Effects of Feeder Design, Wet-Dry Feeder Adjustment Strategy, and Diet Type on the Growth Performance and Carcass Characteristics of Growing-Finishing Pigs[1]

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Summary

A total of 1,287 pigs (PIC 337 × 1050, initially 82.7 lb) were used to compare the effects of a conventional dry feeder, 3 wet-dry feeder adjustment strategies, and 2 diet types on growing-finishing pig performance. There were 27 pigs per pen and 6 pens per treatment. The first wet-dry strategy consisted of maintaining a setting of 18 throughout the study (WD18). The second wet-dry strategy consisted of an initial setting of 18 until d 56 followed by a reduced setting of 14 for the remainder of the experiment (WD14). The third wet-dry strategy consisted of an initial setting of 18 until d 28, a setting of 14 until d 56, and a setting of 10 for the remainder of the experiment (WD10). The conventional dry feeder remained at a setting of 8 throughout the study. The 2 diet types evaluated in this study were a corn-soybean meal-15% DDGS diet and a corn-25% DDGS-20% bakery by-product-soybean meal diet; both diets were fed over 4 dietary phases. Overall (d 0 to 92), all pigs fed using the wet-dry feeder had greater ($P < 0.001$) ADG, ADFI, and final BW than pigs fed with the conventional dry feeder. However, within the wet-dry treatments, pigs fed with WD14 and WD10 had a reduced ($P < 0.05$) ADG compared with pigs fed with WD18. Additionally, ADFI of pigs fed using WD10 was lower ($P < 0.05$) than that of pigs fed with WD18, and ADFI of pigs fed with WD14 was intermediate. There were no differences in F/G among feeder treatments, and growth performance was similar between the 2 diet types. Pigs fed using the wet-dry feeder had greater ($P < 0.02$) HCW, yield, backfat depth, revenue per pig, and feed cost per pig than pigs fed with the conventional dry feeder. The loin depth of pigs fed using the wet-dry feeder was less ($P < 0.04$) than that of pigs fed with the conventional dry feeder. Differences in backfat and loin depth resulted in pigs using the wet-dry feeder having a lower ($P < 0.001$) fat-free lean index (FFLI) than pigs fed with the conventional dry feeder. However, within the wet-dry feeder treatments, pigs fed with WD10 had a reduced ($P < 0.05$) backfat depth and increased ($P < 0.05$) FFLI compared with pigs fed with WD18. The backfat depth and FFLI of pigs fed with WD14 were intermediate. Although not significantly different, income over feed cost was numerically greatest for pigs fed using WD10, followed by conventional dry, WD18, and WD14. In conclusion, reducing the wet-dry feeder setting in later growth periods may improve carcass leanness while maintaining the advantages in growth rate.

Key words: conventional feeder, feeder adjustment, wet-dry feeder

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Introduction

An increase in the feed intake and growth rate of pigs fed using a wet-dry feeder has been demonstrated in several experiments, including recent trials at Kansas State University (Bergstrom et al., 2008[3], 2009[4], 2010a[5]b[6]). However, in some of the experiments comparing feeder designs, pigs fed from a wet-dry feeder have had poorer feed efficiency than pigs fed from a conventional dry feeder. Management factors such as feeder adjustment (Bergstrom et al., 2010a[5]) may influence growth performance of pigs fed using a wet-dry feeder. Although a reduced feeder setting of the wet-dry feeder has generally resulted in improved feed efficiency, it also reduced (or eliminated) the growth advantage over the conventional dry feeder. Therefore, a wet-dry feeder may be more sensitive to changes in feeder adjustment.

Data from recent feeder adjustment experiments suggest that changing the feeder setting of the wet-dry feeder during the growing-finishing period may be an effective method of managing growth and F/G. A greater initial feeder opening could result in an increased growth rate during the early finishing period, and then the feeder opening could be reduced in later finishing periods, resulting in pigs with F/G similar to that of pigs fed with a conventional dry feeder. Therefore, the objective of this research was to compare the effects of a conventional dry feeder, 3 wet-dry feeder adjustment strategies, 2 diet types, and the interaction of these factors on the growth performance and carcass characteristics of growing-finishing pigs.

