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Effects of Increasing Feeding Level During Late Gestation on Sow and Litter Performance[1]

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Summary

A total of 108 gilts and sows (PIC 1050) and their litters were used over 2 gestation and lactation periods to determine the effect of increasing late gestation feeding level on sow and litter performance. Treatments were structured as a 2 × 2 factorial design with main effects of feeding level (0 or 2 lb of extra feed from d 90 to farrowing) and parity group (gilts or sows). The trial was conducted for 2 successive parities, with gilts and sows remaining on the same treatment for both parities.

For the first gestation and lactation period, gilts had increased ($P < 0.001$) backfat thickness on d 35, 90, and 112 of gestation and at farrowing compared with sows but had increased ($P < 0.001$) lactation backfat loss. Increasing late gestation feed increased ($P < 0.001$) weight gain from d 90 to 112 in both gilts and sows.

There were late gestation feeding level × parity interactions observed ($P < 0.04$) for ADFI and total feed intake for the overall lactation period. This was due to gilts having decreased lactation ADFI when fed extra feed in late gestation, but when sows were fed extra feed, lactation ADFI increased. Increasing feeding level in late gestation also increased ($P < 0.04$) total feed cost.

A feeding level × parity interaction was observed ($P < 0.04$) for average weight of total born and live born pigs. Increasing feeding level in late gestation increased piglet birth weight in gilts but decreased piglet weight in sows. Gilts had increased ($P < 0.02$) number and total weight of the total born, live born, and number after fostering compared with older parity sows. Gilts weaned larger ($P < 0.002$) litters and had increased ($P < 0.03$) total litter weaning weight compared with older parity sows. At weaning, sows had a decreased ($P < 0.002$) weaning to breeding interval compared with gilts, and a late gestation feeding level × parity interaction was observed ($P < 0.03$) for conception rate. Gilts that received increased late gestation feed had a greater conception rate than those maintained on the same level, whereas a decrease in conception rate was observed when sows received increased late gestation feed.

During the subsequent lactation period, a feeding level × parity interaction was detected ($P < 0.005$) for lactation backfat loss. This interaction was reflective of an increase in backfat loss in parity 2 sows as the late gestation feeding level was increased and a decrease in backfat loss in parity 3 and older sows with increasing late gestation feeding level. A feeding level × parity interaction was detected ($P < 0.02$) for lactation weight loss; parity 2 sows lost a greater amount of weight when late gestation feeding level was increased, whereas similar weight losses were observed between treatments

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[2] Pig Improvement Company (PIC), Hendersonville, TN.

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in parity 3 and older sows. Total born and live born numbers and total litter weight were greater ($P < 0.006$) in parity 2 sows than in parity 3 and older sows. A late gestation feeding level × parity interaction was observed ($P < 0.01$) for average weight of both total born and live born pigs because of an increase in piglet birth weight as parity 2 sows were supplemented with 2 lb of additional feed in late gestation with a slight numeric decrease in parity 3 and older sows. Additional feed in late gestation increased ($P < 0.02$) average piglet weaning weight, with a large improvement observed in parity 2 sows. Total number weaned and total weight at weaning were increased ($P < 0.004$) in parity 2 sows compared with parity 3 and older sows. This trial indicates that adding extra feed to late gestation diets increased feed cost with no benefit in sow performance. In gilts, conception rate and litter weaning weight were increased during the second parity, but no other benefits were found.

Key words: gestation feeding, lactation, sow

Introduction

Implementing efficient feeding strategies for gestating sows is an important management practice needed for production of offspring as well as maintenance of sow health and longevity. As feed prices increase, it is important to mange sow feeding levels to meet the needs of animals without incurring unnecessary cost. Researchers from Kansas State University (K-State) have developed strategies for managing sow feeding levels based on individual sow weight and backfat thickness (Young et al., 2003[4]). Although nutrient requirements for fetal development are low during the first two-thirds of gestation, requirements increase exponentially in late gestation as fetal growth increases. Research has shown that increasing nutrients during late gestation can increase piglet birth weight and thereby increase weaning weight. However, other research trials have indicated little benefit to increasing feed intake in late gestation. Therefore, the objective of this trial was to observe the effects of increasing late gestating feeding levels on sow and litter performance over 2 lactation periods.

