

FEEDING LATE-TERM BROODMARES

By Karen Briggs

We've known for some time now that the dietary intake of a pregnant mare can have a significant impact on the size, growth rate and overall health of her newborn foal.

The early stages of pregnancy, when the fetus is the size of a walnut, aren't particularly strenuous for the average mare, but that situation begins to change as she enters her fourth month of gestation. Though the unborn foal's weight gain is concentrated in the final four months of the pregnancy, studies have shown that broodmares use the second trimester to gain condition in preparation for the hard work of lactation (nursing). For the average mare, who gains about 16 per cent of her initial body weight during the whole course of her pregnancy, there's no significant weight gain in the first three months — but in the second trimester, she'll put on about 70 per cent of that total increased body condition, given the opportunity.



You need to address more than just the unborn foal's nutritional needs when you're feeding a broodmare. To give her the chance to store extra reserves for milk production, nutritionists have long recommended beginning to increase both the volume and the nutritional content of her feed well before a broodmare enters her final trimester. Not only will she need more protein in her diet (gradually inching up to about 1.3 times its usual level of 8-11 per cent), her body will also demand more energy (calories) to maintain the pregnancy, and her need for calcium and phosphorus will escalate to almost double what she would need if she were not in foal. All of these nutrients are important both for the construction of a strong, healthy foal and for the maintenance of the mare's condition. And that will have a bearing on how easily she 'catches' on her next breeding.

Just as we had all accepted the above feeding practices as gospel, however, along comes a new collaborative study from North Dakota State University and Texas A & M University, which puts the recommendation of increased grain into question to some degree. According to the study, published in the on-line version of the ***Journal of Animal Science*** in November, 2009, the way we feed broodmares can also have far-reaching effects on the development of the foal's placenta — the essential organ which delivers nutrients and sweeps away waste products during gestation — and on the level of IgG immunoglobulins in a mare's colostrum immediately after birth, which as we all know can have a dramatic impact on the immune response of a newborn foal.

Carrie Hammer DVM, Ph.D., an assistant professor at North Dakota State, and her colleagues hypothesized that feeding broodmares too much, or too little, could negatively affect the quality of the resulting colostrum, and that selenium supplementation might offset some of these negative effects.

“Foals subjected to external stimuli, such as reduced nutrient supply to the fetus, can experience lasting effects on their development including reduced neonatal health, skeletal muscle growth, feed efficiency, and athletic performance,” says Hammer.

Her research team separated 28 pregnant quarter horse mares into four diet groups: pasture only, pasture plus selenium supplementation, pasture plus grain, or pasture plus grain and selenium. For those mares receiving selenium, the supplementation began 110 days prior to the mare’s expected foaling date. The team found that the mares on pasture only lost body condition during the trial, while the mares fed grain maintained their body condition. Final body condition scores in both groups, however, remained within the normal range.

They noted no effect from selenium supplementation on foaling variables such as length of gestation, duration of labour, time for the foal to stand and nurse, or newborn body weight, length, or height.

There was also no difference between groups in the expulsion time or weight of the placentas, or any difference in the colostrum fat or protein content.

However, the mares fed grain, with or without selenium, had lower colostrum IgG, and foals from the grain-fed mares tended to have lower serum IgG levels, compared to the mares not fed grain. Despite this, both groups of foals were healthy and had IgG levels well above the level considered ‘failure of passive transfer’ (when the foal doesn’t ingest enough antibodies from the colostrum to confer adequate immunity through his first months of life).

The foals from mares fed grain also tended to have slightly lower body weights (when calculated as a percentage of the mare’s body weight) than did foals from mares on pasture only.

In addition, the mares fed supplemental selenium demonstrated decreased placental cell size, suggesting that the maternal diet in the last trimester of pregnancy can impact both placental efficiency, and colostrum IgG.

Should this data change the way we feed broodmares and change our thought process on providing extra calories and nutrients through grain? Hammer says she wouldn’t jump to conclusions just yet. “These preliminary results should not encourage horse owners to withhold grain from pregnant mares in order to

increase IgG,” she emphasizes. “More research is needed to determine the ramifications of these changes and their mechanisms.”
Stay tuned.

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