Procedures

Procedures used in the experiments were approved by the Kansas State University Institutional Animal Care and Use Committee. The experiments were conducted at a commercial research finishing facility in southwestern Minnesota. The facility was double-curtain sided, with pit fans for minimum ventilation and completely slatted flooring over a deep pit for manure storage. Individual pens were 10 × 18 ft. Each of 12 pens was equipped with a single 60-in.-wide, 5-hole conventional dry feeder (STACO, Inc., Schaefferstown, PA) and a cup waterer. The remaining 36 pens were each equipped with a double-sided wet-dry feeder (Crystal Springs, GroMaster, Inc., Omaha, NE) with a 15-in. feeder opening on both sides that provided access to feed and water. All pens that were equipped with a wet-dry feeder also contained a cup waterer, but the cup waterers were shut off during the experiment. Therefore, the only source of water for pigs in these pens was through the feeder.

A total of 1,287 pigs (PIC 337 × 1050, initially 82.7 lb) were used to compare the effects of a conventional dry feeder, 3 wet-dry feeder adjustment strategies, and 2 diet types on growing-finishing pig performance. There were 27 pigs per pen (13 or 14 barrows and 13 or 14 gilts) and 6 replications per treatment. Three feeder adjustment strategies were evaluated for the wet-dry feeder (Figures 1, 2, 3, and 4), and a single feeder adjustment strategy was selected and used for the conventional dry feeder as a control (Figure 5). To obtain an equal number of replications across the 4 feeder treatments, 12 pens were equipped with the conventional dry feeder, and 36 pens were

[3] Bergstrom et al., Swine Day 2008, Report of Progress 1001, pp. 196-203.
[4] Bergstrom et al., Swine Day 2009, Report of Progress 1020, pp. 252-261.
[5] Bergstrom et al., Swine Day 2010, Report of Progress 1038, pp 178-189.
[6] Bergstrom et al., Swine Day 2010, Report of Progress 1038, pp 201-208.

equipped with a wet-dry feeder to evaluate the 3 wet-dry feeder adjustment strategies. The first wet-dry strategy consisted of maintaining a setting of 18 throughout the study (WD18). The second wet-dry strategy consisted of an initial setting of 18 until d 56 followed by a reduced setting of 14 for the remainder of the experiment (WD14). The third wet-dry strategy consisted of an initial setting of 18 until d 28, a setting of 14 until d 56, and a setting of 10 for the remainder of the experiment (WD10). The conventional dry feeders were maintained at a setting of 8 throughout the study. The 2 diet types evaluated in this study were a corn-soybean meal-15% DDGS diet (CS) and a corn-25% DDGS-20% bakery by-product-soybean meal diet (BY). Both diets were fed over 4 dietary phases (Table 1).

Pen and feeder weights were measured on d 14, 28, 42, 56, 72, and 92 to determine average BW, ADG, ADFI, F/G, and feed cost per pig. On d 72, 3 pigs (2 barrows and 1 gilt) from each pen were weighed and removed for marketing. At the conclusion of the experiment on d 92, carcass data were obtained for 1,097 pigs to determine the effects of feeder treatment and diet type on carcass characteristics and profitability.

On d 20 and 83, measurements of the actual feeder opening were obtained for all of the feeders. Methods used to determine the opening of the conventional dry feeder were the same as those reported by Duttlinger et al. (2008[7]). For the wet-dry feeder, the mean gap opening was determined with two measurements (one from each side of the feeder) from the top of the feeder shelf to the bottom edge of the feed storage hopper. A digital photo of the pan/trough of each feeder was also taken. Afterward, the pictures were independently scored for percentage of pan coverage by a panel of 6 trained people. The mean pan coverage score of each feeder was used to determine the relationship between feeder opening and percentage of feed coverage.

Data were analyzed to compare the effects of the 2 feeder types (conventional dry vs. wet dry), 3 wet-dry adjustment strategies (WD18 vs. WD14 vs. WD10), and 2 diet types (CS vs. BY) by using a completely randomized design and the PROC MIXED procedure of SAS. Pen was the experimental unit. Hot carcass weight was used as a covariate for the comparison of carcass characteristics.

Results

The mean opening of the wet dry feeder was greater ($P < 0.05$) than that of the conventional dry feeder on d 20 and 83, but the mean opening of the conventional dry feeder was greater ($P < 0.05$) than that of the WD10 setting on d 83 (Table 2). The mean opening of the wet-dry feeder decreased ($P < 0.05$) with each reduction in setting from 18 to 14 to 10. There was a feeder design × diet type interaction ($P < 0.01$) for the percentage of pan coverage on d 20. This occurred because the pan coverage of the wet-dry feeder was relatively similar between the 2 diet types but the pan coverage of the conventional dry feeder was considerably greater with the BY diet than with the CS diet. There were no significant differences in pan coverage on d 83, but the pan coverage for WD10 and the conventional dry feeder were numerically the lowest.