Procedures

The protocol used in this experiment was approved by the K-State Institutional Animal Care and Use Committee. The study was conducted at the K-State Swine Teaching and Research Center in Manhattan, KS.

A total of 108 gilts and sows (PIC 1050) and their litters were used in this study over 2 lactation periods. Treatments were structured as a 2 × 2 factorial design with main effects of feeding level (0 or 2 lb of additional feed from d 90 to farrowing) and parity group (gilts and sows). The trial was conducted for 2 successive parities. Thus, data are presented comparing gilts to sows for the first farrowing and then comparing parity 2 vs. parity 3 and greater for the second farrowing. Treatments were allotted to gilts and sows in a generalized block design with farrowing group as the blocking factor. Four farrowing groups of approximately 27 gilts and sows were used to obtain the 108 gilts and sows used for the trial.

On d 35 of gestation, gilts and sows were confirmed pregnant using real-time ultrasound and designated as candidates for inclusion in the study. Sows were primarily

[4] Young et al., Swine Day 2003, Report of Progress 920, pp. 19-32.

second and third parity with a few fourth parity sows. At the time of assignment, gilts and sows were weighed and backfat thickness was measured. Backfat thickness was measured at the last rib approximately 4 in. off the midline. From these measurements, sow feeding levels were assigned on the basis of previous research to meet the nutritional needs of the gestating female as outlined by the NRC (1998[5]) and to achieve an optimal body condition and backfat thickness. Feed box accuracy was determined to ensure appropriate gestation feeding levels.

On d 90, gilts and sows were weighed and late gestation feeding level treatments were assigned to animals and balanced for sow weight and backfat thickness. On d 112 of gestation, gilts and sows were weighed, backfat thickness was measured, and animals were moved to the farrowing facility. From d 112 until farrowing, gilts and sows remained on the same feeding level as offered from d 90 to 112. Upon farrowing, piglets were weighed and processed and mummified pigs and stillbirths were recorded. From these records, the number of pigs, total weight, and average weight were calculated for total born and live born piglets. Sows were weighed and backfat thickness was determined at farrowing. Cross-fostering was performed within 24 h after farrowing to standardize litter size within late gestation feeding level treatments. Total pigs, average birth weight, and total birth weight were also calculated for the piglets remaining on the sow at cross-fostering. Piglets were individually weighed at weaning to determine number weaned, average weaning weight, total litter weight, piglet weight gain, piglet daily weight gain, litter weight gain, and preweaning mortality. Gilts and sows were weighed and backfat thickness was measured at weaning. Upon weaning and re-breeding of the sows, weight and backfat thickness were used to set gestation feeding levels for subsequent performance. Days to return to estrus was determined on the basis of the first mating. Conception rate was calculated as number of sows confirmed pregnant on d 28 divided by number of sows bred. Gilts were then considered parity 2 (P2) sows and analyzed separately from parity 3 and greater (P3+) sows. Similar to the first gestation and lactation period, sow weight, backfat thickness measurements, and litter performance criteria were determined at similar days of pregnancy and lactation.

The composition of the both the gestation and lactation diets is shown in Table 1. The gestation and lactation diets were formulated to contain 0.66% and 1.10% total lysine, or 0.57% and 0.97% standardized ileal digestible lysine, respectively. For the first 3 d after farrowing, sows were gradually stepped up on feed, and after d 3, all sows were allowed ad libitum access to the lactation diet. Lactation sow feed disappearance was determined weekly to calculate ADFI and total feed intake for lactating sows. Temperature in the farrowing facility was maintained at a minimum of 68°F, and supplemental heat was provided to the piglets with heat lamps. On the basis of sow weight and backfat thickness measurements, changes in weight and backfat level were determined for each of the farrowing periods. Sow and litter weight gain in lactation were determined and used with total lactation feed intake to determine a ratio of feed intake to sow and litter weight gain. Finally, feed costs were determined for each sow gestation and lactation period.

Data were analyzed as a generalized block design with parity designation and late gestation feeding level as fixed effects and farrowing group as a random effect using the

[5] NRC. 1998. Nutrient Requirements of Swine. 10th ed. Natl. Acad. Press, Washington, DC.

