

The interaction of group size and alley width on the movement of near market pigs

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SUMMARY

The objective of this study was to examine the interaction between group size and alley width on the ease and speed of movement of near-market pigs. Pigs were moved in different group sizes through a three-sided simulated handling course, in which alley width could be changed. Data were collected on heart rate, duration, handling and behavioural measures. Moving a group of 4 or 8 animals is preferred for minimizing stress and alley width of 0.9m appears to be most conducive to easy handling.

INTRODUCTION

Current recommendations advise that pigs should be moved on farm in small groups of 5 or 6. However packing plants routinely move groups of 25-50 pigs with ease from lairage pens to the squeeze tub. One difference is in facility design. On farms, the alley is generally limited to the width of two pigs (approx. 0.6 m), whereas in plants the alleys may be 2-3 m wide. Therefore, handling challenges and stress related to larger group sizes on farms may be due, in part, to crowding resulting from space limitations. As farms increase the number of pigs handled and loaded each week, specialized handling and loading facilities may be warranted in order to minimize stress, speed the process and reduce labour costs. In this perspective, we examined the interaction between the group size and the alley width on the ease and speed of movement of near-market pigs.

EXPERIMENTAL PROCEDURE

This study was undertaken at the Prairie Swine Centre. Forty-four finishing pigs within three weeks of market, weighing between 100-115 kg, were used each day during this trial. A randomized block design was used with treatments in a 4 x 4 factorial arrangement: 1) alley width (0.6, 0.9, 1.2 or 2.4 m), and 2) group size (4, 8, 12 or 20 pigs). Alley width sizes were based on the shoulder widths of pigs (approx. 30 cm) and included 2, 3, 4 and 8 body widths (0.60, 0.9, 1.2 and 2.4 m). Five replicates of each alley width, group size combination was undertaken.

Pigs were moved through a three-sided simulated handling course (Figure 1). One handler was used, moving the pigs with paddle and board only. Once the animals were moved from the holding pen to the starting pen, they were left for five minutes to rest and to acclimatize to the pen and unfamiliar pigs. After the run of the course, pigs were held in the end pen for five minutes before being returned to their respective holding pens.

Heart rate data were collected from five minutes prior to running the course, while pigs were in the starting pen, and

“When handling near-market weight hogs, group sizes of 4 or 8 pigs is preferred for minimizing stress based on handling and behavioural measures”

until five minutes after the end of the run while pigs waited in the end pen. Each run of the course included two pigs wearing a heart monitor. Pigs were also scored for vocalizations (squeals), turnbacks, piling, slipping and falling events. The time to complete the course was measured. The number of touches and slaps given by the handler to move pigs through the course were recorded. At the end of each run, the handler also provided a subjective rating of handling ease or difficulty using a visual analogue scale where “minimal difficulty” was labeled at one end, “average difficulty” in the centre of the scale, and “maximum difficulty” at the end of the scale.

RESULTS AND DISCUSSION

Pigs moved in groups of 12 or 20 emitted more squeals than those moved in groups of 4 or 8 (figure 2). They took significantly more time to complete the course (figure 3) than

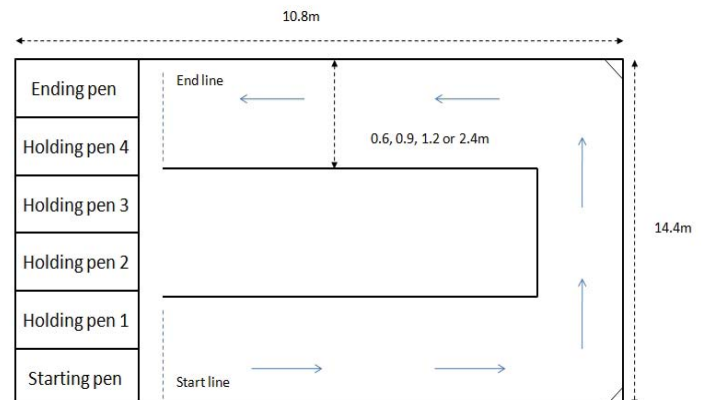


Figure 1. Handling Course

smaller groups (4 and 8 animals). In addition a significantly higher number of turn backs were also recorded when pigs were moved in groups of 12 or 20 (compared to 4 and 8), and in group size 8 compared to 4 (figure 4). This highlights the challenge of moving animals in larger group sizes, which results in a stressful situation. The handling measures (figure 5) showed that handling became more challenging as group size increased. This matches the results found for the behavioural measures in that group size 4 was rated as easier to manage by the handler than larger group sizes and group sizes of 4 and 8 required less handler intervention than group sizes 12 and 20.

