

EFFECT OF IRON SOURCE (ORAL VS INJECTABLE) FOR YOUNG PIGS ON WEIGHT GAIN, SURVIVAL, HEMATOCRIT, AND HEMOGLOBIN

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Story in Brief

An oral dose of iron prior to gut closure may be a non-invasive alternative to injectable iron dextran. This study involving 122 pigs from 12 Yorkshire sows was conducted to compare injectable iron dextran with two concentrations of iron methionine⁴ as a source of iron for neonatal pigs. Pigs were randomly allotted within sex to one of three treatments within 24 hours after farrowing. Treatments were 1) iron dextran injection intramuscularly (1 cc providing 100 mg of iron/pig), 2) iron methionine (2 cc providing 250 mg iron/pig given orally), or 3) concentrated iron methionine (1 cc providing 250 mg iron/pig orally). Pigs were weighed at birth and at weaning and plasma samples were obtained on day 1, 7, 14 and 21 for hematocrit and hemoglobin determination. Pig weaning weight at day 21 (LS mean = 11.62) and survival to weaning (LS mean = 88.7%) were not affected by treatment. Hematocrit and hemoglobin values decreased linearly from day 1 to day 21 in pigs given all iron sources, however, the rate of decline was greater in pigs receiving the two oral iron supplements. This study suggests that the administration of a single dose of 250 mg of an iron methionine complex may be sufficient to meet the iron needs of pigs reared to three weeks of age without access to creep feed.

(Key Words: Iron Source, Iron Methionine.)

Introduction

Availability of an injectable source of iron has been inconsistent, and no acceptable substitute has been available. Oral iron sources may offer an effective alternative to iron dextran because there is less infection risk. Cromwell et al. (1992) observed that an orally dosed iron given to pigs three

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to twelve hours after birth had no effect on survival or pig weaning weight at 28 days. This study compared iron dextran with two concentrations of iron methionine as an oral iron source for neonatal pigs.

Materials and Methods

A total of 122 pigs from 12 Yorkshire sows were randomly allotted within sex to one of three treatments within 24 hours after farrowing. Crossfostered pigs moved within the first 24 hours and prior to allotment to treatment were considered the same as pigs of the recipient dam. Pigs received iron from one of the following sources. 1) iron dextran injection, 1 cc/pig injected intramuscularly; 2) iron methionine, 2 cc/pig given orally; 3) concentrated iron methionine, 1 cc/pig given orally. The iron dextran provided 100 mg of iron, and the two oral iron treatments provided 250 mg of iron. No creep feed was offered before 21 days of age, but pigs had access to sow feed.

Blood samples were obtained on day 1, 7, 14, and 21. Heparin was used as an anticoagulant at the rate of .1 mg/ml of blood. Hemoglobin and hematocrit were determined on all samples. Pigs were weighed at birth and at day 21, and all deaths were recorded.

Results and Discussion

Pigs given 2 ml of iron methionine or 1 ml of concentrated iron methionine orally had similar weight gains and weaning weights when compared to pigs receiving 100 mg of iron from an injectable iron dextran (Table 1). Similarly, survival of pigs in this study was very good with an 88.6% overall survival and was not affected by iron source. Hematocrit and hemoglobin values decreased linearly ($P < .01$) from day 1 to day 21 in pigs receiving all iron sources. The rate of decrease was greater, however, in pigs receiving the two oral iron supplements when compared to those receiving iron dextran resulting in a treatment x time interaction ($P < .001$). Hematocrit and Hemoglobin levels were not affected by iron source on day 7, but by day 14 and 21, pigs receiving iron dextran had higher hematocrit and hemoglobin values than pigs given either oral iron source ($P < .01$).

This study suggests that the administration of a single oral dose of 250 mg of an iron methionine complex may be sufficient to meet the iron needs of pigs reared to three weeks of age without access to creep feed. Although hemoglobin values were reduced at day 14 and 21 when compared to pigs given an injection of iron dextran, the levels were maintained well above the level of 8 g/100 ml (NRC, 1988), which is suggested to be the level where

Table 1. Effect of iron source (oral vs injectable) on weight gain, survival, hematocrit and hemoglobin of young pigs^a.

Item	Treatment			SE
	Iron dextran (inject.)	Femet (oral)	Femet + (oral)	
No. of pigs	41	42	39	
Initial WT, lb	3.12	3.20	3.18	
Final WT, lb	11.64	11.74	11.45	.40
Gain, lb	8.49	8.48	8.22	.37
Hematocrit, % ^{bc}				
Day 1	32.87	33.27	34.27	.63
Day 7	32.76	31.44	31.52	.63
Day 14	33.46 ^d	25.99 ^e	25.64 ^e	.64
Day 21	29.80 ^d	23.05 ^e	22.53 ^e	.70
Hemoglobin, g/100ml ^{bc}				
Day 1	13.42	13.31	13.51	.22
Day 7	12.44	12.51	12.67	.21
Day 14	12.44 ^d	10.21 ^e	10.69 ^e	.20
Day 21	11.11 ^d	9.39 ^e	9.57 ^e	.22
Survival, %	87.80	85.72	92.31	

^a Least squares means.

^b Linear decrease in hematocrit and hemoglobin values with time in all treatments, respectively ($P < .009$).

^c Treatment*time interaction ($P < .001$).

^{d,e} Means in the same row with different superscripts differ ($P < .001$).

borderline anemia occurs. The reduced hemoglobin levels observed in this study did not affect either weight gain or pig survival.

Literature Cited

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