



Yearlings graze on sweet clover at a ranch in North Dakota. The best pasture for growing horses is a mixture of legume and grass.

To Grow On

Feeding yearlings properly is crucial for sound development.

By Tonya Ratliff-Garrison

IT'S SPRING, AND LAST YEAR'S ADORABLE FOAL IS NOW A GANGLY yearling. No longer does he rely on Mom for much of his nutritional needs. He's on his own.

"It's one of a horse's rapid growth periods," said Sarah Ralston, V.M.D., Ph.D., an associate professor specializing in equine nutrition at Rutgers University.

"They're not growing quite as fast as when they were weanlings or foals, but they're still putting on a significant amount of height and weight. With anything that's growing rapidly, without the proper nutrients, there's a big danger of the development not going as it should."

The average Quarter Horse will have achieved 90 percent of his full height and 66 percent of his mature weight by the time he's 12 months old. However, yearlings are not adult horses, and they cannot be fed as if they were.

"The difference between a yearling and an adult horse is simple: Yearlings are still growing," said Pete Gibbs, Ph.D., a Texas A&M Extension horse specialist. "They need appropriate amounts of quality protein and minerals compared to older horses."

Most important in a yearling's diet are the building blocks for his bones: protein, calcium, phosphorus and trace minerals.

But not all yearlings are the same. Youngsters being conditioned or in training have different nutritional needs than those living carefree in the pasture.

"Yearling horses can meet the majority of their nutrient requirements for moderate growth from forage if they graze 15 or more hours per day on good pasture or are given high-quality hay," Gibbs said. "However, yearlings being fitted or receiving forced exercise will require a

combination of roughage and concentrate, regardless of whether for moderate or rapid growth. And, if you intend to achieve high quality rapid growth, that concentrate feed had better be balanced."

With all these factors to consider, it's understandable why it can be confusing when it comes to setting up a proper feeding program for yearlings. To help sort it all out, Ralston and Gibbs offer this advice.

Forage

FORAGE IS THE CENTERPIECE OF A YEARLING'S DIET, AND HE should be fed the best possible.

"Put your money into the hay," Ralston said. "If you have good quality hay that's 14 percent to 16 percent protein with a good balance of minerals in it, you won't need supplements."

The best forage is legume or a 50/50 mixed legume and grass hay.

"There is no doubt that legumes such as alfalfa seem to give young horses more bloom, a nicer hair coat, all of that, and it is easily explained by the difference in nutrient content compared to grass hays," Gibbs said.

"Research conducted here at Texas A&M University has compared digestion of different qualities and types of hay, and the long story short is excellent quality alfalfa hay is more digestible than excellent quality grass hay. However, excellent quality grass hay is more digestible than average quality alfalfa hay."

Good alfalfa hay has on average 1.2 Mcal of digestible energy per pound while timothy hay has as little as 0.6 Mcal digestible energy per pound. Also, hay cut in the early stages



Yearlings do well on free-choice hay, which should be of the utmost quality.

of maturity is the best to feed because it has the highest energy and protein content and lowest amount of lignin, which is indigestible.

“If the hay is adequate, you can often get good growth with minimal concentrate,” Ralston said. “But bottom line, if a yearling is on grass hay, he’ll need a higher concentration of protein and calcium in his diet because grass is very low in protein and calcium.”

Ralston and Gibbs stress it’s best to have hay analyzed for nutrient content.

“Put your money in an analysis so you know what you’re getting, especially before you start adding supplements to a yearling’s diet,” Ralston said.

But it’s not always feasible to feed top quality hay on a consistent basis.

“If a farm is fortunate enough to feed all young horses the same quality hay throughout their yearling year, that tends to work pretty well,” Gibbs said. “But when a farm has to switch hays several times during the yearling year, there can be dramatic changes in the nutrients, which in turn contributes to changes in a yearling’s growth rate.”

An option to ensure consistent nutrient content is to feed hay cubes or a complete feed.

“As long as it’s an alfalfa-based cube, it should be fine,” Ralston said. “Timothy/alfalfa mix cubes work well and can be basically fed free choice, but straight alfalfa cubes might need to be fed in limited amounts to avoid excessive weight gain.

“Also, since the horses can eat them quickly they will spend fairly long periods of time without something to chew on and may turn into ‘termites,’ chewing the wood in their environment to compensate for the lack of ‘chew’ time.”

