

### Summary

Forty-two boars averaging 67 lbs. were used to study how various levels of calcium and phosphorus in their feed affected their development. Calcium-to phosphorus ratios of 1.2 to 1 were maintained in all treatment diets, which ranged from a low of .55% calcium and .45% phosphorus to a high of 1.30% calcium and 1.05% phosphorus. Seven treatment groups were replicated three times. No significant differences were observed for average daily gain, feed efficiency, carcass length, and backfat. Based on this trial, it appears that 0.55% calcium and 0.45% phosphorus is adequate for optimum growth of developing boars.

### Introduction

Leg problems in young boars seem to be increasing for swine producers. Some leg problems seem to be due to structural unsoundness; some may be due to inadequate dietary calcium (Ca) and/or phosphorus (P). Most producers give developing boars amounts equal to the recommended mineral requirements for growing barrows and gilts, but that practice may be questionable in that boars grow at a faster rate and are freer of backfat. Therefore, the objective of this study was to evaluate the use of five levels of Ca and P in the rations of developing boars as measured by feed efficiency and average daily gain, carcass backfat, and length.

### Procedure

Forty-two crossbred boars ( $\frac{1}{4}D\frac{1}{4}Y\frac{1}{2}H$ ) averaging 65 lbs. were randomly assigned by weight and litter to seven dietary treatments: (A) 0.55% calcium, 0.45% phosphorus; (B) 0.74% calcium, 0.60% phosphorus; (C) 0.93% calcium, 0.75% phosphorus; (D) 1.1% calcium and 0.90% phosphorus; (E) 1.30% calcium, 1.05% phosphorus; (F) ration B to 150 lbs. followed by ration D to 250 lbs.; (G) ration D to 150 lbs. followed by ration B to 250 lbs. Each treatment was replicated three times. Composition of diets is shown in table 23 .

Boars were housed in an open-fronted barn, two per pen (4' x 16'). Pigs in each pen had access to a one-hole self feeder and an automatic waterer. Boars were fed a pelleted corn-soybean meal diet supplemented with sources of calcium and phosphorus to the desired levels. Boars in each pen were weighed off feed when they averaged 250 lbs.; they then were slaughtered and their carcass backfat and length determined. Bone samples were collected to analyze for breaking strength, ash content, and other factors. (Analyses have not been completed.)

### Results and Discussion

As shown in table 24 , different levels of dietary Ca and P (fed at a ratio of 1.2 to 1) did not significantly influence feed consumption, daily gain, or feed efficiency. This feeding

trial, however, indicated that optimum growth and efficiency were maintained at a dietary level of .55% calcium and .45% phosphorus.

There were no significant differences in backfat thickness or carcass length among the boars in the seven dietary treatments.

Chemical analysis of rations used in this study were as follows: (A) .56% Ca - .55% P, (B) .77% Ca - .63% P, (C) .81% Ca - .68% P, (D) 1.11% Ca - .88% P, (E) 1.50% Ca - 1.27% P.

Table 23 . Composition of rations.

	(A)	(B)	(C)	(D)	(E) <sup>a</sup>
Calcium, %	.55	.74	.93	1.10	1.30
Phosphorus, %	.45	.60	.75	.90	1.05
<b>Ingredients, %:</b>					
Corn	73.24	72.37	71.50	70.63	69.75
Soybean meal (44%) <sup>b</sup>	24.00	24.00	24.00	24.00	24.00
Dicalcium phosphate <sup>c</sup>	.62	1.33	2.05	2.76	3.50
Limestone	.79	.95	1.10	1.26	1.40
Salt	.50	.50	.50	.50	.50
Trace mineral	.10	.10	.10	.10	.10
Vit. premix	.50	.50	.50	.50	.50
Antibiotic	.10	.10	.10	.10	.10

<sup>a</sup>(F) = ration B to 150 lbs. followed by D to 250 lbs.; (G) = ration D to 150 lbs. followed by ration B to 250 lbs.

<sup>b</sup>Soybean meal used analyzed .53% calcium, .55% phosphorus.

<sup>c</sup>Dicalcium phosphate used contained 18% calcium, 21% phosphorus.

<sup>d</sup>Limestone used contained 38% calcium.

Table 24 . Performance of developing boars fed various levels of calcium and phosphorus at ratio of 1.2 to 1.

Treat-ment	Calcium %	Phos-phorus %	Daily gain lb.	(kg) <sup>a</sup>	Feed/gain lb. <sup>b</sup>	Daily intake lb.	(kg) <sup>b</sup>
A	.55	.45	1.96	(.89)	2.97	5.83	(2.65)
B	.74	.60	1.91	(.87)	3.02	5.75	(2.61)
C	.93	.75	2.07	(.94)	2.91	6.02	(2.73)
D	1.10	.90	1.82	(.83)	3.09	5.61	(2.55)
E	1.30	1.05	2.05	(.93)	3.00	6.13	(2.78)
F Trt B to 150 lbs. then D			2.09	(.95)	2.95	6.15	(2.79)
G Trt D to 150 lbs. then B			2.06	(.94)	2.90	6.00	(2.72)

<sup>a</sup>Each value is the average of six pigs.

<sup>b</sup>Each value is the average of three pens (two pigs each).

Table 25 . Carcass data for boars fed various amounts of calcium and phosphorus. <sup>a</sup>

Treat-ment	Calcium %	Phosphorus %	Slaughter (weight, lb.)	Carcass Length	BF
A.	.56	.45	268.0	32.9	.93
B	.74	.60	260.8	32.5	.84
C	.94	.75	273.5	33.2	.98
D	1.12	.90	259.7	32.4	.85
E	1.31	1.05	272.2	33.2	.90
F Trt B to 150 lbs. then D			275.8	33.1	.99
G Trt D to 150 lbs. then B			276.2	33.6	.94

<sup>a</sup>Each value is an average of six pigs per treatment.