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EFFECT OF IRON, LYSINE, VITAMINS AND AN ANTIBIOTIC IN WATER
ON GROWING-FINISHING SWINE

R. W. Seerley

Several studies have been conducted at this station with nutrients or additives in the water, but studies have not been made on treatments with several nutrients and additives in combination. If water is used as a means of feeding nutrients, then it is reasonable that several nutrients could be fed in the water. The following experiment was conducted as a preliminary investigation on the effects of several nutrients and an antibiotic in water.

Experimental Procedure

Experimental treatments were:

Lot 1 - Basal ration (complete diet)

Lot 2 - Basal ration plus 15 mg. of ferric choline citrate per gallon of water (8.34 lb.)

Lot 3 - Basal ration without vitamin-antibiotic premix, but the water premix in the water

Lot 4 - High protein ration without vitamin-antibiotic premix, but the water premix in the water (This treatment is the same as 3, except more protein was fed.)

The experiment was started on June 13, 1966. Pigs were allotted on the basis of breed and sex and then assigned at random to treatment. There were five Duroc and five Yorkshire pigs in each lot and there were three barrows and two gilts in each breed.

Pigs were confined on concrete in quarters with a sleeping shed and feeding floor. Feed and water were provided ad libitum in wooden self-feeders and 80 gallon tank-type automatic waterers, respectively. All lots, except 4, were fed a 14% crude protein ration to approximately 110 pounds of body weight. A 12% crude protein ration was fed from 110 lb. to the end of the trial (table 1). These rations were adequate and well fortified for good growth and feed utilization. Pigs in lot 4 were fed a 16% crude protein ration throughout the trial (sixteen percent crude protein is more than recommended for heavier pigs by current standards).

Table 1. Ration Composition, Lb.

Ingredient	Basal ration		Higher protein ration (lot 4)
	14% C.P.	12% C.P.	16% C.P.
Shelled corn	1686	1780	1590
Soybean meal (50%)	256	160	350
Dicalcium phosphate	32	36	34
Limestone	10	6	12
T.M. salt	10	10	10
Premix	a or b	a or b	a

^a The water premix provided 4,000 I.U. vitamin A, 400 I.U. vitamin D, 7 mg. riboflavin, 19 mg. niacin, 16 mg. pantothenic acid, 16 mcg. vitamin B₁₂, 400 mg. choline, 70 gm. tylosin and 15 mg. ferric choline citrate per gallon of water.

^b The feed premix (lots 1 and 2) provided 1135 I.U. vitamin A, 340 I.U. vitamin D, 2 mg. riboflavin, 4 mg. pantothenic acid, 9 mg. niacin, 10 mg. choline chloride, 7 mcg. vitamin B₁₂ and 5 mg. tylosin per pound of ration.

Results

A summary of the results is presented in table 2. When pigs were fed the control ration plus ferric choline citrate in the water, they had essentially the same rate of gain, feed consumption and feed efficiency as the control pigs. Apparently the ferric choline citrate did not produce any growth response in this treatment over that produced by the basal ration.

Pigs fed the water premix (lot 3) gained 5.5% faster than the control pigs, but they required the same quantity of feed per pound of gain as the control pigs. When the same water premix and more protein were fed (lot 4), pigs gained 10.3% faster and required 4.6% less feed per pound of gain than the control pigs.

Both groups of pigs fed the water premix consumed more feed per day than the pigs fed the complete feed. The improvement in feed intake probably accounts for most of the improvement in daily gain. However, the several variables in the treatments cannot be separated and the effect of each nutrient or additive individually cannot be determined in this trial. The main effect in lot 4 was probably due to more amino acids, but there could have been an synergistic interaction effect between ingredients, also.

In summary, these results are in agreement with most of the other research with nutrients in the water. The growth rate and feed utilization of pigs fed nutrients in the water were generally at least equal to pigs fed traditional complete rations. It appears that vitamins and antibiotics can be added to water at about the same cost per pound of gain as feeding the complete ration. There is an improvement in feed utilization when lysine is fed in water, but the cost is higher at the current prices of lysine.

Table 2. Summary of Experiment

	Basal ration	Basal ration, with F.C.C.	Basal ration, water premix	High protein ration, water premix
Lot number	1	2	3	4
No. pigs	10	10	10	10
Av. initial wt., lb.	81.4	82.9	79.0	77.2
Av. final wt., lb.	203.1	200.0	207.3	203.6
Av. daily gain, lb.	1.64	1.60	1.73	1.81
Av. daily feed, lb.	5.26	5.25	5.65	5.52
Feed per 100 lb. gain, lb.	3.20	3.27	3.26	3.06