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Calcium and phosphorus are two mineral elements that are most often deficient in swine rations. Since they are associated with bone development, any lameness in swine is often attributed to a lack of calcium and/or phosphorus. The objective of this experiment was to study the value of increasing levels of calcium and phosphorus above the minimum recommended requirements for growing-finishing swine.

Experimental Procedure

Forty-eight weanling crossbred pigs averaging 44.5 lb. were divided into two groups and fed the rations shown in table 1. The rations fed to the two groups of pigs were of equal protein content. Rations A and B contained approximately 16% protein and were fed to an average weight of about 115 lb. to market weight. Rations A and C fed to group I contained the minimum amount of calcium and phosphorus recommended by the National Research Council, while rations B and D fed to group II contained from 30 to 40% more calcium and approximately 100% more phosphorus (see table 1). The higher phosphorus levels were fed to give a 1 to 1 ratio of calcium and phosphorus in rations B and D based on a 40% availability of phosphorus in corn and soybean meal since it has been shown that the phosphorus of cereal products is largely unavailable to the pig.

The pigs were housed in open-front houses with adjoining outside concrete pens where feed and water were available.

Results

Results of this experiment are summarized in table 2. Average daily gain and feed efficiency were very good with both ration treatments. The similar results in gains of 1.87 and 1.88 lb. per day and feed conversions of 3.13 and 3.15 indicate that calcium and phosphorus levels had no effect on gain or feed efficiency in these rations. There were no visible differences noted in lameness or other bone abnormalities.

These results support previous research indicating that present National Research Council recommendations of 0.65% calcium and 0.50% phosphorus for growing pigs and 0.50% calcium and 0.40% phosphorus for finishing pigs are adequate for maximum rate and efficiency of gain.

Table 1. Composition of Rations (Percent)

	Ration			
	A	B	C	D
	Weaning to 115 lb.		115 lb. to market	
Ground yellow corn	770	750	884	863
Soybean meal (44%)	205	210	95	100
Dicalcium phosphate	9	31	5	27
Disodium phosphate	--	4	--	3
Limestone	9	--	9	--
Trace mineral salt	5	5	5	5
Premix[a]	2.5	2.5	2.5	2.5
Calculated analysis				
Crude protein, %	15.95	15.99	12.13	12.17
Calcium, %	0.62	0.81	0.50	0.69
Phosphorus, %[b]	0.50 (0.30)	1.01 (0.81)	0.40 (0.22)	0.87 (0.69)

[a] Provided 1500 I.U. vitamin A, 150 I.U. vitamin D, 1 mg. riboflavin, 2.5 mg. calcium pantothenate, 7.5 mg. niacin, 50 mg. choline, 5 mcg. vitamin B_{12} and 5 mg. oxytetracycline per pound of ration.

[b] Values in ( ) are phosphorus levels based on 40% availability of phosphorus in corn and soybean meal.

Table 2. Calcium and Phosphorus Levels in Swine Rations

	Group I	Group II
Calcium Level	0.62 - 0.50	0.81 - 0.69
Phosphorus Level	0.50 - 0.40	1.01 - 0.87
No. of pigs	24	24
Av. initial wt., lb.	44.5	44.5
Av. final wt., lb.	216.2	217.7
Av. daily gain, lb.	1.87	1.88
Av. daily feed, lb.	5.83	5.93
Av. feed per lb. gain, lb.	3.13	3.15