. A boar was present in three of the group pens to assist in identifying return-to-oestrus sows.

Study protocol

One researcher used nine different detection methods over a four-day period to inspect mated sows housed in stalls and pens for any clinical abnormalities. Mated gilts housed in pens in a separate area were not examined. The researcher followed the same route during each inspection. The comparisons that were made during the study were:
Group-housed sows

1. aisle versus within-pen / non-feeding time / don't stand sows up
2. aisle non-feeding versus aisle feeding
3. pen standing up versus pen non-standing up (non-feeding time)

Stall-housed sows

1. front versus back (non-feeding time)
2. back non-standing versus back standing up
3. feeding versus non-feeding (back)

For the purpose of this study, "feeding time" was defined as 7am - 9am. "Non-feeding time" was any time after 10 am. The total time taken to inspect sows using each method was recorded and time per 100 sows calculated.

Clinical abnormalities

Any physical abnormalities observed in sows were recorded; a sick or injured sow demonstrated one or more of the following clinical signs/conditions:

- Leg lesions - ulcers, abrasions, joint effusion or scabbed wounds on fetlocks (dew claws), knees or hocks.
- Claw deformities - cracks, bruises, infections, uneven claws and overgrown horn.
- Poor body condition, a score of less than 3/5.

- Lameness - stilted gait, shuffle, shifting lameness, unwillingness and/or inability to stand (recumbent), scored as abnormal gait – 1, leg carrying/shifting weight – 2 and inability to stand – 3.
- Fight wounds.
- Pressure sores (usually on points of shoulders and/or along spine).
- Discharge from or damage to the vulva

The body condition score (BCS) of individual sows was assessed based on guidelines in the Model Code of Practice for the Welfare of Animals – Pigs (2007). Sows were either recorded as BCS less than 3 or 3 and greater.

Statistics

The proportions of abnormalities detected using the different inspection methods for stall-housed sows (front versus back; feeding time versus non-feeding time) were analysed using a generalized linear model. A 2-sample binomial test was used to compare the effect that standing sows up had on the proportions of abnormalities detected for stall-housed sows inspected from the rear at feeding time. The proportions of abnormalities detected using the different inspection methods for group-housed sows were analysed using a generalized linear model, with inspection location (aisle versus pen and standing sows up; feeding time versus non-feeding) included in the model. All analyses were conducted using Genstat.

Results

The number of stall-housed sows inspected using each treatment method ranged from 339 to 363. The number of group-housed sows inspected using each treatment method ranged from 305 to 328. The sample sizes in each study group varied as sows were transferred between the mating area, stall housing and group housing as per normal management practice on this farm. These movements occurred for fewer than 2% of sows in each population.

Stall-housed sows

A higher proportion of abnormalities were detected when stall-housed sows were inspected at feeding time compared to non-feeding time ($p=0.039$; Table 1). While the highest proportion of abnormalities was detected in sows inspected from the back at feeding time, inspection from tbe rear alone did not detect a significantly higher proportion of abnormalities than inspecting from the front ($p=0.089$). Encouraging sows to stand when examining them from the back during feeding time did not increase detection sensitivity ($p=0.645$).

Different abnormalities were identified in sows using each inspection method. The same lesions were observed in 12/27 (44%) sows identified with abnormalities during both front aisle inspections. The same lesions were observed in approximately half of the sows (22 sows) identified with abnormalities during inspections from the back aisle.

Table 1 Proportion of abnormalities detected and time taken to inspect stall-housed gestating sows using five different inspection methods on a 1000-sow commercial herd.

Stall-housed sows			
Aisle	**Feeding**	**Abnormalities**	**Time taken**
Front	No	27/363 (7%)	33 min (9.1 min/100 sows)
Back	No	27/361 (7%)	28 min (7.7 min/100 sows)
Front	Yes	27/339 (8%)	38 min (11.2 min/100 sows)
Back	Yes	45/339 (13%)	73 min (21.5 min/100 sows)
Back	Yes Standing	42/347 (12%)	65 min (18.7 min/100 sows)

Group-housed sows

The highest proportions of abnormalities were detected when group-housed sows were inspected from within the pen and all sows were encouraged to stand (Table 2). Inspecting sows at feeding time significantly increased the proportion of abnormalities detected compared to non-feeding time inspections ($p<0.001$). Similarly, inspecting pigs from within the pen whilst standing them up increased detection sensitivity relative to aisle inspections ($p<0.001$). The same lesions were detected in 21 sows with clinical abnormalities during the two pen inspections..

Table 2. Proportion of abnormalities detected and time taken to inspect group-housed gestating sows using four different inspection methods on a 1000-sow commercial herd.

Group-housed Sows			
Walk	**Feeding**	**Abnormalities**	**Time taken**
Aisle	Yes	24/328 (7%)	40 min (12.2 min/100 sows)
Aisle	No	7/328 (2%)	50 min (15.2 min/100 sows)
Pen	No	39/307 (13%)	45 min (14.7 min/100 sows)
Pen	Yes Standing	66/305 (22%)	85 min (28 min/100 sows)

Clinical abnormalities

Three hundred and four of the 3017 sows examined over the four days (10.1%) displayed one or more clinical abnormality identified using one or more detection method (Table 3.).

Skin injuries/tears were the most common abnormality detected in stall-housed sows, accounting for 52%, of the abnormalities detected. These were most often observed on the foot and/or the body (Table 3).. Thirty eight percent of abnormalities were sows with a BCS <3, with approximately half of these sows identified by farm staff to receive extra feed.