Overall, the results from the behavioural and handling measures indicate that group size 4 is preferred, based on the number of turnbacks and the subjective handling scored, or that group sizes of 4 and 8 are equally superior to the larger group sizes, based on measures of vocalizations and handling (touches and slaps).

The number of touches and slaps administered by the handler (figure 5) suggest that the middle alley widths of 0.9m and 1.2m are most conducive to easy handling. However, an interaction between group size and alley width for the handling intervention measure of touches and slaps was found and suggests the alley width of 0.9m is preferable as there was no significant difference found between group sizes on this measure. In addition the number of touches and slaps

given were relatively low compared to those given in group size 20 in the wider widths of 1.2m and 2.4m. The higher number of squeals emitted by pigs when moved in alley width of 0.6m (figure 2) compared to the wider widths was a reflection of the tight space causing pigs to bump into other pigs and/or bunch up. The increased difficulty in managing pigs in a wide alley width was the reason for more turnbacks in the 2.4m alley width compared to the smaller widths. Moving pigs in groups of 12 and 20 resulted in many more turnbacks (figure 4) in the alley width size 2.4m compared to 0.9m, for example, where the number of turn backs is uniformly low in group sizes 4, 8 or 12. An interaction between group size and alley width was found for turnbacks and confirms this as the difference in the number of turn backs between group sizes increased dramatically when the alley width was set at 2.4m.

A higher average heart rate was measured in group size 20 compared to group sizes 4 and 8 during the pre and post periods (table 1). This difference was likely a result of stress from mixing with unfamiliar pigs. Pigs sometimes fought during these periods. Thus, when released from the start pen to run the course, heart rates may have lessened for the pigs experiencing higher stress as a result of mixing as they were given the opportunity to escape a conflict situation. Furthermore, although we found higher maximum record heart rates in group size 20 compared to groups of 4 and 8 pigs during the run, the physical activity of the run may have confounded the accuracy of heart rate measures.