MIXED procedure in SAS (SAS Institute, Inc., Cary, NC). Interactions between the fixed treatment effects and farrowing groups were pooled together with the error term because no significant interaction effects with farrowing group were detected. For all responses, sow or litter was used as the experimental unit.

Results

For the initial gestation and lactation period, no feeding level × parity interactions or feeding level differences were observed ($P > 0.29$) for backfat thickness or sow weight measurements on any particular day of gestation or lactation (Table 2). Gilts had increased ($P < 0.001$) backfat depth on d 35, 90, and 112 of gestation and at farrowing compared with sows. Gilts also had increased ($P < 0.001$) lactation backfat loss compared with sows. Sows were heavier ($P < 0.02$) on d 35 of gestation, after farrowing, and at weaning compared with gilts. Gilts and sows that were fed 2 lb of extra feed in late gestation had increased ($P < 0.001$) weight gain from d 90 to 112 compared with those that did not have their feeding level increased. Gilts had increased ($P < 0.001$) lactation weight loss (farrowing weight - weaning weight) and decreased ($P < 0.001$) weight change from d 90 to either farrowing or weaning comparison with sows.

For the initial lactation, feeding level × parity interactions were observed ($P < 0.04$) for ADFI and total feed intake for each week in lactation as well as for the overall lactation period (Table 3). This interaction was due to an increase in lactation feed intake when sow intake was increased in late gestation and a decrease in lactation feed intake when gilt intake was increased in late gestation. The interaction was of greater magnitude in wk 1 than in other weeks. Sows had greater ($P < 0.001$) ADFI each week and greater lactation feed intake during wk 2 and 3 and overall than gilts. Total gestation feed intake, gestation feed cost, and overall feed cost increased ($P < 0.04$) with increasing the late gestation feeding level. However, a feeding level × parity interaction was observed ($P < 0.001$) for lactation feed cost. Increasing late gestation feeding level decreased lactation feed cost in gilts because of the decrease in lactation feed intake, whereas a numeric increase in lactation feed cost was found in sows as feeding level increased in late gestation. Sows also had increased ($P < 0.001$) feed costs during gestation, lactation, and overall than gilts

For litter performance during the first lactation period, a feeding level × parity interaction was observed ($P < 0.04$) for average weight of total born and live born piglets (Table 4). Increased late gestation feeding level led to increased piglet birth weight in gilt litters and decreased piglet weight in sow litters. Gilts also had increased ($P < 0.02$) number and total weight of the total born, live born, and number after fostering and had an increased ($P < 0.05$) percentage of mummified pigs compared with sows. No difference was observed ($P > 0.39$) in the percentage of stillbirths. Gilts weaned larger ($P < 0.002$) litters and had increased ($P < 0.03$) total litter weaning weight and litter weight gain comparison with sows. However, providing gilts and sows with increased levels of late gestation feed offered no benefit ($P > 0.69$) in number weaned, weaning weight, piglet weight gain, or litter weight gain compared with maintaining a constant gestation feeding level. Sow and litter gain also increased ($P < 0.03$) in sows as compared to gilts. Upon weaning, sows had decreased ($P < 0.002$) days to estrus compared with gilts, and a late gestation feeding level × parity interaction was detected for conception rate. Gilts that received increased levels of late gestation feed had a

greater conception rate than those maintained on the same level, whereas a decrease in conception rate was observed when sows received increased late gestation feed.

All females remained on the original late gestation feeding level treatment for the subsequent gestation and lactation period. The sharp difference in conception rate of gilts between different late gestation feeding levels generated a substantial difference in number of gilts that could be used for subsequent performance (Table 5).

For the subsequent gestation and lactation period, no differences in sow weight and backfat thickness were detected ($P > 0.11$) between late gestation feeding levels or parity. However, a level × parity interaction was detected ($P < 0.005$) for lactation backfat loss. This interaction was reflective of an increase in backfat loss in P2 sows as the late gestation feeding level was increased and a decrease in backfat loss in P3+ sows with increasing late gestation feeding level. In addition, P3+ sows were heavier ($P < 0.02$) at farrowing and at weaning that P2 sows. A feeding level × parity interaction was detected ($P < 0.02$) for lactation weight loss; P2 sows lost a greater amount of weight when late gestation feeding level was increased, and similar weight losses were observed in P3+ sows at both late gestation feeding levels. However, increasing late gestation feeding levels increased ($P < 0.01$) weight gain from d 90 of gestation to either d 112 or farrowing in both P2 and P3+ sows.

