Feeding Weanlings and Yearlings to Avoid Developmental Orthopedic Disease (DOD)

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After a foal is weaned, they should be on a balanced diet that contains enough protein and energy—and minerals in correct ratio—for a growing body. Nutritional needs can usually be met with a mix of good grass and alfalfa hay, and some grain if needed. Many weanlings do nicely with no grain, but most people feed grain to make them grow faster. The weanling needs more protein and total calories than a mature horse would for growth, but many people overdo it. A common error is feeding too much protein—some owners feed a diet that's 17 to 18 percent protein, but weanlings need a ration containing about 13 percent protein, and yearlings 12 percent.

Calcium and phosphorus balance is important, and the ratio of these minerals is more important than the quantity. There should always be at least as much calcium as phosphorus, preferably in a range of about 1.2 to 1.8 parts calcium to one part phosphorus (the typical content in grass), and never more than three to one. The most serious imbalance is when phosphorus levels exceed that of calcium, as sometimes happens when feeding too much grain (grains are higher in phosphorus while forages are higher in calcium). Too much phosphorus prevents proper utilization of calcium. Weanlings being pushed too fast to grow are often fed large amounts of grain and low amounts of hay, resultimg in an inverted calcium-phosphorus ratio. If grain is fed, then the calcium level must be increased to match it—this can be done by feeding more alfalfa.

Protein, digestible energy and minerals should all be present in sufficient quantitites for growth, but excess energy is a major factor in causing developmental orthopedic disease (DOD). Do not overfeed newly-weaned foals. Regardless of the weaning method, there will be a period of somewhat slower growth immediately after being separated from the mare. After a foal recovers from that, he tends to make up for lost time. If you push more feed at him to try to counteract his decrease in weight gain, he may then make a rapid gain for awhile, stimulated by the increased nutrient intake. It's safer to just accept the post-weaning slowdown in weight gain, knowing that the youngster will eventually catch up.

The decrease in weight gain during this transitional period is not critical, but the growth spurt immediately following it can be—in other words, if the foal develops DOD due to this compensatory gain. Physitis often develops in foals after a growth spurt. This type of growth acceleration is especially pronounced in foals that were underfed, sick or not dewormed earlier (with lots of catching up to do in growth), thus experiencing sudden weight gain after being well fed and dewormed during the weaning period. This growth spurt can be a problem any time a foal bounces back from illness or after having been off their feed for any reason. The challenge in feeding the young horse is to try to keep his growth at a smooth rate with no sudden changes.

The horse's skeletal growth slows by the time he's a yearling—many youngsters have reached 90 percent of mature height (though they should be a much lower percent of mature weight, with much filling out yet to do) by the time they are yearlings. They have attained most of their skeletal size, and growth rate of the bones has slowed considerably. Even though the bones aren't full size or strength (due to incomplete mineral content) until the horse is about four, the fact they are growing slower now puts the yearling at less risk of developing various skeletal problems than he was during his first year of life. Overfeeding a yearling may be less likely to induce DOD than overfeeding the weanling.

Their weight gain should always be slower than skeletal growth. Even though they may have reached 90 percent of their height and nearly 90 percent of their heart girth measurement, the yearling should not be more than about 65 percent of mature weight. If they are heavier than that, they have too much weight on immature bones,

which can cause leg problems. A common cause of physitis in young horses is too much weight on the growth plates of the long bones, causing the growth plates to widen and flare out.

Excessive starch in the diet of a young horse is a major contributing factor for DOD. You can put weight on a horse any time, but you only have a short time (in his early life) to build strong, sound bones. It's best to feed grain sparingly.

Energy in a diet can be derived from forages, grain, or fat. A low grain (high forage) ration is safer and cheaper than a high grain diet, producing the same results in the long run. Several studies have shown that yearlings on a high grain, low forage diet (with grain providing half of the energy) had no significant advantage in wither height than yearlings fed low grain diets (20 percent of the energy) and more hay. In one study at Texas A & M, yearlings eating just pasture grew as tall in wither height as yearlings getting half their energy as grain. Feeding more grain did not result in a larger yearling, just a fatter one.

Overfeeding concentrates may hinder actual growth, making a young horse fatter instead. Yearlings on pasture without any grain may actually grow taller in wither height than yearlings fed grain, even though the grain-fed individuals weigh more and have higher body fat content—some of the extra energy fed is deposited as fat.

Yearlings not being pushed for sale or show do well on grass pasture alone, supplemented with a little alfalfa hay if pasture quality declines in late summer, and can be fed a mix of alfalfa and grass hay during winter. Weanlings and yearlings being fed for optimum growth can be fed fat as a supplement, to give additional calories and energy without relying so much on grain. This reduces the risk of skeletal and digestive problems. Fat-supplemented youngsters can eat less concentrate, and still gain weight and enjoy sufficient growth. In one study, fat-supplemented weanlings digested their feeds better and gained more weight on less feed than the control group not getting the extra fat. Fat doesn't seem to cause the detrimental effects on skeletal development (nor have the risk for colic or founder) that high levels of grain can do.

It's safe to feed free-choice hay (preferably immature grass hay, which is more palatable and nutritious than mature grass hay, and whatever quality of alfalfa hay is needed to provide necessary nutrients) and add the amount of grain required for desired growth rate. Always keep in mind that accelerated growth and early stress (training or forced exercise) can be harmful to immature skeletons.

