

The Influence of Two Levels of Feed Intake During Gestation on the Reproductive Performance of Gilts

J. C. Hillier, Marvin Heeney, and Ray Washam

The nutrition of the bred gilt during gestation has been shown to have a marked influence on her reproductive performance. Specific nutrient deficiencies have been demonstrated. This test was designed to study the influence of level of energy intake with protein, mineral, and vitamin requirements at recommended daily levels.

The compositions of the gestation rations tested are shown in Table 1. Ration one was a 14 percent protein ration that has been used in gestation studies with gilts for the past several years. Ration two was calculated to supply the same daily protein, mineral, and vitamin amounts when fed at the rate of 70 percent of the amount of ration one. Only the daily energy allowance was limited in group two below

Table 1. — Gestation Rations.

Ration Number:	One	Two
Level of daily feed intake (lbs.)		
1960	7.0	4.9
1961	6.3	4.5
Percentage composition of ration		
Milo, Western Yellow, ground	82.08	63.91
Soybean meal, 44%	2.80	9.70
Tankage, 60%	2.80	9.70
Dehy. alfalfa meal, 17%	10.00	14.30
Dicalcium phosphate	1.10	1.30
Calcium carbonate	0.50	0.00
Salt (trace mineral)	0.50	0.72
Zinc sulfate	0.02	0.03
B ₁₂ supplement ¹	0.10	0.14
B complex vitamins ²	0.10	0.20
Total	100.00	100.00
Calculated chemical composition		
Protein	14.01	20.02
Calcium	0.82	1.17
Phosphorus	0.59	0.83
T.D.N.	75.00	73.00
Cost per cwt. of ration, (\$)	2.10	2.40

¹Contains 6 mg. of B₁₂ activity per pound.

²Contains 2,000 mg. of riboflavin, 4,000 mg. of pantothenic acid, 9,000 mg. of niacin, and 90,000 mg. of choline per pound.

Table 2. — Calculated Average Daily Nutrient Intake During Gestation.

Ration:	One		Two	
	1960	1961	1960	1961
Avg. amount fed (lbs.)	7.00	6.30	4.90	4.50
T.D.N. (lbs.)	5.15	4.64	3.58	3.29
Protein (lbs.)	0.98	0.88	0.98	0.90
Calcium (lbs.)	0.06	0.05	0.06	0.05
Phosphorus (lbs.)	0.04	0.04	0.04	0.04
Alfalfa meal (lbs.)	0.70	0.63	0.70	0.64
Riboflavin (mg.)	21.20	19.08	22.80	20.93
Pantothenic acid (mg.)	67.8	61.04	60.2	55.30

that fed group one. In the first trial (1960), ration one was fed at the rate of 7 lbs. per day and ration two at the rate of 4.9 lbs. per day. In the second trial, the levels were 6.3 and 4.5 lbs. daily, fed in two equal feedings. These levels of feed intake remained constant throughout gestation.

The gilts used were Yorkshire and Hampshire gilts that had been well grown up to breeding age. For the most part they had been used on growing-finishing tests in confinement up to a weight of 200 lbs. — 165 days of age. They were then hand fed on pasture for approximately 75 days before breeding. During the last two weeks prior to the breeding season, the daily feed allowance was increased. As the gilts were bred they were moved to the test lots and started on the trial. Gilts that re-occurred in heat were re-bred and allowed to remain in their test group. Each group of gilts was restricted to a dry lot, thus their entire nutrient intake during the gestation period came from the ration fed. As each gilt reached 110 days of gestation she was taken to the farrowing barn and prepared for farrowing. During the period from 110 days of gestation to 14 days post farrowing, these gilts were fed on an individual basis in relation to their appetite. Their average consumption during this period was 7 lbs. per day. From 14 to 42 days post farrowing these gilts had access to the lactation ration in a self-feeder and to water. Each litter ran with their mother in a concrete floored pen. The sows were moved out on the 42nd day post farrowing and the pigs continued on the creep ration until they were 56 days of age.

