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Methods of preventing baby pig anemia compared

B A. Koch

Robert H. Hines

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Abstract

Anemia as it most frequently occurs in baby pigs usually is caused by an iron deficiency. Iron stored in a baby pig is extremely limited and is quickly used to produce hemoglobin to maintain oxygen-carrying capacity in the blood. Supplemental iron is needed almost immediately since the quantity of iron received from sow's milk is extremely small.; Swine Day, Manhattan, KS, September 25, 1969

Keywords

Swine day, 1969; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 151; Swine; Anemia; Iron

Methods of preventing baby pig anemia compared

R.H. Hines & B.A. Koch

Anemia as it most frequently occurs in baby pigs usually is caused by an iron deficiency. Iron stored in a baby pig is extremely limited and is quickly used to produce hemoglobin to maintain oxygen-carrying capacity in the blood. Supplemental iron is needed almost immediately since the quantity of iron received from sow's milk is extremely small.

Procedure

This study compared the efficacy of an iron-dextran preparation, an iron-dextran plus Vitamin B_{12} preparation, and an oral iron. In addition, injectable iron preparations were compared by injection site. The efficacy of one or two injections of iron was also compared.

Trial 1: Thirteen Duroc litters were assigned randomly to one of three treatments.

Treatment A--Water-soluble iron (Ferric ammonium citrate) dissolved in pigs' drinking water from parturition thru day 20. Water fountains were placed in farrowing crates near the supplemental heat source.

Treatment B--Injectable iron dextran (150 mg.) was administered intramuscularly in the ham when pigs were 4 days old.

Treatment C--Same as Treatment B but with dextran plus Vitamin B_{12}.

All pigs were weighed at 4 days, 14 days, and 28 days of age. Hematocrits were determined at those ages using blood from an ear vein. The correlation between hematocrit and hemoglobin values is approximately .9, therefore only hematocrit values were used in this study.

Trial 2: Thirteen Yorkshire litters were used to compare two injectable irons administered intramuscularly in the ham and neck, and subcutaneously behind the front leg. Litter treatments were assigned rotationally within the litter. Each pig received 150 mg. of iron-dextran or iron-dextran plus B_{12} at 4 days of age, pigs were weighed and hematocrit values determined at 4, 14, and 28 days.

Trial 3: Fifteen Hampshire litters were used to compare one injection of 150 mg. of iron at 4 days of age or one injection of 150 mg. at 4 days followed by an additional 100 mg. injection at 14 days. Odd numbered pigs in each litter received the second injection.

Results and Discussion

In all iron trials pigs were reared in confinement on concrete slatted floors and were weaned at 30-35 days of age. Results of trial 1 are summarized in table 9. No significant differences in weight or hematocrits were observed between the iron administered in drinking water or injected. Hematocrit values observed confirm those of several researchers. No symptoms of baby pig anemia were observed.

Trial 2 data is presented in table 10. There were no significant differences due to method of injection. Both injectable iron sources maintained normal hematocrit values; however, hematocrit values for iron-dextran only were slightly higher. Twenty-eight-day weights favored iron-dextran plus Vitamin B_{12} treatment.

Data from trial 3 is presented in table 11. Weight gains were similar for each treatment. Injecting an additional 100 mg. of iron at 14 days did not significantly affect hematocrit values, but raised them slightly.

Summary

These studies involving 318 pigs indicate that:

1. Orally administered iron (ferric ammonium citrate) in the drinking water is an effective way to prevent baby pig anemia.

2. One injection of 150 mg. of iron is adequate to maintain normal hematocrit values and weight gains.

3. Using proper techniques, one may inject iron intramuscularly in the ham or neck or subcutaneously with equal results.

Table 9. An oral and two injectable irons compared

	Ferric ammonium citrate in water,[A]	Iron-dextran,[B]	Iron-dextran plus B_{12}[C]
No. pigs	32	37	31
Weight, lbs.			
4 days	3.6	4.1	3.6
14 days	7.0	7.6	7.2
28 days	13.7	14.7	13.3
Hematocrit (%)			
4 days	30.2	31.9	32.1
14 days	36.7	37.4	36.9
28 days	35.1	35.5	34.4

A--A. E. Staley Co. Day-one.
B--Single injection of 150 mg. (1.5 cc of Armidexan)
C--Single injection of 150 mg. (2.5 cc of Rubrafer)

Table 10. Three injection sites for iron compared

Injection site	Iron-dextran[A]			Iron-dextran + B_{12}[B]		
	IM-ham	IM-neck	Sub-Q[C]	IM-ham	IM-neck	Sub-Q[C]
No. pigs	19	20	19	18	19	19
Weight, lbs.						
4 days	3.4	3.6	3.5	3.4	3.7	3.7
14 days	7.7	8.3	7.8	8.2	8.3	8.6
28 days	13.8	15.4	14.4	15.2	15.3	15.2
Hematocrit, (%)						
4 days	27.9	27.9	28.0	28.1	28.0	25.8
14 days	35.5	33.8	36.3	34.5	34.6	33.0
28 days	32.8	32.2	32.0	31.8	31.1	29.5

A--Single injection, 150 mg (1.5 cc of Armidexan)
B--Single injection, 150 mg (2.6 cc of Rubrafer)
C--Subcutaneous posterior to front leg elbow.

Table 11. One and two injections of iron compared

Type of iron	Iron-dextran[A]		Iron-dextran + B_{12}[B]	
Amount of iron	150 mg.[C]	250 mg.[D]	150 mg.[C]	250 mg.[D]
No. pigs	26	31	24	33
Weight, lbs.				
4 days	3.8	3.7	3.8	3.9
14 days	7.0	7.1	7.4	7.0
28 days	12.4	12.0	12.2	11.8
Hematocrit, (%)				
4 days	27.2	26.2	27.0	27.9
14 days	38.1	37.8	35.8	37.0
28 days	37.2	39.6	34.6	39.3

A--Armidexan
B--Rubrafer
C--150 mg. administered at 4 days
D--150 mg. administered at 4 days with an additional 100 mg. at 14 days.