For subsequent lactation feed intake, no interactions or feeding level differences were observed ($P > 0.09$) for total or daily sow feed intake (Table 6). In addition, P2 sows had decreased ($P < 0.05$) total and daily feed intake for wk 1 compared with P3+ sows and tended to have decreased ($P < 0.09$) overall total and daily lactation feed intake. The addition of increased levels of late gestation feed also increased ($P < 0.004$) gestation feed intake, gestation feed cost, and total feed cost.

Total born, live born, average pig weight, and total litter weight were increased ($P < 0.006$) in P2 sows compared with P3+ sows (Table 7). A late gestation feeding level × parity interaction was observed ($P < 0.01$) for average weight of both total born and live born pigs, and a similar trend was observed ($P < 0.07$) at cross-fostering. These interactions were reflective of increased piglet birth weight as P2 sows were fed the additional 2 lb of feed in late gestation, and a slight numeric decrease in P3+ sows. The cause of this increase in average weight could be related to the supplementation of extra feed in late gestation or it may be reflective of the numeric decrease in the number of pigs born. Despite the interaction, providing additional feed in late gestation tended to increase ($P < 0.07$) average pig weight for total born, live born, and those remaining at cross-fostering. Average pig weight at weaning also increased ($P < 0.02$) with supplementation of additional feed in gestation, with a large improvement observed in P2 sows. Total number weaned and total weight at weaning were increased ($P < 0.004$) in P2 sows compared with P3+ sows. Daily and overall piglet weight gain was increased ($P < 0.04$) with the addition of supplemental feed in late gestation, and daily and overall litter weight gain was increased ($P < 0.02$) in P2 sows compared with P3+ sows.

Discussion

This study has shown several important traits that should be evaluated when considering increasing late gestation feeding levels. The initial farrowing showed that increasing

the gestation feeding level for the last 3 wk of gestation resulted in an increase in weight gain of sows and gilts during this period but did not translate into an increase in litter weight and resulted in no difference in pig weaning weight. However, increasing the feeding level for gilts that were adequate or marginally excessive in their level of backfat at d 90 of gestation resulted in decreased lactation feed intake. Regardless of the late gestation feeding level, gilts lost an excessive amount of backfat thickness (approximately 5 mm) during the first lactation period. However, gilts that received increased feed in late gestation had better conception rates than those remaining on the original level. Subsequently, the P2 sows (previously gilts) that received additional feed in late gestation had increased average piglet birth and weaning weight during the subsequent lactation period. For the most part, there was no performance benefit to increasing late gestation feeding level in either lactation period for older sows. Increasing late gestation feeding level increased sow feed costs by $3.50 to $5.00 per sow per gestation and lactation combined periods. This trial indicates that adding extra feed to late gestation diets increased feed cost with no benefit in sow performance. In gilts, conception rate and litter weaning weight were increased during the second parity, but no other benefits were found.

Table 1. Composition of diets (as-fed basis)[1]

Ingredient, %	Gestation	Lactation
Corn	80.75	65.28
Soybean meal (46.5% CP)	14.95	30.80
Monocalcium P (21% P)	1.70	1.45
Limestone	1.35	1.20
Salt	0.50	0.50
Vitamin premix	0.25	0.25
Trace mineral premix	0.15	0.15
Sow vitamin add pack	0.25	0.25
Phytase[2]	0.10	0.10
Total	100	100
Calculated analysis		
ME, kcal/lb	1,482	1,485
CP, %	13.8	19.9
Total lysine, %	0.66	1.10
SID[3] amino acids, %		
Lysine	0.57	0.97
Threonine	0.43	0.65
Methionine	0.21	0.29
Tryptophan	0.13	0.21
Isoleucine	0.48	0.75
Leucine	1.22	1.60
Ca, %	0.90	0.85
P, %	0.69	0.70
Available P, %[4]	0.52	0.48
Diet cost, $/ton[5]	194.61	228.24

[1] A total of 108 gilts and sows (PIC 1050) were used over 2 gestation and farrowing periods to determine the effect of providing an extra 2 lb of gestation diet in late gestation.
[2] Provided 272 phytase units per pound of diet.
[3] Standardized ileal digestible.
[4] Phytase provided 0.11% and 0.10% available P to the gestation and lactation diets, respectively.
[5] Diet costs were based on corn at $3.50/bu and soybean meal at $350/ton with a $12/ton processing and delivery fee.

