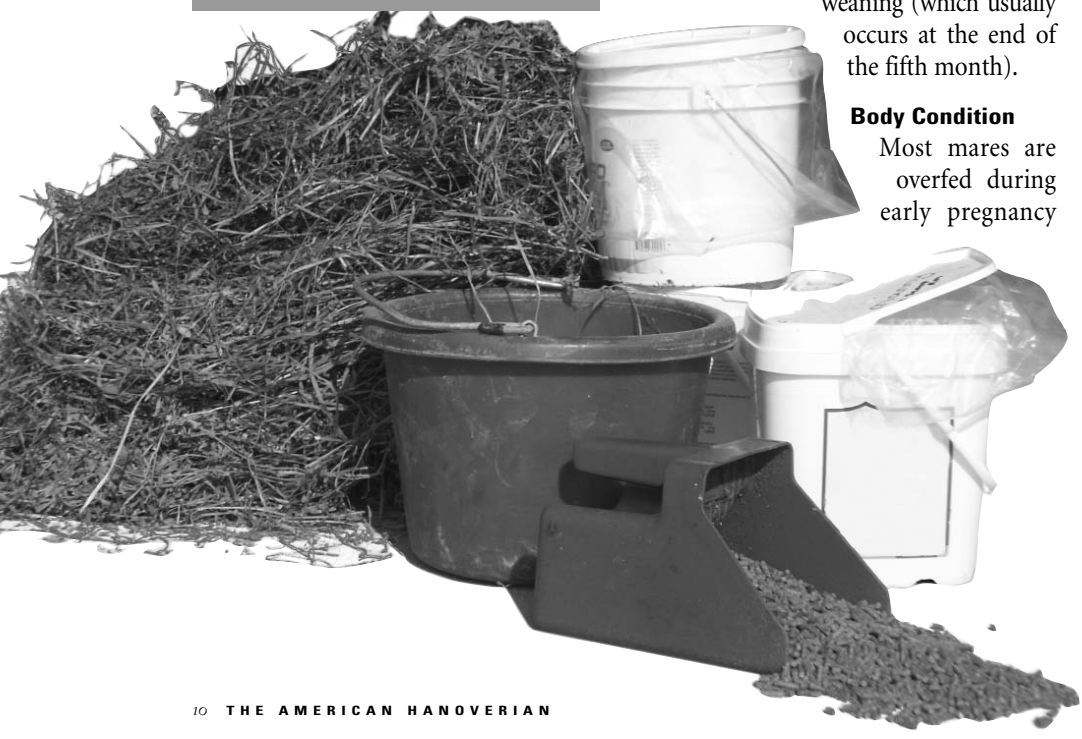
Broodmare Nutrition Guidelines

See how the correct diet for each stage of pregnancy is vital to your broodmare's reproductive ability and the health of her foal.

THE CORRECT DIET FOR THE PREGNANT mare begins with the same ingredients that you would use for all other classes of horses. Start with fresh, free-choice water, offer as good a quality of hay as possible, and if additional nutrients are necessary, add a concentrate. Next, balance the diet with needed vitamins and minerals using a top-dressed supplement, add a probiotic for digestive health, and you have a good nutritional foundation to work from. From that point additional increases in vitamins and minerals, nutraceuticals or other nutritional supplements can be considered.

[BY **DR. SHEILA SCHILS**]

The stages of pregnancy have been called the first, second and third trimesters. While this terminology is still frequently used, the more common terminology is early gestation (from conception through the end of the sixth month) and late gestation (from the seventh month through birth).



Make all changes, both additions and subtractions, in the diet gradually. For example, start to make the changes to the diet necessary for lactation during the final weeks of gestation. But remember, you must be as careful to take away feeds as slowly as you add them. This allows the mare's digestive system to adjust to either more or less of a particular feed reducing the chances of digestive problems.

Stages of Pregnancy

The stages of pregnancy have been called the first, second and third trimesters. While this terminology is still frequently used, the more common terminology is early gestation (from conception through the end of the sixth month) and late gestation (from the seventh month through birth). Nutritionists are tending to use the terms of early and late gestation because the nutritional needs of the mare become distinctly different as the mare progresses from one stage into the other.

In addition, the needs of the mare between early and late lactation are distinctly different. Early lactation is considered the period from birth through three months and late lactation is four months through weaning (which usually occurs at the end of the fifth month).

Body Condition

Most mares are overfed during early pregnancy and underfed during lactation. Mares should have a little extra body fat as they go into the last stages of gestation to give them some available fat reserves to meet the demands of early lactation. However, obesity can reduce milk production, resulting in a slower growth of the foal. Obesity does not seem to have a detrimental affect on ease of foaling or duration of pregnancy as it does in other species; however, a fit mare is always better than an overweight unfit mare. Keep in mind other problems such as founder or colic can result if mares are overfed.

