1975

Effect of Supplemental Iron Pig Starter Diets

Richard C. Wahlstrom
South Dakota State University

George W. Libal

Steven L. Robbins

James L. Girard

South Dakota State University
Brookings, South Dakota

Department of Animal Science
Agricultural Experiment Station

A.S. Series 75-61

Effect of Supplemental Iron in Pig Starter Diets

Richard C. Wahlstrom, George W. Libal,
Steven L. Robbins and James L. Girard

Iron is a necessary mineral element for the pig. A lack of iron in the diet results in a lowered level of hemoglobin in the blood and anemia develops. This problem is noted more in young nursing pigs because the sow's milk does not supply sufficient iron to meet the needs of the rapidly growing pig. It is generally assumed that once the pig starts to eat a dry feed diet they receive enough iron from the ingredients in the diet.

Iron is added to most trace mineral salts and trace mineral mixtures at low levels. However, it has been reported by some swine producers that they obtain better performance of pigs when fed a relatively high level of iron. Therefore, the objective of this experiment was to determine if there was any benefit of adding iron at levels up to 250 ppm on pig growth, feed efficiency or blood parameters.

Experimental Procedure

Two trials were conducted. In each trial, 72 crossbred pigs approximately 4 weeks old and weighing 18.9 lb. were allotted 6 pigs per pen to 4 treatments replicated three times. The pigs were housed in 8 by 8 feet, concrete floored pens in a confinement house. Feed and water were provided ad libitum.

The composition of the basal diet is shown in table 1. Iron sulfate was added to this diet to provide 0, 62.5, 125 and 250 ppm of iron for treatments 1, 2, 3 and 4, respectively. The experiment was conducted for 4 weeks.

Results

The results of the two trials were combined and are shown in table 2. There were no significant differences among the treatment groups in rate of gain, feed/gain or any of the blood parameters.

Pigs fed the iron supplemented diets gained slightly faster than those pigs fed the control diet. Average daily gain of pigs fed 125 ppm of supplemental iron was 0.89 lb. and those pigs fed 62.5 or 250 ppm gained 0.85 lb. while the control pigs gained 0.79 lb. daily.

The slightly faster rate of gain of pigs fed diets supplemented with iron was associated with higher daily feed consumption. Daily feed consumption was 1.70, 1.87, 1.88 and 1.87 lb. of diets containing 0, 62.5, 125 and 250 ppm of supplemental iron. Feed efficiency was similar among groups.

It would appear that the control diet which contained 13 ppm of iron from the trace mineral salt was adequate for blood formation as these pigs had hematocrits, hemoglobin and red cell numbers essentially equal to those of pigs fed the supplemented diets. White blood cells were slightly higher in pigs fed the control diet but were not significantly different from those for the other treatment groups.

Summary

One hundred forty-four pigs averaging about 19 lb. initially were used to study the effect of supplementing starter diets with 0, 62.5, 125 or 250 ppm of iron.

There were no significant effects on rate of gain, feed consumption, feed/gain, percent hematocrit, level of hemoglobin or white and red blood cell numbers.

Table 1. Composition of Basal Diet

Ingredients	Percent
Ground yellow corn	73.0
Soybean meal, 48%	24.2
Trace mineralized salt[a]	0.4
Dicalcium phosphate	1.4
Ground limestone	0.7
Vitamin-antibiotic premix[b]	0.3

[a]Provided 32 ppm of zinc and 13 ppm of iron in addition to NaCl, manganese, copper, cobalt and iodine.

[b]Supplied per lb. of diet: vitamin A, 1800 IU; vitamin D, 180 IU; vitamin E, 3 IU; riboflavin, 1.5 mg; pantothenic acid, 6 mg; niacin, 12 mg; choline, 60 mg; vitamin B_{12}, 9 mcg; aureomycin, 50 mg; penicillin, 25 mg and sulfamethazine, 25 milligrams.

Table 2. Effect of Supplemental Iron in Pig Starter Diets

	Supplemental iron, ppm			
	0	62.5	125	250
Number of pigs	36	36	36	36
Avg. initial wt., lb.	18.9	18.9	18.9	18.8
Avg. final wt., lb.	41.1	42.6	43.7	42.5
Avg. daily gain, lb.	0.79	0.85	0.89	0.85
Avg. daily feed consumed, lb.	1.70	1.87	1.88	1.87
Feed/gain	2.16	2.21	2.14	2.22
Avg. blood hematocrit, %[a]	36.28	35.94	36.31	36.78
Avg. blood hemoglobin, g %	12.11	11.82	12.11	12.18
Avg. white blood cells, thousand/mm^3	15.20	13.54	13.42	13.23
Avg. red blood cells, million/mm^3	7.19	7.23	7.04	7.28

[a]All blood data are values at the end of the experiment.