Concentrates

WHEN ADDING A CONCENTRATED FEED, evaluate the yearling’s total diet. That means looking beyond the percentage of protein in the diet.

Although protein is important – too little or too much can result in health problems – a diet must also provide a yearling with all the essential minerals and vitamins he needs to grow properly.

“Don’t just go on the protein content,” Ralston said. “You want to feed a concentrate

that is formulated for growth.”

The average yearling requires 12 percent to 16 percent crude protein as well as adequate vitamin A, magnesium, potassium, lysine, selenium, copper, zinc, calcium and phosphorus.

“A good rule of thumb is 14 percent to 16 percent protein, calcium over 0.8 percent and phosphorus around 0.4 percent to 0.6 percent because you always want more calcium than phosphorus,” Ralston said.

There are several concentrated feeds that have been developed with yearling horses in mind. Each of these feeds provides the right amounts of macro- and micro-minerals as well as fat- and water-soluble vitamins.

“These well-balanced feeds are designed to meet those nutrient requirements to promote sound development in growing horses,” Gibbs said. “Balanced feeds are worth strong consideration because somebody has taken the time to formulate the feed to make sure it contains adequate nutrients relative to the calories in that feed.”

Some concentrates are also formulated with specific forages in mind.

“If you’ve got a yearling on grass hay, feed a formula that has more protein and calcium because grass hay is very low in protein and calcium. But if you have one on alfalfa hay, then you can feed a formula that doesn’t have as much protein and calcium,” Ralston said.

“Several companies are taking this approach of formulating feeds to complement what hay is fed, and I think that’s a sound one. But you have to remember if you are feeding alfalfa to a yearling that’s getting a concentrate for grass hay, you’re unbalancing the nutrition.”

Many owners prefer to feed straight oats to their yearlings. However, Gibbs stresses that oats don’t provide a balanced diet.

“Oats are deficient in lysine, and when fed with alfalfa hay, yearlings will often be 5 percent to 10 percent short on the amino acids they need to really promote development,” he said.

In a Texas A&M study, a set of yearlings was fed oats and alfalfa hay while another set was given a balanced feed with the same amount of alfalfa hay.

“With both groups eating the same amount of calories each day, the yearlings fed oats gained twice as much fat while those fed the balanced diet gained more wither height and had more bone density,” Gibbs said.

“The reason is pretty simple: In the absence of all nutrients needed for growth promotion, they will deposit fat and gain weight. Then, when you add in a forced exercise component, some of these yearlings will be attempting to build bone in a system that is not receiving all the ingredients needed for strong skeletal development.”

There are products available to balance an oat diet for growing horses. However, Gibbs and Ralston advise owners to be cautious when adding supplements.

“You really can run the risk of getting excess or toxicities if you don’t know what your horse is already getting from his diet,” Ralston said.

Before adding a supplement, make sure it meets the needs of a yearling.



TONYA BATHLIFE-GARRISON

Several companies have developed concentrated feeds with yearlings in mind. For example, AQHA Corporate Partner Nutrena created Life Design Growth with the appropriate minerals and vitamins to meet a growing horse’s needs.

DAILY NUTRIENT REQUIREMENTS OF YEARLINGS*

	WEIGHT (LB)	DAILY GAIN (KG)	DIGESTIBLE ENERGY (MICAL)	CRUDE PROTEIN (LB)	LYSINE (G)	CALCIUM (G)	PHOSPHORUS (G)	MAGNESIUM (G)	POTASSIUM (G)	VITAMIN A (103 IU)
Yearling (12 months)										
Moderate Growth	715	.50	18.9	1.90	36	29	16	5.5	17.8	15
Rapid Growth	715	.65	21.3	2.10	40	34	19	5.7	18.2	15
Long Yearling (18 months)										
Not in Training	880	.35	19.8	2.00	38	27	15	6.4	21.1	18
In Training	880	.35	26.5	1.95	2.60	36	20	8.6	28.2	18

**For horses maturing to 1,100 pounds.*
Source: National Research Council Nutrient Requirements of Horses

“The horse world is full of supplements that claim to do just about everything imaginable,” Gibbs said. “While some supplements may actually be beneficial, many have never been subjected to efficacy research at all. It is not known whether they make any difference.”

