
EFFECT OF FEED PRESENTATION ON THE FEEDING BEHAVIOUR OF GROWER/FINISHER PIGS

Kimberly A.M. MacDonald, and Harold W. Gonyou

Introduction

Recent research suggests the once standard five pigs per feeder space underestimates the actual carrying capacity of most modern feeder designs. The maximum number of pigs that can be fed from a single feeder space should be highly correlated with the eating speed of the animals. The feeding behaviour of pigs is influenced by many factors such as, but not limited to, competition, feed type (pellet vs. mash), presentation (dry vs. wet/dry or liquid feeding systems) and pig size. In this study, we examined the effect of feed type and presentation on the eating behaviour of grower/finisher pigs. Furthermore, we attempted to determine if these effects would then translate into higher stocking densities of the feeder (based on percentage of capacity of the feeder).

Methods

Experiment One. Pigs were randomly assigned to each of four treatments: dry mash (DM), wet/dry mash (WM), dry pellets (DP) and wet/dry pellets (WP), fed from a single space feeder. Each pen contained six barrows and six gilts, and the average weight in each pen was similar. Feed was weighed as it was added to the feeder; pigs and any remaining feed were weighed every two weeks. When the pigs were small (35-45 kg), the pens were videotaped for two consecutive 24-hour periods in order to determine total duration of eating. Video recordings and analysis were repeated when the pigs were large (90-100kg) to determine the effects of size on time spent eating and if this effect was consistent across the treatments.

Experiment Two. Using data from experiment one, an estimate of the number of pigs required to create various levels of feeder space utilization (stocking density) under each previously outlined feeding condition was calculated. Grower pig numbers were based on small data, while finisher phase numbers were calculated using large pig data. Stocking densities examined were standard (12 pigs/pen), 95, 110 and 125% of feeder capacity in the grower phase and 80, 102.5 and 125% of capacity in the finisher phase. Pigs stayed in the grower phase for six weeks before being randomly reassigned to the finisher phase treatments, where they stayed for four weeks. Video recordings were taken

when the pigs were 35-45kg in grower and during the third week of finisher. Feed was weighed as it was added to the feeders, and pigs were weighed regularly.

Results

Experiment One. Pigs fed a DM diet spent significantly more time at the feeder than those fed WM, DP or WP (refer to table 1). There was no significant difference in total duration of eating among WM, DP and WP fed pigs. ADFI was similar among treatment groups. However, ADG was lower in DM fed pigs as compared to WM or WP treatments. DP pigs had intermediate gains (see table 1). Large pigs spent less time at the feeder than small pigs.

Experiment Two. Comparisons between groups of similar size (12 pigs in grower and 18 pigs in finisher) revealed results similar to those found in experiment one. In the grower phase, DM pigs spent more time at the feeder than DP, WM and WP fed pigs (98.3 vs. 87.6 vs. 61.2 vs. 80.0 min/pig/day). Also, DM pigs gained less than WM, DP or WP fed pigs (748 vs. 833 vs. 799 vs. 792 g/day). Pigs fed a WM diet had higher ADFI, while no significant differences were found in ADFI among DM, DP and WP fed pigs (2.15 vs. 1.91 vs. 1.86 vs. 1.88 kg/pig/day). Similar trends were apparent in the finisher phase (see Table 2).

As stocking density increased, time spent eating per pig decreased in both grower and finisher phases, regardless of feed type or presentation. Likewise, ADG and ADFI had a tendency to decrease as stocking density increased, particularly in treatments that exceeded 100% of capacity. However, the point at which production values significantly decreased varied based on feed type and presentation.