Table 2. Effects of late gestation feeding level and parity designation on sow weight and backfat[1]

	Gilt		Sow			Probability, *P* <		
Late gestation feeding level[2]:	Normal	+ 2 lb	Normal	+ 2 lb	SEM	Level × Parity	Parity	Level
no.	22	21	33	32	---	---	---	---
Gestation length, d	114.9	115.4	115.5	116.0	---	---	---	---
Lactation length, d	20.8	20.6	19.9	19.4	---	---	---	---
Backfat measurements, mm[3]								
Gestation d 35	20.0	20.1	13.5	13.7	0.78	0.94	0.001	0.83
Gestation d 90	20.3	20.4	14.9	14.9	0.91	0.96	0.001	0.93
Gestation d 112	19.0	19.9	14.9	15.3	0.77	0.70	0.001	0.39
Farrowing	18.4	18.7	14.8	15.4	0.69	0.77	0.001	0.51
Weaning	15.1	14.5	13.4	13.9	0.75	0.38	0.09	0.94
Lactation backfat loss, mm[4]	3.4	4.3	1.3	1.4	0.57	0.30	0.001	0.22
Weights, lb								
Gestation d 35	415.8	412.8	432.9	434.7	11.42	0.76	0.02	0.94
Gestation d 90	497.0	498.2	506.1	504.7	13.36	0.89	0.40	0.99
Gestation d 112	528.9	542.0	541.8	551.5	13.25	0.87	0.27	0.25
Farrowing	485.4	491.3	520.0	527.8	12.57	0.92	0.001	0.44
Weaning	455.4	450.0	503.1	512.3	14.51	0.40	0.001	0.83
Weight changes, lb								
Farrowing to weaning	-30.1	-41.2	-16.7	-15.3	4.79	0.12	0.001	0.23
d 90 to 112	32.2	43.9	35.5	46.6	4.60	0.92	0.36	0.001
d 90 to farrowing	-10.9	-6.3	13.3	22.5	4.52	0.57	0.001	0.09
d 90 to weaning	-41.1	-47.3	-3.4	7.2	5.91	0.12	0.001	0.69

[1] A total of 108 gilts and sows (PIC 1050) were used over 2 farrowings to determine the effect of increasing feeding level in late gestation.
[2] Late gestation feeding levels were set at d 90 of gestation. Normal = the same level as designated at d 35 by BW and last rib backfat; +2 lb = 2 lb more than the d 35 level.
[3] Backfat measurements were determined by averaging both sides at the last rib approximately 4 in. off the midline.
[4] Lactation backfat loss = Farrowing backfat - Weaning backfat.

Table 3. Effects of late gestation feeding level and parity designation on lactation feed intake[1]

	Gilt		Sow			Probability, *P* <		
Late gestation feeding level[2]:	Normal	+ 2 lb	Normal	+ 2 lb	SEM	Level × Parity	Parity	Level
no.	22	21	33	32	---	---	---	---
Gestation d 35 feed amount, lb/d	4.6	4.5	5.7	5.7	---	---	---	---
Gestation d 90 feed amount, lb/d	4.6	6.5	5.7	7.7	---	---	---	---
Total gestation feed intake, lb[3]	522.6	573.7	657.8	708.2	16.41	0.99	0.001	0.001
Lactation ADFI, lb								
wk 1	9.9	6.8	10.6	11.6	0.89	0.001	0.001	0.03
wk 2	12.1	10.5	13.7	14.1	0.46	0.007	0.001	0.09
wk 3	13.2	12.1	14.0	14.5	0.81	0.04	0.001	0.43
Overall	11.7	10.0	12.9	13.5	0.49	0.001	0.001	0.10
Lactation total intake, lb								
wk 1	65.8	47.9	61.6	62.8	4.87	0.02	0.17	0.03
wk 2	84.9	73.7	96.1	98.7	3.25	0.007	0.001	0.09
wk 3	92.7	85.0	97.9	101.3	5.66	0.04	0.001	0.43
Overall	243.9	207.3	255.1	262.4	9.37	0.004	0.001	0.06
Feed cost, $/female[4]								
Gestation	50.85	55.82	64.01	68.91	1.597	0.99	0.001	0.001
Lactation	27.83	23.66	29.12	29.95	1.070	0.004	0.001	0.06
Total feed[5]	78.74	79.52	93.08	98.83	1.959	0.11	0.001	0.04

