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COMPARISON OF SOW AND GILT PERFORMANCE AS AFFECTED BY GESTATION ENERGY INTAKE

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Gestation energy needs of sows include maintenance as well as tissue growth associated with pregnancy and fetal development. Gilts have the additional demands of body tissue growth but less maintenance needs because of smaller body size. Differences in total daily energy needs between sows and gilts have not been resolved. Results of three trials conducted to compare energy needs for specific gestation gains for sows and gilts were reported last year (Swine 84-10). These results suggested the need for approximately 870 Kcal of additional metabolizable energy (ME) (.6 lb of feed) for gilts with the desired gains of .5 lb/day for sows and .9 lb/day for gilts. The trial reported herein was designed to evaluate comparative performance of sows and gilts fed a wide range of ME levels.

(Key Words: Gestation, Metabolizable Energy, Sows, Gilts, Performance.)

Experimental Procedure

Nineteen mature sows and 15 first litter sows (gilts) were allotted to three dietary energy groups approximately 30 days after breeding. Allotment was on the basis of weight and breeding date within age groups. The dietary treatments were as follows:

Treatment 1 - 4500 Kcal ME/day provided by 3.2 lb of diet
Treatment 2 - 6000 Kcal ME/day provided by 4.1 lb of diet
Treatment 3 - 9000 Kcal ME/day provided by 6.1 lb of diet

Sows in each treatment group were fed a different diet formulated to supply 125% of all NRC minimum recommended nutrient levels except energy. Feeding level was controlled by individual feeding stalls. Composition of the diets is shown in table 1.

Sows were brought into the farrowing barn at 110 days of gestation. Four pounds of a 14% protein lactation diet were fed until parturition and then the sows were allowed ad libitum feed consumption. Throughout the trial, sow weights were obtained, backfat measurements were taken and pig numbers and weights recorded.

Table 1. Composition of Experimental Diets (%)

Treatment	1	2	3
Feeding Level	3.2	4.1	6.1
ME, Kcal/day	4500	6000	9000
Ground corn	66.10	79.50	93.90
Soybean meal	28.80	16.40	3.25
Dicalcium phosphate	3.00	2.20	1.10
Limestone	1.14	1.00	.95
Salt, white	.50	.40	.30
Premix[a]	.50	.50	.50
	100.00	100.00	100.00

[a] Minerals and vitamins as well as other nutrients calculated to be supplied at 125% NRC recommended minimum daily levels.

Lactation feed consumption was recorded. After weaning at 21-28 days after parturition, days to return to estrus was also recorded. The trial was conducted in the summer months and the farrowing period was late August and September.

Results

Table 2 summarizes the effects of energy levels averaged across sow-gilt groups for sow weights, backfat and lactation feed consumption. Gestation weight gain for the 4500 and 6000 Kcal treatment groups was 45 and 48 lbs, respectively. The 9000 Kcal group gained significantly more weight (77 lb) than the lower energy treatment groups. These weight gains were from allotment post-breeding and thus do not represent total gestation gains. Sow post-farrowing and weaning weights were similar. However, weight loss during lactation approached significance ($P<.10$) with the highest weight loss (21 lb) occurring for the 9000 Kcal group which was the group which had the greatest gestation gain. Rebreeding weights did not differ statistically due to gestation energy levels.

Backfat changes during gestation were small and nonsignificant. All groups lost backfat during gestation. A difference of 2.8 mm of backfat existed between the 6000 and 9000 Kcal group after lactation. At allotment the difference was 2.1 mm. Daily feed consumption during lactation was varied from 14.2 to 17.2 lbs/day and was not significantly different among treatment groups.

Table 2. Comparison of Weights and Backfats of Sows and Gilts Due to Gestation Energy Levels

Gestation Feeding Level, lb Daily Energy Consumption, ME	3.2 4500	4.1 6000	6.1 9000	
No. of sows	12	9	13	
Allotment weight, lb	378	392	378	
110 day weight, lb	423	440	455	
Gestation weight change	45	48	77	**
Post-farrowing weight, lb	391	406	418	
Weaning weight, lb	388	395	397	
Lactation weight change, lb	- 3	- 11	- 21	
Rebreeding weight, lb	358	373	378	
Allotment backfat, mm	24.0	22.0	24.1	
110 day backfat, mm	22.4	22.4	24.9	
Gestation backfat change, mm	- 1.6	.4	.8	
Weaning backfat, mm	19.1	18.7	21.5	*
Lactation backfat change, mm	- 3.3	- 3.7	- 3.4	
Total lactation feed consumption, lb	352	379	340	
Daily lactation feed consumption, lb	14.7	17.2	14.2	

* P<.05.
** P<.01.

