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Richard C. Wahlstrom

*South Dakota State University*

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# The Effect of Vitamin D in Rations for Growing Pigs Fed in the Absence of Direct Sunlight<sup>1/</sup>

Richard C. Wahlstrom

Previous to this experiment two trials were conducted here that did not indicate a need for supplemental vitamin D for growing pigs fed in the absence of direct sunlight. In these previous trials a complete mixed ration containing recommended amounts of calcium and phosphorus was fed.

The experiment reported here was conducted to see if supplemental vitamin D was required for growing pigs in the absence of sunlight when a mineral supplement was fed free-choice as well as when a complete mixed ration was fed.

## Experimental Plan

Thirty-two weanling pigs were allotted as equally as possible into groups of 4 pigs each. Two groups of pigs were placed on each ration treatment. The treatments were as follows:

Basal ration A

Basal ration A / vitamin D (90 I.U./lb.)

Basal ration B

Basal ration B / vitamin D (90 I.U./lb.)

The composition of the basal rations is shown in table 1. Ration A contained approximately 0.50 per cent calcium and 0.48 per cent phosphorus. In ration B the mineral supplement was fed free choice.

Each group of 4 pigs was confined to an inside 8 x 10 foot pen. They were provided with an automatic waterer and self-feeder.

## Summary of Results

The results of this experiment are shown in table 2. All pigs fed ration A grew rapidly and were very efficient producers. This was true regardless of whether supplemental vitamin D was present or not. These results were similar to our previous results when complete mixed rations were fed. However, when ration B was fed the pigs did very poorly in the absence of vitamin D. Five of the eight pigs showed definite signs of rickets. Symptoms were lameness, crooked legs, poor growth and soreness of feet and legs which was evidenced by the objection of these animals to stand or walk. One pig developed posterior paralysis and was sacrificed.

Supplementing ration B with vitamin D resulted in an increase in rate of gain but did not give complete protection against rickets. Two of the pigs fed this ration also developed rickets. The other 6 pigs did not show visible symptoms of rickets but they did not gain as rapidly as did the pigs fed ration A.

It was quite evident that the pigs fed ration B did not consume enough mineral supplement free-choice to provide them with adequate calcium. It appears that adding vitamin D to this ration did enhance the availability or utilization of the calcium as the pigs fed ration B plus vitamin D grew faster and more efficiently and fewer pigs developed rickets than when vitamin D supplementation was absent.

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<sup>1/</sup> Presented at South Dakota State College Swine Field Day, September 19, 1957.

In this trial where young pigs were exposed to sunlight prior to weaning, there was no indication of a need for supplemental vitamin D if well balanced mixed rations were fed during the growing, finishing phase. When a mineral supplement was fed free-choice, along with a ration low in calcium, to pigs in the absence of sunlight, there was a benefit from supplemental vitamin D. However, this ration containing vitamin D did not support optimum growth because of the failure of the pigs to consume adequate amounts of mineral supplement. It is therefore recommended that if pigs are to be confined in the absence of sunlight a ration that contains adequate amounts of calcium should be fed rather than including the calcium in a mineral supplement fed free-choice.

Table 1. Composition of Rations Used (Per Cent)

	<u>Ration A</u>	<u>Ration B</u>
Ground yellow corn	80.65	82.85
Soybean oil meal	17.0	17.0
Steamed bone meal	1.0	*
Ground limestone	0.7	*
Trace mineral salt	0.5	*
Vitamin-antibiotic	0.15	0.15

\* Mineral mixture composed of equal parts of steamed bone meal, ground limestone and trace mineral salt fed free-choice.

Table 2. Vitamin D in Swine Rations

<u>Treatment</u>		<u>Ave. Daily Gain</u>	<u>Feed/day</u>	<u>Feed/cwt. gain</u>
Ration A	Rep I	1.78	5.33	298
	Rep II	1.80	5.42	302
	Ave.	1.79	5.38	300
Ration A / vitamin D	Rep I	1.81	5.57	308
	Rep II	1.80	5.59	311
	Ave.	1.80	5.58	310
Ration B	Rep I	1.06	3.97	374
	Rep II	1.03	4.11	399
	Ave.	1.05	4.04	385
Ration B / vitamin D	Rep I	1.29	4.05	314
	Rep II	1.56	5.35	344
	Ave.	1.42	4.71	330