Broodmare Nutrition: Feeding the Pregnant Mare

BY HEATHER SMITH THOMAS / PHOTOS BY ANNE M. EBERHARDT

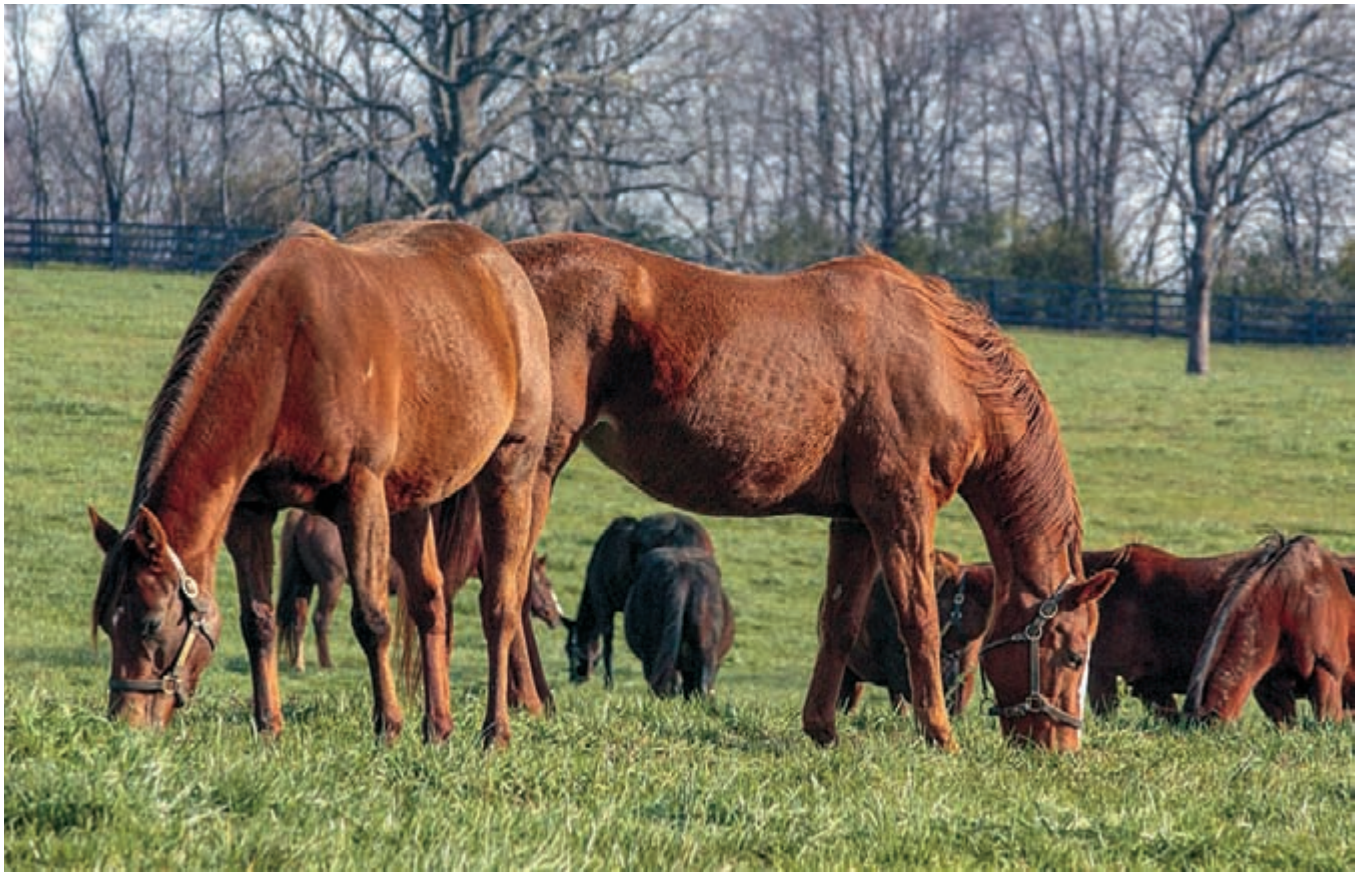
THE MARES YOU PLAN TO BREED need adequate body condition and proper nutrients (in proper balance) in order to cycle and conceive early in the breeding season. Proper nutrition is also important during the pregnancy. The future of a developing embryo/fetus depends upon health and nutrition of the dam. This formative time for the fetus can be adversely influenced by the uterine environment if the mare is exposed to certain diseases, toxins, or a poor diet.

