

Great Expectations—feeding your pregnant mare

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This month's article is mostly for those who are still fairly new to horse breeding, particularly those who are breeding their mares for the first time. Awaiting a foal is such an exciting time! It can also be a confusing and uncertain time. So many people, books, and magazine or internet articles will be giving you advice or telling you horror stories (which you'd do best to immediately disregard!). I'm about to add to the pile of information already out there on managing your mare through her pregnancy, but I'll endeavor to do it in a way that makes you feel more enabled to meet your mare's changing needs.

I want to begin by reminding you that conception, pregnancy/gestation, and birth are all natural processes. They've been going on for eons without our interference. (In fact, in some ways the more we interfere with the process, the greater the chance that things will go wrong.) So, relax and enjoy these next few months with your mare.

What your mare needs from you right now is basically the same as what she needed from you before she conceived. For example, she still needs plenty of exercise, the company of her friends, good nutrition, and all of the other basic needs I talked about in the September issue. [The PDF download: *Do horses get fibromyalgia?*] Some modifications will be needed as her pregnancy progresses, though. No doubt you're already aware of most of them, and have already

given some thought to her increasing nutritional needs, her need for a safe, clean, and quiet place in which to foal, and so on; and you should already have discussed appropriate vaccination and deworming protocols with your veterinarian. So, I thought I'd focus on the one area where mare owners often find themselves a bit at sea: her changing nutritional needs throughout pregnancy.

Changing needs

This may surprise some people, but the mare's nutritional needs do not significantly increase above her basic, nonpregnant needs until about the 8th or 9th month of pregnancy. That means for the first two trimesters of her pregnancy you do not need to feed her extra or anything special, unless she is underweight. (If your mare is in lean or poor body condition, start increasing the amount of calories in her diet now. Just be sure to do it *gradually*.)

From about 8 months onward, the mare's need for most nutrients, but especially calories, protein, calcium, phosphorus, and vitamin A, substantially increases. Those needs become even greater *after* she foals, because the nutritional requirements for milk production (lactation) to meet the needs of the rapidly growing foal are huge. Table 1 shows how the daily nutrient requirements for an 1100-lb mare change throughout pregnancy and lactation. [Scroll down to the next page.]

Table 1. Daily requirements for certain nutrients at different stages of the reproductive cycle. These values are for a mare who weighs approximately 1100 lb (500 kg) when not pregnant.

Nutrient	Nonpregnant (and not in work)	Early to Mid- pregnancy (0–8 mths)	Late pregnancy (9 mths–foaling)*	Lactation (first 3 mths)
calories (digestible energy, Mcal/day)	16.4	16.4	18.2–19.7	28.3
crude protein (lb/day)	1.4	1.4	1.75–1.9	3.1
calcium (grams/day)	20	20	35–37	56
phosphorus (grams/day)	14	14	26–28	36
vitamin A (IU/day)	15,000	15,000	30,000	30,000

The values in this table are averages only; some mares will require a little more, and some mares a little less, to meet their individual needs. Use the mare's body condition and appetite as a guide to the adequacy of her calorie and protein intake.

* This column provides a range of values, because most nutrient requirements increase between 9 and 11 months.

From this table, it appears that the mare's nutritional needs suddenly increase between the 8th and 9th month of pregnancy. That's the limitation of reducing a living, dynamic organism or process to a number on a chart. In reality, the mare's nutritional needs steadily increase from about 6 months onward; they simply increase more rapidly from about 8 months on.

Fetal growth, and thus the mare's increasing nutritional needs, are a continuum, rather than a series of sudden jumps. So, that is how you should approach her changing nutritional needs. Start gradually

increasing the amount of feed she receives from 6 or 7 months onward, using her body condition and appetite as a guide. When she reaches her 9th month, expect to increase her feed even more, again using her body condition and appetite as a guide.

Figure 1 illustrates how the weight (and thus the size) of the fetus increases during gestation. This graph will help you know what's going on in there, and therefore how your mare's nutritional needs change as her pregnancy progresses.

[Scroll down to the next page.]

