

# Feeding the Pregnant Mare

**T**raditional wisdom for feeding mares is that nutritional requirements in early pregnancy are not much different than requirements for body maintenance, and that the greatest need for additional nutrients is during the last trimester (final 110 days), when the fetus is growing fastest. This is generally true, in terms of the pregnant mare's energy requirements, but recent research has shown that it's very important to make sure she has optimal nutrition, especially in terms of vitamins and minerals, throughout the entire pregnancy to ensure proper health and growth of the conceptus from the beginning.

*Pregnant mares  
require optimal nutrition  
throughout the entire  
pregnancy*

During the past two decades, we've learned more about fine-tuning our feeding of pregnant mares, and research is still ongoing. Dr. Stephen Duren, an equine nutritionist for Performance Horse Nutrition in Weiser, Idaho, said conscientious horse breeders have always tried to optimize health and development of the unborn foal, but the Thoroughbred industry has been under more pressure recently, in light of breakdowns at the track, to determine if we can do more nutritionally to prepare young horses for the racetrack.

Dr. Burton Stanier, assistant professor of equine nutrition at Pennsylvania State University, said there are two important things to consider when feeding broodmares. First, make sure the fetus develops optimally in a healthy environment and, second, feed the proper amount of energy. "We have to be careful we're not supplying a lot of energy early on, unless the mare is also lactating, because this often means the mare will just get fat," he said. "During early gestation, minerals and vitamins are more important than energy, but we don't have enough information yet to know spe-



The mare's nutrition helps optimize the health and development of her foal

ANNE M. EBERHARDT PHOTO

cifically what these requirements are for the growing fetus. We are still learning.”

## NUTRIENT REQUIREMENTS OF HORSES: REVISED

The equine industry recently updated the National Research Council's (NRC) Nutrient Requirements of Horses. “The requirements listed for pregnant mares have changed somewhat from those published in 1989,” said Duren. “We used to think of mares as having two stages of gestation—early or late. The new NRC guidelines break it down further. We now look at whether a mare is less than five months pregnant (early pregnancy) and after that we break it down month by month until foaling,” he said.

The NRC guidelines for digestible energy requirements for a 500-kg (1,100-pound) mare per day for early pregnancy (less than five months) is 16.7 megacalories (Mcal—one Mcal is equal to 1,000 calories referred to in human diets). This will increase through the following months: 17.1 Mcal at five months gestation, 17.4 at six months, 17.9 at seven months, 18.5 at eight months, 19.2 at nine months, 20.2 at 10 months, and 21.4 at 11 months. “Going from 16.7 in early gestation to 21.4 in late gestation is a 30% increase in energy re-

quirements,” explained Staniar. If you are unsure how to address this in a ration, work with an equine nutritionist to help you figure it out.

“Feed manufacturers are now formulating feeds to account for the highest monthly requirements these mares would have,” Duren said, “and fortifying their products in such a way that these nutrients are delivered within the normal feeding rates.” The horse owner can be assured, when buying a product that’s balanced for a pregnant mare, that it will adequately cover all the bases. Most feed manufacturers also make a product that contains the vitamins and minerals without all the calories. This is a “diet” variety for mares that hold condition well and don’t need the extra calories.

Dr. Brian Nielsen, a professor in the Department of Animal Science at Michigan State University, worked on the new NRC guidelines and said most of a mare’s requirements can be met with good forage, but people need to be aware of mineral requirements. “A fair amount of minerals are being deposited in the young fetus,” said Nielsen. “People feeding straight grain such as oats or just corn, and hay that’s low in calcium, could create a problem with too much phosphorus and not

enough calcium for ideal bone deposition. If you are feeding a commercial concentrate or a legume hay, you are probably fine, however.”

If you feed grain, he recommends using a commercial concentrate that’s already balanced for minerals. Then, if you live in an area that is deficient in copper or selenium, these bases are covered.

## BODY CONDITION

“We always need to pay attention to the mare’s condition, since she’s supplying the nutrients and energy to the unborn foal,” said Staniar. “We want her to go through parturition and enter early lactation in good body condition because she needs energy reserves to produce milk. Secondly, we’re often looking to breed her back again. Reproduction shuts down when a mare is in poor condition,” he said.

