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Abstract

Two trials (n = 5,728 weaned pigs) were conducted to determine the effects of weaning age (12 to 21.5 days) on pig performance in a three-site production system. The second trial also examined the effects of modifying nursery feed budgets according to weaning age. In both studies, wean-to-finish ADG, mortality rate, average pig gain per days postweaning, and pounds sold per pig weaned improved linearly as weaning age increased. The improvements in growth rate and mortality largely occurred in the initial 42-days post-weaning, with some ongoing growth improvement to slaughter. Modifying nursery feed budgets did not affect wean-to-finish growth performance. These studies indicate increasing weaning age up to 21.5 days predictably improves grow-finish throughput within a three-site production system.; Swine Day, Manhattan, KS, November 14, 2002

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EFFECTS OF WEANING AGE ON PIG PERFORMANCE IN THREE-SITE PRODUCTION

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Summary

Two trials (n = 5,728 weaned pigs) were conducted to determine the effects of weaning age (12 to 21.5 days) on pig performance in a three-site production system. The second trial also examined the effects of modifying nursery feed budgets according to weaning age. In both studies, wean-to-finish ADG, mortality rate, average pig gain per days post-weaning, and pounds sold per pig weaned improved linearly as weaning age increased. The improvements in growth rate and mortality largely occurred in the initial 42-days post-weaning, with some ongoing growth improvement to slaughter. Modifying nursery feed budgets did not affect wean-to-finish growth performance. These studies indicate increasing weaning age up to 21.5 days predictably improves grow-finish throughput within a three-site production system.

(Key Words: Weaning Age, Throughput, Growth.)

Introduction

Previous research has demonstrated positive effects associated with segregated early weaning (SEW). Segregated early-weaning research has predominantly studied either pathogen elimination or growth performance benefits due to segregating production versus the on-site rearing of growing pigs. However, limited prospective research has been conducted to quantify the impact of weaning age within an applied SEW production scheme. Therefore, the objective of our first trial was to quantify the impact of weaning age on pig performance within a three-site production system. A second trial was completed to evaluate the effects of both weaning age and alternative nursery feed budget regimens on pig performance. Specifically, whether growth performance responses due to weaning age were significantly affected by altering nursery feed budgets.

Procedures

These experiments were completed with pigs originating from a 7,300-head sow farm with pigs flowing into single source, all-in all-out nursery and finishing sites. In Trial 1, treatments included weaning litters of pigs at 12, 15, 18, or 21 days of age. In Trial 2, litters were weaned at 15, 16, 18, 19, 21, or 22 days of age. This resulted in three wean age treatments (15.5, 18.5, and 21.5 days of age, i.e., 15.5 days = 50% 15 day pigs, and 50% 16 day pigs) Litters were ear notched at birth (18 to 20 litters/day of weaning age in each block), and all pigs were subsequently individually ear-tagged, weighed, and gender recorded three days prior to weaning. Each trial had four blocks. Each block consisted of all weaning age treatments weaned on the

[1]Food Animal Health and Management Center.

same day into the same nursery. Each block remained intact as pigs were transferred from nursery to finishing site. Pigs were only removed from trial pens due to either death or if a non-recoverable, moribund condition existed.

At weaning, pigs (PIC 280 × C22; Trial 1 n=2,272, Trial 2 n=3,456) of each age group were allotted using the individual pig weight and gender information. Each of the four blocks had four replicates (pens) per age (Trial 1) or age by feed budget combination (Trial 2). Each pen contained an equal number of barrows and gilts. Using the individual pig weight and gender information, each pen was allotted to replicate the normal weight distribution of barrows and gilts being weaned within each age group. Pens contained 36 pigs with the exception that the first block in Trial 1 had 34 pigs per pen. Nursery pens were 8 × 12 ft with wire flooring and two nipple waterers. Each pen contained a double-sided feeder with 5 holes on each side. In Trial 1, all pigs were fed a common three-phase nursery feed budget (Table 1). In Trial 2, each age group was fed a nursery feed budget that was classified as either being more or less complex. These nursery feed budget classifications were determined both on formulation complexity and the quantity of the complex diets fed (Table 2). Feed delivery was recorded on a pen basis throughout the nursery period. All pens were weighed at 42 days post-weaning, with individual pig weights being recorded. Growth and feed efficiency were calculated utilizing trial allotment weights attained 3 days prior to weaning. Weighing and tagging pigs prior to weaning was necessary due to labor availability.