The results of the 1960 trial are shown in Table 3. Gilts receiving 7 lbs. per day gained 136.5 lbs. during gestation; those receiving 4.9 lbs. of feed gained 85.3 lbs. or 51.2 lbs. less during this period. Litters from the high level gilts weighed 1.7 lbs. more and contained .80 more pigs at farrowing. Pig losses from farrowing to weaning were greater among litters nursing gilts which had been on restricted feed intake during gestation. However, it is doubtful if these losses can be attributed to the gestation treatment of the gilts. When placed on self-feeders during lactation, the low level gilts consumed about one pound more feed per

Table 3. — The Influence of Two Levels of Feed Intake During Gestation on the Reproduction Performance of Gilts. May - November 1960.

Sow Treatment (Ration Number)	One	Two	Difference (One-Two)
Avg. daily feed intake (lbs.)	7.0	4.9	+2.1
Avg. daily T.D.N. intake (lbs.)	5.2	3.6	+1.6
Avg. litter weight at farrowing (lbs.)	28.4	26.7	+1.7
Avg. birth weight per pig (lbs.)	2.5	2.5	00.0
Avg. no. pigs farrowed per litter	11.5	10.7	+0.8
Avg. no. stillborn pigs per litter	1.4	1.4	0.0
Avg. no. pigs weaned per litter	9.0	7.1	+1.9
Avg. litter weight — 42 days (lbs.)	166.5	148.6	+17.9
Avg. litter weight — 56 days (lbs.)	231.6	207.2	+24.4
Avg. pig weight — 56 days (lbs.)	25.7	29.1	-3.4
Weights on Gilts (lbs.)			
Avg. initial weight of gilts at breeding	315.5	319.0	-3.5
Avg. weight of gilts at farrowing	452.0	404.3	+47.7
Avg. weight gained during gestation	136.5	85.3	+51.2
Avg. gilt weight 7 days post farrowing	409.6	361.5	+48.1
Avg. gilt weight at weaning	336.4	336.4	0.0
Avg. weight loss of gilts farrowing to weaning	115.6	67.9	+47.7
Avg. daily weight loss	2.8	1.6	+1.2
Avg. weight increase — breeding to weaning	20.9	17.4	+3.5
Feed Weights			
Avg. feed per gilt — 114 days gestation	798.0	558.6	+239.4
Avg. feed per gilt during lactation (0-42 days)	356.0	398.0	-42.0
Avg. total feed per gilt farrowing	1154.0	95.6	+197.4
Avg. creep feed consumed per litter	168.2	173.3	-5.1
Avg. creep feed consumed per pig weaned	18.7	24.4	-5.7
Avg. total feed per litter (sow and creep)	1322.2	1129.9	+192.3
Avg. total feed per pig weaned	146.9	159.1	-12.2

day than those that had received more feed during lactation, thus, they lost 51.20 lbs. less weight during lactation (136.5 vs. 85.30). Both groups had about the same starting and ending weight. However, those on ration one had each consumed 197.4 lbs. more during the combined gestation and lactation period than those on ration two.

In terms of the combined gestation and lactation feed to the sow and the creep ration to the pigs, 146.9 lbs. was required in group one and 159.1 lbs. in group two for each pig weaned. This difference is due largely to the smaller number of pigs weaned in group two. The pigs in both groups were unusually light at weaning. The exact cause of this is not known.

It seemed that the high level gilts in the first test were receiving a little more feed than was necessary so the intake was reduced to 6.3 and 4.5 lbs. for the second trial. The results of this trial are given in Table 4. Here the pattern was much the same as for the first trial. The high

Table 4. — The Influence of Two Levels of Feed Intake During Gestation on the Reproductive Performance of Gilts. May - December 1961.

