

## Comparison of Iron Injections Under Different Types of Management Systems

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Nutritional anemia was a common hazard among baby pigs until it was discovered to be caused by the lack of iron and copper in the diet. Experiments have shown that 10-15 milligrams of iron is required daily, preferably in the form of iron salts. Various methods have been used to meet this requirement, but recently, the use of iron injections has become a common method.

In the spring of 1958, two trials were conducted at the Fort Reno Experiment Station to study iron injections for different types of management systems. In Trial I, two levels of iron injection were compared to no injection under four types of management systems. In Trial II, the two levels of iron injections were compared under two types of management systems.

### Trial I—Procedure

Trial I included 28 litters (254 pigs) from five different lines of breeding. Each litter was divided into three groups at five days of age. Group A of each litter received 2 cc of iron dextran\*\*, Group B received 1 cc of an iron-cobalt-folic acid injection†, and Group C served as a control group and received no injection.

When the litters were six days old, they were distributed over four types of management systems. Nine litters were placed in alfalfa pasture lots and nineteen litters were housed on concrete floors in confinement. The litters raised on concrete received three different types of management. Five litters received an iron solution†† in baby pig waters placed in the creep feeding pens, four litters received fresh dirt in their pens, and the remaining 10 litters received no additional iron supplement.

All pigs were weaned at approximately eight weeks of age, and the individual weaning weights were adjusted to a 56-day weight. The average individual 56-day pig weight of those living at weaning, and the percent survival from five days of age to weaning were used as the two measures of response in this study.

\* Acknowledgement is given Dr. J. W. Wolfe, Director of Veterinary Clinic, O.S.U., for his assistance in obtaining the supplies of iron, and for recommending the amounts to administer.

\*\*Sold under the trade name of Ferrexteran. Two cc contains: 100 mg elemental iron (as ferric hydroxide) in complex with dextran; and 0.25% Phenol.

†Sold under the trade name of Chromagen; furnished by Savage Laboratories, Bellaire, Texas. One cc contains: 4.5 mg Cobalt Gluconate; 29.5 mg Iron Peptonized (5 mg elemental iron); 2.5 mg. Folic Acid; 2.5 mcg Liver Injection (Beef); 1.0% Procaine HCl; and 0.5% Phenol.

††Sold under the trade name of Co-Fer-Mel and administered at the rate of 2 oz. per gallon of water. Each ounce contains: 72 gm Iron Sulfate; ¼ gm Cobalt sulfate; 5% Glycerin; and trace amounts of Copper Sulfate, Zinc Sulfate and Dextrose.

## Trial I—Results and Discussion

### Average Weaning Weight

Results (Table 1) indicate that the pigs receiving the iron dextran injections (Group A) averaged 6.2 pounds heavier than those receiving the iron-cobalt-folic acid injections (Group B), and 7.1 pounds heavier than those receiving no injection (Group C).

TABLE 1. Average 56-day pig weight in pounds.

Group	Pasture	Confinement	Confinement & Iron in Water	Confinement & Dirt in Pen	Over-all Average
A	36.9	36.9	38.7	36.2	37.1
B	35.9	24.4	33.4	32.8	30.9
C	34.7	22.4	32.6	32.6	30.0
Average	35.9	28.3	34.9	33.9	

Iron dextran injection had its largest effects upon the pigs raised in confinement without additional iron supplement, and its smallest effects upon the pigs raised on pasture. The iron dextran injection pigs raised in confinement average 12.5 pounds more than those receiving the iron-cobalt-folic acid injection, and 14.5 pounds more than those receiving no injection.

It should also be noted that the addition of iron supplement in the form of fresh dirt, or in the form of an iron solution in the drinking water, increased the average weaning weight of the pigs. The pigs receiving the fresh dirt averaged 5.6 pounds more than those on confinement without additional iron supplement. Those receiving iron in their drinking water averaged 6.6 pounds more than those on confinement without additional iron supplement.