What a pregnant mare eats during gestation—quantity and quality of various nutrients—can have a long-lasting effect on her foal. Also, if the pregnant mare has a foal at her side and is lactating, her nutritional requirements will be much greater than the demands of pregnancy alone.

Brian Nielsen, PhD (professor of exercise physiology and nutrition at Michigan State University) says his class had recently been talking about broodmare nutrition, and the reason conception rate in horses is lower than what we'd tolerate in beef cattle or other livestock.

"One student who already had a background with sheep and beef cattle asked if it was because horse people manage them wrong and may get them too fat," he said. "However, in contrast to those livestock species, the big issue is having horses too thin.

"With cattle you don't want cows too fat or they may have more dystocia or de-



The quantity and quality of a pregnant mare's diet can have a lasting impact on her future foal

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creased milk production. And with sheep we often flush the ewes by having them a bit thin and then putting them on an increasing plane of nutrition just before breeding season so they will ovulate more readily and have more twins or triplets. We do some things with other livestock species that we don't do with our horses."

Proper body condition in mares (not thin, but not obese) is often the key to successful breeding. Dr. Don Henneke came up with the Henneke body condition scoring system (on a scale of 1-9 with 1 being emaciated and 9 being obese) during his graduate study at Texas A&M University.

This scoring is based on both visual appraisal and palpable fat covering of six major points of the horse that are most responsive to changes in body fat.

Henneke also did studies looking at broodmares—whether they were thin or fat and how that might affect conception rate and foaling rate.

"He found that when mares are thin, lower than a body condition score of 5, when we start to see some ribs showing, it takes longer for them to begin ovulating again after foaling," Nielsen said. "If mares are thin, it will thus take longer to get them back in foal.

"That research, done back in the mid-1980s, showed that days to second ovulation was about a week longer in thin mares than in fatter mares. Since we are trying to keep mares on a yearly foaling schedule and not have them foal later next year (or fail to get pregnant), this becomes a bit of a problem," he continued.

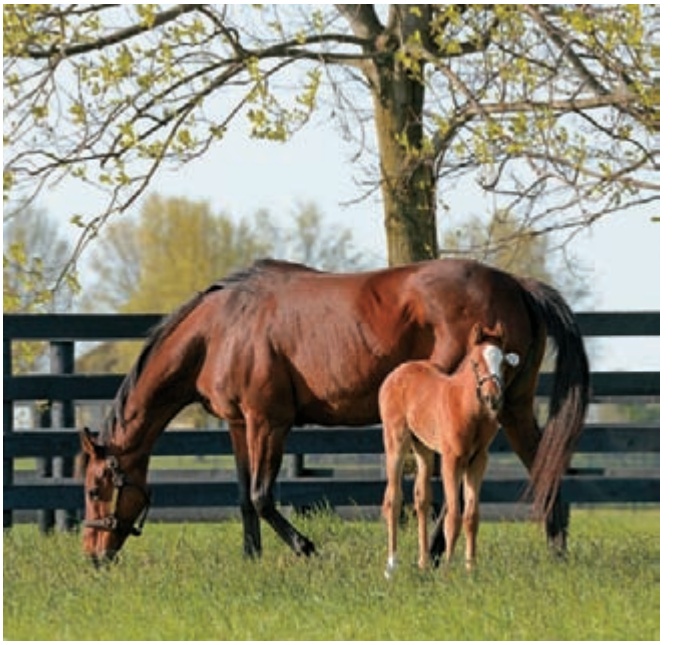
"Henneke's study divided mares into three different categories: mares that were thin and below a body condition score of 5, moderate-condition mares that were at a score of about a 5-6.5, and the last category was fat mares, at a score greater than 7. The 13 mares that were fat all got pregnant when bred. The four mares that were in moderate body condition all got pregnant. There were 11 mares in the thin group below body condition score of 5 and when those mares were bred, only seven of them got pregnant. Looking at the mares that were able to conceive, all mares in the study that were body score 5 or greater got pregnant whereas only seven out of 11 thin mares got pregnant," Nielsen said.

