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In recent years much of the interest in nutrition of the gravid sow has been centered around restricting feed intake regardless of the weight gain of the sow. It has now become a common practice to restrict intake so that weight gain during gestation is limited to a maximum of 75 to 100 pounds. More recently, there has been some interest in the feeding of 2,2 - dichlorovinyl dimethyl phosphate (dichlorvos) near the end of gestation to attempt to increase the number of live pigs born and growth rate following birth.

This report deals with the weight gain of the sow and the use of dichlorvos as well as prefarrowing energy level treatment of the sow and how they affect the productivity of the sow and the performance of the newborn pig immediately following birth.

Experimental Procedure

Fifty-two gravid, crossbred gilts were randomly allotted into four treatment groups. All gilts were maintained in dirt lots and group fed according to the weekly weight gain treatment of each group as shown in table 2. All groups were fed the ration as shown in table 1. The gilts were fed once daily with water supplied ad libitum. All gilts were weighed weekly and the amount of feed fed per group per day was determined by the amount of weight gained during the preceding week.

Table 1. Composition of Ration

Ingredient	Percent
Oats	45.0
Alfalfa	35.0
Soybean meal (44%)	10.0
Molasses	5.0
Meat scraps	5.0

Table 2. Gilt Treatment

Group	Weight Gain	Dichlorvos
1	0-20 lb.	none
2	20-45 lb.	none
3	0-20 lb.	800 mg./day
4	20-45 lb.	800 mg./day

An attempt was made to restrict the gain of gilts in groups 1 and 3 to less than 20 lb. during gestation, while gilts in groups 2 and 4 were allowed to gain from 20 to 45 lb. Gilts in groups 3 and 4 were fed 800 mg. dichlorvos per day for 21 to 30 days prior to farrowing. At the 104th day of gestation each gilt was weighed, placed in a clean farrowing pen and assigned to one of the following prefarrowing energy treatments: (1) Basal ration to meet their maintenance requirement, (2) maintenance requirement plus 1000 Kcal. digestible energy per day, or (3) maintenance requirement plus 2000 Kcal. digestible energy per day. Sugar and fat were added at the rate of 15% to rations 2 and 3, respectively, to increase the energy intake and yet keep the total feed intake uniform between treatments.

Each gilt was weighed just before farrowing and again immediately after farrowing. At birth each pig was weighed and identified by litter and order of birth within the litter. The first eight pigs born were then assigned to eight different time treatments following birth. At the proper time of either 0, 6, 12, 18, 24, 36, 48, or 72 hr. after birth each pig was killed and various tissue samples were collected for a chemical study (not to be reported here).

Results

The results of this experiment are shown in tables 3, 4, and 5. Although not statistically significant, there were slight differences in weight gain of the gilts during the ten-day energy level treatment. Those gilts receiving the ration with 15% added fat gained the most weight (17.8 lb.), those on ration B containing 15% added sugar gained slightly less (17.5 lb.), and those on the control ration gained the least (15.2 lb.). Even though weight gain treatment of the gilt prior to the energy level treatment had no statistically significant effect on weight gain during the energy level treatment, those gilts gaining the least prior to the ten-day treatment did gain the most during the ten-day treatment. However, the exact opposite was true between dichlorvos treatments. There were no important differences in gestation length due to any of the treatments in this trial.

The most total and live pigs were farrowed by gilts on the lower weight gain and no dichlorvos treatment. The second most total and live pigs were farrowed by gilts on the higher weight gain and treated with dichlorvos, with the remaining two groups being nearly equal in numbers of pigs per litter.

Average birth weight was not affected by any treatment. However, the litters with a smaller number of pigs had heavier average birth weights than litters with a greater number of pigs. This is in agreement with previously reported work that there is an inverse ralationship between litter size and birth weight.

There were some differences in weight gain of the pigs following birth. The percentage increase in birth weight of pigs from gilts fed dichlorvos was less than that of pigs from the control gilts at 72 hr. of age (26.3% compared to 34.0%). Figure 1 shows the growth of all pigs in this experiment and reflects the differences due to time treatment. The values shown here are the percentage increases in birth weight at each of the specified time intervals. It is of interest to note the depression in the rate of growth at 12 hr. and again at 48 hr. after birth.

Summary

Fifty-two gravid gilts representing four treatment groups were fed to gain either 0 to 20 or 20 to 45 lb. during gestation and received either 0 or 800 mg. of dichlorvos daily from 21 to 30 days prior to farrowing. In addition each gilt was randomly placed on one of three energy intake levels for 10 days prior to farrowing. Sugar or fat was added at the rate of 15% of the total ration to increase energy intake 1000 Kcal. and 2000 Kcal. per day, respectively, over the control ration which was fed at a rate to meet the resting metabolic requirement of the gilt. These rations were fed from day 104 of gestation until the gilt farrowed. Eight pigs from each litter were killed each at one of eight time intervals (from 0-72 hr.) after birth for chemical analysis and the amount of increase in birth weight was determined.

During the ten-day prefarrowing treatment, the weight gain of the gilts was directly related to the amount of energy they received daily. Gestation length was not affected by any of the prefarrowing treatments. Gilts on the lower weight gain treatment and receiving no dichlorvos produced the most pigs per litter followed by the higher gaining gilts that received dichlorvos, with average birth weight being inversely related to number of pigs born. Gilts receiving no dichlorvos produced pigs that had greater body weight gains to 72 hr. of age than did pigs from gilts receiving dichlorvos.