Fetal Weight During Gestation

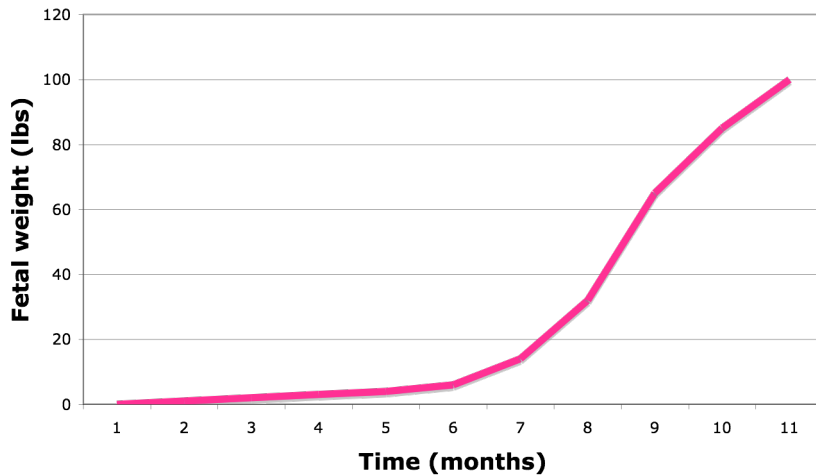


Figure 1. Graph showing how the weight/size of the fetal foal increases during gestation. (These data are for a Thoroughbred foal, weighing approximately 100 lb at birth.)

What and how much

Regardless of the stage of pregnancy, as well as throughout lactation, the mare’s diet should be based on good-quality roughage—pasture and/or hay. As a general rule of thumb, a mare with limited pasture intake should be offered good quality hay at a rate of 2%–3% of her body weight per day. For an 1100-lb mare, that’s in the range of 22–33 lbs of hay/day (i.e. $0.02 \times 1100 = 22$). In general, you’d feed at 3% body weight for thin mares and mares in late pregnancy and early lactation, and feed at 2% body weight for mares in good body condition.

My preference for most mares is a mix of grass hay and alfalfa hay, at a ratio of 70:30 (grass:alfalfa) and up to 50:50, depending on the circumstances. This blend provides additional protein and calcium, both of which are needed in greater amounts during late pregnancy and lactation.

Take a look at Table 2. It shows the number of calories and amounts of crude protein, calcium, phosphorus, and vitamin A provided by a 70:30 mix of orchard grass hay and alfalfa hay, when fed at 2% and 3% of body weight for an 1100-lb mare.

Table 2. Nutrients supplied by a 70:30 mix of orchard grass hay and alfalfa hay. The amounts fed represent 2% and 3% of bodyweight for an 1100-lb (500 kg) mare.

Nutrient	22 lb of hay (2% bwt/day)	33 lb of hay (3% bwt/day)
calories (digestible energy, Mcal)	19.7	29.7
crude protein (lb)	2.8	4.3
calcium (grams)	53.8	86
phosphorus (grams)	27.6	41
vitamin A (IU)	>176,000	>282,000

Now take a look back at Table 1. Notice that, even at the lower rate of 2% bwt/day, this hay diet meets or exceeds the mare's needs for these particular nutrients during late pregnancy. (That should not be much of a surprise, as grass is the foundation of the horse's natural diet.) So, it is not necessarily true that, just because she is pregnant, the mare needs to be fed lots of extra stuff. She can meet most, if not all, of her need for calories, protein, calcium, phosphorus, and vitamin A through good quality roughage alone, if enough is fed.

Having said that, though, a hay-only diet is likely to be deficient in certain micronutrients (e.g. some of the trace minerals and vitamin E), no matter how good the hay quality. For this reason, I typically recommend a good quality multivitamin-mineral supplement for horses on roughage-only diets. And as many forages grown in this part of the country are marginal or deficient in selenium, a good quality selenium supplement is important, too.

Concentrates (grain, sweet feed, pellets, and other high-calorie feeds) should be fed only as a supplement, when roughage alone cannot meet the mare's increasing need for calories or protein. How do you know if roughage is meeting her needs for calories and protein? She'll remain in good body condition as her pregnancy progresses. If you notice that she is starting to lose condition, despite her expanding belly, then increase the amount of hay you're feeding her, up the alfalfa portion to 50%, or, if she is already being offered as much hay as she'll eat, start adding a concentrate. Supplemental concentrates are frequently needed for the first 2–3 months of lactation because of the huge demands of milk production for those first few months.

My preference is for a low-starch (i.e. minimal grain), fat-supplemented concentrate, rather than a grain-based feed. Not only is a high-grain diet not natural for the horse and increases the risk for colic, laminitis, and several other health problems, there is mounting evidence that osteochondrosis (abnormal development of bone and joint cartilage) in foals is linked to high-grain diets. Feeding high-grain diets to foals certainly increases the incidence of osteochondrosis lesions (OCD and various other developmental orthopedic disorders). I believe that feeding pregnant mares a high-grain diet also contributes, perhaps even moreso,

as the foundation for the foal's entire musculoskeletal system is laid down before birth.

There are now several low-starch, fat-supplemented, calorie-dense feeds on the market. Most are formulated for performance horses, so they may not perfectly meet the mineral requirements for pregnancy and lactation. But remember that the product is being fed only as a supplement, to get more calories into the mare. Her basic diet of hay (and pasture, if you have it) is already meeting her major mineral needs, and if she is also receiving a good quality multivitamin-mineral supplement, you should have all the bases covered.

