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DEHYDRATED ALFALFA MEAL FOR BROOD SOWS KEPT CONTINUOUSLY ON CONCRETE

R. W. Seerley and K. C. Wahlstrom

In 1958 a project was initiated to study the effects of alfalfa meal in rations for growing-finishing pigs and sows which were kept in confinement. The pigs and sows used in experiments have been kept in confinement and on concrete from birth. Experiments with growing pigs have been reported in the 1959 and 1962 swine day reports. The results of the first farrowing of an experiment with sows was presented in 1960 (A. H. Swine 2, 1960). This experiment was continued until these sows farrowed 3 litters. A summary of the complete experiment is reported herein.

Experimental Procedure

The forty-four gilts used in this trial had been fed rations containing four different levels of dehydrated alfalfa meal from weaning to market weight on concrete dry lot. As each gilt reached a weight of approximately 200 pounds she was placed on this experiment in the lot which received the same alfalfa level as she had been fed previously. The four levels of alfalfa were 0, 2.5, 5.0 and 10.0 per cent. The gestation rations shown in table 1 were hand fed at approximately 5 to 6 pounds per day. These rations contained approximately 15.5 per cent protein and were also fed during the pre-gestation period. Breeding was started in early November when gilts were about 8 months of age. Sows that did not conceive or did not come into heat after a two month breeding period were sacrificed and their reproductive tracts examined for abnormalities.

Approximately 5 days before the sows were due to farrow they were brought to the farrowing house and placed in individual pens. They remained in these pens until the pigs were weaned at six weeks of age and the sows were returned to the gestation lots. The lactation rations shown in table 1 were hand fed twice daily at a level that the sows received all the feed they would clean up.

During gestation each lot of sows had access to an inside pen 14 by 20 feet with an adjoining outside lot 14 by 20 feet. The individual pens used during lactation were 8 by 8 feet. Floors were concrete in both gestation and lactation pens.

Table 2 summarizes the three farrowings.

First farrowing. A marked difference was observed in the number of sows farrowing their first litter. Four sows did not conceive in Lot 1. Two of these sows were never observed in heat and were sacrificed. The reproductive tract of one of these sows appeared normal, but the other sow's tract was infantile and showed no indication of ovulation. The other two sows were bred and appeared to have conceived. One of these came into heat 43 days after breeding and was slaughtered. Her ovaries and reproductive tract appeared normal. The other sow was not observed in heat until shortly before she was due to farrow so she was retained in the lot for further study.

Table 1. Composition of Gestation and Lactation Rations

Lot	1	2	3	4
Alfalfa level, %	0	2.5	5.0	10.0
	%	%	%	%
<u>Gestation Rations</u>				
Ground yellow corn	42.5	41.5	40.5	38.4
Ground oats	42.5	41.5	40.5	38.4
Soybean meal	9.9	9.6	9.3	8.7
Tankage	3.3	3.2	3.1	2.9
Dehydrated alfalfa meal	--	2.5	5.0	10.0
Dicalcium phosphate	0.6	0.6	0.7	0.7
Limestone	0.4	0.4	0.3	0.2
T. M. salt	0.5	0.5	0.5	0.5
Vitamin-antibiotic premix ¹	0.2	0.2	0.2	0.2
<u>Lactation Rations</u>				
Ground yellow corn	67.0	65.2	63.6	60.4
Ground oats	16.8	16.3	15.9	15.1
Soybean meal	5.75	5.65	5.45	5.00
Tankage	5.75	5.65	5.45	5.00
Linseed oil meal	3.0	3.0	3.0	3.0
Dehydrated alfalfa meal	--	2.5	5.0	10.0
Dicalcium phosphate	1.0	0.95	0.85	0.75
T. M. salt	0.5	0.5	0.5	0.5
Vitamin-antibiotic premix ¹	0.25	0.25	0.25	0.25

¹ Premix provided 2 mg. riboflavin, 4 mg. pantothenic acid, 9 mg. niacin, 10 mg. choline chloride, 5 mcg. B₁₂, 2270 I.U. vitamin A, 284 I.U. vitamin D and 5 mg. antibiotic per pound of ration. The antibiotic was increased to 10 mg. per pound of lactation ration.