A number of studies have shown that one of the main driving points of reproductive success is body condition of the mare. “She needs energy reserves in order to cycle, conceive, and maintain pregnancy,” said Duren. Even if she does conceive, a mare that is thin and losing weight might absorb and lose the pregnancy. Mother Nature decides she can’t afford the luxury of pregnancy.

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Louisiana	4,217	2,009	48%
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Number of mares in parentheses were covered in the Northern Hemisphere on Southern Hemisphere time.

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“That doesn’t generally happen in Central Kentucky because this region is blessed with good quality grass as well as a lot of good feed manufacturers,” said

Duren. “In some of the more remote areas of the Thoroughbred industry, however, where grass is limited or horses are in a dry-lot situation or the natural forage isn’t up to quality, it becomes even more important to feed these mares properly.”

Nielsen pointed out that people used to think mares should be thin rather than fat, thinking they might have foaling problems if they’re fat. This is true with cattle. An obese dairy cow has a greater risk for dystocia (difficult birth) because she stores fat in the pelvic area and also becomes tired during prolonged labor. But fat mares don’t have foaling problems; they don’t take as much time in labor as a dairy cow. And research has shown fleshy mares have better reproductive success than thin ones.

“Even if the mare is at body condition score 5 when she foals (you can’t see her ribs but can easily feel them),” said Nielsen, “her energy demands for lactation are so great that she’ll lose a little weight. There’s an old saying that you should feed a lactating mare like a dairy cow or else she’ll look like one. Otherwise, she may be getting thin at the time you are trying to rebreed her.” It’s better for her to have some body reserves.

Staniar said ideal body condition for a broodmare is typically in the range of 6 to 7 on the Henneke Body Condition Scoring System (where 1 is emaciated and 9

is obese). “If she’s down to 5 or 5.5 I don’t worry much, but you don’t want her less than that,” he said. “A score of 7 is all right, but if she gets above that, we worry about metabolic problems for that mare, and how this influences her health. We’re now beginning to look at how her metabolic health influences that of her unborn foal. The fetus is gathering information about the environment it will enter, based on the broodmare’s environment and body metabolism. This determines how the fetus sets up its own metabolism.”

Energy is the one nutrient that must be adjusted to the needs of the individual mare. You must feed a thin mare a higher energy level than an easy-keeping mare or a mare that’s lactating as well as pregnant. “Dietary adjustments must be made to ensure she will maintain adequate body condition year-round,” said Duren. In a good broodmare program, mares are never allowed to become thin, nor too fat. “This may require two or three dietary changes through the normal pregnancy/lactation curve the mares go through.”

#### FETAL PROGRAMMING

“Researchers are working on the idea that some human diseases are due to ‘fetal programming,’ ” said Duren. “This relates to nutrition in early pregnancy. Many important things are happening very early.”

Dr. Tania Cubitt, an equine nutritionist at Performance Horse Nutrition based near Middleburg, Va., said what you feed the mare in early pregnancy makes a difference in how the fetus is “programmed,” nutritionally, taking signals from the mare’s metabolism, etc. “We haven’t done a lot of fetal programming studies in the

horse, as compared with humans and other species, since the horse is not a good model to work with, and very expensive to do,” said Cubitt. “Most of these studies are terminal, such as research in sheep, taking the fetus when the ewe is euthanized and removing fetal tissues to look at. We learn a lot from this, but we don’t have that luxury in horses. We take what we learn in species like sheep, and what we are seeing in people, and attempt to apply this to the horse.

“In people, we’re finding that an obese mother sets up an environment for her fetus in which it grows excessively,” she continued. “We can’t definitely say that overfeeding a mare will potentially cause developmental orthopedic disease in a foal, but this is something to think about. Overfeeding a mare may predispose her foal to growth problems, because it is growing so rapidly in utero. Research in other species shows that the mother’s nutritional environment sets that fetus up, and has far-reaching effects on post-natal development. Once a foal is born, all you can do is manage what you have, to the best of your ability.” But while it’s still in the uterus, you have the opportunity to build the little foal correctly, by what you feed the mare.

It’s always wise to avoid large grain meals. “The fetus is receiving signals from the broodmare,” said Staniar. “One problem with feeding a large grain meal is that it comes into the GI (gastrointestinal) tract in a huge mass and is absorbed as a large amount of glucose, creating a big rise in insulin. This has a cascade effect on a lot of other hormones. Hormones are the communication network within the body, telling all the tissues what to do—and telling the fetus what to do and how to develop. We are currently studying how the way we feed the broodmare affects the foal. If we feed a high-starch feed, for instance, does that influence insulin sensitivity in the foal?” asked Staniar.

