Alfalfa Haylage for Sows During Gestation

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Summary

Digestion and nitrogen retention studies suggest that three pounds of good quality alfalfa haylage dry matter and two pounds of a grain, mineral, and vitamin premix will meet the nutritional requirements of sows during gestation.

Quality of the haylage is extremely important for sows. Third-cutting alfalfa had a higher digestible energy and digestible protein than did the more mature first-cutting haylage. The digestible energy of alfalfa haylage for sows was 954 to 1,096 Kcal/pound.

Sows fed alfalfa haylage and ONLY ONE pound of a grain vitamin and mineral premix farrowed pigs that were lighter at birth than pigs farrowed from sows fed 4½ pounds of a corn-soy diet during gestation.

Introduction

In swine production the major cost is for feed, and about 25% of that cost in a farrow-to-finish operation can be attributed to maintaining the breeding herd. Our goal in feeding sows during gestation is to meet the nutritional requirements at the least cost with satisfactory litter size and pig survival.

Several recent studies have suggested that sows during gestation can use high-fiber feedstuffs not normally used in swine rations. Of the high-fiber feedstuffs, alfalfa appears to have the most potential as an alternative feedstuff for swine.

To determine the nutritional value of alfalfa haylage for sows during gestation, we designed a study aimed at finding how to take maximum advantage of the energy and protein in alfalfa haylage.

Procedures

After a 30-day breeding period, gilts were randomly assigned either to the control corn-soybean meal diet (14.0% protein, .8% calcium, and .6% phosphorus) fed at the rate of 4½ pounds per head per day on a concrete slab, or to all the alfalfa haylage they would consume once a day on a concrete

slab. Alfalfa haylage contained 50% dry matter and was stored in an oxygen-limiting structure. Gilts fed the alfalfa haylage received one pound per head per day of a corn base supplement (Table 35). The supplement was fed as a 3/16 inch pellet, top-dressed on the haylage. Gilts were individually weighed at the start of experiment and on the 105-110th day of gestation, when they were moved into the farrowing house.

Table 35. Haylage "Supplement[a]"

	lbs/2000
Ground corn	1712
Monosodium phosphate	200
Salt	40
Vitamin mix	40
Trace minerals	8
	2,000

[a]Fed at one pound per head per day.

All gilts were fed the control corn-soybean meal diet from the time they entered the farrowing house and during the 21-day lactation period. During lactation gilts were fed ad libitum. After weaning, sows were fed the control diet during the 30-day breeding period and then returned to the same gestation diets for three reproductive cycles.

Pigs were individually weighed at birth and when 21-days old. Creep feed was offered to the litters at 14-days of age.

During each reproductive cycle, 8 animals (4 controls and 4 on alfalfa haylage) were placed in metabolism cages to determine the digestibility of energy and protein. Nitrogen retention was also determined.

Results and Discussion

Composition of the alfalfa haylage used in these studies is given in Table 36. The first-cutting material was more mature and contained less protein and more fiber than did the third-cutting haylage. Quality of the haylage had a marked effect on digestibility of the energy and protein in the alfalfa haylage by sows, Table 37. The better-quality third-cutting material contained more digestible energy and digestible protein than did the more mature first-cutting haylage.

Table 36. Composition of Alfalfa Haylage, dry-basis

	1st cutting	3rd cutting
Crude protein, %	17.90	20.34
Crude fiber, %	33.90	27.62
Calcium, %	1.59	1.69
Phosphorus, %	.28	.29

Table 37. Apparent Digestibility of Protein and Energy in Alfalfa Haylage

	1st cutting	3rd cutting
Protein digestibility, %	50.7	63.0
Energy digestibility, %	48.8	54.0
DE for alfalfa haylage (Kcal/lb.)	954	1096

Sows fed 4½ pounds of 14% protein corn-soybean diet retained 15.3 g of nitrogen per day. Sows fed three pounds of good-quality third-cutting alfalfa haylage plus one pound of corn, vitamin, and mineral supplement retained 14.5 g of nitrogen per day. These nitrogen retention values demonstrate that three pounds of good-quality alfalfa haylage dry matter plus one pound of a grain, vitamin, and mineral supplement will meet the amino acid needs of sows during gestation.

Although sows were fed all the alfalfa haylage they would consume once per day on a concrete slab, the first few days their intake of haylage was very small. During the second and third reproductive cycles, sows were fed an average of 3.4 pounds of haylage dry matter during gestation. Part of this was wasted and not consumed. The concrete slab was cleaned each day before sows were fed, and the quantity of haylage adjusted based on intake of the previous day.

Reproductive performance is shown in Table 38. During the first reproductive cycle, gilts fed alfalfa haylage plus one pound of a grain, vitamin, and mineral premix farrowed pigs that weighed less at birth than did pigs farrowed by the control gilts. Although that trend for reduced birth weights was observed during the second and third reproductive cycles, it affected survival rate only in the gilts. Gilts consumed less haylage than did second- and third-litter sows and, therefore, consumed less energy.

Table 38. Effect of Alfalfa Haylage on Reproductive Performance

	Control	Alfalfa Haylage
1st Reproductive Cycle 1st Reprod		
No. of litters	29	21
No. pigs born alive/litter	8.76	9.09
Birth wt. of live pigs, lb.	2.66	2.38
No. of pigs at 21 days/litter	7.21	6.39
Avg. pig wt. at 21 days, lb.	9.32	8.67
2nd Reproductive Cycle		
No. of litters	19	14
No. pigs born alive	10.32	11.71
Birth wt. of live pigs, lb.	2.83	2.55
No. of pigs at 21 days/litter	8.53	8.71
Avg. pig wt. at 21 days, lb.	9.10	9.16
3rd Reproductive Cycle		
No. of litters	18	14
No. pigs born alive	10.50	9.43
Birth wt. of live pigs, lb.	2.80	2.54
No. of pigs at 21 days/litter	7.39	7.00
Avg. pig wt. at 21 days, lb.	10.00	9.24

It is important to remember that gilts and sows in these studies received only one pound of a grain, vitamin, and mineral premix in addition to all the alfalfa haylage they would consume. Sows consuming three pounds of haylage dry matter plus one pound of the corn-base supplement, based on our digestion studies, were receiving 4,788 Kcal of DE/sow/day. Therefore, the reduction in birth weight observed in these studies was a function of energy intake. Our digestion studies demonstrate that sows should have been fed two pounds of the grain supplement to provide adequate energy for sows during gestation.

In some commercial operations, sows consume more haylage than what we observed in these studies. In those operations, haylage commonly is fed twice/day, inside where protected from sun and rain.

Quality, particle size, method, and frequency of feeding certainly influence haylage intake.

These studies demonstrate, three pounds of good-quality alfalfa haylage and two pounds of a grain, vitamin, and mineral supplement should meet the nutritional needs of sows during gestation. Gilts may require additional grain if they do not consume the three pounds of haylage dry matter per day.