[1] A total of 108 gilts and sows (PIC 1050) were used over 2 farrowings to determine the effect of increasing feeding level in late gestation.
[2] Late gestation feeding levels were set at d 90 of gestation. Normal = the same level as designated at d 35 by BW and last rib backfat; +2 lb = 2 lb more than the d 35 level.
[3] Total gestation feed intake assumes that the same level as set on d 35 was used from d 0 to 35.
[4] Feed costs are based on corn at $3.50/bu and soybean meal at $350/ton.
[5] Total feed cost combines both gestation and lactation feed intake.

Table 4. Effects of late gestation feeding level and parity designation on piglet performance[1]

	Gilt		Sow			Probability, *P* <		
Late gestation feeding level[2]:	Normal	+ 2 lb	Normal	+ 2 lb	SEM	Level × Parity	Parity	Level
no.	22	21	33	32	---	---	---	---
Total born								
no.	14.6	14.0	11.9	12.9	0.82	0.20	0.004	0.70
avg. wt, lb[3]	3.10	3.29	3.38	3.14	0.130	0.04	0.55	0.80
Total wt, lb[3]	44.3	43.7	38.3	39.0	2.02	0.74	0.004	0.99
Mummies, %	1.86	3.95	1.25	0.84	1.075	0.18	0.05	0.36
Stillbirths, %	3.40	3.35	4.53	4.25	1.538	0.93	0.40	0.89
Live born								
no.	13.8	12.9	11.2	12.3	0.73	0.13	0.02	0.82
avg. wt, lb	3.13	3.32	3.39	3.15	0.127	0.04	0.67	0.78
Total wt, lb	43.0	42.2	36.8	37.4	1.93	0.67	0.002	0.96
Cross-fostering								
no.	12.5	12.4	11.2	11.5	0.34	0.58	0.001	0.63
avg. wt, lb[4]	3.22	3.25	3.28	3.18	0.072	0.18	0.93	0.53
Total wt, lb[4]	40.0	40.4	36.6	36.5	0.98	0.79	0.001	0.89
Weaning								
no.	11.5	11.5	10.6	10.5	0.32	0.91	0.002	0.98
avg. wt, lb	13.40	13.35	13.45	13.28	0.315	0.82	0.98	0.70
Total wt, lb	152.6	153.7	141.6	139.4	4.60	0.69	0.003	0.89
Piglet wt gain, lb								
Daily	0.48	0.48	0.50	0.50	0.018	0.99	0.10	0.97
Overall	10.16	10.08	10.19	10.11	0.305	0.99	0.92	0.77
Litter wt gain, lb								
Daily	5.43	5.47	5.27	5.31	0.215	0.99	0.36	0.83
Overall	112.6	113.2	105.0	103.0	4.40	0.72	0.03	0.86
Preweaning mortality	7.35	7.05	5.65	8.28	2.117	0.40	0.90	0.50
Sow and litter wt gain, lb[5]	82.5	71.9	88.2	87.6	6.66	0.28	0.03	0.23
Feed intake/sow and litter wt gain[6]	3.3	1.9	3.0	3.5	0.57	0.07	0.21	0.34
Subsequent performance								
Wean to breed, d	5.15	4.71	4.47	4.40	0.171	0.24	0.002	0.10
Conception rate, %	77.27	95.24	96.97	87.50	6.521	0.03	0.32	0.48

[1] A total of 108 gilts and sows (PIC 1050) were used over 2 farrowings to determine the effect of increasing feeding level in late gestation.
[2] Late gestation feeding levels were set at d 90 of gestation. Normal = the same level as designated at d 35 by BW and last rib backfat; +2 lb = 2 lb more than the d 35 level.
[3] Weights of total born reflect only pigs born alive or stillbirths and not mummified pigs.
[4] Cross-fostering weights reflect the total and mean birth weights of piglets that survived until fostering, which occurred at approximately 24 h.
[5] Sow and litter wt gain = (Sow weaning wt - Sow farrowing wt) + (litter wt gain).
[6] Feed intake/sow and litter wt gain= (Total lactation sow feed intake)/(Sow and litter wt gain during lactation).

