

Broodmare Diet Impacts Placenta and Colostrum

By Stacey Oke, DVM, MSc

The diet you offer your gestating mare, particularly in the last trimester, can influence development of the placenta as well as the level of immunoglobulins (IgGs) in the colostrum, reports a research team from North Dakota and Texas.

"Foals subjected to external stimulants, such as reduced nutrient supply to the fetus, can have lasting effects on development including reduced neonatal health, skeletal muscle growth, feed efficiency, and athletic performance," said Carrie Hammer, DVM, PhD, an assistant professor at North Dakota State University.

This phenomenon is referred to as developmental programming.

Hammer and colleagues hypothesized that feeding broodmares too much or too little would negatively affect colostrum quality, and that selenium supplementation could offset some of these negative effects. To test their hypothesis, they randomly separated 28 Quarter Horse mares into one of four treatment groups: pasture, pasture plus selenium, pasture plus grain, or pasture plus grain and selenium. Selenium supplementation started 110 days prior to foaling.

Key findings in this study were:

- Mares on pasture lost body condition during the trial while mares fed grain maintained their body condition, but the final body condition scores in both groups remained within the normal range;
- There was no effect of selenium supplementation or nutrition group on foaling variables (i.e., gestation length, time from water breaking to birth, time to stand and nurse, foal body weight, length, and height);
- Mares fed supplemental selenium had decreased placental cell size;
- No difference in placental cell number, cellular activity, expulsion time or weight was noted, and
- No difference in colostrum fat, protein, milk urea nitrogen, or somatic cell count was identified.

Mares fed grain with or without selenium had lower colostrum IgG, and foals from grain-fed mares tended to have lower serum IgG levels compared to

the groups of horses not fed grain. Both groups of foals were healthy and IgG concentrations were well above the level considered failure of passive transfer.

"Overall, this data suggests that maternal diet during the last third of gestation impacts both placental efficiency and colostral IgG," summarized Hammer. "Of course, more research is needed to determine the ramifications of these changes and their mechanisms."

Hammer emphasized these preliminary results should not encourage horse owners to withhold grain from pregnant mares in order to increase IgG.

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