"Then when you look at the ones that were able to maintain pregnancy, 12 out of the 13 fat mares maintained their pregnancies, four out of the four moderate mares remained pregnant, but only four of the seven thin pregnant mares remained pregnant."

The thin mares sacrificed their fetuses because they didn't have enough reserve body condition to maintain themselves and a fetus.

"Mother Nature is saying, 'you can't take care of yourself, so you can't try and raise a baby,' " Nielsen said. "Looking at total numbers, there were 17 mares with body condition score of 5 or better, and they all got pregnant, and 16 of them went ahead and maintained the pregnancy. By contrast, out of the 11 thin mares, only four had successful pregnancies."

Some people think that if a mare is fat, they want her to lose a little weight before they breed her. Yet a mare that's losing



A mare with a foal has greater nutritional needs

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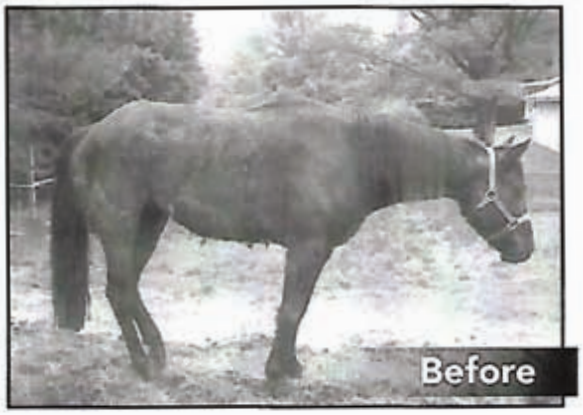

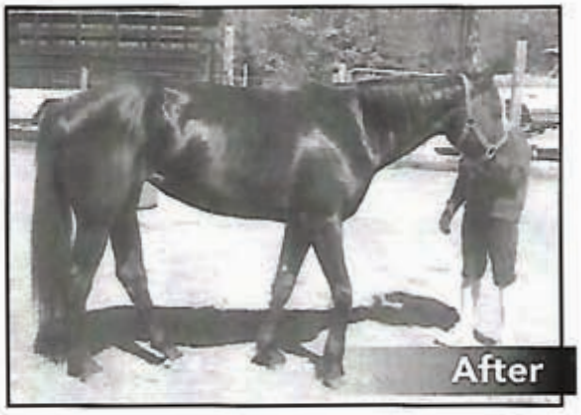

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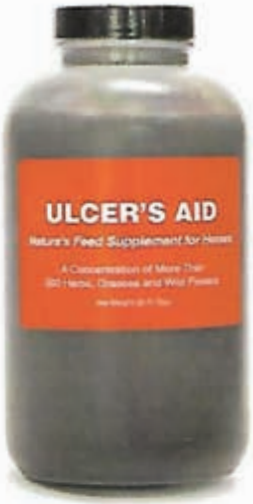