Health Problems

ALTHOUGH DEVELOPMENTAL ORTHOPEDIC DISEASE IN YOUNG horses originates from many causes such as heredity and exercise, diet and nutritional imbalances can play a key role. DOD complex includes epiphysitis, osteochondrosis and juvenile arthritis, among other disorders.

In the 1970s, excessive protein was blamed but this theory has since been dispelled.

“Restricting protein will not result in improved bone growth, and actually can be harmful,” Ralston said. “But on the other hand, overfeeding energy – greater than 100 percent of the National Research Council’s recommendations – can cause problems, especially if mineral intake is not increased at the same time.”

Ralston theorizes that the overfeeding of carbohydrates, especially when combined with mineral imbalances and excess energy, is the primary trigger of DOD.

“These factors can cause abnormal and improper mineralization of bone, which translates into legs that are prone to develop defects,” she said.

A diet must be balanced to achieve musculoskeletal health.

“Malnutrition includes both underfeeding and overfeeding nutrients,” Ralston said. “Underfeeding will stunt a growing horse and increase the risk of disease. Overfeeding, especially calories and supplements, can potentially cause permanent damage to the limbs and possible metabolic repercussions.”

Ralston thinks the overfeeding of carbohydrate-rich grains, such as sweet feed, might cause a young horse to grow into an adult horse with equine metabolic syndrome, or insulin resistance.

“Those starches and sugars are fairly rapidly digested in the small intestine, and cause an increase in the blood glucose, which then causes an increase in insulin release,” she said. “When they’re adapted to a ration that has a lot of starch and sugar in it, for some reason their cells become less sensitive to the action of the insulin, and you need more insulin to clear the same amount of glucose.”

The high insulin levels in turn interfere with growth hormones.

“It’s best if you can avoid huge peaks and valleys in the glucose/insulin,” Ralston said. “So try not to feed the sweet feeds that have a lot of molasses added.”

Feeding Management

ONE OF THE BEST MANAGEMENT PRACTICES IN FEEDING YEARLINGS is to spread the nutrient supply over more meals.

“Research here at Texas A&M some 10 years ago provided some useful information on maximizing nutrient absorption,” Gibbs said. “There is a limit, for instance, to protein absorption, and the best way to maximize that absorption is to feed more small meals compared to fewer large meals.”

Most yearlings receive large amounts of concentrated feed in two meals per day. Gibbs, however, recommends spreading that same amount of concentrate over three or four feedings.

“Not more feed, just more feedings,” he said.

It then becomes important to keep the intervals between feedings as consistent as possible.

“It makes sense that equal times between all feedings will kind of even things out,” Gibbs said. “If I were feeding yearlings three times per day, I would want those feedings to be about eight hours apart.”

But not all yearlings are the same.

Some youngsters live the carefree life of a horse in the pasture until they are 2 or 3 while others are stalled in preparation for show or a sale. And then there are those long yearlings that enter training for a performance career.

That’s why a yearling’s feeding program must be tailored to fit his needs.

Maintenance

DURING THE SPRING AND SUMMER, A GOOD MIXED GRASS AND legume pasture or hay might be all a yearling needs for moderate growth. But his forage should be analyzed to ensure he is meeting all of his nutrient needs.

An average weight gain for a yearling is about 1 to 1.25 pounds daily up to 18 months of age.

“You don’t want them rail thin,” Ralston said. “What you want is the lean look where you can’t see their ribs, but you can feel them. That is ideal.”

For a yearling getting most of his forage from pasture, an owner needs to ensure there is enough grazing available to maintain a proper diet. A yearling needs about 60 to 80 pounds of forage dry matter per 100 pounds of his body weight, which in a quality pasture that is actively growing would be a stocking rate of about three yearlings per acre.

“There are several studies from Texas A&M that demonstrate yearlings can grow at a moderate rate on nothing more than improved pastures,” Gibbs said. “A yearling grazing about 15 hours per day will gain just over a pound a day if he has unlimited access to really good grass grazing. Horsemen not in a hurry to develop

a yearling can use varieties of Bermuda grass overseeded with winter grazing, to have grass available throughout the year.”

During the heat of the summer or a drought, though, grass can be scorched and lose its nutritional value. A poor pasture will cause a youngster's growth rate to suffer. That is when his diet must be supplemented with quality hay and concentrates.

Rapid Growth

WHEN IT COMES TO A YEARLING BEING FITTED FOR A SHOW OR sale, size does matter.

