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Dehydrated alfalfa to control intake of self-fed sows during gestation (1976)

G L. Allee

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Dehydrated Alfalfa to Control Intake of Self-fed Sows During Gestation

Gary L. Allee

Summary

Two trials with 47 second-and third-litter sows and one trial involving 40 gilts were conducted to evaluate self-feeding a diet containing 96% dehydrated alfalfa during gestation. Sows were maintained in outside lots (approximately 2 1/2 acres) until the 100 - 110th day of gestation. The control gestation ration (15% protein sorghum-soybean meal) was fed in individual feeding stalls at 2 kg (4.4 lbs.) per head per day.

All sows were fed a 16% protein diet ad libitum during the 28-day lactation period. Trial I using Yorkshire sows started in July with sows farrowing in September. Trial II using Duroc sows started in September with sows farrowing in November and December. Gilts bred in March and April and farrowing in June were used in trial III.

Intake of self-fed sows was measured weekly. In the first trial, feed intake of self-fed sows averaged 3.88 kg (8.54 lbs.) daily with a gestation weight gain of 29 kg (53.8 lbs.). Self-fed sows in trial II consumed an average of 2.90 kg (6.38 lbs.) daily and gained 23.3 kg (51.3 lbs.) during gestation. Self-fed gilts in trial III consumed an average of 2.56 kg (5.63 lbs.) daily and gained 19.6 kg (43.2 lbs.) from 30 days post-breeding to farrowing. Control gilts gained 39.1 kg (86.0 lbs.) during gestation.

Reproductive performances of the combined trials showed small and nonsignificant differences in number of pigs born alive, number weaned per litter, and 14- or 28-day pigs' weights. Pigs from self-fed sows in trial I and III (but not trial II) tended to weigh less at birth than pigs from sows on the control diet. These limited data suggest that such a ration self-fed to sows during gestation will not produce excessive weight gains.

Introduction

Some method of limit feeding sows during gestation is necessary to prevent excessive weight gain. Excessive weight gains increases both feed cost and embryonic mortality. There is a great deal of interest in the swine industry in additional products or compounds that will allow sows to be self-fed during gestation without excessive weight gains.

Procedures

General

Sows, maintained in outside lots of approximately 2 1/2 acres, were allotted to treatments after a 30-day breeding period. The control group was fed 2 kg (4.4 pounds) per head per day of a sorghum-soybean meal ration (15.0% protein,

0.75% calcium, and 0.51% phosphorus) in individual feeding stalls. The self-fed group had access to the dehydrated alfalfa ration (table 1) supplemented with vitamins and mineral from a self-feeder. Both diets were fed as 3/16 inch pellets. Feed intake of the self-fed sows was determined weekly. Sows were individually weighed when the experiment started and the 100 - 110th day of gestation (when sows were moved into the farrowing house). All sows were fed a 16% protein ration ad libitum from the time they were moved to the farrowing house and during the 28-day lactation period. Pigs were weighed at birth, and when 14 and 28 days old.

Table 1 . Composition of self-fed alfalfa ration, %.

Ingredient	%
Dehy. alfalfa (17% protein)	96.9
Mono. sodium phosphate	2.5
Vitamin mix	0.5
Trace minerals	0.1
	100.00

Trial I. Twenty-eight second- and third-litter Yorkshire sows were randomly allotted by weight to treatments after a 30-day breeding period. Trial I started in July with sows farrowing in September. Based on preliminary studies, 25% sorghum was substituted for dehydrated alfalfa for the first three weeks to encourage consumption.

Trial II. Twenty-six second-litter Duroc sows after a 30-day breeding period were randomly allotted by weight to treatments. The trial started in September with sows farrowing in November and December.

Digestion trial. After approximately 80 days of gestation, six sows (three from each treatment) were placed in individual digestion crates allowing for separate collection of urine and feces. A five-day pretest period preceded two consecutive five-day collection periods. Feed intake was 4.4 pounds for sows on the control ration and 5.0 pounds for sows fed the dehydrated alfalfa ration.

Trial III. Forty Duroc gilts were randomly allotted to treatments by litter and weight after a 30-day breeding period. To encourage consumption in the self-fed group 25% sorghum was substituted for dehydrated alfalfa the first three weeks.

Results and Discussion

Weekly feed consumption of self-fed sows in trial I is shown in table 2 . The first three weeks 25% sorghum replaced dehydrated alfalfa to encourage consumption. During the trial we encountered no marked reduction in feed consumption, as we had in preliminary trials when switching to a ration containing high levels of dehydrated alfalfa. Self-fed sows consumed an average of 8.53 pounds of feed daily from 30 days post-breeding to farrowing. Sows on the control ration (fed 4.4 pounds of a sorghum-soybean meal) in individual feeding stalls gained 81.8 pounds during gestation; self-fed sows, 69.1 pounds. Reproductive performance of sows in trial I are shown in table 3 . Differences between number of pigs born, number of pigs weaned, or 14- or 28-day-pig weights were not significant. Birth weights of pigs from self-fed sows were 2.77

pounds compared with 2.99 pounds of pigs from control sows.

Table 2. Feed consumption of self-fed sows (trial I).