The typical 1100 lb mare should gain between 100 and 130 pounds during pregnancy and a 1250 lb mare should gain between 115 and 150 pounds. So, when should weight gain happen? Two-thirds of the total weight gain should occur during the last three months of pregnancy.

Pre-Pregnancy

A well-balanced ration for your mare, complete with all the necessary vitamins and minerals, is necessary before conception. You should analyze your feeding program well before she becomes pregnant.

Two vitamins that have been studied relative to reproductive performance are vitamins A and E. The use of these vitamins together has been shown to improve reproduction performance of barren mares. Selenium works together with vitamin E. A deficiency in selenium has been shown to cause reproductive failure in other species, and could have the same effect on horses. Many areas of the U.S. are deficient in selenium, therefore this is especially important for horse owners in certain areas of the country. However, be aware that the toxicity level of selenium is close to the recommended level, so it is important to have just the right amount in the diet. More is not necessarily better.

Early Gestation

Nutritional requirements for a broodmare in good condition during early gestation are essentially the same as for her when she


RITA BOEHM PHOTO

is not pregnant. You should not start to "feed her for two" once she becomes pregnant! The reason no additional nutrients are required during early gestation is because at the end of the sixth month the fetus weighs less than 2 percent of the mare's weight. However, during these early developmental stages, it is extremely important that the mare receives the proper levels of vitamins and minerals, so the foal will have all the necessary building blocks to develop properly. This is why it is necessary to correct any deficiencies in the diet before the mare becomes pregnant.

Many mares continue to exercise frequently throughout the first and second trimester, and therefore should be fed relative to the level of performance. Again, no additional nutrients are needed due to pregnancy during this time.

A chart at the end of this article shows how the nutritional needs of the mare changes throughout pregnancy and lactation.

Late Gestation

Energy

After seven months the fetus begins to develop rapidly in size, and this growth increases the energy requirements of the mare. The foal will grow an average of three-quarters to one pound per day during late gestation.

Currently, there is work showing that energy requirements during late gestation increases at a dramatically higher percentage than originally reported by National Research Council (NRC) in 1989. More work is necessary to determine if these higher levels are appropriate for all mares. The best guideline is to watch your mare and her body condition should be a determining factor when deciding to increase her energy during late pregnancy.

One of the safest ways to increase energy is with the addition of fat. Fat supplementation adds more calories to the diet without getting the level of carbohydrates too high. A concentrate having 5 to 10 percent fat would be a good choice to supplement good quality hay for most mares.

In addition, some mares may start to reduce their intake because of the abdominal pressure from the growing foal. A higher fat content grain ration can get the calorie level higher while reducing the bulk of the feed. Feeding smaller, more frequent meals may also help.

Protein

Protein requirements are increased during late gestation to about 1.3 times maintenance levels. Whole roasted soybean is a good source of protein with the added benefits of a high fat content. Soybean meal will only supply the protein not the fat (the meal is the by-product of oil production).

Minerals

Trace mineral supplementation is necessary during this period because the fetus stores iron, zinc, copper and manganese in the liver as well as calcium and phosphorus for use during the first few months after the foal is born. Current work is showing that during the tenth month almost half of mineral retention occurs in the fetus. If the mare does not receive adequate levels of minerals during late gestation, the fetus will be born with a mineral deficiency. Studies have shown that a mineral deficiency in the newborn is likely to be one of the main causes of developmental orthopedic diseases in foals, of which OCD lesions is a component. In addition, the mare's milk is low in these minerals so the passage of minerals to the foal after birth is minimal.

Vitamins

The vitamin levels during late gestation will increase slightly above early gestation. Because most late gestation occurs during the winter months where much of the country has limited or no fresh forage available, the addition of vitamins A, D and vitamin E is always a good idea.

Early and Late Lactation

The mare's nutrient requirements are much higher during early lactation than during any phase of pregnancy. Not only must the mare be able to produce high-quality milk for the foal, but she must also maintain condition if she is going to be bred again during lactation. The quantity of hay and grain is not as important as the quality. Simply feeding the mare more food will not necessarily meet her and her foal's requirements.

Mare's milk quality can vary widely, probably because we don't tend to breed for good milk producers, so each mare must be evaluated as an individual during lactation. A mare will draw on her own nutrients to maintain the quality of her milk, but she won't be able to do this indefinitely, and eventually the quality of the milk will decrease.