There were no feeder × diet type interactions for growth and carcass characteristics during the experiment. From d 0 to 28, pigs fed using the wet-dry feeder had greater

[7] Duttlinger et al. Swine Day 2008, Report of Progress 1001, pp 204-214.

($P < 0.02$) ADG and ADFI than pigs fed with conventional dry feeder (Table 3). Also, pigs fed the CS diet had greater ($P < 0.01$) ADG than those fed the BY diet (Table 4). However, there were no differences in F/G or d-28 BW among any of the treatments.

All pigs fed using the wet-dry feeder continued to have greater ($P < 0.001$) ADG and ADFI compared with pigs fed using the conventional dry feeder from d 28 to 56, and the performance of pigs fed with a reduced setting of 14 remained similar to that of pigs fed with a wet-dry setting of 18. This resulted in a heavier ($P < 0.002$) d-56 BW for pigs fed with the wet-dry feeder compared with pigs fed using the conventional dry feeder. There were no differences in F/G among feeder treatments. Pigs fed the CS diet had greater ($P < 0.01$) ADFI and poorer ($P < 0.04$) F/G than pigs fed the BY diet, but ADG and d-56 BW were similar for the 2 diet types.

From d 56 to 92 and overall (d 0 to 92), all pigs fed using the wet-dry feeder had greater ($P < 0.001$) ADG, ADFI, and final BW than pigs fed with the conventional dry feeder. However, within the wet-dry treatments, the ADG of pigs fed with WD14 and WD10 was reduced ($P < 0.05$) compared with that of pigs fed with WD18. Additionally, ADFI of pigs fed with WD10 was lower ($P < 0.05$) than that of pigs fed with WD18, and ADFI of pigs fed with WD14 was intermediate. There were no differences in F/G among feeder treatments, and growth performance was similar between the 2 diet types.

Pigs fed using the wet-dry feeder had greater ($P < 0.02$) HCW, yield, backfat depth, revenue per pig, and feed cost per pig than pigs fed with the conventional dry feeder. The loin depth of pigs fed using the wet-dry feeder was less ($P < 0.04$) than that of pigs fed with the conventional dry feeder. The differences in backfat and loin depth resulted in pigs fed with the wet-dry feeder having a lower ($P < 0.001$) fat-free lean index (FFLI) than pigs fed with the conventional dry feeder. However, within the wet-dry feeder treatments, the backfat depth of pigs fed with WD10 was reduced ($P < 0.05$) and FFLI was increased ($P < 0.05$) compared with pigs fed with WD18. The backfat depth and FFLI of pigs fed with WD14 was intermediate. Although not significantly different, income over feed cost (IOFC) was numerically greatest for pigs fed using WD10, followed by conventional dry, WD18, and WD14.

Pigs fed the CS diet had less ($P < 0.02$) loin depth and greater ($P < 0.001$) feed cost per pig than pigs fed the BY diet. However, the FFLI of pigs fed the CS and BY diets were similar. Although not significantly different, the IOFC for pigs fed the BY diet was approximately $1.48 greater than that of pigs fed the CS diet.

Discussion

In this experiment, pigs fed using the wet-dry feeder had greater ADG and ADFI than pigs fed using the conventional dry feeder, and, unlike some previous experiments done in the same research facility, there were no differences in F/G. Also, strategies to reduce the feeder setting of the wet-dry feeder during later growth phases did not affect F/G. Although changing the wet-dry setting from 18 to 14 on d 28 (WD10) did not result in changes in growth performance, reducing the wet-dry setting from 18 to 14 (WD14) and 14 to 10 (WD10) on d 56 resulted in a subsequent reduction in ADFI and ADG compared with maintaining a wet-dry setting of 18 throughout the experiment. However, ADG and ADFI of pigs fed using any of the wet-dry settings remained greater than those of pigs fed with the conventional dry feeder from d 56 to 92 and overall. This resulted in pigs fed using WD18, WD14, and WD10 having 7.4%, 4.6%, and 5.2%, respectively, greater final BW on d 92 than pigs fed using the conventional dry feeder.

