

A Review of Large Group Housing

Harold Gonyou and Lee Whittington



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Introduction

Over the past 5 years the concept of large groups of grower-finisher pigs has expanded. Not only does it include extensive (outdoor raised) operations and hoop structure barns but the conversion or special construction of conventional housing modified to accommodate groups much larger than the traditional 20 pigs per pen. Why? There were four drivers: A desire to reduce construction costs by simplifying penning and barn design; herd sizes were becoming large enough that large groups could be formed without commingling ages; electronic sorting technology provided a means to deal with the critical task of accurately separating at market without high labour costs; and finally improved use of space could improve profitability and relieve the crowding effect brought on by higher sow productivity over the past decade.

“Reduced housing costs and better space utilization resulted in a net benefit of \$4.77 per pig when using a group housing system.”

Balancing these forces for change were the concerns that large group housing could lead to poorer performance, increased development of vices (tail biting, flank biting), and increased weight variation (variable growth rates). In fact these three concerns were identified in scientific papers and production manuals in the late 1980's (English, et. al 1988).

Recently a series of studies carried out at Prairie Swine Centre and elsewhere have confirmed what pioneering pork producers suspected from their observations – there is little or no negative impact from group size on these three key areas.

Proof #1 – Aggression declines in larger groups

Aggression is primarily a problem when groups are first mixed, group size does not seem to play a significant role in either the length of time aggression is observed or the severity. Aggression declines significantly after the first 2 hours in all group sizes studied (10,20,40,80 pigs per pen). In fact one study showed significantly less aggression in the larger group (80 pigs per pen) versus the other group sizes. To explain this a second series of studies was developed that looked at aggression over

the first 3 days post-mixing. The large groups exhibited slightly less aggression than the small groups on day one, with no significant differences on days 2 or 3.

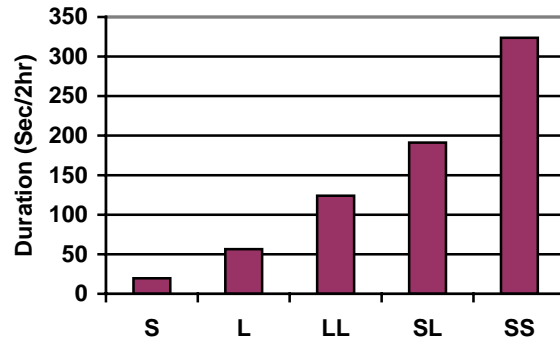


Figure 1. Aggression measured by minutes of fighting following mixing. Pigs from small groups (S) and Large groups (L) were mixed in various combinations.

The source of the pigs and their previous experience seems to have a much greater bearing on aggression being observed in the grower finisher barn than does the size of the group. In this study the pigs were mixed based on their pen or origin. That is pigs from large pen environments were mixed with either pigs from other large pens or pigs from small pens. Pigs from small pens were treated accordingly by mixing either with pigs from large pens or pigs from other small pens. In a trial which observed aggression over a 12 week period, it was determined that the pigs with experience from a large pen tended to exhibit more 'tolerance' and there was significantly less aggression in these pens. The highest amount of aggression was exhibited by pigs from small pens.

There is reason to believe that one of the contributors to good results in large groups is that the pigs develop a social tolerance to large numbers of pigs and use their space differently than pigs raised in small social groups. This builds further on observations previously reported that pigs in large groups utilize their whole pen environment in large group settings and are not territorial in their use of space for eating, sleeping or defecating.

Proof #2 – Average Daily Gain

Eight 11-week trials of 4 groups of 18 (small group) and 2 groups of 108 (large group) grower-finisher pigs per pen were evaluated. Equal numbers of barrows and gilts were used in each group. Feed was made available free choice from single space wet/dry feeders, with one feeder hole for every 9 pigs. Floor space in the fully slatted room was equal for the two group sizes.

Pigs in smaller groups had a higher growth rate (10%, $P < 0.05$) during the first 2-week period. ADG for the entire grower-finisher period was slightly higher (2%, $P < 0.05$) for the pigs in the smaller groups compared to the larger groups (Figure 2).

During week 2-5 and week 7-11 was similar between the two group sizes and no difference was observed on feed efficiency for either of these periods.

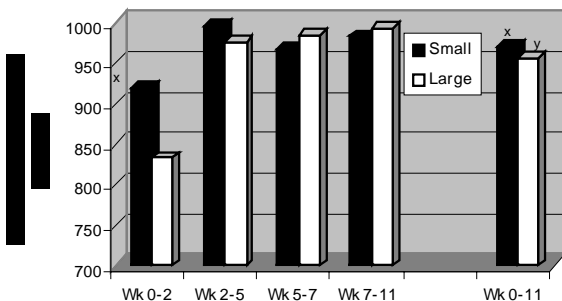


Figure 2. Effect of Group Size on ADG

The overall effect of a slight reduction in ADG has been seen by two other research groups (Wolter, USA $< 2\%$; and Turner, UK also $< 2\%$).

Proof #3 Body Weight variation does not change with increasing size of the group

For the same series of experiments discussed under average daily gain, variation in body weight was also measured. Upon entry to the room, all pigs were weighed. The pigs assigned randomly to the small groups had an average body weight of 31.9 kg and a CV of 14.8%. The pigs assigned to the large groups began the trial at an average body weight of 31.6 kg and a CV of 15.7%. The CV is a measure of uniformity of the population and is calculated by taking the standard deviation and dividing it by the mean weight of the group, the higher the CV the lower the uniformity across the group. For example, a CV of 10% is a more uniform group than one with a CV of 25%.

From a barn management perspective we are mostly concerned about the amount of variation in the group as they near market weight. An increase in variation (greater spread of weights in group) would mean a longer period of weighing and sorting at market. In the worst case this increased variation might not only lead to a longer shipping period but also an increase in total days that the group needs to stay in the barn to reach desired weights.

At the end of the experimental period, variation in pig body weight within a group was similar between the two groups. The small group finished with a CV of 9.6%, and the large groups animals finished with a CV of 10.3%.

The Bottom Line

Although pigs in larger group size tend to have a slight reduction in overall average daily gain, in general, the performance of the pigs in larger group size was not inferior to the smaller group size.

In an analysis of large group housing we completed as part of the VIDO-sponsored Considerations For Large Group Housing, the value of improved sorting techniques using electronic sorters, combined with reduced housing costs and better space utilization resulted in a net benefit of \$4.77 per pig when using a group housing system.



Dr. Gonyou in a large group pen, observing the reaction to human contact. One of the additional benefits of Large Group Housing is greater interaction with barn staff on a daily basis, resulting in increased familiarity and perhaps leading to improved handling.