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Richard C. Wahlstrom
South Dakota State University

George W. Libal

Alan Vogel

Richard M. Luther

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Why Add Vitamin Supplements to Diets of Growing-Finishing Pigs?

Richard C. Wahlstrom, George W. Libal, Alan Vogel and Richard M. Luther

A great deal of variation appears to exist in the amount of supplemental vitamins that are added to diets for growing-finishing pigs. Many pigs are fed diets that do not contain any supplemental vitamins, others receive diets containing levels of vitamins that meet the recommendations of the National Research Council (NRC) and still others are fed diets containing levels of vitamins considerably higher than the NRC recommended levels. This experiment was conducted to determine the value, if any, of recommended and excess levels of vitamins in growing-finishing pig diets.

Experimental Procedure

Seventy-two crossbred pigs averaging about 35 lb. were allotted to three replications of three treatments on the basis of weight, sex and ancestry. Each lot was composed of four barrows and four gilts. The pigs were housed in a confinement, slotted floor building. The 5 x 16 foot pens of each replicate varied in slotted floor area. Floors were totally slotted in the pens of replicate 1, 25% slotted in pens of replicate 2 and 50% slotted in pens of replicate 3.

The compositions of the corn-soybean meal basal diets, which were self-fed, are shown in table 1. The diets were changed from 15% protein to 12% protein when pigs averaged approximately 125 pounds.

The three treatments were as follows:

1. Basal diet, no added vitamins
2. Basal diet plus recommended levels of vitamins
3. Basal diet plus excess levels of vitamins.

The compositions of the vitamin supplements are shown in table 2. The supplement used in treatment 2 supplied vitamins at levels near those recommended by the NRC, while the supplement used in treatment 3 supplied 20 times the levels of vitamins A and D and 5 times the levels of B vitamins that were added to treatment 2.

Results

Performance data for this experiment are shown in table 3. Pigs in treatment 1 that were fed the basal diet without supplemental vitamins grew at a slower rate during both the growing and finishing phases than pigs fed supplemental vitamins. This slower growth was accompanied by a reduced feed intake and slightly increased feed requirement. Average daily gains up to an average pig weight of 125 lb. were 1.31 for pigs fed the unsupplemented diet and 1.51 and 1.48 lb. for pigs receiving the vitamin supplemented diets. However, after 125 lb. the difference in gains was greater as the unsupplemented pigs gained only 1.26 lb. per day compared to 1.63 and 1.57 lb. per day for pigs fed vitamin supplemented diets. This larger

difference in gains is probably a reflection of the greater difference in feed consumption. During the growing phase, pigs fed supplemental vitamins consumed approximately 0.36 lb. more feed daily and during the finishing phase they consumed about 0.95 lb. more feed daily than pigs that were fed the diets without vitamin supplementation. There was a greater variation in performance of pigs in treatment 1 than in the other two treatments. This could indicate some difference in individual pig requirements for vitamins and it is also possible that these pigs were more susceptible to certain stress conditions. Four pigs had to be removed from this treatment compared to three pigs in treatment 2 and none in treatment 3.

There were no advantages in growth rate or feed/gain by increasing vitamins above the NRC recommended levels. Performance was similar for these two vitamin supplemented treatments during both the growing and finishing periods.

Summary

Seventy-two weanling pigs were used in an experiment to study the effect of supplemental vitamins added to a corn-soybean meal diet. Pigs fed supplemental vitamins gained about 18% faster and required 3% less feed than pigs that did not receive a vitamin supplement. Feed consumption was significantly lower for pigs fed the unsupplemented diets. There was no advantage of increasing the vitamin levels over NRC recommended levels.

Table 1. Composition of Basal Diet (Percent)

Ingredients	To 125 lb.	125 to 200 lb.
Ground yellow corn	79.4	89.8
Soybean meal (44%)	17.7	7.9
Dicalcium phosphate	1.7	1.1
Ground limestone	0.5	0.5
Trace mineral salt (0.8% zinc)	0.5	0.5
Premix	0.2	0.2

Table 2. Vitamins Added Per Pound of Diet

	Treatment		
	1	2	3
Vitamin A, IU	0	800	16,000
Vitamin D, IU	0	90	1,800
Vitamin E, IU	0	5	10
Riboflavin, mg	0	1.25	6.25
Pantothenic acid, mg	0	5	25
Niacin, mg	0	10	50
Choline, mg	0	50	250
Vitamin B ₁₂ , mcg	0	7.5	37.5

Table 3. Effect of Vitamin Supplementation on Performance on Growing-Finishing Pigs

	Treatment ^a		
	1	2	3
Number of pigs ^b	20 ^c	21 ^c	24
Avg. initial wt., lb.	35.4	35.6	35.3
Avg. final wt., lb.	174.2	199.2	198.2
Growing phase			
Avg. daily gain, lb.	1.31	1.51	1.48
Avg. daily feed, lb.	3.91	4.30	4.25
Feed/gain	3.04	2.89	2.86
Finishing phase			
Avg. daily gain, lb.	1.26	1.63	1.57
Avg. daily feed, lb.	5.24	6.20	6.17
Feed/gain	4.40	3.89	3.92
Growing and finishing			
Avg. daily gain, lb.	1.30	1.55	1.52
Avg. daily feed, lb. ^d	4.36	5.09	5.01
Feed/gain	3.41	3.32	3.29

^aTreatment 1, no added vitamins; treatment 2, recommended levels and treatment 3, excess levels of vitamins.

^bThree replicates of 8 pigs each per treatment.

^cTwo pigs died, three removed for rectal prolapse and two for leg weakness.

^dSignificant treatment differences (P<.05).