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Trace mineral levels during gestation of sows in confinement-effects on immunoglobulin performance and health of neonatal pigs

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Summary

We compared the effects of two levels of trace minerals fed dams during gestation on the hemoglobin, packed cell volume, performance, and health of 31 litters of neonatal pigs. The dams had been on concrete all of their lives. There were no significant differences in the hemoglobin or packed cell volume in pigs due to trace mineral levels fed the dam during gestation. There were no apparent differences in the incidence of neonatal disease or other problems in any of the pigs. These results indicate no benefit from adding excess trace minerals to the ration of sows during gestation, even though the sows are in confinement.

Procedures

Thirty-one gilts were assigned to one of two trace mineral levels 30 days before the first gilt was to farrow. The control ration contained these added trace minerals (ppm): copper 7.5, iodine 2, iron 75, manganese 75, zinc 75. The high level was a doubling of these levels. The gilts were fed 4 1/2 pounds of a 15% protein soybean meal ration each per day and remained on the gestation rations until after they farrowed. After farrowing the gilts were fed 16% protein sorghum-soybean meal ration ad libitum. Blood samples were taken within 24 hours post farrowing from each sow and her pigs, and when pigs were 2 weeks old. The

birth weights of all pigs were recorded within 24 hours after birth when needle teeth were clipped, tails docked, ears notched, and 150-mg. of iron was given intramuscularly. Weights were also recorded when pigs were 2 and 4 weeks old.

Results and Discussion

Hemoglobin values of sows at farrowing are shown in table 11. Doubling trace mineral levels did not increase hemoglobin or packed cell volume of sows at farrowing. Similarly, feeding twice the level of trace minerals the last third of gestation did not increase hemoglobin levels or packed cell volume in pigs at birth or at two weeks (table 12).

Table 11. Hematology measures of sows at farrowing as influenced by trace mineral levels.

	<u>Control</u>	<u>High level</u>
Hemoglobin	11.2 ± 1	11.5 ± .65
Packed cell volume	34.3 ± 3	35.7 ± 2

Effects of trace mineral levels during gestation on pig weights at birth and 14- and 28-days are shown in table 13. Differences in litter

size, birth weight, 14-day or 28-day weights were not statistically different.

Table 13. Effects of trace mineral levels during the last third of gestation on reproductive performance.

	<u>Control</u>	<u>High level</u>
Litters	15	16
Pigs farrowed	121	156
Litter average	8.1	9.7
Live pigs farrowed	116	149
Litter average	7.7	9.3
Birth weight,(lbs.)	2.8	2.6
14-day avg. wt.,(lbs).	8.4 ± 2.3	8.0 ± 1.7
28-day avg. wt.,(lbs.)	14.3 ± 3.2	12.8 ± 2.5

These results suggest no beneficial effects of increasing the currently used KSU trace mineral levels for sows during gestation, even though sows are in confinement. We reported similar results (Swine Industry Day, 1975) for sows maintained in dirt lots.

Table 12. Hematology measures of pigs at birth and two weeks.

	<u>Control</u>	<u>High level</u>
At birth		
Hemoglobin (gms %)	9.24 ± 1.7	9.28 ± 1.25
Packed cell volume	31.9 ± 6.1	32.8 ± 4.43
Two weeks after birth		
Hemoglobin (gms %)	11.1 ± .8	11.3 ± .87
Packed cell volume	39.2 ± 3.3	40.3 ± 3.5