After about three months of milk production, the foal will start to supplement the milk with significant amounts of hay and grain. Milk quality and amount will begin to decline, therefore the quantity of hay and grain required by the mare earlier in lactation will be reduced. The nutrient quality of the mare's milk by the fourth month provides less than 30 percent of the total energy needs of the foal. As late lactation approaches, the ▸

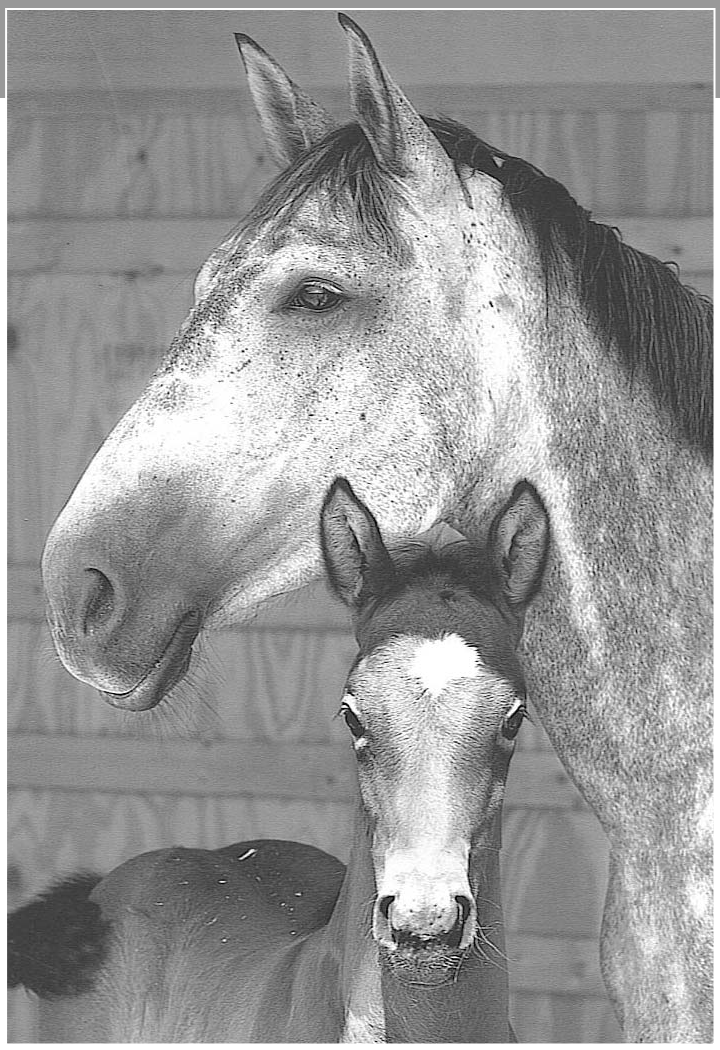
reduction in concentrates and the richer forages fed to the mare should happen gradually until the foal is weaned. This reduction in feed is also felt to help the mare dry up after weaning. Creep feeding of foals will help provide the needed nutrients to the foal during late lactation and will also assist in a smooth transition into weaning.

Energy

In early lactation, the mare's energy needs almost double from maintenance. Because of this, the first eight weeks of lactation can be the most difficult time to maintain the mare's condition. Remember to increase the mare's feed gradually to reduce the chance of nutritionally related problems such as founder and colic.

Protein and Minerals

Protein needs for the mare will more than double during early lactation, and calcium and phosphorus levels will almost triple. Calcium and phosphorus are the minerals of most concern, because these minerals can be passed to the foal through the milk. Typically, a mixed hay containing alfalfa will be necessary to meet the high calcium requirements of the lactating mare. Other minerals passed to the foal are iodine and selenium and those levels need to be adequate during lactation.



IN EARLY LACTATION, THE MARE'S ENERGY NEEDS ALMOST DOUBLE – *Moosilauke RH (Maronjo-EM Electra/Eklatant) and her new foal, Wolkenberge, by Wolkenglanz relax in the sun. Both are owned by Kitty Mitchell of Winterport, Maine.*

NECESSARY NUTRIENTS FOR EACH STAGE OF PREGNANCY

Based on a 1100 lb Mature Mare

Stage	Crude Protein (%)	Energy (Mcal)	Ca (g)	P (g)	Zn (mg)	Cu (mg)
Maintenance	8-10	16-20	30	20	350	120
Early Gestation	8-10	17-20	35	25	400	150
Late Gestation	11-12	20-25	50	35	800	300
Early Lactation	12-14	30-35	68	45	800	300
Late Lactation	11-12	20-25	50	35	800	300

At this point, it is still uncertain how much if any of the other minerals consumed by the mare during lactation are passed to the foal from the mare's milk. However, supplementation to the mare is necessary to provide her with the appropriate vitamins and minerals so that she can remain healthy and produce high quality milk. In addition, the application of a complete vitamin and mineral paste with digestive enzymes and probiotic to the foal during the first few weeks is still felt to be a good preventative practice.