Conclusions

Feed type (mash vs. pellets) and presentation (dry vs. wet/dry) have major affects on swine eating behaviour and, in turn, can influence productivity. Pigs fed dry mash diets spend more time eating, however this effect can be counteracted by the addition of water, such as in a wet/dry feeding system. This same effect does not appear to apply to

*Pigs on a
dry mash
diet spent
more time
at the
feeder than
those on
other diets.*

*Maximum
stocking
density
depends on
feed type
and
presentation.*

wet/dry versus dry pellets, which could be due to a variety of factors, such as palatability or simple mechanics. These results are noticeable in both grower and finisher phases, suggesting that the disadvantages and advantages associated with feed type and presentation are persistent, even with the increased eating speed of larger animals.

Stocking density (based on percentage of capacity) of the feeder also has a strong influence on time spent eating per pig, ADFI and ADG. As stocking density increased there was a general trend for ADG and ADFI to fall, regardless of feed type and presentation (see figure 1 for an example). In the grower phase, the maximum number of pigs that could be fed from a single feeder space without a significant decrease in ADG and ADFI was 15, 19, 20 and 21 for DM,

WM, WP and DP feed respectively. While in the finisher phase, 14, 18 and 23 pigs could be fed DM, WM and DP respectively, from a single feeder space. There was no intermediate group size for WP fed pigs in the finisher phase, but at least 18 pigs can be fed from a single feeder space and maintain good ADG and ADFI.

Acknowledgments

Strategic program funding provided by Sask Pork, Manitoba Pork and Saskatchewan Agriculture and Food Development Fund. Additional funding for this research was made available by the Alberta Agriculture Research Institute and the Alberta Pork Producer Council.

Table 1. Overall effect of feed type and presentation on ADG, ADFI and Total Duration of Eating (Experiment One)

Feed Type	Presentation	ADG (kg)	SEM	ADFI (kg)	SEM	Total Duration of Eating (min/pig/day)	SEM
Mash	Dry	0.792 ^a	0.023	2.50	0.145	106.10 ^a	2.91
Mash	Wet/Dry	0.903 ^b	0.026	2.38	0.145	68.04 ^b	2.91
Pellet	Dry	0.868 ^b	0.021	2.48	0.145	58.79 ^b	2.91
Pellet	Wet/Dry	0.899 ^b	0.025	2.37	0.205	59.70 ^b	2.91

^{ab} ; p <0.05

Table 2. Overall effect of feed type and presentation on ADG, ADFI and Total Duration of Eating - Finisher Phase (Group size = 18 pigs) (Experiment Two)

Feed Type	Presentation	ADG (kg)	SEM	ADFI (kg)	SEM	Total Duration of Eating (min/pig/day)	SEM
Mash	Dry	0.739 ^b	0.046	2.31 ^b	0.139	78.6 ^a	12.35
Mash	Wet/Dry	0.955 ^a	0.046	2.93 ^a	0.139	69.7 ^b	12.35
Pellet	Dry	0.867 ^a	0.045	2.51 ^{a,b}	0.139	68.9 ^b	12.35
Pellet	Wet/Dry	1.02 ^a	0.044	2.71 ^{a,b}	0.139	65.5 ^b	12.35

Numbers with different superscripts have $p < 0.05$

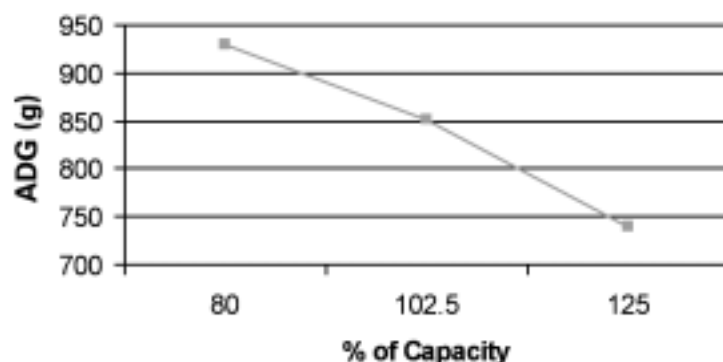


Figure 1. Effect of stocking density on ADG of DM fed pigs in the Finisher Phase