

Effects of Dietary Fat Level on Performance of Early Weaned Pigs

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Story in Brief

The effects of fat supplementation in starter diets for early weaned pigs were studied in a trial utilizing 46 Yorkshire boar pigs. The four treatments included fortified corn-soybean meal diets containing 0, 4, 8 and 12 percent Choice White Grease. The levels of corn and soybean meal were altered to maintain a constant ratio of lysine to energy and vitamins and minerals to energy.

There were no significant treatment differences for total average daily gain (ADG) or feed to gain (F/G) over the entire experiment. However, the pigs on the 12 percent fat diet gained significantly less ($P < .05$) than those on the 8 percent or 4 percent fat diets during the first week of the trial. There were no significant differences between treatments ($P > .40$) for weeks two through five. These data suggest that energy utilization was less efficient in the higher fat diets since there was no improvement in feed efficiency with increasing dietary energy density.

Introduction

Many of the commercially prepared rations available on the market for the early weaned pig contain added fat. Swine producers who mix their own feed or have it mixed have the option of adding fat to young pig rations. It has been suggested that feeding fat-supplemented diets can reduce weaning problems and results in better feed conversion since fat is a major source of energy in sows' milk and would represent less of a dietary change for early weaned pigs. More studies are needed to give pork producers an experimental basis for deciding whether fat should be added to early weaned pig diets. This study was conducted to determine the effect of increasing levels of a very good quality fat on early weaned pig performance.

Materials and Methods

A feeding experiment was conducted with a total of 46 Yorkshire boar pigs to evaluate the effects of fat supplementation in starter pig diets. The four treatments included fortified corn-soybean meal diets containing 0, 4, 8 and 12 percent Choice White Grease (Table 1). The levels of corn and soybean meal were altered to maintain a constant ratio of lysine to energy and vitamins and minerals to energy. Energy content of the diet increased with increasing levels of added fat.

Table 1. Calculated composition of diets.

Ingredients	% Composition (as-fed)			
	Diet number			
	1	2	3	4
Corn	68.03	61.60	55.17	48.74
Soybean meal	28.57	30.83	33.09	35.35
Fat (Choice White Grease) ¹	—	4.00	8.00	12.00
Dicalcium phosphate	1.10	1.155	1.21	1.265
Calcium carbonate	1.20	1.26	1.32	1.38
Vitamin T.M. premix ²	0.75	0.79	0.825	0.86
Salt	0.30	0.315	0.33	0.345
Aureomycin (CTC 10)	0.05	0.05	0.055	0.06
Calculated analysis				
Crude protein (Nx6.25)	19.14	19.60	20.07	20.53
Calcium	.81	.85	.89	.98
Phosphorus	.61	.61	.62	.62
Lysine	1.00	1.05	1.10	1.15
Methionine	.23	.24	.25	.26
Cystine	.25	.26	.27	.28
DE(Kcal/lb)	1550	1626	1703	1780

¹Choice White Grease - stabilized with .005% BHT, minimum titer = 37°, free fatty acids maximum 4%, color 11-B-13 maximum, MIU (moisture, insoluble impurities, unsaponifiable) 1% maximum.

²Vitamin T.M. premix supplied 400,000 I.U. vitamin A; 30,000 I.U. vitamin D; 400 mg riboflavin; 2,000 mg pantothenic acid; 3,000 mg niacin; 80,000 mg choline; 1.5 mg vitamin B₁₂; 1,000 I.U. vitamin E; 200 mg mendeione sodium bisulfite; 20 mg iodine; 9g iron; 2g manganese; 1g copper; 9g zinc; and 10 mg selenium per lb of premix.

Pigs were assigned at random within replicate to treatment. Littermates were spread across treatments as much as possible to minimize litter effects. Replicates one and four consisted of 11 pigs each and two and three consisted of 12 pigs each.

Pigs were individually housed in an environmentally controlled room in elevated metal pens measuring 2 by 3½ feet. The room temperature was maintained at 75 to 80°F. Feed and water were offered *ad libitum*. The average starting age on trial was 30 days, and pigs were on trial 5 weeks. Pig weights were taken at the start of the trial and weekly thereafter. Feed consumption was recorded for the entire 5-week period.

Results and Discussion

Effects of dietary fat level on pig performance are shown in Table 2. Over the 5-week experimental period, dietary fat had no significant effect on total ADG ($P > .48$) or F/G ($P > .35$). Although fat level over the entire feeding period had no effect on overall gain, the pigs on the 12 percent fat diet gained significantly less ($P < .05$) than those on the 8 percent and 4 percent fat diets ($.03 \pm .08$ vs $.30 \pm .07$ and $.25 \pm .08$ lb/day, respectively) during the first week of the trial. This suggests that, for some reason, pigs did not adapt as well to the high fat diet during the first week of the trial. Total ADG averaged across replicates were $.89 \pm .05$, $.89 \pm .06$, $.88 \pm .05$ and $.79 \pm .06$.

Table 2. Performance of pigs averaged over replicates.

Variable	Diet number			
	1	2	3	4
% Choice White Grease	0	4	8	12
No. of pigs	12	11	12	11
Total ADG, lb/day	.89	.89	.88	.79
Wk 1 ADG, lb/day	.22 ^{a,b}	.25 ^a	.30 ^a	.03 ^b
Wk 2 ADG, lb/day	.62	.61	.60	.50
Wk 3 ADG, lb/day	1.04	.99	.97	.85
Wk 4 ADG, lb/day	1.17	1.16	1.04	1.10
Wk 5 ADG, lb/day	1.40	1.44	1.51	1.46
Total F/G, lb feed/lb gain	2.05	1.84	2.02	1.96
Total avg feed intake (lb)	62.96	54.52	60.66	53.61

^{a,b}Means in the same row with different superscripts differ significantly ($P < .05$).

lb/day for the 0, 4, 8 and 12 percent fat diets, respectively. There were no significant differences between diets ($P > .40$) for week two through week five. Total F/G averaged across replicates were $2.05 \pm .08$, $1.84 \pm .09$, $2.02 \pm .08$ and $1.96 \pm .09$ lb feed/lb gain for the 0, 4, 8 and 12 percent fat diets, respectively. With increasing energy density in the higher fat diets there was no increase in feed efficiency, therefore there appeared to be less efficient utilization of energy in the higher fat diets for this age of pig. On the basis of this experiment, it would not appear advantageous to add fat to diets fed to pigs that are weaned at 30 days of age.