Table 5. Effects of late gestation feeding level and parity designation on sow weight and backfat of subsequent performance[1]

	Parity 2		Parity 3+			Probability, P <		
Late gestation feeding level[2]:	Normal	+ 2 lb	Normal	+ 2 lb	SEM	Level × Parity	Parity	Level
no.	14	19	26	25	---	---	---	---
Gestation length, d	115.9	115.9	115.8	116.3	---	---	---	---
Lactation length, d	19.2	19.5	19.8	19.4	---	---	---	---
Backfat measurements, mm[3]								
Gestation d 90	15.4	16.5	14.7	15.5	1.32	0.88	0.32	0.25
Gestation d 112	15.2	16.8	15.0	16.1	1.34	0.77	0.63	0.12
Farrowing	14.8	16.2	14.9	15.8	1.35	0.79	0.87	0.20
Weaning	14.5	14.4	13.7	15.5	1.25	0.22	0.90	0.27
Lactation backfat loss, mm[4]	0.45	1.94	1.15	0.14	0.67	0.005	0.21	0.58
Weights, lb								
Gestation d 90	492.8	510.2	520.1	528.5	19.2	0.72	0.08	0.30
Gestation d 112	547.0	565.9	560.9	577.8	21.0	0.95	0.35	0.19
Farrowing	516.8	533.3	551.2	561.8	19.6	0.82	0.02	0.29
Weaning	504.5	501.6	531.5	549.4	18.8	0.40	0.003	0.54
Weight changes, lb								
Farrowing to weaning	-11.6	-31.5	-16.2	-12.6	7.03	0.02	0.12	0.08
d 90 to 112	40.1	55.3	40.4	49.8	3.56	0.20	0.27	0.001
d 90 to farrowing	8.8	23.0	25.7	33.9	6.56	0.48	0.002	0.01
d 90 to weaning	-1.3	-8.2	10.5	20.9	9.59	0.17	0.002	0.78

[1] A total of 88 of the original 108 gilts and sows (PIC 1050) were used to determine the effects of late gestation sow feeding level on a subsequent lactation period.

[2] Late gestation feeding treatments were set at d 90 of gestation. Normal = the same level as designated at breeding; +2 lb = 2 lb higher than that particular level.

[3] Backfat measurements were determined by averaging both sides at the last rib approximately 4 in. off the midline.

[4] Lactation backfat loss = Farrowing backfat - Weaning backfat.

Table 6. Effects of late gestation feeding level and parity designation on lactation feed intake of subsequent farrowing[1]

	Parity 2		Parity 3+			Probability, $P <$		
Late gestation feeding level[2]:	Normal	+ 2 lb	Normal	+ 2 lb	SEM	Level × Parity	Parity	Level
no.	14	19	26	25	---	---	---	---
Gestation d 0 feed amount, lb/d	5.7	5.6	5.7	5.8	---	---	---	---
Gestation d 90 feed amount, lb/d	5.7	7.6	5.7	7.8	---	---	---	---
Total gestation feed intake, lb	663.5	701.0	659.8	723.8	16.95	0.34	0.50	0.001
Lactation ADFI, lb								
wk 1	11.2	11.4	11.8	13.1	0.86	0.30	0.05	0.18
wk 2	14.1	13.4	13.8	14.5	0.72	0.13	0.46	0.96
wk 3	15.9	15.0	16.0	16.6	0.91	0.21	0.14	0.78
Overall	14.0	13.4	14.0	14.9	0.66	0.10	0.09	0.73
Lactation total intake, lb								
wk 1	57.8	61.9	69.9	71.7	7.55	0.81	0.03	0.54
wk 2	98.9	94.1	96.4	101.5	5.04	0.13	0.46	0.96
wk 3	111.3	104.9	112.3	116.4	6.37	0.21	0.14	0.78
Overall	267.6	261.3	278.3	289.3	15.52	0.39	0.06	0.82
Feed cost, $/female[3]								
Gestation	64.56	68.21	64.20	70.43	1.649	0.34	0.50	0.001
Lactation	30.54	29.82	31.76	33.01	1.344	0.39	0.06	0.82
Total feed[4]	95.14	98.03	95.98	103.43	2.195	0.20	0.08	0.004

