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Protein Levels for Lactating Sows

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The major objective of lactation feeding is to provide the lactating sow with proper nutrients to allow her to produce maximum quantities of milk resulting in heavy weaning weights of pigs. There is also evidence to show that protein levels of feed during gestation have an influence on lactation performance. The lactating sow fed ad libitum during lactation consumes a considerable quantity of feed and, at today's feed prices, this represents a large cost. If protein percentage of the lactation diet was reduced, savings in sow feed cost could be realized. The trials reported herein were designed to study the effect of a lower level of protein for the lactating sow.

Experimental Procedure

Two trials were conducted to evaluate the effect of protein level during lactation on pig performance and sow weight change during lactation. The first trial was conducted in late spring and involved 10 gilts and 21 sows and the second trial was conducted in the fall and involved 16 gilts and 16 sows. The sows were allotted to two dietary treatments on the basis of age, weight and previous gestation feeding regime. The composition of the experimental diets is shown in table 1. The high protein diet (15.8% protein) was a typical lactation diet containing 10% ground beet pulp and the low protein diet (12.0% protein) was similar except lower in protein.

Pigs and sows were weighed after parturition and at 7, 14 and 21 days of lactation. Total litter weight, average pig weight and sow weight change were calculated for each period. Sows were fed ad libitum one of the two diets and daily feed consumption was recorded. From this data feed required for each pig weaned was calculated.

Results

Litter production data for trial 1 are shown in table 2. These data are from 5 gilts and 11 sows receiving the low protein diet and 5 gilts and 10 sows receiving the high protein diet. No significant differences in litter size, total litter weight or average pig weight at birth, 7, 14 or 21 days were found. A small difference in initial litter size between the two treatment groups existed throughout the trial.

Table 3 shows the sow weight change and feed consumption data of trial 1. Although no statistically significant differences were found in sow weight change, those sows on the low protein diet remained rather constant in weight while those on the high protein diet gained nearly 15 lb. during the 21-day lactation. Feed consumption was slightly higher at 7, 14 and 21 days for sows receiving the higher

protein diet. However, when feed consumption was calculated on the basis of pigs weaned, slightly less feed was consumed per pig weaned by sows receiving the higher protein diet. None of these differences were statistically significant.

Litter and production data from trial 2 are shown in table 4. Eight gilts and 9 sows received the low protein diet and 8 gilts and 7 sows received the high protein diet. Litter size at birth was equal between the two groups. At 21 days the high protein group had an advantage of one pig per litter. Litter weight and average pig weight were higher for those sows fed the higher protein diet after parturition. None of these differences, however, were statistically significant.

Table 5 shows sow weight change and feed consumption in trial 2. The high protein group of sows was heavier initially and gained slightly more weight over the 21-day lactation. Total feed consumption was greater at 7, 14 and 21 days for those sows receiving the low protein diet. As a result of this and larger litters at 21 days, the high protein group had a significant advantage of consuming 10.5 lb. less feed per pig weaned.

Although numbers of sows in each trial were not sufficient to obtain statistical significance, these data would indicate that sows receiving a high protein diet during lactation consume less feed and gain more weight during lactation than sows on a low protein diet. In these two trials there was a one pig advantage at weaning for sows receiving the high protein diet.

Table 1. Percent Composition of the Diets

Dietary protein level	12%	15.8%
Ground yellow corn	78.1	68.5
Soybean meal (48.5%)	8.4	18.0
Ground beet pulp	10.0	10.0
Dicalcium phosphate	2.0	2.0
Ground limestone	0.8	0.8
Trace mineralized salt (high zinc)	0.5	0.5
Vitamin premix	0.2	0.2

Table 2. Litter Production Data--Trial 1

	Lactation protein levels	
	12%	15.8%
Birth		
Litter size	11.0	12.3
Litter weight, lb.	31.3	31.1
Avg. pig weight, lb.	2.8	2.7
7 days		
Litter size	9.0	10.0
Litter weight, lb.	41.7	43.6
Avg. pig weight, lb.	4.6	4.3
14 days		
Litter size	8.6	9.8
Litter weight, lb.	61.3	67.5
Avg. pig weight, lb.	7.2	6.9
21 days		
Litter size	8.6	9.7
Litter weight, lb.	83.6	94.5
Avg. pig weight, lb.	10.0	9.8

Table 3. Sow Weight Change and Feed Consumption--Trial 1

	Lactation protein levels	
	12%	15.8%
Sow weight after farrowing, lb.	438.9	419.5
Sow weight, 21 days lactation, lb.	438.2	435.8
Sow weight change, lb.		
7 days	2.0	11.5
14 days	2.7	14.7
21 days	-0.7	14.7
Sow feed consumption, lb.		
7 days	94.4	100.3
14 days	218.3	225.9
21 days	348.8	369.3
Feed consumed/pig weaned, lb.	44.0	40.2

Table 4. Litter Production Data--Trial 2

	Lactation protein levels	
	12%	15.8%
Birth		
Litter size	10.9	10.9
Litter weight, lb.	30.2	30.9
Avg. pig weight, lb.	3.0	2.8
7 days		
Litter size	8.9	9.8
Litter weight, lb.	42.4	48.3
Avg. pig weight, lb.	4.8	4.9
14 days		
Litter size	8.6	9.5
Litter weight, lb.	64.8	72.5
Avg. pig weight, lb.	7.6	7.6
21 days		
Litter size	8.3	9.3
Litter weight, lb.	86.4	97.0
Avg. pig weight, lb.	10.4	10.5

Table 5. Sow Weight Change and Feed Consumption--Trial 2

	Lactation protein levels	
	12%	15.8%
Sow weight after farrowing, lb.	440.2	467.2
Sow weight, 21 days lactation, lb.	444.6	476.7
Sow weight change, lb.		
7 days	4.8	4.8
14 days	2.3	8.9
21 days	4.4	9.5
Sow feed consumption, lb.		
7 days[a]	104.4	91.5
14 days	234.7	215.2
21 days	371.7	344.8
Feed consumed/pig weaned, lb.[a]	47.7	38.2

[a]Significant ($P<.05$) difference due to treatment.