As for how much of these calorie-dense concentrate feeds to give her, be guided by her body condition and appetite, rather than what the manufacturer recommends on the bag. That recommendation is only a general guide; and, not to put too fine a point on it, remember that it's in the manufacturer's interest for you to feed a lot of their product. Let your mare guide you here. If she's barely holding steady or is starting to lose weight despite practically eating her weight in hay plus a few pounds per day of a calorie-dense feed, then increase the amount of the concentrate you're feeding her. Just be sure to make any increases *gradually* to avoid digestive upsets.

Keep it simple!

Avoid the temptation to get too complicated with the mare's diet. A good multivitamin-mineral product that is formulated to supplement a roughage-based diet and that the manufacturer indicates is suitable for broodmares should be all your mare needs as an addition to her basic diet. My preference is Platinum Performance Equine, because the manufacturer has taken great care to formulate the product based on available research in equine and human nutrition and on veterinarian and consumer feedback. (I also like it because its base is stabilized flax meal and flax oil, so it's rich in omega-3 fatty acids.) There are several other good multivitamin-mineral products on the market, though.

Lately I've come across a number of horse owners who are feeding about a dozen different supplements or additives all at once. (I counted 16 different tubs in one owner's feed room, and over 20 different bits and pieces in a ration being fed by an owner who was

following the advice of a certain natural horsemanship guru.) My advice to them, and to you, is to follow the KISS principle: *keep it simple, stupid!*

The more things you add, the more likely it is that the diet will become unbalanced by your additions. You can even end up grossly oversupplementing certain nutrients. That's never a good thing, for several reasons: (a) it's a waste of your money, (b) oversupplementation of some minerals can interfere with the absorption or utilization of other needed nutrients, and (c) it may have a detrimental effect on the mare's health or (more often) the foal's development.

While calcium, phosphorus, magnesium, copper, zinc, iodine, and selenium (to name just the major players) are all essential for normal musculoskeletal development, excesses of these minerals can be as bad as deficiencies. Also, the *ratio* of certain minerals (particularly calcium:phosphorus:magnesium and zinc:copper) is every bit as important as the actual amounts fed. As gestation is such a critical time in the horse's life, I recommend leaving ration tinkering to the trained equine nutritionists, rather than guessing and hoping you've gotten it right. The penalty for messing this one up can be harsh—e.g. a promising young sport horse with OCD or some other potentially performance-limiting developmental orthopedic disorder.

At the same time...

Consumption of fresh (i.e. living) plant material and access to a wide variety of plant species are, I believe, essential for good health and development.

Unfortunately, this aspect of equine nutrition is largely overlooked in modern horsekeeping. When free grazing in areas that are rich in non-grass herbage (uncultivated pastures, woodland, other natural areas) is not available to your mare, try to get her a variety of grass hays. Avoid sorghum/Sudan grass, though. Also avoid fescue, unless it has been tested and found to be free of the endophytic fungus that causes a variety of problems with the placenta, fetal development, foaling, and milk production.

I enthusiastically recommend offering fresh or dried herbs to horses as a way of adding quality, quantity, and variety of plant nutrients to the diet. However, very few herbs have been tested for safety in pregnant mares, so I'm rather cautious about using herbs and herbal supplements in these horses. If you want to feed herbs to your mare during pregnancy, then I recommend offering them singly and free-choice (i.e. not mixed in with her feed). Give her the option of refusing them and trust her body's wisdom in the matter.

I think it may be wise to avoid using immune-stimulating herbs, medicinal mushrooms, and other products or supplements that stimulate the immune system, except for specific medical purposes (e.g. infections). Another group of herbs I think it may be wise to avoid during pregnancy are those used as natural dewormers, particularly black walnut and wormwood (*Artemisia*).

It may well be that many of these substances can be safely fed during pregnancy, but too little research has yet been done on them in horses for my satisfaction. There is a lot of good and ever-increasing data on herbs in humans and laboratory animals. However, mares are not the same as women, and while there are more similarities than there are differences, the differences in placental structure and function between the two species are significant. It is not always valid to extrapolate from humans to horses, and as fetal life is such a vulnerable period, I tend to err on the side of caution when considering drugs, herbs, and other medications during pregnancy.

So, to wrap up: keep it simple, base the mare's diet on good quality roughage (ideally, a mix of grass and alfalfa hays, and as much access to good pasture and other fresh herbage as possible), add a well formulated multivitamin-mineral supplement, and provide a more calorie-dense feed if she is not maintaining good body condition. And remember to enjoy the magic of pregnancy and the little bundle of excitement your lovely mare is working on for you.

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