The Impact of Feeder Adjustment and Group Size / Density on Weanling Pig Performance

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Summary

An experiment was conducted to examine the impact of group size / density and feeder adjustment on the performance of weanling pigs. Providing more floor space resulted in increased body weight at 10 weeks of age. Performance was maximized when the feeder gap allowed for 40% of the trough to be covered with feed. Moreover, proper adjustment of the feeder reduced the time spent eating and thus increased feeder capacity.

Introduction

Crowding and /or reduced floor space allowance negatively affects nursery performance and exacerbates social vices such as tail-biting, side-nudging and ear chewing. Feeder adjustment impacts feed intake and can alter feeder capacity. Since some of the detrimental effects of crowding are due to decreased feed intake, adequate floor space and proper feeder adjustment may act in a synergistic fashion to improve pig performance.

Experimental Procedures

Seven hundred and sixteen pigs weaned at an average of 18.2 days of age were assigned to: 1) 24 pigs per pen, 2.5 ft^2 per pig; 2) 20 pigs per pen, 3.0 ft^2 per pig [approximates commercial conditions]; and 3) 16 pigs per pen, 3.75 ft^2 per pig [approximates the Canadian Code of Practice] for a 42 day trial. A commercial, 6 space feeder with an overall width of __. Eight days later (d0 of exp.) feeders were adjusted to provide gap openings of 9.2, 11.8, 17.9, 24.8 and 31.5 mm (see Figures 1 to 3). Only a small bead of feed was available with an opening of 9.2 mm while the entire trough was covered with an opening of 31.5 mm. Feeding behaviour was videotaped on days 3 to 6

Figure 1 **Feeder trough coverage with a gap adjustment providing a gap opening of 9.2 mm.**

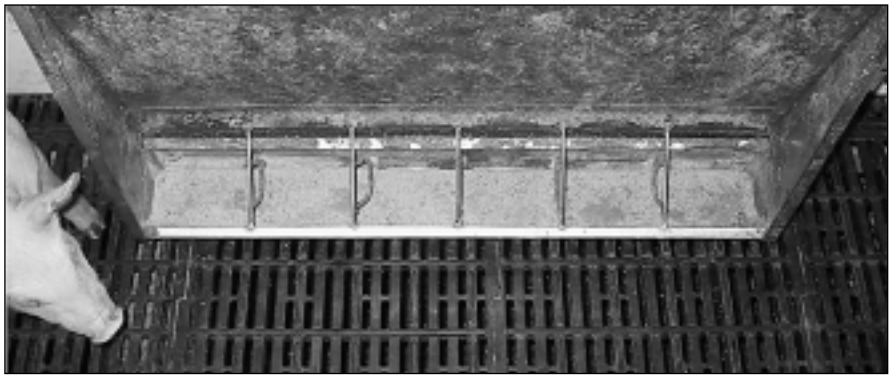

Figure 2 **Feeder trough coverage with a gap adjustment providing a gap opening of 17.9 mm.**

Figure 3 **Feeder trough coverage with a gap adjustment providing a gap opening of 31.5 mm.**

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and on days 39 to 42. On day 42, each pig was scored for incidence and severity of tail biting, side nudging and ear chewing.

Results and Discussion

The effect of treatment on body weight and feed intake were not apparent until the second half of the experiment. Body weight, daily gain and feed intake were maximized with a minimum feeder gap size of 18 mm ($P < 0.05$) or when at least 40% of the feeder trough was covered with feed ($P < 0.05$; Table 1). Younger pigs spent more time eating with a reduced feeder gap; however feed intake and daily gain were lower ($P < 0.05$; Table 1). Assuming feeder capacity is achieved when it is being used 90% of the time, the maximum capacity of a nursery feeder space would be nine pigs when adjusted to a 9 mm gap, but 11 pigs when adjusted to a 25 mm gap. The optimal feeder gap would change with different feed particle size and form; however it is achieved when at least 40% of the trough is covered with feed. Feeders with smaller gaps also required frequent unclogging (data not shown).

Less crowding and 40% coverage in the feeder tray offers the best economic return.