“Surveys show that higher-selling yearlings are taller,” Gibbs said. “Also, rapid growth and development is often important for halter futurity contenders and horses entering race training as yearlings. So many horse owners realize that their young horse's marketing or performance potentials hinge on significant early development.”

The growth rate of young horses can be manipulated with nutrition, but the feeding program must be sophisticated.

“For rapid growth, yearlings will need an appropriate ratio of concentrate to hay, and the feeding program needs to be finely tuned to satisfy the extra nutrients that yearlings require when growing fast or when receiving forced exercise,” Gibbs said.

Many owners wanting to promote rapid growth will top-dress a concentrate with fatty oils or oats. Though not necessarily nutritionally unsound, top dressing might lead to a fat horse rather than a well-muscled horse with strong bones.

“Top dressings of oils or fat supplements for yearlings, like half a cup twice a day, would add lots calories for them but isn't doing anything for bone formation,” Ralston said. “There is increasing evidence and thought that having your yearlings hog fat is not in their best interest. It's putting a lot of extra weight and stress on those developing limbs. It can predispose to insulin resistance, and it can dispose to developmental problems because of the excess weight on those young limbs.”

The worst thing that can be done to a yearling is to not allow him to exercise.

“Excess exercise can cause problems but lack of exercise can really hurt the development of a yearling,” Ralston said. “You stick a yearling into a stall and take him out once a day



A yearling grazing on quality pasture about 15 hours per day will gain just over a pound a day.

for 15 minutes, he's not going to get the bone development he will if he's allowed to run around and play.”

In Training

EXERCISE IS NOT A BAD thing, but for a horse in intense forced exercise or training, the nutritional needs increase.

“Exercise signals the bone to remodel, and it can only get stronger if the nutrients are available that allow the bone to build,” Gibbs said.

In cutting and reining, where size itself is not all that important, the skeletal strength is important. Many of these young horses enter rigorous training programs late in their yearling years, and compromised skeletal integrity is a real concern.

A Texas A&M study with long yearlings in training demonstrated a 35 percent increase in requirements for calcium and phosphorus, and the need for magnesium was about two times higher than previously estimated.

“But these mineral needs are best met by feeding formulated horse feed rather than by trying to supply individual minerals in addition to the feed,” Gibbs said.

Ralston agrees.

“One of the major mistakes I've seen is when colts get put into race training, all of a sudden they're feeding the horses a racehorse formula that is not designed for the young, growing horse,” she said. “They need to keep that calcium/phosphorus/trace mineral intake up.”

Next Stage

RAISING A YOUNG HORSE THAT IS SOUND AND COMPETITIVE FOR today's horse industry requires a careful feeding program.

As a yearling nears his 2-year-old year, he should have lost most of that gangly look and taken on more of the physical characteristics of an adult horse. He will have accomplished most of his growth, at least in skeletal length and height, although he will still continue to fill out with muscle. His nutritional needs will begin to level off to that of an adult horse.

And if a proper diet and exercise has been provided, hopefully, he will fulfill the promise of becoming the champion he was bred to be. ■

Tonya Ratliff-Garrison is a field editor for The American Quarter Horse Journal. She can be reached at tonyag@aqha.org. Andrea Caudill of The American Quarter Horse Racing Journal contributed to this story.

Resources

For more information on feeding young horses, check out these:

- “Start Strong,” by AAEP, *The American Quarter Horse Journal*, April 2004, page 68.
- “A Matter of Moderation,” by Tonya Ratliff-Garrison, *The American Quarter Horse Journal*, April 2006, pages 68-71. Available online for Journal subscribers at www.aqhajournal.com.
- “Feeding Young Horses for Sound Development,” by Pete Gibbs, Ph.D., and Gary Potter, Ph.D., Texas Cooperative Extension publication. Available online at animalscience.tamu.edu/main/academics/equine/B-5043_feedingyoung.pdf.
- “Feeding Race Prospects and Racehorses in Training,” by Pete Gibbs, Ph.D., Gary Potter, Ph.D., and B.D. Scott, Ph.D., Texas Cooperative Extension publication. Available online at animalscience.tamu.edu/sub/academics/equine/B6129_feedingracehorses.pdf.
- “Feeding the Rapidly Growing Foal,” by Sarah Ralston, V.M.D., Ph.D., Rutgers University publication. Available online at www.esc.rutgers.edu/publications/factsheets_nutrition/FS895.htm.