Pigs (Trial 1 n=1,920; Trial 2 n=3,000) were re-allotted within treatment group and block to the finishing phase using the individual 42-day post-weaning weight and gender information. As described for the nursery allotment, finishing pens were allotted such that each pen was a replicate of the population of feeder pigs being placed for each specific treatment and block. All pigs were fed the same feed budget throughout finishing. Diet specifications and feed budget are outlined in Tables 1 and 2. These feed budgets were designed to ensure nutrient requirements were being exceeded for all wean age groups on feed. However, feed delivery information was not collected on a pen basis during the finishing period. In Trial 1, pigs (n=20 pigs/pen; 10 barrows, 10 gilts) were placed in 7.5 × 22 ft finishing pens. In Trial 2, pigs (n=25 pigs/pen; 13 gilts, 12 barrows) were placed in 9.5 × 22 ft finisher pens. Finishing pens had partially slatted concrete flooring (2/3 solid, 1/3 slatted), and curtain sided buildings were naturally ventilated. Each pen had 2 nipple waterers and a 4-hole feeder. Pens weighed off-test at 156 (Trial 1) and 153 (Trial 2) days post-weaning with individual weights being recorded. In Trial 1, each block was transferred to slaughter over a 28-day period after being weighed off-test (Table 3). In Trial 2, all pens in each block were marketed the day after being weighed off-test. Pen identity was maintained through the packing plant in both trials. Live performance and carcass data were analyzed for linear and quadratic effects, with pen serving as the experimental unit for all data analyses.

Results and Discussion

Trial 1. Allotment weight increased (linear, $P<0.0001$, Table 4) with increasing weaning age. Furthermore, the variation in allotment weight was reduced as weaning age increased (quadratic, $P<0.0001$). Allotment weight variation increased most noticeably in the pigs to be weaned at 12-days of age, with variation in older weaning ages similar. Nursery ADG, ADFI, mortality rate, and 42-day post-weaning weight improved (linear, $P<0.0001$) as weaning age increased from 12 to 21 days. Nursery F/G (quadratic, $P<0.03$) and variation in 42-day post-weaning weight (quadratic, $P<0.01$) also improved as weaning age increased. Feed efficiency and 42-day post-weaning weight variation were poorer in the 12-day weaned pigs, with F/G and weight variation among older weaning ages similar. However, step-wise improvements in 42-day post-weaning weight variation were observed as weaning age increased.

Finishing ADG, off-test weight, off-test weight variation, and average weight per day of age improved (linear, $P<0.0001$, Table 5) as weaning age was increased from 12 to 21 days. There were no differences ($P>0.17$) in finishing mortality or carcass yield. However, when adjusting carcass lean measures to a common carcass weight, improvements (quadratic, $P<.0001$) in 10^{th} rib fat depth, loin depth, and percentage lean were observed as weaning age increased. The largest improvements in fat depth and lean percentage were observed as weaning age increased from 18 to 21 days. Loin depth was more quantitatively improved as weaning age increased from 15 to 18 days. Defining the mechanism driving the improvements in lean can only be hypothesized. The spread in body weight that continued to widen throughout the feeding period (Off-test weights: 12 d = 229, 15 d = 241, 18 d = 247, and 21 d = 258 lb) may have played a role in the observed differences in carcass lean at slaughter. Previous research has demonstrated that feeding amino acid densities above the nutrient requirements for optimizing growth and feed conversion yields incremental improvements in carcass lean. The older pigs were heavier at weaning and grew faster throughout the growing period. Therefore, the older pigs were incidentally fed a higher lysine:calorie (g lysine/Mcal ME) ratio relative to average body-weight throughout the feeding period. Previous research has also illustrated that feeding rather simple diets to pigs weaned at a younger age can negatively impact carcass lean. Either the complexity of the nursery diets in this study or the relative magnitude of over-feeding throughout the finishing period may be factors beyond the main effect of weaning age contributing to the differences in carcass lean observed at slaughter.