Decreasing group size and providing more floor space per pig resulted in increased final weight, daily gain, and feed intake (Table 1). When expressed on pork produced per square foot of floor space, the results favour crowding. However, previous research at PSC Elstow revealed that for every kilogram increase in body weight at 11 weeks of age, body weight at 17 weeks of age increased by 1.5 to 1.8 kg. The economics favour reduced crowding when considering the increased growth rate.

The effects of density/group size on final weight was more dramatic with a reduced feeder gap opening (feeder adjustment and group size/density interaction, $P < 0.05$; Figure 4). Neither floor space allowance or feeder adjustment affected the incidents of aggression, measured by skin lesion scores.

Implications

Body weight at 10 weeks of age was greater with increased floor space allowance, however, the kg of pork produced per square foot of floor space was increased with crowding. Nonetheless, when considering the increased net income due to the increase in nursery exit weight, the present results favour reduced crowding.

Optimal feeder gap is obtained when at least 40% of the feeder is covered with feed. Proper feeder gap adjustment reduced the time spent eating and thus increased feeder capacity. Assuming that feeder capacity is achieved when it is being used 90% of the time, the maximum capacity of a nursery feeder space would be nine pigs when adjusted to a 9 mm gap, but 11 pigs when adjusted to a 25 or 32 mm gap

Acknowledgements

Strategic program funding provided by Sask Pork, Alberta Pork, the Manitoba Pork council, and the Sask. Ag. Dev. Fund. Direct funding from the Pig Improvement Co. of Franklin, KY is greatly appreciated.

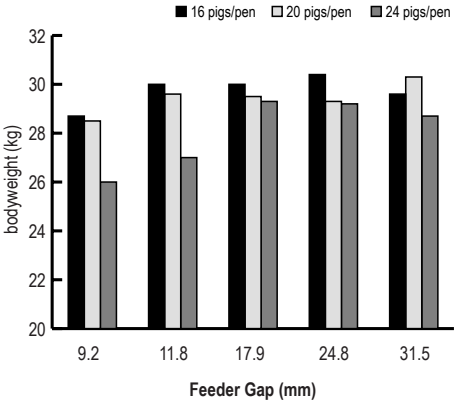

Figure 4 **The impact of treatment on final (d42) weight of pigs. There was an interaction of feeder adjustment and group size/density ($P < 0.05$). 16 pigs per pen provided 3.75 square feet per pig; 20 pigs per pen provided 3.0 square feet per pig and 24 pigs per pen provided 2.5 square feet per pig.**

Table 1 **The impact of feeder gap and group size/density on pig performance, feeder characteristics, time spent eating and lesion scores.**

	Feeder Gap, mm					Pig Density, ft²/pig				Significant
	9.2	11.8	17.9	24.8	31.5	2.5	3.0	3.75	SEM	Effects[1]
Weight, kg										
Initial	6.96	7.10	7.12	7.18	7.03	7.03	7.10	7.09	0.044	ns
Final	27.9	28.9	29.5	29.5	29.56	28.0	29.3	29.6	0.093	F, D
	1	7	5	0		3	9	9		FxD
Daily Gain, kg/d	0.48	0.52	0.53	0.52	0.53	0.50	0.52	0.53	0.002	F, D
Feed Intake, kg/d	0.72	0.75	0.78	0.77	0.78	0.74	0.77	0.79	0.005	F, D
Gain: Feed	0.66	0.69	0.68	0.67	0.68	0.67	0.68	0.68	0.004	ns
Feeder										
Area Clear, %	94.1	88.0	62.6	31.8	8.8	51.9	53.8	59.0	2.28	F
Feed Depth, cm	0.06	0.04	0.30	0.69	1.27	0.48	0.50	0.44	0.028	F
Total Duration of eating, min/pig d[1]										
Days 3-6	142	118	125	116	116	122	127	121	5.99	F, FxD
Days 39-42	97	90	85	79	75	82	85	88	8.93	ns
Skin lesion score[2]	0.06	0.04	0.04	0.05	0.05	0.05	0.05	0.03	0.001	ns

[1] Effect of F (feeder adjustment), D (group size/density), or F x D, significant if $P < 0.05$.

[2] The mean score for belly, ears, body and tail. A score of 0 indicated no lesion, 2 indicated severe lesions.