Week	Intake, kg (lb.)
1	3.61 (7.94)
2	3.94 (8.67)
3	3.95 (8.69)
4	3.57 (7.85)
5	3.49 (7.69)
6	3.94 (8.66)
7	3.22 (7.08)
8	3.99 (8.77)
9	5.18 (11.40)
Avg.	3.88 (8.53)

Table 3. Reproductive performances of sows fed indicated ration (trial I).

	Sorghum	Alfalfa
No. of sows	14	14
No. of sows farrowing	12	11
Gestation wt. gain	37.2 (81.8)	31.4 (69.1)
Pigs born alive/litter	11.2	9.6
Birth wt.	1.34 (2.99)	1.26 (2.77)
14-day wt.	3.85 (8.4)	3.40 (7.5)
28-day wt.	6.54 (14.4)	6.22 (13.7)
No. weaned/litter	9.8	7.9

Weekly feed consumption of self-fed sows in trial II is shown in table 4. Self-fed sows consumed an average of 6.38 pounds of feed daily and gained 51.2 pounds from 30 days post-breeding to farrowing. Sows limit-fed (controls) gained 74.3 pounds during gestation. Reproductive performances (table 5) were similar for both groups.

Table 4. Feed consumption of self-fed sows (trial II).

Week	Intake, kg (lb.)
1	2.67 (5.88)
2	2.19 (4.82)
3	2.47 (5.44)
4	2.74 (6.03)
5	2.88 (6.34)
6	2.79 (6.14)
7	2.30 (5.06)
8	3.52 (7.75)
9	3.57 (7.86)
10	3.85 (8.47)
Avg.	2.90 (6.38)

Table 5 . Reproductive performances of sows fed indicated rations (trial II).

	Sorghum-SBM	Alfalfa
No. of sows	13	13
No. of sows farrowing	11	12
Gestation wt. gain	3.38 (74.3)	23.3 (51.2)
Pigs born alive/litter	7.3	7.7
Birth wt.	1.33 (2.93)	1.40 (3.08)
14-day wt.	3.56 (7.83)	3.56 (7.82)
28-day wt.	6.23 (13.70)	6.73 (14.80)

Weekly feed consumption of self-fed gilts in trial III is shown in table 6 . Feed consumption was only 3.46 pounds the first week even though 25% sorghum replaced alfalfa for the first three weeks to encourage consumption. Self-fed gilts consumed an average of 5.63 pounds daily and gained 43.3 pounds during gestation. Control gilts fed 4.4 pounds of a sorghum-soybean meal ration in individual stalls, gained an average of 86 pounds. Weight gains of self-fed gilts varied more than gains of self-fed sows in previous trials.

Reproductive performances of gilts in trial III are shown in table 7. Differences between number of pigs born, number of pigs weaned, or 14- or 28-day pig weights were not significant. Birth weights of pigs from self-fed gilts were 2.60 pounds compared with 2.78 pounds of pigs from the control gilts.

Results of the digestion trial are shown in table 8 . Apparent energy digestibility of the alfalfa ration was 58.5%. Therefore, the digestible energy of 17% dehydrated alfalfa was determined to be 2288 kcal/kg (1040 kcal/lb), 159% of that published by the National Research Council. If sows fed the 17% dehydrated alfalfa diet consume 5.0 pounds daily, they would be consuming 0.55 pound of digestible protein per day, based on our digestiblity data. That is identical to the digestible protein intake of sows fed the control ration. Nitrogen retention of sows fed the control ration (4.4 pounds daily) was 15.53 g/day. Sows fed the alfalfa ration at 5.0 pounds daily retained 15.83 g nitrogen/day. Therefore, our results suggest that protein should be adequate so long as sows consume 5.0 pounds of the alfalfa ration daily.

Table 6 . Feed consumption of self-fed gilts (trial III).

Week	Intake, kg (lb.)
1	1.57 (3.46)
2	2.26 (4.98)
3	2.59 (5.70)
4	2.02 (4.44)
5	2.37 (5.21)
6	2.38 (5.23)
7	2.50 (5.51)
8	2.66 (5.85)
9	3.10 (6.82)
10	3.39 (7.47)
11	3.29 (7.24)
Avg.	2.56 (5.63)

Table 7. Reproductive performances of Duroc gilts fed indicated rations (trial III).

	Sorghum-SBM	Alfalfa
No. sows started	20	20
No. farrowing	19	18
Initial wt.	138.1 (303.8)	144.7(318.4)
Weight (105 - 100th day gestation)	177.2 (389.8)	164.4(361.6)
Weight gain (gestation)	39.1 (860)	19.7 (43.3)
Pigs born/litter	7.63	6.78
Pigs born live/ litter	6.52	5.61
Birth wt. of live pigs	1.25 (2.78)	1.18 (2.60)
Pigs weaned/litter	5.52	4.82
28-day pig weights	4.98 (10.95)	4.46 (9.81)

Table 8. Digestibilities of alfalfa and control rations.[a]

	Sorghum-SBM	Alfalfa
Protein digestibility, %	85.7	65.8
Energy digestibility, %	89.3	58.5

[a]Each value is the mean of 6 observations.