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Recent research has shown that the protein requirement for the brood sow may not be as great as once thought. Some work has indicated that all-corn diets with no supplementary protein may be satisfactory during gestation. Previous results from this station utilizing oats during gestation with no supplementary protein have been encouraging. The research reported herein was conducted to evaluate corn, a feedstuff low in protein and of relatively poor protein quality supplemented only with minerals, as a complete diet for gestating sows.

Experimental Procedure

Two trials were conducted to evaluate feeding corn without additional protein supplementation to gestating sows. Trial 1 was conducted during the winter and spring with 10 gilts and 24 sows farrowing in May and trial 2 was conducted in the summer with 20 gilts and 19 sows farrowing in September. In both trials animals were allotted to the two experimental diets on the basis of age, weight, ancestry and the herd sire to which they were bred. The experimental diets are shown in table 1. The basal diet was a typical 14% protein, corn-soybean meal gestation diet which contained 10% dehydrated alfalfa meal. The other diet contained no additional protein beyond that supplied by corn. Dicalcium phosphate, limestone and trace mineralized salt (high zinc) were added to both diets to supply the sows' needs. However, no vitamin premix was added to either diet. All sows were placed on their assigned treatments 7 days after breeding and their weights at that time were recorded as initial weights. The sows were housed in open dirt lots with access to portable houses with wooden floors. They were penned according to weight to eliminate as much competition as possible. The sows were fed individually in divided feeding stalls at the rate of 4.5 lb. per day for the basal diet and 4.1 lb. per day for the corn diet. These two feeding rates were calculated to equalize daily energy intake between the two groups.

Sows were brought into the farrowing house and weighed on the 110th day of gestation. Gestation weight gain was calculated based on the 103 days they were on test. At parturition the pigs were recorded as alive or dead and individual pig weights were obtained. From these weights total live litter birth weight and average live pig birth weight were calculated.

Results

A summary of the results of trial 1 is shown in table 2. Five gilts farrowed in each treatment group, while 13 sows fed the basal diet and 11 sows fed the corn diet farrowed. Gestation weight gain was higher for sows receiving the basal diet. However, the difference was not statistically significant because of much individual variation in gain. The number of live pigs born per litter was similar, but stillbirths were significantly higher in litters receiving no supplemental

protein. Total live litter weight and average pig weights were similar between the two treatment groups.

A summary of the results of trial 2 is shown in table 3. Approximately equal numbers of gilts and sows were allotted to each treatment allowing a comparison of sows and gilts receiving the two experimental diets. Sows were significantly heavier when placed on test and were heavier at 110 days of gestation. No difference in gestation weight gain was observed between sows and gilts. Sows farrowed significantly more pigs than gilts and, as a result, total litter birth weight was significantly greater for sows. Number of stillbirths and average pig birth weight, however, were not statistically different between sows and gilts.

Combining the data for sows and gilts to compare dietary treatments revealed a significantly higher gestation weight gain when the basal diet was fed. Number of pigs born alive or stillborn and total litter birth weight or average pig birth weight were unchanged due to type of gestation diet.

These two trials would indicate that sow performance in terms of number of pigs born alive and average pig birth weight was not significantly altered when a gestation corn diet with no supplemental protein was fed. Gestation weight gain was higher when a more properly balanced diet was fed. The effect of this treatment on lactation performance and reproduction over several consecutive gestations is unknown. However, no effect on pig weaning weight or number of pigs weaned was observed in these two trials due to gestation treatments.

Summary

Two trials were conducted comparing 4.5 lb. of a diet containing supplemental protein to 4.1 lb. of a corn diet with no supplemental protein for sows during gestation. Trial 1 consisted of 10 gilts and 24 sows and trial 2 consisted of 20 gilts and 19 sows. Gilts were significantly lighter in weight than sows and farrowed significantly less pigs than sows. When combining data for sows and gilts, greater gestation weight gain was observed from sows on the basal diet. No differences in number of live or stillborn pigs farrowed or in total litter birth weight or average pig birth weight were observed due to dietary treatment.

Table 1. Percentage Composition of Diets

	Basal	Corn
Ground yellow corn	73.6	96.0
Dehydrated alfalfa meal (17%)	10.0	--
Soybean meal (44%)	13.5	--
Dicalcium phosphate	2.0	3.2
Limestone	0.4	0.3
Trace mineralized salt (high zinc)	0.5	0.5

Table 2. Performance of Sows on Trial 1

	Basal	Corn
No. of sows[a]	18	16
Initial sow wt., lb.	405.8	395.3
110-day sow wt., lb.	463.1	442.0
Gestation gain, lb.	57.3	46.7
No. pigs born alive	11.4	11.6
No. stillborn[b]	0.06	0.64
Litter birth wt., lb.	30.4	30.0
Avg. pig birth wt., lb.	2.8	2.7

[a]Each treatment included five gilts and the remainder were sows.

[b]Significant (P<.05) difference in stillbirths due to treatment.

Table 3. Performance of Sows on Trial 2

	Sows		Gilts		Combined	
	Basal	Corn	Basal	Corn	Basal	Corn
Number of sows	9	10	11	9	20	19
Initial sow wt., lb.[a]	421.3	386.1	355.0	323.4	388.2	354.7
110-day sow wt., lb.[b]	540.6	483.0	468.6	430.8	504.6	456.9
Gestation gain, lb.	119.3	96.9	113.6	107.4	116.4	102.1
No. pigs born alive[c]	13.2	12.7	10.8	11.3	12.0	12.0
No. stillborn	0.33	0.80	1.18	1.44	0.76	1.12
Litter birth wt., lb.[d]	36.5	35.0	29.1	28.4	32.8	31.7
Avg. pig birth wt., lb.	2.8	3.0	2.7	2.5	2.8	2.7

[a]Sows were weighed when placed on test individually 7 days after breeding. Significant (P<.005) difference in initial weight between sows and gilts.

[b]Significant (P<.05) difference in 110-day weight due to treatment. Significant (P<.05) difference in 110-day weight between sows and gilts.

[c]Significant (P<.05) difference in number of pigs born alive between sows and gilts.

[d]Significant (P<.005) difference in litter birth wt. between sows and gilts.