Table 2. Dehydrated Alfalfa Meal for Brood Sows in Confinement

Lct		1	2	3	4
Alfalfa level, %		0	2.5	5.0	10.0
No. of sows		11	11	11	11
No. of sows at farrowing	1st litter	7(11) ²	7(11)	11(11)	10(11)
	2nd litter	3(7)	6(7)	9(11)	7(10)
	3rd litter	3(3)	6(6)	9(9)	8(8) ³
Total no. of litters		13(21)	19(24)	29(31)	25(29)
Av. litter size ¹	1st litter	8.28	7.28	8.91	9.90
	2nd litter	8.00	7.50	7.22	8.00
	3rd litter	8.67	10.83	9.89	8.88
	Av.	8.31	8.47	8.69	9.28
	Total stillborn pigs, all litters	1st litter	4	3	6
	2nd litter	0	0	0	1
	3rd litter	2	4	13	1
	(Total) and per litter	(6)0.45	(7)0.37	(19)0.65	(5)0.20
Av. birth wt., pigs, lb.	1st litter	2.91	3.04	2.90	2.85
	2nd litter	2.94	2.98	3.32	3.59
	3rd litter	2.99	3.37	3.24	3.28
	Av.	2.94	3.15	3.12	3.17
	Av. litter size, 42 days	1st litter	6.71	6.00	6.00
2nd litter		4.00	2.33	5.22	6.67
3rd litter		5.00	7.17	5.89	7.25
Av.		5.69	5.21	5.72	7.16
Av. weight of pigs, 42 days, lb.		1st litter	22.7	22.6	18.9
	2nd litter	19.7	24.1	20.0	21.3
	3rd litter	25.1	25.4	26.7	25.5
	Av.	22.7	24.0	21.7	21.9

¹ Litter size included all pigs that appeared normal. When a sow farrowed at night, it was not always possible to determine whether the pig was born alive or still-born.

² The number in parenthesis is the number of possible litters. When a sow failed to conceive, she was slaughtered; therefore 33 litters were not possible for all lots.

³ One sow aborted her second litter, so she was kept for a third litter.

Only one sow in Lot 2 did not come into heat. Her ovaries were cystic at time of slaughter. Three other sows in this lot were bred once and never observed in heat thereafter. When these sows did not farrow, they were slaughtered and all exhibited ovary abnormalities. Two sows had large cystic ovaries. They appeared to have retained corpora which were probably brought on by the cystic condition. The other sow had hemorrhagic ovaries and beginning neoplastic tissue.

All of the sows in Lot 3 and 10 of the sows in Lot 4 settled to the first service. One sow in Lot 4 did not come into heat and examination of her ovaries showed that they were infantile and non-functional. This sow was a litter mate to the sow in Lot 1 that also showed this condition.

Sows fed the 10% alfalfa ration farrowed and weaned a greater number of pigs than did the sows in the other lots. Birth weight was not materially different between lots but average weaning weights were higher in Lots 1 and 2. However, average litter weaning weights of sows fed 10% alfalfa were about equal to that of Lots 1 and 2 because of the difference in the number of pigs weaned. One sow in both Lots 3 and 4 became savage after farrowing during the early morning hours and had killed or injured all of their pigs. These pigs were assumed to have been born alive and are included in the results.

Second farrowing. Results of the second farrowing of these sows were very disappointing. Only three of the original sows in Lot 1 farrowed. Of the seven sows left at breeding time, two never came into heat, one was bred at three consecutive heat periods and one was bred once, was never observed in heat again but did not farrow. All of these four sows were slaughtered. The one sow that had been bred three times was found to have 8 fetuses that were approximately 60 days old. Therefore, it appeared that she conceived with the first service although she continued her estrous cycle. The other sows had reproductive abnormalities.

One sow in each of Lots 2 and 4 and two sows in Lot 3 were bred and never observed in heat thereafter but did not farrow. These sows were retained and were bred for spring farrow. One sow in Lot 4 aborted 14 pigs about 10 days before she was due to farrow and these data are not included. Blood tests immediately after abortion were negative for brucellosis and leptospirosis. One sow in Lot 4 did not exhibit heat after weaning her first litter and was slaughtered. Cystic ovaries were present.

The number of pigs farrowed was somewhat low for second litter sows. It is possible that a rather high embryonic death loss occurred during gestation. The sows did gain more weight than desired and were considered to be overweight at farrowing. The high mortality from birth to weaning was due in part to the condition of the sows, the extreme temperature, and to the occurrence of mastitis in several of the sows. This condition appeared to be more prevalent in the sows on the lower level of alfalfa. Lot 4 sows again weaned the greatest number of pigs.

An interesting observation is the trend for heavier pig birth weights as the level of alfalfa in the ration was increased. This trend was not noted in the first litters.

Third farrowing. All sows kept after their second litter farrowed a third litter. The sow in Lot 4 that aborted her second litter farrowed a third litter. The three sows given no alfalfa meal had smaller litters, smaller pigs at birth and fewer pigs at weaning than sows given alfalfa meal. One sow in Lot 1 and one in Lot 3 lost all their pigs due to mastitis. If these sows were excluded, litter size at weaning would have been approximately equal for all lots.

Summary of three farrowings. A major difference was more sows farrowed when 5 or 10% alfalfa was in the rations. Sows fed the ration without alfalfa meal farrowed only 62% of the potential litters whereas sows fed 2.5, 5 or 10% alfalfa farrowed 79, 93 and 86%, respectively, of the potential litters. Sows fed 10% alfalfa in their ration farrowed larger litters, larger pigs at birth, fewer stillborn pigs, and weaned more pigs than the other treatments.