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Trace mineral levels during gestation - effects on hemoglobin, performance and health of neonatal pigs

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Abstract

Thirty-one litters were used to compare effects of two levels of trace minerals fed dams during gestation on hemoglobin, performance, and health of neonatal pigs. There were no significant differences in number of pigs born alive, birth weight, two-week or four-week weights of the pigs due to trace minerals fed the dams during gestation. Neither were there differences between groups of pigs in hemoglobin, packed cell volume, or erythrocytes at birth or at two-weeks age. There were no apparent differences in the incidence of diarrhea or other neonatal diseases between the two group. Our results suggest no benefits from feeding high levels of trace minerals to sows during gestation.; Swine Day, Manhattan, KS, November 13, 1975

Keywords

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Trace Mineral Levels During Gestation - Effects on Hemoglobin, Performance and Health of Neonatal Pigs

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Summary

Thirty-one litters were used to compare effects of two levels of trace minerals fed dams during gestation on hemoglobin, performance, and health of neonatal pigs.

There were no significant differences in number of pigs born alive, birth weight, two-week or four-week weights of the pigs due to trace minerals fed the dams during gestation. Neither were there differences between groups of pigs in hemoglobin, packed cell volume, or erythrocytes at birth or at two-weeks age. There were no apparent differences in the incidence of diarrhea or other neonatal diseases between the two group.

Our results suggest no benefits from feeding high levels of trace minerals to sows during gestation.

Procedures

Thirty-six Yorkshire gilts, 30 days post-breeding were assigned to one of the two trace mineral levels. The control ration contained these added trace minerals (ppm) copper 7.5, iodine 2, iron 75, manganese 75, zinc 75. The high level ration contained: copper 14, iodine 3.5, iron 140, manganese 140, and zinc 233. Gilts were individually fed 4 1/2 pounds of the 15% protein milo-soybean meal rations daily in individual feeding stalls and remained on the gestation rations until they farrowed. After farrowing all gilts were fed a 16% protein milo-soybean meal ration. Blood samples were taken, within 24 hours after sows farrowed, from each pig for blood analysis. Birthweights of all pigs were recorded within 24 hours after birth, when needle teeth were clipped, tails docked, ears notched and 150 mg of iron given intramuscularly. Individual pig weights were recorded when pigs were two weeks and again when they were 4 weeks old.

Results and Discussion

The effects of trace mineral levels during gestation on birth weight and two and four-week weights are shown in table 18. There were no significant differences in litter size, birth weight, 14-day or 28-day weights, or number of pigs weaned, due to trace mineral levels fed during gestation.

Hemoglobin values of gilts at farrowing are shown in table 19. Increasing the consumption of trace minerals did not increase hemoglobin of the gilts at farrowing. Similarly, feeding high levels of trace minerals during gestation did not increase hemoglobin levels, packed cell volume, or red cell count in offspring at birth or at two weeks (table 20).

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No differences between the two groups of pigs were observed in incidence of diarrhea or other neonatal problems.

The results suggest no beneficial effects on hemoglobin levels or performance of pigs from feeding high levels of trace minerals during gestation. Sows in this study were maintained in dirt lots, which may have provided certain trace minerals. However, feeding high levels of trace minerals did not increase hematology measures.

Table 18. Effect of trace mineral levels during gestation on reproductive performance

	Controls	High levels of trace minerals[1]
Number of litters	15	16
Live pigs farrowed	131	143
Litter size (alive at birth)	8.7 ± 2.7	8.9 ± 3.5
Birth weight	2.6 ± .6	2.6 ± .6
14-day weight	7.8 ± 1.5	7.5 ± 1.5
28-day weight	13.0 ± 2.9	13.1 ± 2.6
Litter average weaned (28 days)	8.3	8.1

[1]Approximately twice the control levels.

Table 19. Hematology measures of gilts at farrowing

	Controls	High levels of trace minerals[1]
Hemoglobin (gms.%)	11.7 ± 2.0	12.1 ± 1.9
PCV (%)	34.2 ± 4.9	35.1 ± 4.4
RBC (million per cmm)	5.9 ± 1.3	5.6 ± .64

[1]Approximately twice the control levels.

Table 20. Hematology measures of pigs at birth and two weeks

	Controls	High levels of trace minerals[1]
Birth		
Hemoglobin	10.7 ± 1.9	10.38 ± 1.5
PCV	33.7 ± 4.9	33.2 ± 4.5
RBC	4.9 ± .8	4.9 ± .9
Two Weeks		
Hemoglobin	11.4 ± 1.5	11.3 ± 1.5
PCV	37.2 ± 4.1	37. ± 4.2
RBC	4.8 ± .8	4.9 ± .6

[1]Dams received approximately twice the trace mineral level of controls.