Unlike previous experiments, the yield of pigs using the wet-dry feeder was greater than that of pigs using the conventional dry feeder. This coincided with a greater difference between the final BW determined at the farm and the live BW determined at the slaughter plant for pigs fed with the wet-dry feeder. The final BW at the farm was determined approximately 36 h before live BW was determined at the plant. The wet-dry feeder had substantially less (≈295 lb less) feed storage capacity than the conventional dry feeder, and (on the basis of the ADFI observed just before the final weighing event) there was approximately enough feed (≈64 lb/feeder) remaining in the wet-dry feeders for an additional 9 h. The conventional dry feeders contained approximately enough feed (≈137 lb/feeder) for an additional 21 h. This indicates that pigs fed using the wet-dry feeder and conventional dry feeder may not have had access to feed for approximately 27 and 15 h, respectively, before slaughter. Therefore, the differences in yield between feeder types were likely due to differences in visceral contents and weight.

As in some previous experiments, pigs using the wet-dry feeder had greater backfat depth and lower FFLI. Although the growth rate was reduced 2.6% compared with WD18, backfat depth was reduced and FFLI increased with the WD10 feeder setting. The growth rate of pigs using WD10 was still 7.2% greater than that of pigs using the conventional dry feeder, and the increased revenue per pig obtained with the wet-dry feeder was maintained with a feed cost per pig that was numerically lower than that of pigs fed using WD18. Collectively, this resulted in pigs fed using WD10 having the greatest IOFC, although IOFC was not statistically different among the feeder treatments.

In conclusion, using a wet-dry feeder may improve ADG, ADFI, and final BW of growing-finishing pigs, regardless of diet type. Although there were no differences in F/G, staged reductions in the setting of the wet-dry feeder resulted in reductions in ADG, ADFI, and backfat depth and improvements in FFLI compared with using a wet-dry feeder at a constant setting of 18. However, the ADG, ADFI, and final BW of pigs fed using staged reductions in the wet-dry setting remained greater than those of pigs fed using the conventional dry feeder. Although IOFC was similar among treatments when determined on a fixed-time basis, the growth advantages achieved with a wet-dry feeder could be economically advantageous in pig flows with a limited number of facilities or days to market. Reducing the wet-dry feeder setting in later growth periods may improve carcass leanness while maintaining the advantages in growth rate.

Figure 1. Feed-shelf/gap-opening adjustment mechanism located inside each end of the feed storage hopper of the wet-dry feeder.

Figure 2. Wet-dry feeder at setting 18 with a 1.25-in. opening and ≈84% pan coverage.

Figure 3. Wet-dry feeder at setting 14 with a 1.00-in. opening and ≈83% pan coverage.

Figure 4. Wet-dry feeder at setting 10 with a 0.75-in. opening and ≈63% pan coverage.

Figure 5. Conventional dry feeder at setting 8 with a 0.74- to 1.07-in. opening and ≈67% pan coverage.

Table 1. Diet composition

	Dietary phase[1]							
	80 to 130 lb		130 to 185 lb		185 to 235 lb		235 lb to mkt.	
Item Treatment[2]:	CS	BY	CS	BY	CS	BY	CS	BY
Ingredient, %								
Corn	65.02	37.31	68.51	40.74	72.14	44.45	63.30	35.62
Soybean meal (46.5% CP)	17.80	15.60	14.60	12.25	11.05	8.60	19.80	17.35
DDGS	15.00	25.00	15.00	25.00	15.00	25.00	15.00	25.00
Bakery by-product	---	20.00	---	20.00	---	20.00	---	20.00
Monocalcium P, 21% P	0.15	---	---	---	---	---	---	---
Limestone	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.05
Salt	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Lysine sulfate	0.54	0.62	0.48	0.56	0.42	0.51	0.42	0.51
L-Threonine	0.03	0.01	0.01	---	---	---	0.01	---
VTM + Optiphos 2000[3]	0.11	0.11	0.10	0.10	0.09	0.09	0.09	0.09
Paylean, 9 g/lb	---	---	---	---	---	---	0.025	0.025
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Cost, $/lb[4]	0.085	0.083	0.081	0.079	0.077	0.075	0.093	0.091
Calculated analysis								
Standardized ileal digestible (SID) amino acids								
Lysine, %	0.96	0.98	0.85	0.86	0.73	0.74	0.95	0.96
Isoleucine:lysine, %	64	66	66	69	69	72	68	70
Leucine:lysine, %	164	169	176	183	194	201	171	177
Methionine:lysine, %	29	30	31	33	34	36	30	32
Met & Cys:lysine, %	59	62	63	67	69	74	62	65
Threonine:lysine, %	60	60	62	62	63	66	62	63
Tryptophan:lysine, %	17	17	17	17	17	17	18	18
Valine:lysine, %	76	79	80	83	85	88	80	83
CP, %	17.9	19.4	17.1	18.5	15.7	17.1	19.0	20.4
Total lysine, %	1.10	1.13	0.98	1.01	0.85	0.88	1.09	1.12
ME, kcal/lb	1,524	1,552	1,529	1,555	1,530	1,555	1,527	1,553
SID lysine:ME ratio, g/Mcal	2.86	2.86	2.52	2.52	2.16	2.17	2.82	2.81
Ca, %	0.49	0.48	0.44	0.47	0.42	0.46	0.47	0.50
P, %	0.44	0.44	0.40	0.43	0.39	0.41	0.42	0.45
Available P, %	0.28	0.29	0.25	0.26	0.23	0.25	0.21	0.26