Wean-to-finish ADG, mortality, average pig gain per days post-weaning, and pounds sold per pig weaned improved (linear, $P<0.0001$, Table 6) as weaning age increased from 12 to 21 days. In these analyses, both ADG and average pig gain were determined. Average daily gain (ADG) was calculated to be a more holistic measure of throughput, as weight and days lost due to mortality were not accounted for in ADG calculations. Contrarily, average pig gain is simply a measure of growth rate that is not influenced by mortality. Similar to ADG, pounds sold per pig weaned more holistically evaluated the effects of weaning age on production system throughput. Expressing weight sold on a per pig weaned basis enables wean-to-finish throughput to be quantified in a manner that directly relates to value of the weaned pig. This removes mortality-induced bias in traditional closeout information.

Trial 2. There was no age by feed budget interactions ($P>0.26$) during the nursery phase. Allotment weight increased (quadratic, $P<0.001$,Table 7) with increasing weaning age. Although numerically similar, variation in allotment weight appeared to change (quadratic, $P<0.04$) as weaning age increased. The results of the allotment weights need to be interpreted with caution due to the allotment procedure, which made each pen within age group equivocal in average pig weight and pig weight variation. Therefore, the small within age group variation makes test statistics very sensitive on these allotment weight measures. Numerically speaking, allotment weights increased linearly (15.5 d = 9.0, 18.5 d = 10.5, 21.5 d =12.4 lb) with weaning age, but variation at weaning (15.5 d = 19.6, 18.5 d = 20.2, 21.5 d = 19.4 CV%) was similar between age groups. Nursery ADG, ADFI, and 42-day post-weaning weight improved (linear, *P*<0.0001) as weaning age increased from 15.5 to 21.5 days. Weight variation at the end of the nursery phase also improved (linear, *P*<0.003) and removal rate tended to decrease (*P*<0.09) as weaning age increased. However, nursery F/G was poorer (linear, *P*<0.0001) as weaning age increased. Nursery feed budget complexity did not affect (*P*>0.29) growth rate, feed efficiency, or mortality. However, pigs fed the more complex nursery feed budgets tended (*P*<0.06) to have reduced variation in weight at 42-days post-weaning.

Similar to the nursery phase, there were no age by feed budget interactions (*P*>0.14) for the growth parameters measured during the finisher phase in Trial 2. Finishing ADG, off-test weight, and average pig weight per day of age improved (linear, *P*<0.003, Table 8) as weaning age increased from 15.5 to 21.5 days. In addition, there were no differences (*P*>0.17) in either off-test weight variation, or finishing mortality rate associated with weaning age. There was no effect (*P*>0.10) of weaning age on carcass yield. After adjusting lean measures to a common carcass weight, wean age by nursery feed budget interactions (*P*<0.03) for 10^{th} rib fat depth, loin depth, and lean percentage were observed. Increasing nursery feed budget complexity improved (*P*<0.002) carcass yield and, as a result, tended (*P*<0.08) to increase average carcass weights. Only pigs weaned in the 15.5 day treatment had within age group differences in carcass yield (less complex = 74.72 vs. more complex = 75.96, SE 0.38%, *P*<0.0004), and carcass weight (less complex = 180.3 vs. more complex = 184.6, SE 2.4 lb, *P*<0.003). These within age group differences in carcass weight described for the pigs weaned at 15.5 days, coupled with similar within age group carcass weights in pigs weaned at 18.5 and 21.5 days, explains the nursery feed schedule by wean age interaction (*P*<0.03) on carcass weight observed. We have no explanation for the improvement in carcass yield by increasing nursery feed budget complexity in the youngest age group of wean pigs. In Trial 2, all pens were slaughtered the day after they were weighed off-test. Therefore, average carcass weight was confounded within weaning age. Confounding weaning age and average carcass weight, along with the magnitude of weight adjustment needed to bring carcass lean measures to a common carcass weight, may have played a role in the complicated interactions observed. In summary, the weaning age by nursery feed budget interactions limit the interpretation of either of these main effects on carcass lean.