[1] A total of 88 of the original 108 gilts and sows (PIC 1050) were used to determine the effects of late gestation sow feeding level on a subsequent lactation period.
[2] Late gestation feeding treatments were set at d 90 of gestation. Normal = the same level as designated at breeding; +2 lb = 2 lb higher than that particular level.
[3] Feed costs are based on corn at $3.50/bu and soybean meal at $350/ton.
[4] Total feed cost combines both gestation and lactation feed intake.

Table 7. Effects of late gestation feeding level and parity designation on piglet performance in a subsequent litter[1]

	Parity 2		Parity 3+			Probability, $P <$		
Late gestation feeding level[2]:	Normal	+ 2 lb	Normal	+ 2 lb	SEM	Level × Parity	Parity	Level
no.	14	19	26	25	---	---	---	---
Total born								
no.	15.1	13.5	12.3	12.2	0.89	0.29	0.006	0.28
avg. wt, lb[3]	3.17	3.69	3.18	3.10	0.180	0.01	0.02	0.07
Total wt, lb[3]	47.1	48.4	36.6	37.2	3.05	0.87	0.001	0.65
Mummies, %	0.94	1.26	1.71	0.77	0.796	0.35	0.84	0.65
Stillbirths, %	6.60	4.26	6.07	6.18	1.960	0.46	0.68	0.50
Live born								
no.	14.0	12.7	11.2	11.4	1.07	0.27	0.004	0.42
avg. wt, lb	3.17	3.71	3.21	3.13	0.18	0.01	0.03	0.05
Total wt, lb	44.6	46.5	34.6	35.2	3.17	0.75	0.001	0.53
Cross-fostering								
no.	12.0	11.8	11.1	11.4	0.55	0.57	0.08	0.87
avg. wt, lb[4]	3.28	3.65	3.21	3.21	0.15	0.07	0.009	0.06
Total wt, lb[4]	39.2	43.0	35.3	36.6	2.17	0.39	0.001	0.07
Weaning								
no.	11.2	11.2	10.2	10.1	0.56	0.81	0.004	0.82
avg. wt, lb	13.05	14.52	13.46	13.80	0.58	0.14	0.67	0.02
Total wt, lb	146.8	163.0	136.3	138.4	8.86	0.22	0.004	0.11
Piglet wt gain, lb								
Daily	0.51	0.56	0.52	0.55	0.02	0.46	0.89	0.02
Overall	9.77	10.87	10.25	10.59	0.51	0.24	0.77	0.04
Litter wt gain, lb								
Daily	5.58	6.13	5.09	5.25	0.35	0.38	0.004	0.12
Overall	107.57	120.15	101.07	101.68	7.81	0.24	0.02	0.19
Preweaning mortality, %	6.09	5.16	7.26	11.02	3.50	0.30	0.13	0.53
Sow and litter wt gain, lb[5]	95.0	87.8	85.1	89.7	8.74	0.31	0.48	0.82
Feed intake/sow and litter wt gain[6]	2.95	3.04	3.65	3.63	0.48	0.85	0.04	0.91

[1] A total of 88 of the original 108 gilts and sows (PIC 1050) were used to determine the effects of late gestation sow feeding level on a subsequent lactation period.
[2] Late gestation feeding treatments were set at d 90 of gestation. Normal = the same level as designated at breeding; +2 lb = 2 lb higher than that particular level.
[3] Weights of total born reflect only pigs born alive or stillbirths and not mummified pigs.
[4] Cross-fostering weights reflect the total and mean birth weights of piglets that survived until fostering, which occurred at approximately 24 h.
[5] Sow and litter wt gain during lactation = (Sow weaning wt - Sow farrowing wt) + litter wt gain.
[6] Feed intake/sow and litter wt gain = (Total lactation sow feed intake)/(Sow and litter wt gain during lactation).