Lameness was the most common abnormality detected in group-housed sows, accounting for 39% of abnormalities detected. Fewer skin lesions/injuries were observed in group-housed sows than stall-housed sows, accounting for 41.5% of total abnormalities. Most skin lesions in group-housed sows were due to fight wounds, with 11/12 sows in one pen demonstrating fight wounds. Approximately 10% of sows inspected in the group-housing systems had a BCS <3. Sows identified as not eating during aisle inspections were located at the back of the pen at feeding time.

Table 3. Abnormalities detected during observations of stall-housed and group-housed sows on a 1000-sow commercial herd.

	# Abnormalities	Sows observed	% Sows	of BCS < 3	Lesions				Lame	Not eating
					Body	Foot	Leg	Vulva		
Stalled	168	1749	9.6	75	33	37	19	13	19	1
				38%	17.5%	18.5%	9.5%	6.5%	9.5%	0.5%
Group	136	1268	10.7	15	35	9	9	10	60	14
				10%	23%	6%	6%	6.5%	39%	9.5%
TOTAL	**304**	**3017**	**10.1**	**90**	**68**	**46**	**28**	**23**	**79**	**15**
				26%	**20%**	**14%**	**8%**	**4%**	**24%**	**4%**

There were 79 sows detected with lameness over the 4-day inspection period. Details regarding lameness severity score and affected limb are presented in Table 4. Of the lame sows identified, only 20 had a visible lesion associated with the affected leg. Fifty four lame sows could have their affected limb identified. There were only two sows identified with a lameness score of 3 (unable/difficulty rising). One of these sows was able to raise her hind limbs and kneel on her forelimbs, while the other sow appeared to have splayed hips when observing her attempts to rise.

Table 4. Severity (lameness score) and limb affected,among lame sows identified during gestation on a 1000-sow commercial farm.

Affected Limb	Lameness Score 1	2	3	Total
LF	4			**4**
RF	1	2		**3**
LH	5	14		**19**
RH	11	18		**29**
LH/RH		1		**1**
RH/LF		1		**1**
NA	18	2	2	**22**
Total	**39**	**38**	**2**	**79**

LF – Left forelimb, RF – Right forelimb, LH – Left hind limb, RH – Right hind limb
NA – Affected limb not identifiable.

Discussion

This study was conducted to compare the sensitivity of different methods of examining gestating sows housed in stalls and pens to detect clinical abnormalities. To the authors' knowledge, this is the first published report to examine different inspection methods for sows in stalls. Our findings for group-housed sows are in agreement with Schemann *et al* (2010). These researchers found that the most sensitive method of detecting abnormalities in group-housed pigs at saleyards and abattoirs was from within the pen while encouraging them to stand and move off.[3] These results highlight the importance of being able to observe pigs getting up and moving off, particularly for detecting lameness problems. The results from the current study suggest that examining group-housed sows from the aisle walk at non feeding time, would potentially miss a large proportion of sick or injured sows and therefore delay appropriate treatment, if it was required.

Under the conditions of this study, feeding time was found to be the most sensitive time of the day to identify sick or injured sows. This was particularly true for stall-housed sows examined from the back. As different abnormalities were detected within the populations of sows examined at different times, it may be worthwhile for farm staff to vary their inspection times/methods to increase their chances of detecting anything untoward.

Lameness accounted for a quarter of all abnormalities detected. Anil *et al* (2009) reported that the productivity of the lame sow is reduced relative to non-lame sows. These researchers reported that lame sows have fewer litters (less than 3.0 litters for lame sows versus 4.5 litters for non-lame sows) and higher pre-weaning mortality (27.7% for lame sows versus 12.4% for non-lame sows) than healthy sows. It is very important to identify lameness early and monitor sows progression once treatment (palliative or medical) has started. In contrast to Anil *et al.,* (2009), Enokida *et al*., (2010) demonstrated that claw lesions in lactating sows were not related to negative reproductive performance and culling risk, but there was a relationship with postural behaviour.

Adding a softer floor to gestation sow housing has the potential to reduce the incidence of lesion abnormalities. Elmore *et al*., (2010) hypothesised that the addition of rubber matting would improve sow health, comfort and welfare during gestation. These researchers reported that sows that had mats available would get up and lie down more frequently, which was deciphered as more comfortable to stand on their legs/feet. Following on from this, the total number of lesions present were less on the sows with mats compared to sows on cement flooring, but the incidence of lameness was similar on both flooring types. An association was confirmed between floor type and hind limb lesions, cement flooring having the highest incidence. [7]

In the current study, there was one pen where 92% of sows had fight wounds on their bodies. Karlen *et al.,* (2008) reported that the amount of vigorous fighting among mixed sows decreases from Week 1 to Week 9. Aggression among group-housed sows in Week 9 included only head knocks, single bites and charges by dominant animals and avoidance behaviour by submissive ones. [8]

Whilst the personnel on the farm were observed to examine sows during feeding, it was interesting that only one sow had a recorded treatment during the observation period (data not shown). Whilst not all abnormalities detected during this study would have warranted treatment, this suggests that either the farm staff were not observing abnormalities, were not recording treatments or were reluctant to treat. As there were no written standard operating procedures regarding inspecting and treating pregnant sows on this farm, farm staff would have benefitted from some written instructions for sow observations.[3]

Acknowledgements

This project was undertaken with the support of Australian Pork Limited and Industry and Investment NSW. The assistance of the piggery managers and staff is acknowledged.

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