Wean-to-finish ADG, average pig gain per days post-weaning, pounds sold per pig weaned (linear, *P*<.00001, Table 9), and wean to finish mortality (linear, *P*<0.03) improved as weaning age was increased from 15.5 to 21.5 days. Nursery feed budget complexity did not affect (*P*>0.27) wean-to-finish growth performance parameters measured.

Conclusions

The linear improvements in growth and throughput observed with increasing wean age are likely functions of both weight and physiological maturity at weaning. Weaning weight is directly confounded within weaning age in this study. Therefore, it is not appropriate to translate the weaning age effects directly back to weaning weight or other interim pig weights. Translating wean age performance improvements back to interim pig weight basis is only appropriate when the improved interim weights are due to an increased weaning age.

These trials indicate that weaning age has a significant and repeatable effect on growing pig performance within a given set of health and management conditions. These linear improvements in growth and livability largely occur in the 42-day post-weaning period, with some ongoing growth improvements in the finishing phase. These studies suggest that the magnitude of growth rate improvement observed with increasing wean age is rather predictable within a given production system. However, the magnitude of the mortality improvement likely depends on baseline nursery mortality rates, as well as other pig-flow, site, or system specific challenges. Altering nursery feed budgets according to weaning age did not affect wean to finish growth performance. These trials did not conclusively demonstrate that either weaning age or nursery feed budgets affected carcass parameters measured. In summary, the linear improvements in throughput associated with increasing weaning age illustrate the importance for pork production systems to clearly rationalize weaning age targets. These studies indicate that population weaning age is a predictable input influencing the level of grow-finish throughput that is achieved within a given three-site production system.

Table 1. Feed Budget and Diet Composition (Trial 1)[a]

	Nursery			Finisher		
Item	Phase I	Phase II	Phase III	Phase IV	Phase V	Phase VI
Feed budget (lb/head)	3	6	remainder	110	150	remainder
Composition of diet %						
Spray-dried animal plasma, %	2.85	-	-	-	-	-
Lactose, %	20	12	-	-	-	-
TID lysine, %	1.37	1.21	1.14	1.05	0.97	0.86
Kcal of ME / lb	1580	1580	1570	1600	1609	1620

[a]All weaning age treatments (12, 15, 18, or 21 d) in trial 1 were fed a common feed budget.

Table 2. Feed Budget and Diet Composition (Trial 2)[a,b]

		Feed budget (lb/head)						
	Nursery budget	Nursery				Finisher		
	complexity	Phase				Phase		
Wean age, d	classification	SEW	I	II	III	IV	V	VI
15.5	less	0	4	6	remainder	110	150	remainder
15.5	more	1.5	4	8.5	remainder	110	150	remainder
18.5	less	0	4	6	remainder	110	150	remainder
18.5	more	1	4	7	remainder	110	150	remainder
21.5	less	0	2	8	remainder	110	150	remainder
21.5	more	0	4	6	remainder	110	150	remainder
Composition of diet								
Spray-dried animal plasma, %		6.7	3.5	-	-	-	-	-
Lactose, %		22.5	20.0	11.0	-	-	-	-
TID lysine, %		1.40	1.56	1.37	1.26	1.05	0.90	0.78
Kcal of ME / lb		1595	1550	1550	1580	1575	1575	1575

[a]Each weaning age group (15.5, 18.5, or 21.5 d) was fed a nursery feed budget that was classified as either being more or less complex. The complexity classification was determined both on formulation complexity and the quantity of the more complex diets fed.
[b]Finishing feed budgets were common across treatments.

Table 3. Schedule for Transfer to Slaughter (Trial 1)[a]

	Weaning Age, days			
	12	15	18	21
Day after off-test weight	Number of pens tranferred[b]			
0	0	0	2	2
7	0	2	2	2
14	2	2	2	2
21	2	2	0	0
28	2	0	0	0

[a]All pens weighed off-test on a common day, with pens being sold in an all-out by pen basis over the next 28 days.

[b]Each pen placed with 20 pigs (10 barrows, 10 gilts).