Vitamins

During early lactation, vitamin A and D requirements almost double from early gestation to lactation. Vitamin D is necessary for the absorption of calcium, so it is essential to the production of milk by the lactating mare. Vitamin E levels should be doubled also. Vitamin E is an excellent antioxidant and is important for the maintenance of a strong immune system and normal reproductive function. This is especially important if mare will be rebred soon.

Passage of vitamins to the foal through the mare's milk is also under study. It is felt that Vitamins A and D are not passed to the foal in the mare's milk, and perhaps this is a problem with some of the other vitamins as well. Low vitamin A results in a compromised immune function leading to more susceptibility to infectious diseases, especially those causing respiratory problems and diarrhea. Again, the supplementation of the foal seems to be a good preventative practice.

In summary, the mare must be fed appropriate levels of vitamins for her system to function efficiently but we cannot just assume that the mare will provide the foal with all the necessary nutrients for growth and so we must supplement the foal as well.

Some Additional Concerns

Fescue Pasture and Hay

Many nutritionists recommend keeping all mares off fescue pasture or hay if you are planning to breed them, or if they are ▸

pregnant or lactating. In addition, some foals on fescue are exhibiting slow growth rates, and many recommendations are now to keep growing horses off fescue as well.

Fescue grass and hay can contain an endophyte that is responsible for abortion in the mare. This endophyte can be difficult to accurately test for, so be careful about feeding any fescue hay.

Management of Pastures Containing Fescue when Used for Pregnant Mares:

- Remove the mare from infected pastures at least 30 days before breeding and for entire gestation (conservative method), or at 60 days prior to foaling.
- Alternatively, domperidone can be administered in last few weeks of gestation. However, the drug can cause milk to stream before delivery, and therefore no colostrum is available for the foal at birth.
- Keep mare and foal off the infected fescue until weaning to prevent low milk production. Keep weanling and yearlings off fescue because consumption may slow growth.

In addition, certain hybrid Sorghum, Sudan or Johnson grasses have been reported to cause cystitis syndrome or prussic acid poisoning.

So After all of this… What Should I Feed?

First, each diet must be looked at on an individual basis. For example, a different grain mix and supplement may be necessary for use with grass hay vs. mixed hay or alfalfa hay – even for the same horse under the same conditions. Also, some horses tend to be more susceptible to small changes in diet than other horses, and other metabolic differences may effect the horse's utilization of nutrients. And finally, some of the results (both good and bad) may show up long after the young horse has left the breeding barn. At that point, pinpointing what has caused these results can be difficult. This is why nutritionists are hesitant to print a generic "recipe" for a diet until the specific situation of the horse is evaluated. A great diet for an easy keeper may cause severe problems for the nervous hard-keeper. However, once you understand the components of a good diet you can begin to develop a good ration suitable to your specific situation.

The chart on the previous page lists some of the necessary nutrients, and how these levels change as pregnancy advances. These levels are obtained by adding all the components of the diet (e.g. hay, grain and supplements). A common misconception is that if the total protein should be 12 percent then you should buy a grain that is 12 percent. This is not necessarily true because if you are feeding five flakes of an 8 percent protein hay plus a couple of pounds of a 12 percent protein grain per day, your total protein will only be a little over 8 percent.

Nutrition is only one of the many components important in the horse's development. Genetics and exercise also play important roles. We have a long way to go in understanding exactly what nutrition can and cannot do for our pregnant mares and their foals, but we are getting closer everyday to understanding more of the pieces of the puzzle. ■

Dr. Sheila Schils of Equine Nutritional Consulting is an independent equine nutritional consultant. She is available to analyze your specific nutritional plan and assist you in making any necessary changes to improve the nutrition of your horses. Contact her at (715) 425-7643, e-mail Sbschils@pressenter.com or visit www.pressenter.com/~sbschils/ for more information.

In the Ribbons

TODD SUTHERLAND PHOTO

EM Push Play and Sandra Lockwood

Hunter High Point Champion

Carol Esterkin's Elite Hanoverian mare, Push Play, has made quite a splash on the hunter circuit with rider Sandra Lockwood, winning among other things, the 2002 Year End Pacific Coast H.S.A. High Point Adult Amateur 18-35 Championship.

EM Push Play – 1988 Hanoverian mare (Pasha-Tequilla Sunset/Trajan). Owned by Carol Esterkin of Tarzana, Calif., and bred by St. George's Farm, Calif.