[1] Each dietary phase was formulated for the BW ranges described in the table.
[2] CS = Corn-soybean meal-15% DDGS, BY = Corn-DDGS-bakery by-product-soybean meal.
[3] VTM = Vitamin and trace mineral premix. Optiphos 2000 provided 0.07 to 0.12% available P.
[4] Ingredient prices used were: corn, $121/ton; soybean meal, $296/ton; DDGS, $98/ton; bakery by-product, $135/ton; limestone, $40/ton; salt, $64/ton; lysine sulfate, $1,000/ton; L-threonine, $2,580/ton; vitamin and trace mineral premix, $2,365/ton; phytase, $4,980/ton; Paylean, $66,000/ton; and $12/ton processing and delivery fee.

Table 2. Effect of feeder design, diet type, and changing feeder adjustment of a wet-dry feeder on feeder gap opening and pan coverage during the growing-finishing period[1]

Feeder design:	Wet-dry						Conventional dry						
Feeder setting strategy:	18-18-18		18-18-14		18-14-10		8			$P <$			
Diet type[2]:	CS	BY	CS	BY	CS	BY	CS	BY	SEM	Feeder design × Diet type	Feeder design	Diet type	Wet-dry setting
Feeder data	(18 setting)		(14 setting)		(10 setting)								
Max. opening,[3,4] in.	1.25[a]		1.00[b]		0.75[c]		1.07[d]		0.014	N/A[5]	0.001	N/A	0.001
Min. opening,[6] in.	1.25[a]		1.00[b]		0.75[c]		0.74[c]		0.017	N/A	0.001	N/A	0.001
Avg. opening, in.	1.25[a]		1.00[b]		0.75[c]		0.91[d]		0.015	N/A	0.001	N/A	0.001
d 20 pan coverage, %	73	80	N/A	N/A	N/A	N/A	41	86	7.0	0.01	---[7]	0.001	N/A
d 83 pan coverage, %	76	89	78	84	64	62	58	69	10.1	---	---	---	---

[1] A total of 24 pens containing 27 pigs each.
[2] CS = Corn-soybean meal-15% DDGS, BY = Corn-DDGS-bakery by-product-soybean meal.
[3] Means within a row with different superscripts differ ($P < 0.05$).
[4] Measured from the bottom of the feed pan (conventional dry) or shelf (wet-dry) to the bottom of the feed agitation plate (conventional dry) at the narrowest position or feeder hopper (wet-dry).
[5] N/A = not applicable.
[6] Measured from the bottom of the feed pan (conventional dry) or shelf (wet-dry) to the bottom of the feed agitation plate (conventional dry) at the widest position or feeder hopper (wet-dry).
[7] Not significant ($P > 0.05$).

Table 3. Effects of feeder design and changing feeder adjustment of a wet-dry feeder on the growth performance and carcass characteristics of growing-finishing pigs[1]

