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K B. Beeman

D A. Schoneweis

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Comparison of oral iron and injectable iron for the prevention of iron deficiency anemia in baby pigs

Abstract

One of two oral iron compounds or an injectable iron (100 mg iron per treatment) were administered to pigs on d 1 and 15 postfarrowing, and they were compared with untreated littermates. There was no significant difference between the pigs receiving the oral iron and the negative controls in serum iron or total iron binding capacity. Pigs that received iron by injection had higher serum iron and packed cell volume and a lower total iron binding capacity compared with pigs given oral iron or untreated controls.; Swine Day, Manhattan, KS, November 19, 1992

Keywords

Swine day, 1992; Kansas Agricultural Experiment Station contribution; no. 93-142-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 667; Swine; Piglet; Iron; Anemia

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**COMPARISON OF ORAL IRON AND INJECTABLE IRON
FOR THE PREVENTION OF IRON DEFICIENCY
ANEMIA IN BABY PIGS**

K. B. Beeman¹ and D. A. Schoneweis¹

Summary

One of two oral iron compounds or an injectable iron (100 mg iron per treatment) were administered to pigs on d 1 and 15 postfarrowing, and they were compared with untreated littermates. There was no significant difference between the pigs receiving the oral iron and the negative controls in serum iron or total iron binding capacity. Pigs that received iron by injection had higher serum iron and packed cell volume and a lower total iron binding capacity compared with pigs given oral iron or untreated controls.

(Key Words: Piglet, Iron, Anemia.)

Introduction

In 1990, all injectable iron products approved in the United States were removed from the market pending upgrading of the manufacturer's equipment and manufacturing protocols. Many oral iron products were sold; however, their abilities to prevent anemia were variable. This experiment compared two oral iron products, an injectable iron, and effects of no supplemental iron in neonatal pigs.

Experimental Design

Five litters of crossbred piglets were used in the experiment. After the sow had finished farrowing, the pigs were processed and ear notched. Pigs 1, 4, and 7 (group 1) received 100 mg of an oral iron compound (F4C-70) on d 1 and 15. Pigs 2, 5, and 8

(group 2) received 100 mg of iron fumarate orally on d 1 and 15. Pigs 3, 6, and 9 (group 3) received 100 mg of iron dextran IM in the neck on d 1 and 15. Other pigs in the litter served as negative controls (group 4). The pigs were weighed on d 1 and at one, two, and three weeks of age. Pigs were bled at one, two, and three weeks of age for serum iron (SI), total iron binding capacity (TIBC) and packed cell volume (PCV) determinations.

Results and Discussion

Weight gains were similar for the groups (9.6 lb). Growth rate was probably not affected in this study, because typically at least 3 to 4 weeks are required to observe a depression in growth rate from anemia. There was no significant difference in the SI or TIBC levels of the pigs receiving the oral iron and the negative control pigs; however, the injectable iron produced significantly improved SI and TIBC values ($P < .01$; Table 1). Total iron binding capacity indicates the amount of iron the serum could bind, and the higher the number, the greater the likelihood that the pig is anemic. The PCV gives an estimation of the number of erythrocytes and amount of hemoglobin and is used to determine if an animal is anemic. The injectable iron produced a marked increase in the PCV. There was no significant difference in the PCV of pigs receiving oral iron and the negative controls. These results suggest that oral iron products are not as effective as injectable iron in preventing anemia in baby pigs.

¹ Department of Clinical Sciences, College of Veterinary Medicine

Table 1. Average Values for Serum Iron, Total Iron Binding Capacity, and Packed Cell Volume for Pigs (Age 22 Days)

Item	Iron source			
	Serum iron F4C-70	Oral iron fumerate	Injectable iron dextran	Control
Serum iron, $\mu\text{g}/\text{dL}$	31.1 ^a	29.1 ^a	161.8 ^b	26.2 ^a
Total iron binding capacity, $\mu\text{g}/\text{dL}$	613 ^a	670 ^a	382 ^b	672 ^a
Packed cell volume, %	22.1 ^a	20.3 ^a	36.0 ^b	18.8 ^a

^{ab}Means on the same row with different superscripts differ ($P < .05$).



Mark Nelson, breeding barn manager, artificially inseminates a gilt.