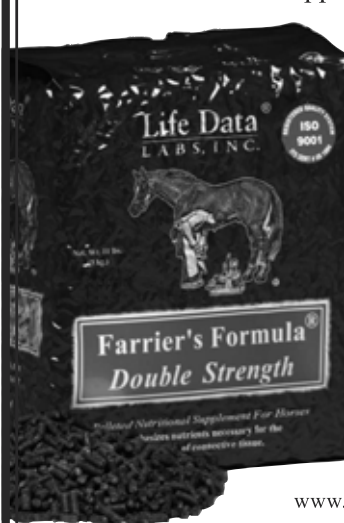
#### FEEDING MANAGEMENT

Although we know the mare’s requirements continually change as she moves through pregnancy, we might not meticulously alter her diet each month, but we should try to feed her according to body condition and use concentrates appropriately fortified for pregnant mares. “We can do a lot for the health of the mare and foal by paying attention during early to mid-pregnancy,” said Staniar. “When a human mother becomes pregnant, she starts taking prenatal vitamins and paying attention to what she’s eating throughout gestation. Humans don’t wait until the last trimester and then start thinking about the baby. Proper nutrition is important all the way through.”

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Most broodmares are bred in the spring. "During early and mid-gestation, the mare often has good forage if there's pasture available," said Staniar. "But as she enters late gestation, when the fetus is growing rapidly and her energy requirements increase, it may be winter—if she's foaling in February or March. It becomes more difficult to maintain her condition unless you are paying attention. You can get into trouble if you've let her drop off in condition during early and mid-gestation. It's harder to put the condition back on her if you're fighting against the environment along with the increased growth and needs of the fetus."

Some horsemen become complacent if the mare is on pasture. She's probably all right, unless the pasture has declined in nutrient value. Even if a mare is lactating during pregnancy, her milk production will be waning or the foal will be weaned before her last trimester. If you feed her adequately for lactation, the pregnancy will be taken care of.

During early and mid-gestation, the actual feeding routine will depend on whether the mare's on good pasture, fed a supplement to augment a so-so pasture, or fed hay and grain. Make sure the hay and grain ration is appropriate for her needs. "Pay close attention to her body condition, checking her every week or two," said Staniar.

Most Thoroughbred farms feed mares individually, even when on pasture. Mares will have different needs, depending on age, energy efficiency, etc. Some might have been recently retired from racing and some might have long-term injuries.

"They may become sore when carrying the extra weight of pregnancy, especially in late gestation or while walking on frozen ground," said Duren. "Any time they are sore, or healing, these injuries require additional nutrition. They are catabolic; without extra energy in the diet these mares would lose weight.

"Most farm managers separate mares by foaling date, energy needs, or body condition," Duren continued. "If they can't be separated into different paddocks, feeding adjustments are made for individual mares when they are brought in daily and fed. Attentive broodmare managers are making changes on at least a weekly or daily basis if a mare gets behind; they don't allow a mare to fall through the cracks and get into a situation where reproductive performance or health of the foal would suffer."


If you feed grain, split the daily ration into several portions and feed small meals. Even when feeding hay and no grain, it's best to split the ration into several feedings or have hay in front of the

mare all the time.

"This is more in line with what she would be eating if she were grazing—eating more or less continually through the day rather than one or two large feedings," said Staniar. Just from a physical and mechanical aspect, the fetus takes up more room in the abdomen in late gestation, leaving less room for the GI tract and large masses of feed.

"The mare generally has less appetite during late gestation, just because she doesn't have a lot of room for food," said Staniar. "It's a big mistake to let her get to late gestation in less-than-optimal body

condition with no reserves, because no matter how much you try to feed her at that point, you can't get her to eat enough to gain it back."

A mare's energy requirements at the end of gestation are about 21.4 Mcal, but soon after foaling those requirements rise to 31.7 Mcal in early lactation. "If you've dug yourself into a hole by letting her get into poor condition just before foaling, even by feeding her extra you usually can't dig yourself out of that hole," explained Staniar. "Then you may have trouble breeding her back, because she's too thin." 

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