Table 3. Performance of Gilts on Two Weight Gains, Dichlorvos Treatment and Three Energy Intake Levels Prior to Farrowing

	Gilt Wt. Gain		Dichlorvos		Prefarrowing energy levels		
	0-20 lb. (26)[a]	20-45 lb. (21)	0 (25)	800 mg. (22)	Control (17)	+1000 Kcal. (15)	+2000 Kcal. (15)
Gestation wt. gain, lb.	8.73	27.37	23.96	9.22	18.62	17.47	13.79
Prefarrowing energy level treatment wt. gain, lb.	17.73	14.56	17.95	14.48	15.18	17.51	17.84
Total gestation wt. gain, lb.	26.46	41.93	41.91	23.70	33.80	34.98	31.63
Wt. loss at farrowing, lb.	45.52	52.49	47.41	49.79	48.44	48.29	48.93
Gestation length	113.00	113.90	113.40	113.50	113.20	113.40	113.70
Pigs farrowed per litter	10.73	10.43	10.68	10.50	9.94	10.40	11.53
Pigs farrowed alive per litter	10.46	10.43	10.48	10.23	9.76	10.00	11.40
Av. birth wt., lb.	2.82	3.04	2.91	2.93	2.90	3.02	2.84
Wt. gain to 72 hr., %	30.75 (26)	30.43 (17)	34.04 (24)	26.31 (19)	30.86 (15)	31.93 (14)	29.06 (14)

[a] Numbers in parenthesis indicate the number of pigs represented in each average.

Table 4. Performance of Gilts on Three Energy Intake Levels Prior to Farrowing

Dichlorvos Treatment	Control					
Gestation Wt. Gain Treatment	0-20 lb.			20-45 lb.		
Prefarrowing energy level treatment	A (5)[a]	B (4)	C (4)	A (4)	B (4)	C (4)
Gestation gain, lb.	16.90	8.21	22.44	22.73	43.34	26.18
Prefarrowing energy level treatment gain, lb.	19.18	19.47	23.21	13.35	18.11	19.47
Total gestation wt. gain, lb.	36.08	27.68	45.65	36.08	61.45	45.65
Wt. loss due to farrowing, lb.	42.50	48.95	47.92	42.86	49.94	55.59
Gestation length	112.20	112.00	114.50	114.00	114.25	113.50
Pigs farrowed per litter	11.00	12.00	11.75	8.25	9.25	11.75
Pigs farrowed alive per litter	11.00	11.25	11.50	8.25	9.00	11.75
Av. birth wt., lb.	2.68	2.75	2.86	3.10	3.36	3.12
Wt. gain to 72 hr., %	37.14	27.58	34.52	36.75	39.33	28.81

[a] Numbers in parenthesis indicate the number of pigs represented in each average.

Table 4. Continued

Dichlorvos Treatment	800 mg./day					
Gestation Wt. Gain Treatment	0-20 lb.			20-45 lb.		
Prefarrowing energy level treatment	A (5)	B (4)	C (4)	A (3)	B (3)	C (3)
Gestation gain, lb.	6.99	-5.97	-7.52	28.16	26.25	14.22
Prefarrowing energy level treatment gain, lb.	11.97	20.42	18.70	16.35	10.27	7.41
Total gestation wt. gain, lb.	18.96	14.45	11.18	44.51	36.52	21.63
Wt. loss due to farrowing, lb.	48.84	42.64	42.20	65.19	52.80	52.58
Gestation length	113.60	113.50	112.50	113.00	113.70	114.70
Pigs farrowed per litter	9.80	9.25	10.75	10.67	11.33	12.00
Pigs farrowed alive per litter	9.40	9.25	10.50	10.33	10.67	12.00
Av. birth wt., lb.	3.11	3.23	2.73	3.02	3.02	2.96
Wt. gain to 72 hr., %	22.49	33.03	30.22	27.28	23.66	16.35

Table 5. Performance of Gilts on Two Weight Gains and Dichlorvos Treatment

Dichlorvos Treatment	Control		800 mg./day	
Weight gain treatment	(13)[a] 0-20 lb. gain	(12) 20-45 lb. gain	(13) 0-20 lb. gain	(9) 20-45 lb. gain
Gestation wt. gain, lb.	17.6	30.8	-.66	22.9
Prefarrowing energy level treatment wt. gain, lb.	18.8	16.9	15.9	11.3
Total gestation wt. gain, lb.	36.4	47.7	15.2	34.2
Wt. loss at farrowing, lb.	46.2	44.8	44.9	56.8
Gestation length, days	112.8	113.9	113.2	113.8
Pigs farrowed per litter	11.54	9.75	9.92	11.33
Pigs farrowed alive per litter	11.23	9.67	9.69	11.00
Av. birth wt., lb.	2.76	3.19	3.03	3.00
Wt. gain to 72 hr., %	33.39	34.96	28.11	22.43

[a] Numbers in parenthesis indicate the number of pigs represented in each average.

Figure 1. Percentage Increase in Birth Weight to 72 Hours.