Table 4. Influence of Weaning Age on Nursery Performance (Trial 1)[a]

	Weaning Age					Probability (*P*<)	
Item	12	15	18	21	SE	Linear	Quadratic
Allotment weight, lb[b]	7.6	9.4	10.8	12.7	0.12	0.0001	0.77
Allotment weight CV, %[c]	20.4	17.1	18.6	17.6	0.96	0.0001	0.0001
Regressed weaning weight, lb[d]	9.3	10.9	12.6	14.3	.	.	.
ADG, lb[e,f]	0.66	0.81	0.90	1.05	0.01	0.0001	0.66
ADFI, lb[e,f]	0.94	1.13	1.25	1.44	0.02	0.0001	0.64
Feed/gain[e,f]	1.42	1.39	1.38	1.38	0.01	0.0006	0.03
Mortality, %	5.25	2.82	2.11	0.54	0.76	0.0001	0.55
42-days post-weaning, lb	37.3	44.7	49.8	56.9	0.58	0.0001	0.60
42-days post-weaning CV,%[c]	20.0	15.6	14.4	12.9	0.68	0.0001	0.01

[a]2,272 pigs with 34 or 36 pigs per pen (50% barrows, 50% gilts), and 16 replications (pens) per treatment, or a total of 64 pens on test.

[b]Allotment weights were taken on all pigs 3 days prior to weaning.

[c]CV = Coefficient of Variation = (Standard Deviation of Weight / Mean Weight) * 100.

[d]Predicted treatment mean weaning weights were calculated by regressing the 3-day pre-weaning weights on a pen basis. (Weaning weight, lb = .5612Wean Age + 2.525; R^2=.97).

[e]Allottment weights were used for all growth and efficiency calculations.

[f]ADG, ADFI, and F:G are all calculated with alloted pen weight, 42-day pen weight, and pen space days post-weaning.

Table 5. Influence of Weaning Age on Finishing Performance (Trial 1)[a]

	Weaning Age					Probability (*P*<)	
Item	12	15	18	21	SE	Linear	Quadratic
Allotment weight, lb	37.3	44.9	49.9	57.0	0.51	0.0001	0.14
Allotment weight CV, %[b]	19.5	14.8	13.7	12.4	0.55	0.0001	0.0001
ADG, lb[c]	1.59	1.60	1.62	1.69	0.02	0.002	0.19
Mortality, %	4.38	5.21	4.79	3.13	0.94	0.32	0.19
Off-test weight, lb	229.1	240.6	247	258.7	1.79	0.0001	0.94
Off-test weight CV, %[b]	12.4	10.4	10.4	9.0	0.64	0.0001	0.51
Off-test weight / day of age, lb[d]	1.36	1.40	1.42	1.46	0.01	0.0001	0.89
Carcass weight[e], lb	197.4	196.7	194.5	201.5	2.76	0.21	0.04
Yield, %	75.9	75.5	75.6	75.8	0.23	0.81	0.17
10th rib fat depth, in[f]	0.70	0.69	0.70	0.66	0.01	0.0001	0.0001
Loin depth, in[f]	2.53	2.52	2.57	2.55	0.02	0.0001	0.001
Lean, %[f]	54.55	54.58	54.73	54.90	0.11	0.0001	0.0001

[a]1,920 pigs with 20 pigs (10 barrows, 10 gilts) per pen and 24 replications (pens) per treatment, or 96 pens on test.

[b]CV = Coefficient of Variation = (Standard Deviation of Weight / Mean Weight) * 100.

[c]ADG = (Off-test pen weight - allotment pen weight) / (# of pigs spaces * # of days on-test).

[d]Off-test weight per day of age = Off-test weight / pig age.

[e]Due to extended transfer to slaughter strategy, comparing carcass weights between treatments was not of interest.

[f]10th rib backfat, loin depth, and lean percentage measures are all adjusted to a common carcass weight utilizing carcass weight as a covariate.