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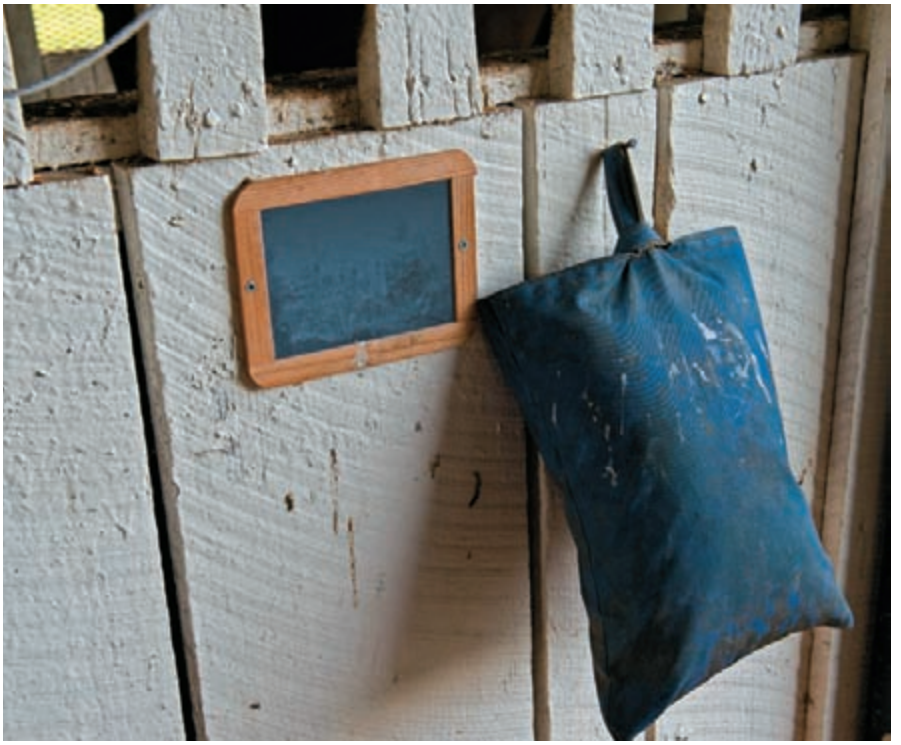
weight is much less likely to cycle than a mare that's in optimum condition or gaining weight.

Trying to breed a mare that's losing weight is absolutely the wrong time—because Mother Nature is getting the wrong signal for maintaining a successful pregnancy.

The other part to this is looking at the number of cycles it takes for a mare to become pregnant—how many times you have to breed her.



Mares' meals might need to be individualized

"Henneke's work showed that the moderate and fat mares took 1.4 cycles to conception," Nielsen said. "This means about half the mares you bred caught on the first breeding, and the other half took another cycle. In contrast, the thin mares averaged 2.8 cycles to become pregnant. This means you had to breed them about three times before they conceived."

The other research Nielsen mentions is some work looking at dystocia issues done in the late 1980s.

"In that study they got some mares up to body condition score of 8 to 9 and found no effect on these mares or their foals in terms of foaling and dystocia," he said. "Fat mares don't seem to have a problem foaling (in contrast to fat cows), but there may be other issues.

"Newer research is looking at epigenetics and the influence fetal environment has on the fetus and its future growth and health. The mare (or even her dam) has some influence on future generations, depending on whether she is too thin or too fat. This is an interesting area of research. We need to realize

that apart from the issues of laminitis in the too-fat mare, we might also create some other problems like insulin dysregulation in the foal," Nielsen said.

"In terms of breeding condition and reproduction, however, I'd rather have a mare that's a little more toward the fat side than thin. There's an old saying that you should feed your broodmare like a dairy cow, or else she'll look like one, especially when she starts lactation. Energy requirements go up tremendously during lactation," he said.

Even if you have a mare in a body condition score of 5, which is a nice target, she might not maintain that condition after foaling because with lactation she will start losing weight unless you are feeding her a lot. She'll rob from her own body reserves to feed the foal.

"This is the same time we want to rebreed her, so you don't want her losing weight right after foaling and slipping below a body condition score of 5," Nielsen said.

Stephen Duren, PhD (Performance Horse Nutrition), says the key is to remember the pregnant mare is developing a fetus we want to become an equine athlete—a future racehorse.

"We take broodmare nutrition very seriously," he said. "We used to concentrate only on the third trimester, which is the last 110 days of the pregnancy. Certainly that's important because that's when most of the fetal growth occurs. There's a large increase in calorie requirement, protein requirement, and requirements for calcium, phosphorus, and lysine in the pregnant mare during that time. Those nutrients must all increase in her diet during that last trimester of pregnancy.

