EFFECT OF FEEDER DESIGN ON FINISHING PIG GROWTH PERFORMANCE[1]

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Summary

A total of three hundred pigs (initial BW = 111.6 lb) was used in two identical 70-d growth trials to determine the effect of feeder design on finishing pig growth performance. Pigs were allotted by initial body weight and were assigned to pens with one of three different feeder designs. Five replications of each treatment were evaluated during the summer (July through September) and another five replications during winter months (November through January). All pigs were fed the same milo-soybean meal diet formulated to contain .65% lysine, .65% Ca, and .55% P and fed in meal form. Feeder design had no effect on average daily gain (ADG) or average daily feed intake (ADFI) of finishing pigs. Pigs fed from the wet/dry feeder had improved feed efficiency (F/G) compared to pigs fed from either of the dry feeders. Water disappearance was lower for the pigs eating from the wet/dry feeder. These results suggest that the use of a single-hole, wet/dry feeder for growing-finishing pigs improves F/G and reduces water wastage.

(Key Words: Pigs, Feeders, Growth.)

Introduction

Feed cost represents 60 to 70% of the total cost of production for a swine operation. The finishing phase will account for the major proportion of this cost. Therefore, reducing cost of feed per pound of gain would greatly affect the overall cost of production. Recent developments in feeder design and technology may affect feed intake, feed efficiency, water intake, water wastage, and feeding behavior. Therefore, the objective of this experiment was to compare three different feeder designs in terms of finishing pig growth performance and water disappearance.

Procedures

A total of 300 finishing pigs (initial BW 111.6 lb) was used in two identical 70-d growth trials. Pigs were allotted by initial body weight, gender, and ancestry and were assigned to pens with one of three different feeder designs. One hundred fifty pigs were used per trial in a randomized complete block design with 10 pigs per pen. Five replications were conducted during the summer months (July through September) and five replications were conducted during the winter months (November through January). The first feeder evaluated was a dry, two-hole feeder with a partition between the feeder holes to minimize pig interaction (Aco®). The second was a single-hole, wet/dry shelf feeder with a nipple waterer located at the base of the trough (Crystal Spring®). The third feeder was an eight-hole, round, dry feeder with a wheel agitator (Osborne®). Pigs were housed in a building with pens measuring 16 × 6 ft with 50% solid and 50% slatted flooring. Dry feeders contained one nipple waterer per pen, and the wet/dry feeder had one nipple waterer at the base of the feeder trough. This was the only access

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to water the pigs received throughout the trial. During the summer months, the pigs were drip cooled. Three water meters were installed to record daily water disappearance for each treatment. Because only one observation was made per treatment, water usage was not statistically analyzed.

Results and Discussion

Average daily gain during the summer trial was not affected by the feeder design. However, pigs fed from the wet/dry feeder had a slight numerical advantage in ADG. No difference was observed for ADFI during the summer trial, with all pigs consuming about 6.6 lb of feed per day. Pigs fed from the wet/dry feeder had approximately 7.7% better F/G ($P < .05$) than pigs consuming feed from either of the dry feeders. A large numerical response occurred during the summer months, with the pigs eating from the wet/dry feeder using 42% less water than pigs using either of the dry feeders.

Similar to the results from the summer trial, no differences were observed in ADG or ADFI among pigs fed from the different feeders during the winter trial. Pigs fed during the winter months had greater ADFI ($P < .01$) and poorer F/G than pigs fed during the summer months. Similar to the summer trial, pigs fed from the wet/dry feeder had 7.7% better F/G ($P < .05$) than pigs fed from either of the dry feeders. The difference in water disappearance was not as great for pigs fed in the winter trial as compared to those in the summer trial. However, a slight numerical advantage occurred for pigs fed from the wet/dry feeder.

We were concerned at the start of the trial that the wet/dry feeder only having one feeder hole might result in restricted feeding or increased pig aggression. Competition for feed may decrease consumption and ADG. Therefore, pigs were weighed on d 14 of the trials to determine the acclimation period to the new feeders. The first 14 d of the summer trial showed no difference in pig performance. However, during the winter trial, pigs fed from the wet/dry feeder had decreased ADFI, resulting in decreased ADG. However, this resulted in an improvement in F/G (feeder design $\times$ season interaction $P < .05$). This suggests possible increased competition for feed and limited intakes. However, these initial differences did not affect pig performance for the overall trial.

In summary, feeder design had no effect on ADG or ADFI of finishing pigs. However, F/G was improved approximately 7 to 8% for pigs fed from the single-hole, wet/dry shelf feeder compared to pigs fed from either of the dry feeders. Water disappearance for pigs eating from the wet/dry feeder was lower, but this response was predominately observed during the summer trial. Therefore, use of a wet/dry shelf feeder for growing-finishing pigs improves F/G and reduces water wastage.

Table 1. Effect of Feeder Design on Finishing Pig Growth Performance[a]

Item	Summer			Winter			CV
	2-Hole dry	1-Hole wet/dry	8-Hole round	2-Hole dry	1-Hole wet/dry	8-Hole round	
Initial wt, lb[b]	109.35	109.35	109.35	113.98	113.98	113.98	1.1
ADG, lb	1.72	1.85	1.72	1.83	1.83	1.81	7.8
ADFI, lb[b]	6.55	6.70	6.70	7.76	7.08	7.50	4.4
F/G[bc]	3.85	3.57	3.85	4.17	3.85	4.17	6.8
Final wt, lb[d]	229.94	238.76	229.50	242.29	242.07	239.42	4.1
Water use, gal/d[e]	2.25	1.24	2.06	1.95	1.82	1.90	

[a]A total of 300 finishing pigs with 5 replications per treatment during the summer and winter trials.
[bc]Season effect ($P < .01$ and .05, respectively).
[d]1-hole wet/dry feeder vs 2-hole dry feeder or 8-hole round feeder ($P < .05$).
[e]Water disappearance (gallons/pig/d).

Table 2. Initial Growth Performance from d 0 to 14[a]

Item	Winter			Summer			CV
	2-Hole dry	1-Hole wet/dry	8-Hole round	2-Hole dry	1-Hole wet/dry	8-Hole round	
ADG, lb	1.76	1.61	1.83	1.61	1.79	1.68	15.0
ADFI, lb[b]	7.32	4.83	5.91	5.45	5.75	5.95	13.1
F/G[c]	4.17	2.94	4.35	3.45	3.23	3.57	11.3

[a]A total of 300 finishing pigs with 5 replications per treatment during the summer and winter trials.
[b]Feeder design × season interaction ($P < .01$).
[c]Winter trial feeder effect ($P < .05$).