Table 3 summarizes the same criteria for parity averaged across energy levels. Significant weight differences existed between sows and gilts and the magnitude of the differences was similar at all stages of the reproductive cycle.

Gilts were significantly fatter at time of allotment but lost this advantage by the end of gestation. Higher fat losses (nonsignificant) during lactation by gilts resulted in similar weaning backfat levels between gilts and sows. Feed consumption during lactation was significantly higher for sows than for gilts, with daily feed levels of 17.3 and 12.5, respectively.

Table 3. Comparison of Weights and Backfat of Gilts and Sows Averaged Across Gestation Energy Treatments

	Gilts	Sows	
No. of sows	15	19	
Allotment weight, lb	346	420	**
110 day weight, lb	396	482	**
Gestation gain, lb	50	62	
Post-farrowing weight, lb	367	443	**
Weaning weight, lb	345	441	**
Lactation weight change, lb	- 22	- 2	
Rebreeding weight, lb	326	413	**
Allotment backfat, mm	24.8	21.9	*
110 day backfat, mm	23.9	22.6	
Gestation backfat change, mm	- .9	+ .3	
Weaning backfat, mm	19.9	19.6	
Lactation backfat change, mm	- 3.9	- 2.9	
Total lactation feed consumption, lb	300	414	**
Daily lactation feed consumption, lb	12.5	17.3	**

* P<.05.
** P<.01.

Tables 4 and 5 summarize the reproduction information by treatments and by parity. No differences in number of pigs or pig and litter weights at birth or at weaning were observed. Sows and gilts performed similarly and gestation energy level had little effect on pig production. Days to return to estrus was significantly longer (8.1 vs 4.7) for gilts compared to sows. However, energy level ranging from 4500 to 9000 Kcal/day had no effect on this parameter.

No interactions between parity and gestation energy levels were observed. Thus gilts and sows performed similarly when receiving the same energy levels. It appears that under the conditions of this experiment during the summer months, 4500 Kcal of ME was sufficient for either sows or gilts.

Summary

A total of 34 gilts and sows were used to evaluate daily ME levels of 4500, 6000 and 9000 Kcal during gestation. The 9000 Kcal group gained significantly more weight during gestation and lost more weight during lactation than the lower energy sows. Backfat changes were not affected by treatment. Weight differ-

ences existed between gilts and sows and the magnitude of difference remained similar during the trial. Gilts were fatter than sows at allotment but similar to sows at the end of lactation. Lactation feed consumption was similar among treatment groups but sows consumed more feed than gilts. Sows returned to estrus sooner than did gilts. No interactions between parity and energy levels were observed.

Table 4. Comparison of Farrowing Performance of Sows and Gilts Due to Energy Levels

Gestation Feeding Level, lb Daily Energy Consumption, ME	3.2 4500	4.1 6000	6.1 9000
No. of sows	12	9	13
No. pigs born alive	10.2	10.0	10.3
Litter birth weight, lb	33.3	34.9	35.1
Avg pig birth weight, lb	3.28	3.56	3.43
No. pigs weaned	8.4	8.8	9.1
Litter weaning weight, lb	116.1	131.4	126.2
Avg pig weaning weight, lb	14.1	15.5	14.1
Days to return to estrus	5.5	6.4	7.3

Table 5. Comparison of Farrowing Performance of Sows and Gilts Averaged Across Gestation Energy Treatments

	Gilts	Sows	
No. of sows	15	19	
No. pigs born alive	9.5	10.8	
Litter birth weight, lb	33.1	35.8	
Avg pig birth weight, lb	3.54	3.32	
No. pigs weaned	8.2	9.3	
Litter weaning weight, lb	113.1	136.1	
Avg pig weaning weight, lb	14.5	14.6	
Days to return to estrus	8.1	4.7	**

** P<.01.