Sow Treatment (Ration Number)	One	Two	Difference (One-Two)
Avg. daily feed intake — gestation (lbs.)	6.3	4.5	+1.8
No. gilts bred	12.0	12.0	0.0
No. gilts farrowing	9.0	11.0	-2.0
Avg. No. services per litter farrowed	1.0	1.6	-0.6
Avg. length of gestation (days)	112.9	113.6	-0.7
Avg. litter weight at farrowing (lbs.)	27.7	26.9	+0.8
Avg. birth weight per pig (lbs.)	2.6	2.5	+0.1
Avg. no. pigs farrowed per litter	11.0	10.8	+0.2
Avg. no. stillborn pigs per litter	.4	.3	+0.1
Avg. no. pigs lost per litter (0-14 days)	1.6	1.7	-0.1
Avg. no. pigs lost per litter (14-56 days)	.3	.2	+0.1
Avg. no. pigs weaned per litter	8.9	8.6	+0.3
Avg. litter weight — 42 days (lbs.)	173.2	176.4	-3.2
Avg. litter weight — 56 days (lbs.)	245.0	251.7	-6.7
Avg. pig weight — 56 days (lbs.)	28.4	29.8	-1.4
Weights on Gilts			
Avg. initial wt. of gilts at breeding (lbs.)	358.6	347.1	+11.5
Avg. gilt weight at farrowing	498.8	452.8	+37.0
Avg. gilt weight 14 days post farrowing	417.4	384.7	+32.7
Avg. gilt weight at weaning	364.0	354.4	+9.6
Avg. weight loss on gilts — farrowing to weaning	126.6	98.5	+28.1
Avg. daily wt. loss — farrowing to weaning (lbs.)	3.0	2.3	+0.7
Avg. weight change — breeding to weaning (lbs.)	+5.4	+7.3	-1.9
Feed Weights			
Avg. feed per gilt — 114 days gestation	718.0	490.0	+228.0
Avg. feed per gilt during lactation (0-42 days)	412.9	498.5	-85.6
Avg. total feed per gilt farrowing	1130.9	979.6	+151.3
Avg. creep feed consumed per litter	190.4	196.0	-5.6
Avg. creep feed consumed per pig (weaned)	22.0	21.0	-1.0
Avg. creep feed per litter (sow and creep)	1321.4	1175.6	+145.8
Avg. total feed per pig weaned	148.6	136.1	+12.5

level gilts consumed 228 lbs. more feed each during gestation and gained an average of 37 lbs. more during this period. However, the low level gilts consumed an average of 85.6 lbs. more during lactation when they were self-fed. Considering the greater consumption during lactation, the low level gilts average 151.3 lbs. less feed from breeding to weaning. They averaged only 9.6 lbs. lighter in weight at weaning.

The performance in terms of litter size, livability, weaning weights, and feed consumption of the pigs was essentially the same in both groups. In this trial pigs raised by gilts on the low level of feed intake during gestation were charged with 136.1 lbs. of feed as compared to 148.6 lbs. for pigs farrowed and raised by gilts fed the higher level. This is the reverse from the situation in the first trial and is probably due

to the fact that the average litter size at weaning was about the same for each group in Trial Two whereas there were fewer pigs weaned per litter in the low level group in Trial One.

In considering the results of these trials it should be pointed out that the daily intake of such essential nutrients as protein, minerals, and vitamins was essentially the same for both groups of gilts during gestation. These intakes were at, or near, the National Research Council recommended levels. Only the total digestible nutrient level for group 2 was held below N.R.C. recommended allowances. Gilts in group 2 appeared to be quite hungry and thin, particularly as they approached farrowing. When placed on self-feeders during lactation, these gilts consumed more feed and lost less weight; thus, at weaning the two groups of gilts were essentially alike in appearance.

Bermuda Grass Hay for Wintering Beef Cattle

*A. B. Nelson, W. C. Elder,
G. R. Waller, and W. D. Campbell*

Pasture improvement programs have resulted in the increased use of improved strains of bermuda grass, which in turn have made large quantities of bermuda grass hay available for feeding. The protein content of the forage may vary considerably with fertilizer treatments. Little is known of the nutritive value of such hays for beef cattle. Preliminary studies have indicated that gains of cattle fed bermuda hay containing 13.1 percent protein were increased when supplemental cottonseed meal was fed. Thus, supplemental feeding (protein or energy) is important with bermuda hay even though chemical composition of the hay does not so indicate. The great potential production of bermuda hay could serve as the basis of an expanded beef cattle program when proper nutrient supplementation of the hay when fed to cattle has been determined.

Procedure

Thirty grade Hereford weanling calves were divided into three lots (five steers and five heifers per lot) on December 21, 1961. Each lot was placed in one-acre traps and fed hay ad libitum. Those in Lot 1 were fed prairie hay and 1.25 lb. of pelleted cottonseed meal per head daily. The supplement was fed at the rate of twice the daily allowance every other day. The hay, which had been harvested at the Lake Blackwell experimental range area, was mainly little bluestem with appreciable quantities of big bluestem and Indian grass.