# Nutrition and Reproduction

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"Sex is truly a luxury in the body--you've got to be productive before you can be reproductive," began David Pugh, DVM, MS, Dipl. ACT, Dipl. ACVN, a professor of reproduction at Auburn University, in his presentation, "Nutrition and Its Effects on Reproduction" at the Hagyard-Davidson-McGee Bluegrass Equine Reproduction Symposium Oct. 23-26, 2002, in Lexington, Ky. He stated that broodmares with a body condition score (BCS) of less than 4 on a nine-point scale exhibit:

- Increased length of spring transition (to proper estrous cycling);
- Increased time from foaling to ovulation;
- Increased number of cycles to conception;
- Decreased conception rates;
- Increased fetal wastage (fetal loss); and
- Decreased milk production.

Pugh discussed several other points to remember when considering nutrition relative to equine reproduction, including the following.

**Feeding Broodmares**

- Underfeeding might delay the date of first ovulation in maturing mares.
- Moderate mare body weight gain or loss during gestation doesn't appear to greatly affect foal weight.
- More than 60% of the foal's growth occurs in the last trimester of the pregnancy. Most non-draft horses gain 150-200 pounds during gestation.
- Feeding fat beginning at nine months of gestation will increase the mare's milk fat percentage, but not birth weight of the foal.
- Pugh recommends a diet with 8-9% protein until nine months of gestation, then a diet with 9-10%

protein for months 10-11. Inadequate protein can decrease foal birth weight, even in mares in good body condition. But too much protein can be problematic--mares with a history of stress and consumption of high-protein or legume-rich diets may have placental edema or premature separation of the placenta, particularly with diets high in some estrogen-rich legumes. A rising nutritional plane, or feeding for weight gain, in pregnant mares (especially with high protein) is associated with placental edema (indicative of placental inflammation, which can decrease the nutrients going to the foal).

- Supplementing vitamin E near the end of gestation may increase IgA and IgG (types of antibodies) in colostrum.

**Mare Problems**

- Copper in the diet *may* decrease the incidence of rupture of the middle uterine artery, utero-ovarian artery, or external iliac artery.
- For mares with ventral edema and potential rupture of the prepubic tendon, rectus abdomen muscle, oblique abdominal, and transverse abdominal muscles (more common in older mares with poor abdominal tone), it might be best to induce parturition. Nutritional treatment includes decreasing salt (which might require cutting out commercial feeds that normally contain salt) in the diet and lowering fiber content to decrease weight of feed in the gastrointestinal tract.
- Eclampsia (convulsions and coma associated with hypertension, edema, and/or excess protein in the urine) can occur two weeks or so after foaling, and is associated with lactation, stress (such as inadequate intake or transport stress). Decreasing high-protein feeds in the diet such as alfalfa in late gestation might help prevent this condition in susceptible mares. Treatment of affected mares involves decreasing dietary calcium two to five weeks before foaling, then adding calcium to the diet after foaling. These mares need a high-protein, high-calcium diet after foaling and throughout lactation, said Pugh.
- Overweight mares are more likely to get laminitis when problems such as retained placenta occur, so maintaining mares in a more normal body condition might help prevent laminitis secondary to other problems.

**Feeding Stallions**

- A stallion with a heavy breeding schedule might require more than 25% more energy during the breeding season compared to the non-breeding season.
- High-calcium feeds can depress the horse's absorption of zinc, resulting in a zinc deficiency. This can be a problem in stallions, though it's rare.

**General Feeding Notes**

- When trying to balance minerals in any horse's diet, you should select one designed for your area and soil type. However, trucking in hay or feed grown in other areas can change this; consult an equine nutritionist for help in balancing your horse's diet.
- A high fat content in the diet can decrease absorption of some minerals.
- Studies indicate that once a diet is balanced for vitamins and minerals, addition of supplements *does not* enhance fertility. Additionally, one study presented at the American Association of Equine Practitioners convention in 1991 found that many horses that are supplemented have significant dietary imbalances, and no improvement in their rations from the supplements.
- Feed effects might be stronger in horses that already have problems.
- Animals that are prone to problems need a diet analysis to determine if the diet is causing or worsening problems.

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