"But we also can't forget the first and second trimesters because this is when a lot of the neural development of the fetus takes place," he said. "This early development is crucial, too. We also have several different scenarios. If we are talking about a barren mare or a maiden mare, often we have programmed those mares to get pregnant; we are feeding a diet with an increasing caloric content, so those mares are not in a negative energy balance."

> "The requirements for early development and neural development of that small fetus will all be more than covered if the mare is being fed appropriately as a lactating mare."
>
> — STEPHEN DUREN

We want the mare gaining, not losing weight, if we want to get her pregnant. We don't want those mares in a negative energy balance going into the breeding season.

After becoming pregnant, these mares would go through the first, second, and third trimesters without the added

It is important to keep a mare in proper body condition through nutrition

requirement for lactation.

"The other scenario is the pregnant mare with a foal at her side and is lactating," Duren said. "During her early pregnancy or even the second trimester, her requirements are greater. We must feed those mares appropriately for a lactating mare, and this would cover any of the requirements for early pregnancy and the small, developing fetus."

"You address the needs of lactation, breed her, and she becomes pregnant. The requirements for early development and neural development of that small fetus will all be more than covered if the mare is being fed appropriately as a lactating mare. Then she is not losing weight while nursing her foal," he said.

Weight and condition of the mare tell you the caloric value of the diet, and this is the only dietary factor that you can actually visualize and ascertain (via body condition).

"You can simply look at the body condition of the mare to see if she is holding her weight, losing weight, or gaining weight," he explained.

It's not so easy to tell, however, whether she is getting adequate protein, minerals, trace minerals, and vitamins.

"You can't determine these visually," Duren said. "This is where you have to resort to diet analysis to make sure you are feeding her not only enough calories (which you can see by her body condition) but also enough protein and other nutrients that enable her to maintain herself, repair her tissues, and replenish what she is giving to the nursing foal by making milk. She has to produce milk as well as provide for the developing fetus.

"On a Thoroughbred farm, mares are often grouped in terms of their nutritional requirements. If you have a mare that is grossly overweight or some that are underweight, we often put them in a separate group so we can feed them differently," he said. "Initially, when doing reproductive work to get them safely in foal, or back in foal, those mares are coming to the barn daily, so even if they are not in separate groups, we can still feed them individually. Typically those mares are in stalls at least part of the day, and often they are fed their grain meals inside. Those meals can be individually tailored."

An overweight mare might simply need a ration-balancer pellet or a lower-calorie diet than a mare that struggles to maintain her weight. Lactating mares with their foals are often out on pasture at least part of the day. Good pasture can help with their nutritional needs. In some climates, however, there won't be green pasture yet when the mares foal.

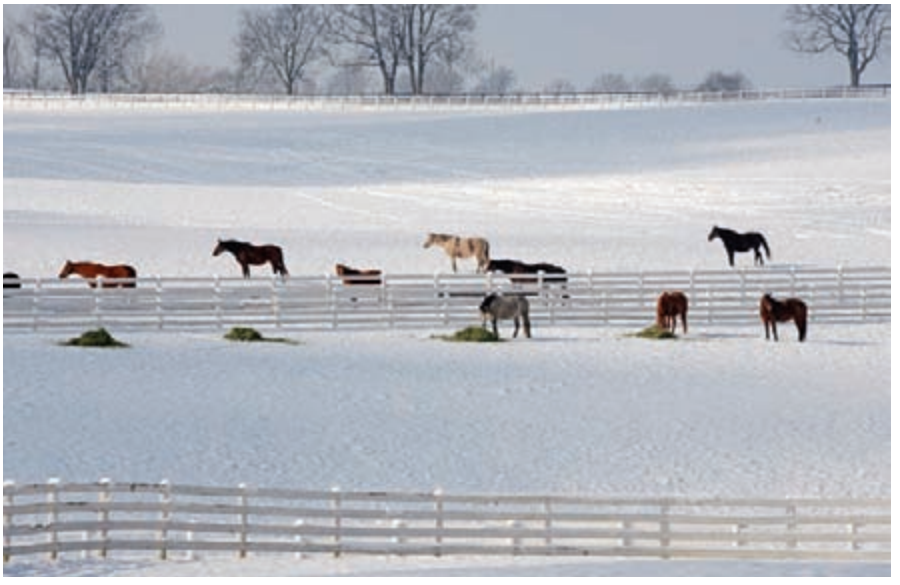
> "The main thing to do is get enough calories into the mare so that Mother Nature can give the green light to go ahead and get pregnant."
>
> — BRIAN NIELSEN

