Whole blood selenium concentrations in pre-suckle newborn foals
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Introduction: Selenium deficiency will cause abortion in pregnant mares and neonatal problems in foals. While most horse owners provide oral selenium supplementation to pregnant mares, losses still occur. The objective of this study was to determine whole blood selenium concentrations in newborn foals from mares that were supplemented with selenium during gestation. The hypothesis was that each foal’s whole blood selenium concentration would be similar to that of its dam.

Materials and methods: Ten healthy Quarter Horse mares from the same farm were fed a diet consisting of second cutting alfalfa hay and wet COB with a selenium supplement throughout gestation. Each mare was fed 4-6 mg of selenium (sodium selenite) daily per NRC recommendations. After foaling but before nursing, a whole blood sample was collected from the jugular vein from both the mare and the foal into separate EDTA vacutainer tubes. Samples were shipped on ice to the University of Michigan Veterinary Diagnostic Laboratory, where selenium concentrations were determined. The laboratory’s reference range for whole blood selenium concentrations in adult horses is 160-275 ng/mL. The laboratory does not have a reference range for newborn horses but reference values are age dependent and concentrations that are marginal for adults may be adequate for weanlings. Comparisons were made between normal and deficient whole blood selenium concentration groups using a two-tailed Student’s t test. Significance was defined as P<0.05. Linear regression analysis was used to compare maternal and newborn selenium concentrations. Statistical analysis was performed using Microsoft Excel® software.

Results: Five mares had whole blood selenium concentrations below the reference range (mean±SD137±3.8 ng/mL), which was significantly lower than the other five mares (mean±SD188.8±12.97 ng/mL). All ten foals had very low whole blood selenium concentrations (54-106 ng/mL) that did not differ significantly depending upon which group their dams were in. There was no correlation between each dam’s and foal’s whole blood selenium concentration (see adjacent figure).

Conclusion: This is the first study to report on whole blood selenium concentrations in pre-suckle newborn foals. Additional data are needed to determine what the normal whole blood selenium concentration is in newborn foals and if NRC recommendations in pregnant mares should be increased.

Keywords: Foal; NRC; pregnant mare; selenium concentration; whole blood