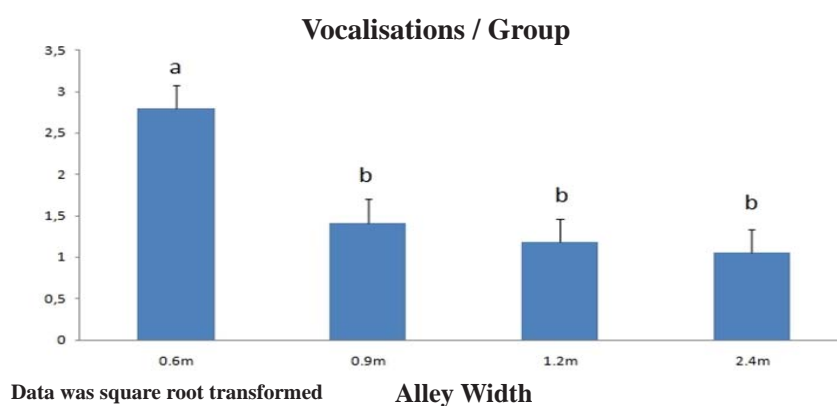


Figure 2. Number of vocalizations for each alley width

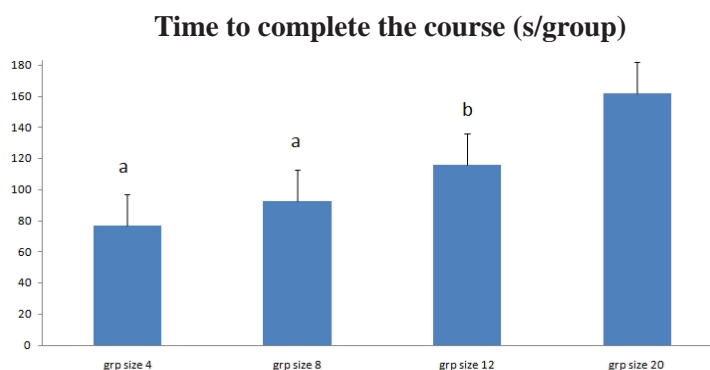


Figure 3. Time to complete the handling course for each group size

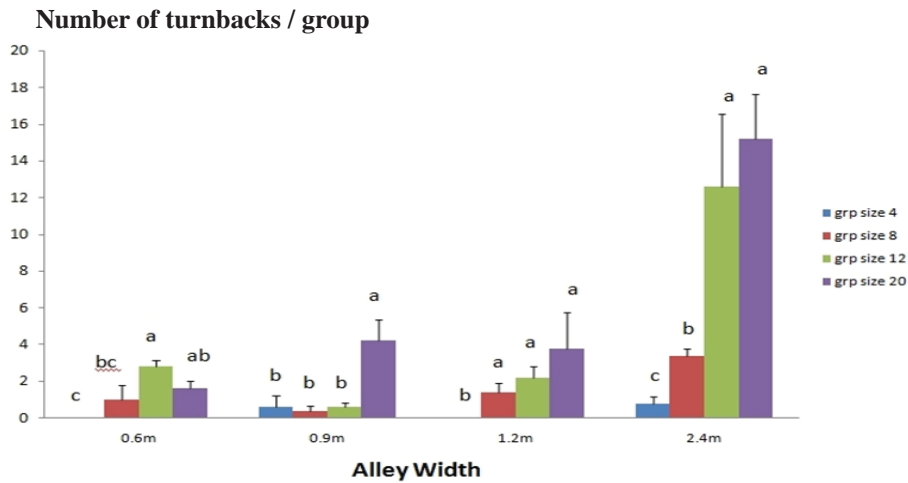


Figure 4. Interaction between group size and alley width

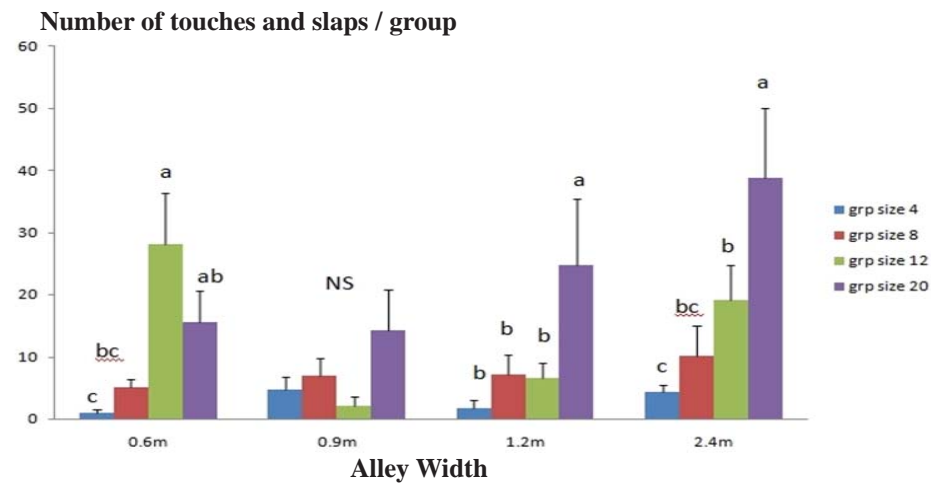


Figure 5. Interaction between group size and alley width effects on the number of touches or slaps given by the handler

IMPLICATIONS

Maximizing the ease with which animals are moved and handled requires taking into account a variety of factors. Our results support the current recommendations and suggest that moving pigs in group sizes that are appropriate for the alley width used can reduce handling time and contribute to improved welfare. This study could be extended in order to assess the effect of ramp widths on pig's movement during loading and unloading.

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Table 1. Heart rate data

	Group Size			
	4	8	12	20
Pre HR Average*	11.22 ^{bc}	11.16 ^b	11.64 ^{ac}	11.92 ^a
Run HR Maximum	175.1 ^b	175.9 ^b	186.6 ^{ab}	192.5 ^a
Post HR average	133.2 ^{bc}	129.6 ^c	141.1 ^{ab}	146.8 ^a

* transformed data; Means with different letters in the same row are significantly different ($P < 0.01$).