"In countries such as Japan, and in upstate New York where there is snow on the ground when the early-foaling mares foal, those mares will hit peak lactation before there's green grass," Duren said. "We need to increase the calorie content of their diets. These mares will typically go from eating a grass hay to a hay that has some added alfalfa and more calories. The mare manager may continue with free-choice grass for these lactating mares and then limit-feed a small amount of alfalfa to add the protein and calories that would ordinarily be coming from abundant grass pasture."

Because of the cold weather, early foaling mares are typically on a higher rate of intake for their grain/concentrate compared with some of the later-foaling mares. It takes more calories in cold weather just to produce the body heat needed to keep warm. If you have a cold winter, you have to feed them more.

"It's always important to give any broodmare—whether she is pregnant or lactating (or both)—free choice access to good-quality forage," he said. "This might be in the form of abundant pasture or free-choice grass hay, and if there is snow and cold weather, she also needs a certain amount of limit-fed alfalfa hay. Broodmare nutrition always starts with good forage.

"We need to make sure the forage is good and abundant, and then we add the appropriate grain concentrate at levels enough to maintain desired body condition."



Snow and cold weather require more calories to keep warm, so pregnant mares might need access to alfalfa hay

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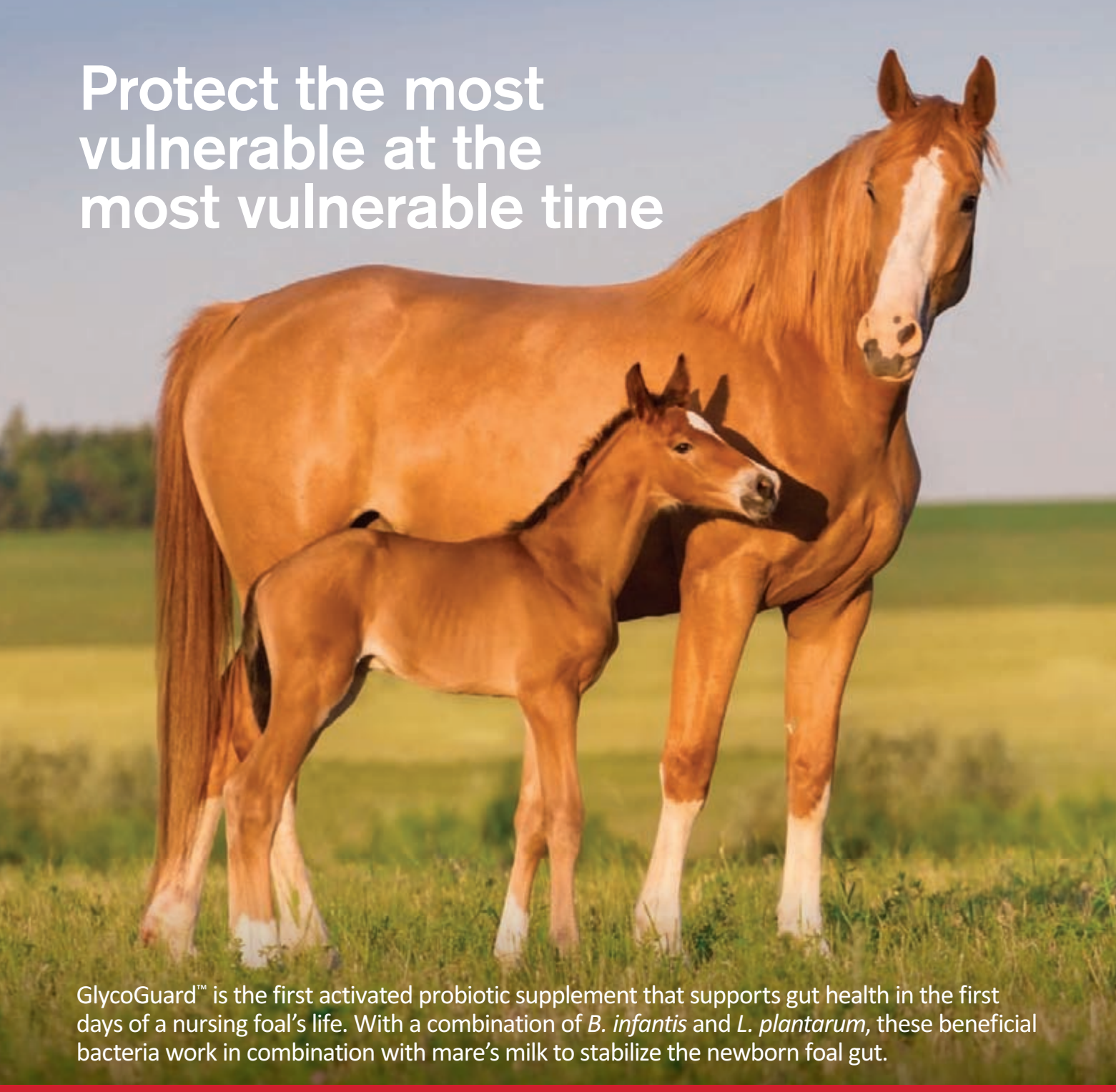