### Percent Survival from Time of Injection to Weaning

Considering the over-all average, the percentage survival (Table 2) tends to be highest for the pigs receiving the iron dextran injection and lowest for those receiving no injection. Ninety percent of those injected with iron dextran at six days of age reached weaning age as compared to 80 percent of the controls. Iron dextran injection tended to have its greatest effect on the survival rate for pigs raised in confinement (85 percent compared to 70 percent).

Results in Table 2 indicate that the litters raised on concrete, without additional iron supplement, had the highest death loss. The addition of iron in the drinking water or the addition of fresh dirt in the pen tended to increase the survival rate from 75 percent to 95 percent and 90 percent respectively.

TABLE 2. Percentage reaching weaning age.

Group	Pasture	Confinement	Confinement & Iron in Water	Confinement & Dirt in Pen	Over-all Average
A	90	85	95	100	90
B	90	70	100	82	84
C	83	70	90	88	80
Average	88	75	95	90	

### Trial II—Procedure

Six sow litters and 22 gilt litters (213 pigs) from five different lines of breeding were used to compare the iron dextran and the iron-cobalt-folic acid injections on pasture and in confinement. Each litter was divided into two groups at five days of age: Half of the litter received 2 cc of iron dextran and the other half received 1 cc of iron-cobalt-folic acid injection. Nineteen of these litters were placed on pasture when they were six days old. Nine litters were housed on concrete in confinement until they were weaned at eight weeks of age.

### Trial II—Results and Discussion

#### Average Weaning Weight

The results obtained in this trial were similar to those obtained in Trial I. The pigs which were raised on concrete in confinement and receiving the iron dextran injection averaged 3.6 pounds more than those that received the iron-cobalt-folic acid injection (36.1 pounds compared to 32.5 pounds). No important difference was noted in the average 56-day weights for the two types of injections under pasture conditions. (37.4 pounds compared to 37.7 pounds).

#### Percent Survival from Time of Injection to Weaning

Eighty-eight percent of those receiving iron dextran injections and raised in confinement reached weaning age as compared to 76 percent of those receiving the iron-cobalt-folic acid injections. However, no difference was noted between the two types of injections for the pigs raised on pasture (90 percent of the pigs injected survived to weaning.)

### Summary

Two trials, including 56 litters (467 pigs) from five different lines of breeding, were conducted to study the effects of iron injections under various types of management systems.

The addition of iron resulted in heavier pigs at weaning and a higher survival rate to weaning. Results indicated that pigs injected

with 100 milligrams of iron dextran weighed more at weaning and had a lower death loss than those injected with iron-cobalt-folic acid which contained only five milligrams of elemental iron, or those receiving no injection.

Iron dextran had its largest effects on pigs raised on concrete in confinement without additional iron supplement. It was noted that the addition of iron in the water of the baby pig waterer or fresh dirt in the pen tended to increase the average weaning weight and the percentage survival for pigs raised in confinement.

## **A Comparison of Pasture and Confinement Systems For Raising Hogs**

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In contrast to the long established practice of raising hogs on pasture, an increasing number are being raised in confinement on concrete floors. During the period of constructing confinement facilities for hogs at the Fort Reno station, confinement facilities were not available for the entire herd. This presented an opportunity to divide the herd and compare performance under the two systems of management.

### **1957 Fall Pigs**

#### **Procedure**

The 42 sows farrowed in August and September of 1957 were divided equally into three groups according to age and line of breeding. All sows were fed alike on pasture during gestation and were farrowed in a central farrowing barn. Sows in Groups 1 and 2 were moved from the barn to alfalfa pasture where the litters were handled alike from 6 days of age until the litters were weaned at about 56 days of age. Six sows and litters were allotted to each 1½ acre pasture lot according to the age of litter.

After weaning, the litters from Group 1 sows were continued on pasture, and the litters from Group 2 sows were moved to concrete floored pens (10 x 22 feet) where each litter was fed in a separate pen. The Group 3 sows raised their litters in individual 10 x 22 feet concrete floored pens, and after weaning, the litters were continued in the same confinement pens.