Table 6. Influence of Weaning Age on Wean-to-Finish Performance (Trial 1)[a]

	Weaning Age					Probability (P<)	
Item	12	15	18	21	SE	Linear	Quadratic
Allotment weight, lb	7.5	9.4	10.8	12.7	0.11	0.0001	0.68
Off-test weight, lb	229	240.6	247.0	259	1.79	0.0001	0.94
ADG, lb[b]	1.28	1.36	1.40	1.51	0.02	0.0001	0.36
Mortality, %[c]	9.39	7.88	6.80	3.68	0.95	0.0001	0.39
Average pig gain/ days post-weaning, lb[d]	1.42	1.48	1.51	1.57	0.01	0.0001	0.96
Pounds sold / pig weaned, lb[e]	207.5	221.6	230.3	249.3	2.89	0.0001	0.35

[a]Linking nursery allotment weights and nursery mortality data within treatment and block to respective finisher pen to quantify wean to finish performance.

[b]ADG = (Finisher pen weight sold - (nursery allotment weight * # of wean pigs required to place finishing pen)) / (# of wean pigs required to place finishing pen * # of days post-weaning).

[c]Mortality = (1 - (Finishing pen inventory weighed off-test / # of wean pigs to place finishing pen))*100.

[d]Average pig gain / days post-weaning = (Off-test weight - allotment weight) / # of days post-weaning.

[e]Pounds sold / pig weaned = Off-test pen weight / # of wean pigs required to place finishing pen.

Table 7. Influence of Weaning Age and Nursery Feed Budget Complexity on Nursery Performance (Trial 2)[a]

	Less Complex Nursery Budget			More Complex Nursery Budget				Probability ($P<$)			
	Wean Age, d										
Item	15.5	18.5	21.5	15.5	18.5	21.5	SE	Linear Age	Quadratic Age	Feed Budget	Age*Feed Budget
Allotment weight, lb[b]	9.0	10.5	12.4	9.0	10.5	12.5	0.21	0.0001	0.001	0.99	0.63
Allotment weight CV, %[c]	19.5	20.0	19.2	19.8	20.4	19.5	0.51	0.49	0.04	0.30	0.99
Regressed weaning weight, lb[d]	10.7	12.4	14.1	10.7	12.4	14.1	.	.	.	.	.
ADG, lb[e,f]	0.96	1.06	1.17	0.95	1.07	1.15	0.03	0.0001	0.70	0.51	0.30
ADFI, lb[e,f]	1.26	1.39	1.56	1.24	1.40	1.53	0.03	0.0001	0.79	0.29	0.26
Feed/gain[e,f]	1.30	1.31	1.33	1.30	1.31	1.34	0.01	0.0001	0.64	0.77	0.90
Mortality, %	1.91	1.91	1.22	2.43	1.22	1.39	0.50	0.09	0.69	0.99	0.46
42-days post-weaning, lb	50.5	55.9	62.2	50.2	56.0	61.6	1.41	0.0001	0.57	0.37	0.60
42-days post-weaning CV, %[c]	15.4	14.2	13.1	14.0	13.1	13.0	0.75	0.003	0.58	0.06	0.47

[a]3,456 pigs with 36 pigs per pen (18 barrows, 18 gilts), and 16 replications (pens) per treatment, or a total of 96 pens on test.

[b]Allotment weights were taken on all pigs 3 days prior to weaning.

[c]CV = Coefficient of Variation =(Standard Deviation / Mean) * 100.

[d]Predicted treatment mean weaning weights were calculated by regressing the 3-day pre-weaning weights on a pen basis (Weaning weight, lb = .5714Wean Age + 1.734; R^2=.92).

[e]Allotment weights were used for all growth and efficiency calculations.

[f]ADG, ADFI, and F:G are all calculated with allotted pen weight, 42 day pen weight, and pen space days post-weaning.