Protein provides one of the building blocks for growth, so if you are growing a yearling at a normal, natural rate (as nature intended) he'll have a lower requirement for protein. Horses 12 months and older should never be fed a diet that is more than 50 percent concentrate by weight, as this is much too high for most individuals. For best health and soundness (less risk of leg problems, laminitis or colic), a yearling can be fed like a mature horse, making sure he has access to feed more often, and adding a little extra protein, energy and minerals for his continued growth.

Young horses fed for moderate growth rate (forages only, no grain) may not grow as fast as those fed for fast growth, but will have similar mature height and weight by the time they are mature. Pushing a horse for more growth won't grow him any bigger—it just gets him there faster and with more risk for unsoundness.

Avoiding DOD

Overfeeding young horses is the prime cause of the aforesaid DOD, a term covering the many things that contribute to poor skeletal development in the growing animal—physitis (inflammation of growth plates), osteochondrosis (improper calcification of bone under the cartilage layer), osteochodritis dissecans (OCD—cartilage over the improperly ossified bone peels off or comes loose), contracted tendons (forward or backward crookedness of legs, due to tightening of a tendon) or subchondral bone cysts (a type of osteochondrosis in which the bone beneath the cartilage of a joint fails to ossify, resulting in a pocket of inferior material that won't support the overlying cartilage).

These types of skeletal defects were unknown in young horses 100 years ago, and were first described in 1947. Since then, the problem has mushroomed due to both modern feeding practices as well as to selection and breeding for faster-growing, faster-maturing animals. Skeletal problems can occur any time the young horse is growing too fast, with one part of growth (such as mineralization of bone) not quite keeping up with the rest. The best way to prevent problems is to keep young horses lean and fit, rather than fat. If you can't feel a youngster's ribs at all, he is overfed.

DOD can occur any time between birth and about 16 months old. Foals from parents selected for fast growth and early maturity are most at risk—they may be genetically programmed for fast growth. When overfeeding is added to this genetic potential, skeletal problems are common. Make sure young horses are never overfed, and that growth rate remains steady and smooth by avoiding sudden changes in diet and exercise schedules. Developmental disorders often tend to show up within four to six weeks after a sudden growth spurt.

DOD can vary in severity from physitis, which often resolves on its own as the young horse grows, to OCD, which creates weak spots in the bone (where cartilage at the bone ends and joints do not turn to bone properly). These weaker areas are vulnerable to inflammation, twisting, breaking or tearing. This can result in compressed vertebrae, twisted bones, shoulder cysts, swollen fetlock joints, and separated pieces of cartilage and bone within the stifle joints, or in hock problems at an early age, with flaps or fragments of cartilage separating from the bone. The most common sites for OCD are the hock, stifle, fetlock and shoulder.

Young horses are often overfed protein, energy and calcium. The daily calcium requirement for a growing horse is 30 grams, but a typical alfalfa/sweetfeed diet gives him 154 grams. It also gives

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too much energy. A University of Maryland study (1981-86) showed that the most consistent aspect of high energy diets for youngsters is large amounts of grain and concentrates containing soluble carbohydrates (starches and non-fiber sugars) in much higher levels than would be available to a horse grazing natural feeds.

A study in Australia induced OCD in foals by feeding them 128 percent of the National Research Council's recommendation for daily energy intake. Studies in Canada and Florida found young horses fed 130 percent of recommended calories didn't develop OCD if their mineral intake was also increased to 130 percent. This illustrates the fact that horsemen who overfeed youngsters must be very careful to keep everything in balance, and this can be tricky. It's wise to stay away from large amounts of sweet feed, and use feeds or pellets designed specifically for young horses.

Large intake of dietary sugar (much more than needed for moderate growth) causes changes in insulin and thyroid function, creating developmental cartilage disorders and OCD. Studies at the University of Maryland confirmed that overfeeding (high starch/high sugar) young horses changes their hormone function. Insulin can interfere with mineralization of bones and calcium-phosphorus metabolism in the body. It also affects release of growth hormones and thyroxin, which has an effect on cartilage formation.

Large amounts of insulin are secreted in overfed youngsters, especially when eating large grain feedings. It's safer to feed several small meals through the day, producing lower levels. Insulin stimulates the initial growth stage of cartilage and speeds removal of thyroid hormones from the blood. The latter are thus not available to perform their function in stimulating maturation of newly developed cartilage. So the immature cartilage is being produced faster than normal, but matures more slowly, therefore creating very serious problems.

Probably the most common mistake made by horse breeders is overuse of grain and supplements when feeding youngsters, rather than relying on forage. Forages break down into fatty acids, which are then converted to energy—a much safer route for obtaining the energy needed in a diet. By contrast, grains contain starch, which breaks down into glucose, which causes elevation of insulin levels. Rather than depend on grain and supplements, it's better to base the diet on forage. Test your hay and pasture, then build a balanced ration around it. The surest way to avoid trouble is to allow young horses to grow up lean and active, on natural feeds or a diet carefully balanced, staying away from starches and sugars.

Raising young horses in large pastures at total liberty reduces incidence of OCD. The increased exercise level gives some immediate and direct conversion of sugars (from grain) to energy instead of increasing insulin production. Finally, weanlings and yearlings should never be confined to box stalls or small paddocks.