Feeder design:	Wet-dry			Conventional dry		P <	
Feeder setting strategy:	18-18-18	18-18-14	18-14-10	8	SEM	Feeder design	Wet-dry setting
Live performance							
d 0 to 28 feeder setting:	18	18	18	8			
ADG, lb	2.13	2.08	2.10	1.99	0.026	0.001	N/A[2]
ADFI, lb	4.68	4.71	4.70	4.53	0.056	0.02	N/A
F/G	2.20	2.26	2.24	2.28	0.22	---[3]	N/A
d 28 BW, lb	142.1	140.7	141.9	138.6	2.06	---	N/A
d 28 to 56 feeder setting:	18	18	14	8			
ADG, lb	2.19	2.16	2.18	1.96	0.024	0.001	---
ADFI, lb	6.37	6.26	6.25	5.65	0.073	0.001	---
F/G	2.90	2.90	2.86	2.89	0.025	---	---
d 56 BW, lb	203.6	201.2	203.1	193.4	2.35	0.002	---
d 56 to 92 feeder setting:	18	14	10	8			
ADG[4], lb	2.54[a]	2.41[b]	2.39[b]	2.28	0.030	0.001	0.05
ADFI, lb	7.20[a]	6.97[ab]	6.73[b]	6.46	0.086	0.001	0.05
F/G	2.84	2.89	2.82	2.83	0.027	---	---
d 0 to 92							
ADG, lb	2.30[a]	2.23[b]	2.24[b]	2.09	0.018	0.001	0.05
ADFI, lb	6.15[a]	6.04[ab]	5.94[b]	5.60	0.062	0.001	0.05
F/G	2.67	2.71	2.66	2.68	0.018	---	---
d 92 BW, lb	292.2	284.6	286.2	272.0	2.75	0.001	---
Carcass and economics							
HCW, lb	209.6	205.6	207.8	198.2	2.33	0.01	---
Yield, %	76.5	76.7	76.9	75.9	0.26	0.02	---
Backfat depth, in.	0.77[a]	0.75[ab]	0.73[b]	0.69	0.011	0.001	0.05
Loin depth, in.	2.49	2.47	2.50	2.57	0.032	0.04	---
FFLI[5]	49.3[a]	49.4[ab]	49.7[b]	50.2	0.14	0.001	0.05
Revenue/pig, $	142.56	139.68	142.49	136.61	1.699	0.02	---
Feed, $/pig	72.68	71.61	70.86	66.54	0.725	0.001	---
IOFC[6], $	69.88	68.07	71.34	70.07	1.255	---	---

[1] A total of 1,287 pigs (PIC, 337 × 1050) with an initial BW of 82.7 lb were placed in 48 pens containing 27 pigs each. Carcass data were obtained for 1,097 pigs. Hot carcass weight was used as a covariate for comparison of backfat depth, loin depth, and FFLI.
[2] N/A = not applicable.
[3] Not significant ($P > 0.05$).
[4] Means for the wet-dry feeder treatments within a row with different superscripts differ ($P < 0.05$).
[5] FFLI = fat-free lean index.
[6] IOFC = income over feed cost; calculated by subtracting feed cost per pig from revenue per pig using a carcass base price of $66.97/cwt and premiums/discounts.

Table 4. Effects of diet type on the growth performance and carcass characteristics of growing-finishing pigs[1]

	Diet type			
	Corn-soybean meal with 15% DDGSS	Corn-soybean meal with 25% DDGS and 20% bakery by-product	SEM	$P <$
Live performance				
d 0 to 28				
ADG, lb	2.11	2.04	0.018	0.01
ADFI, lb	4.69	4.61	0.039	---[2]
F/G	2.22	2.26	0.016	---
d 28 BW, lb	141.7	139.9	1.45	---
d 28 to 56				
ADG, lb	2.14	2.11	0.017	---
ADFI, lb	6.23	6.03	0.052	0.01
F/G	2.92	2.86	0.018	0.04
d 56 BW, lb	201.7	199.0	1.66	---
d 56 to 92				
ADG, lb	2.41	2.40	0.021	---
ADFI, lb	6.85	6.82	0.061	---
F/G	2.84	2.84	0.019	---
d 0 to 92				
ADG, lb	2.23	2.20	0.013	---
ADFI, lb	5.98	5.88	0.044	---
F/G	2.68	2.68	0.013	---
d 92 BW, lb	285.3	282.2	1.94	---
Carcass and economics				
HCW, lb	207.1	203.5	1.69	---
Yield, %	76.4	76.7	0.19	---
Backfat depth, in.	0.75	0.73	0.008	---
Loin depth, in.	2.47	2.55	0.027	0.02
FFLI[3]	49.6	49.8	0.10	---
Revenue/pig, $	141.15	139.51	1.231	---
Feed, $/pig	71.91	68.94	0.513	0.001
IOFC[4], $	69.10	70.58	0.909	---

[1] A total of 1,287 pigs (PIC, 337 × 1050) with an initial BW of 82.7 lb were placed in 48 pens containing 27 pigs each. Hot carcass weight was used as a covariate for comparison of backfat depth, loin depth, and fat-free lean index.
[2] Not significant ($P > 0.05$).
[3] FFLI = fat-free lean index.
[4] IOFC = income over feed cost; calculated by subtracting the feed cost per pig from the revenue per pig using a carcass base price of $66.97/cwt and premiums/discounts.