Table 8. Influence of Weaning Age and Nursery Feed Budget Complexity on Finishing Performance[a]

	Less Complex Nursery Budget			More Complex Nursery Budget				Probability (*P*<)			
	Wean Age, d										
Item	15.5	18.5	21.5	15.5	18.5	21.5	SE	Linear Age	Quadratic Age	Feed Budget	Age*Feed Budget
Allotment weight, lb	50.6	56.1	62.3	50.4	56.1	61.8	1.41	0.0001	0.33	0.10	0.22
Allotment weight CV, %[b]	14.2	12.7	12.0	13.0	12.2	12.1	0.61	0.0001	0.23	0.08	0.23
ADG, lb[c]	1.73	1.75	1.78	1.72	1.74	1.77	0.03	0.003	0.58	0.39	0.98
Mortality, %	1.00	2.00	1.00	2.61	1.80	1.40	0.62	0.30	0.42	0.20	0.29
Off-test weight, lb	245.9	255.4	263.2	248	254.1	262.4	2.95	0.0001	0.91	0.99	0.30
Off-test weight CV, %[b]	10.2	9.8	9.2	9.7	8.7	9.8	0.43	0.34	0.17	0.33	0.14
Off-test weight / day of age, lb[d]	1.46	1.49	1.51	1.47	1.48	1.50	0.01	0.0001	0.97	0.98	0.34
Carcass weight[e], lb	180.3	188.9	194.7	184.6	188.1	195.5	2.38	0.0001	0.73	0.08	0.03
Yield, %	74.72	74.83	75.21	75.95	75.19	75.52	0.38	0.89	0.10	0.002	0.10
10th rib fat depth, in[f]	0.66	0.64	0.66	0.66	0.67	0.67	0.02	0.13	0.001	0.0001	0.0001
Loin depth, in[f]	2.54	2.54	2.51	2.52	2.52	2.51	0.02	0.0001	0.0001	0.002	0.03
Lean, %[f]	54.86	54.95	54.74	54.81	54.75	54.66	0.10	0.0002	0.0001	0.0001	0.0004

[a]3,000 pigs with 25 pigs (12 barrows, 13 gilts) per pen and 20 replications (pens) per treatment, or a total of 120 pens on test.

[b]CV = Coefficient of Variation =(Standard Deviation / Mean) * 100.

[c]ADG = (Off-test pen weight - allotment pen weight) / (# of pigs spaces * # of days on-test).

[d]Off-test weight per day of age = Off-test weight / pig age.

[e]Due to extended tranfer to slaughter strategy, comparing carcass weights between treatments was not of interest.

[f]10th rib backfat, loin depth, and lean percentage measures are all adjusted to a common carcass weight.

Table 9. Influence of Weaning Age and Nursery Feed Budget Complexity on Wean-to-Finish Performance (Trial 2)[a]

	Less Complex Nursery Budget			More Complex Nursery Budget							
	Wean Age, d							Probability (*P*<)			
Item	15.5	18.5	21.5	15.5	18.5	21.5	SE	Linear Age	Quadratic Age	Feed Budget	Age*Feed Budget
Allotment weight, lb	9.0	10.5	12.4	9.0	10.5	12.5	0.21	0.0001	0.0001	1.00	0.52
Off-test weight, lb	245.9	255.4	263.2	248	254.1	262.4	2.95	0.0001	0.91	0.99	0.30
ADG, lb[b]	1.50	1.53	1.60	1.48	1.54	1.58	0.02	0.0001	0.78	0.37	0.53
Mortality, %[c]	2.89	3.86	2.20	4.95	2.99	2.77	0.69	0.03	0.69	0.27	0.08
Average pig gain/ days post-weaning, lb[d]	1.54	1.60	1.64	1.56	1.59	1.63	0.01	0.0001	0.76	0.85	0.27
Pounds sold / pig weaned, lb[e]	238.8	245.6	257.3	235.6	246.3	255.1	2.72	0.0001	0.70	0.35	0.53

[a]Linking nursery allotment weights and nursery mortality data within treatment and block to respective finisher pen to quantify wean to finish performance.

[b]ADG = ((Finisher pen weight sold - (nursery allotment weight * # of wean pigs required to place finishing pen)) / (# of wean pigs required to place finishing pen * # of days post-weaning).

[c]Mortality = (1 - (Finishing pen inventory weighed off-test / # of wean pigs required to place finishing pen))*100.

[d]Average pig gain / days post-weaning = (Off-test weight - allotment weight) / # of days post-weaning.

[e]Pounds sold / pig weaned = Off-test pen weight / # of wean pigs required to place finishing pen.