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SUMMARY

You can only visually assess the caloric content of the diet (which is manifested by body condition). You then need to make sure, if you are providing a balancer pellet or a full-grain concentrate in adequate amounts that it is well fortified and designed specifically for a broodmare at that stage of pregnancy or lactation. You will be feeding barren and maiden mares differently than you'll be feeding a lactating mare in early pregnancy. It is important to consider not only the last trimester, but also the first two trimesters when a lot of the nerve and tissue development is occurring.

Broodmare nutrition always starts with good forage

The broodmare needs good overall nutrition, with good-quality protein in adequate amounts, and plenty of energy, along with the right nutrients in terms of minerals—both the macro- and micro-minerals that are needed in lesser amounts. This is important for pregnant mares and lactating mares.

"You need to know the nutrient content of your forages, and if you are feeding concentrates, you need a balanced concentrate that is fortified to take care of any possible imbalances," Nielsen said. "But the main thing to do is get enough calories into the mare so that Mother Nature can give the green light to go ahead and get pregnant." BH

Heather Smith Thomas is a freelance writer based in Idaho.

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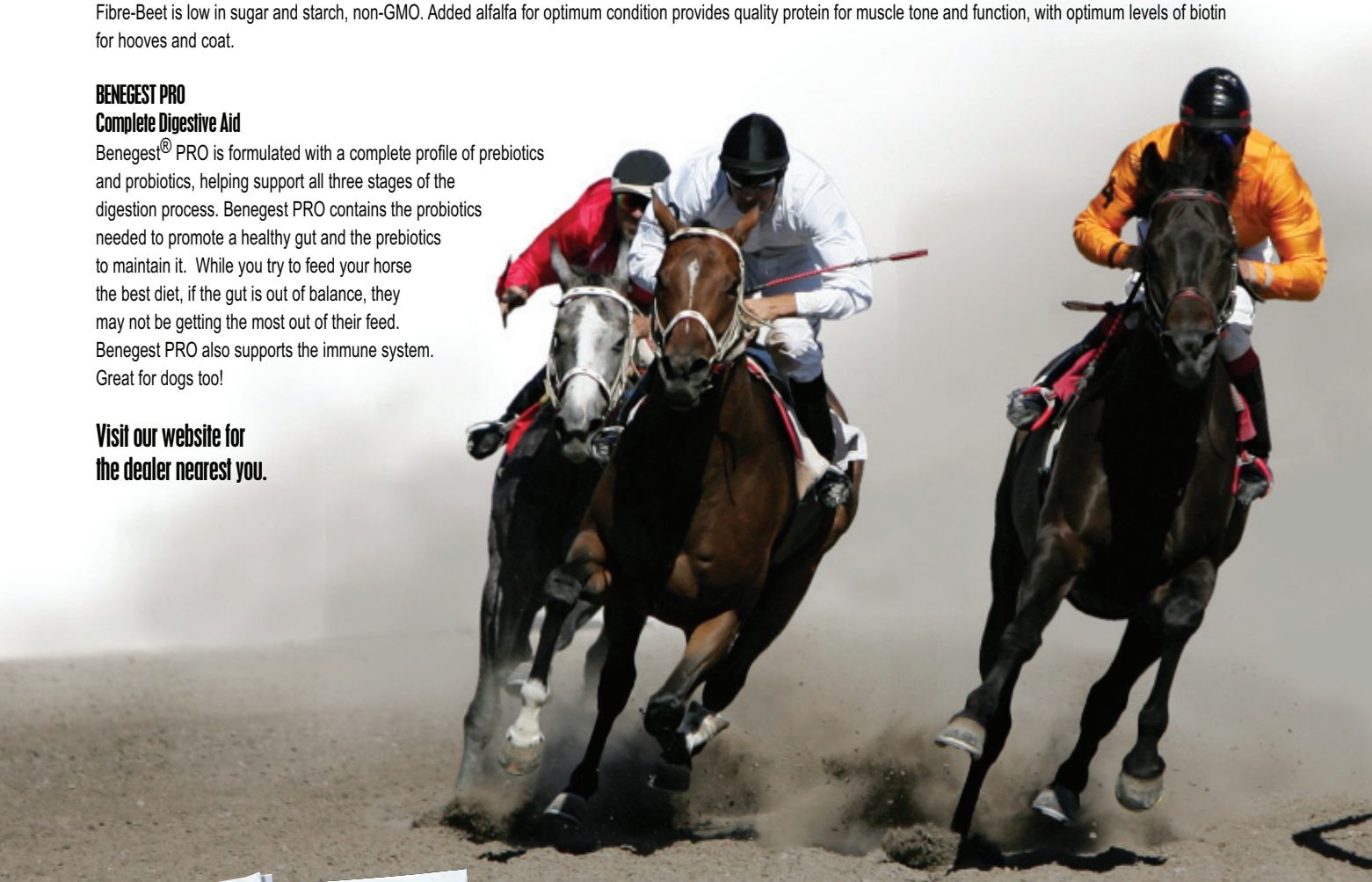

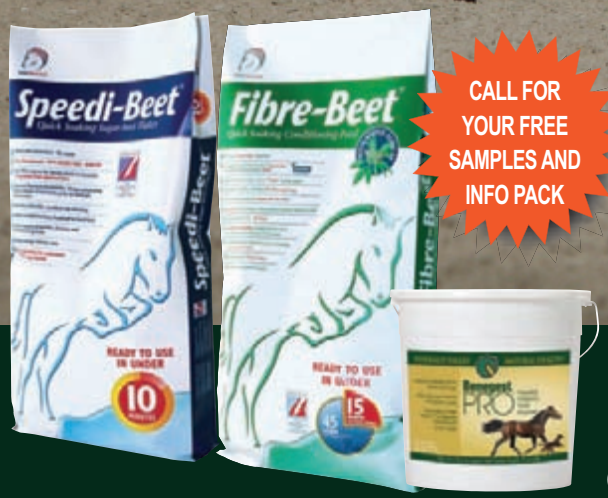

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