Bringing Them up Right

By Jim Ward, DVM

Raising a foal today is challenging. The challenge is to raise a foal that will grow rapidly to satisfy the demands of the marketplace and still produce an athlete that will perform competitively. The demands of the marketplace are for fast-growing, early maturing foals. This is what buyers want. Buyers also want yearlings that can train and perform successfully. In the past, there was divided opinion on whether these two dynamics could be accomplished together and, if so, how to do it.

The Equine Committee of the National Research Council in fact has made two recommendations: one for fast growth and one for moderate growth. This was in 1989. Either growth rate produces mature horses that will grow as big as their genetic growth rate will allow. Rapidly growing horses will reach their mature height and weight much earlier than those fed for a moderate rate of growth.

Since that time, much has been learned about feeding foals and management of foals. There have been many studies made on the relationship of bone density and bone and cartilage development to nutrition and exercise management. We know that different nutrients and their levels in the diet are important as well as those nutrients' relationship to each other. It can be just as wrong to have an excess of a nutrient or nutrients as it is to have a deficiency of a nutrient. We also have learned that exercise management can have a profound influence on bone and cartilage development and the relationship to soundness later in training and racing.

A major concern of horsemen is the occurrence of Developmental Orthopedic Disease (DOD) in young horses. This is a group of disorders that includes:

1. **Epiphysitis/physitis** — inflammation of the growth plate, such as "open knees," "hourglass fetlocks" and/or an enlarged ridge just above a joint;
2. **Flexural deformities** — may be present at birth (congenital) or acquired — "buck knees," "contracted tendons," "club feet" and "knuckling over;"
3. **Angular limb deformities** — valgus conformation ("knock-knees" or "cow hocked") or varus conformation ("bow legged");
4. **Osteochondrosis** — cartilage or bone fragments usually involving a joint or bone cysts that may or may not communicate with a joint; and
5. **"Wobblers"** — malformation of spinal vertebrae producing an alteration of gait because of spinal cord impingement.
6. **Cuboidal Disease**— Foals are born with underdeveloped bones in the knees or hocks and show limb weakness and laxity.

All of these disorders have a genetic, a nutritional and a management relationship. At present we have to live with the genetic considerations; the nutrition and management factors we can do something about.

Start the nutritional program early. Raising a good foal starts with the pregnant mare. A foal's development really accelerates when the mare enters her last 90 days before foaling. Sixty-five percent (65%) of the growth of the unborn fetus occurs during the last 90 days. The mare's energy needs (caloric intake) increase 20%, her protein needs go up 35% and her calcium and phosphorus needs go up 90%. Increased levels of potassium, magnesium and selenium are also needed. The most common error in broodmare management is not increasing a mare's nutrition during the last 90 days and having mares foal with their ribs showing (Body Score of ‹ 5, according to the Texas A&M Animal Science Department system of measuring body condition.) This may compromise the foal. The ability to breed the mare back is compromised as well.

The milk that is produced the first three days is called colostrum. It is rich in antibodies that help protect the foal against disease until the foal develops its immune system. It is also rich in nutrient content and will really "jump start" a foal. A mare's nutrient content of her milk starts to decline after two weeks. Her production starts declining after one month. A foal should start eating with the mare during this period.

A good management practice is to start making a creep feed available between one and two months of age. Creep feed should be introduced slowly and, with careful monitoring, should be made available on a free-choice basis. Feeders should be checked daily, and you should be careful to discard any feed that is old or has any bad appearance. Feed may become spoiled by birds, rodents or weather. Feeders should be placed in an area where mares congregate and must be mare-proof. The area must be constructed in a manner that will allow easy access for foals and will minimize injury. Dominant foals may have to be removed from a pasture, particularly if they prevent other foals from entering the creep feeder. At this age, foals are capable of gaining 2.5-to-3 pounds daily, and, with the right feed, owners can take advantage of this early growth potential. Feeds developed for creep feeding have a higher nutrient content than feeds formulated for mares. This is why foals that have been fed a ration formulated for foals outperform those eating with their dams. When fed a balanced ration, foals will grow to their genetic potential without increasing the risk of incurring DOD, provided exercise management is done properly. A balanced ration is defined as one that provides all of the nutrients needed in a 24-hour period in their proper amounts and in the proper relationship to each other. This balanced ration is sometimes referred to as the "nutrient-to-calorie ratio," which means that all nutrients are balanced to the energy level in the ration. Listed below are some of the relationships in a balanced ration for a foal at weaning designed to reach a mature body weight of 1,100-to-1,300 pounds:

Digestible Energy (DE) — 8.5 Mcal/100 kg (220 lbs) of body weight per day
Crude Protein (CP) — DE x 50 = Grams of CP per day
Lysine — DE x 2.1 = Grams of Lysine per day
Calcium (Ca) — DE x 2.0 = Grams of Calcium per day
Phosphorus (P)—Ca x .55 = Grams of Phosphorus per day

There are other relationships as well, such as copper, zinc, manganese, selenium and vitamins. As you can see, this is complex, so it becomes apparent that it is better to feed a commercially formulated ration rather than guess at it. We have two feeds that are formulated for the growing horse that are balanced when fed good quality hay free choice (either good quality coastal harvested at less than 28 days maturity or a mixture of coastal and alfalfa). Those are Life Design Youth and SafeChoice. Weanlings should be fed the concentrate at 1.5% of body weight, more or less depending on body score. This results in approximately a 30:70 forage to concentrate ratio which is important because of limitations of forage digestion in weanlings in the hind gut. As foals progress to the yearling stage the feeding rate remains the same in pounds and they compensate by consuming more forage. Example: a weanling weighs 600 lbs at weaning at 6 months of age. We would feed Youth or SafeChoice at a daily rate of 9 lbs and free choice good quality hay. Ideally we would feed 3 lbs per feeding three times per day to enhance digestion and absorption in the small intestine. Foals that have been creep fed will self regulate and spread out consumption over a greater time period. At 1 year of age we would still be feeding 9 lbs per day and our forage: concentrate ratio would increase. This coincides with the improved forage digestion that yearling's experience. Again feeding rates should be tied to body scores (maintain a body score of 5 and not over 6).

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Foals should be weaned at 4-to-6 months of age. There will be less of a setback if these foals have been on a good creep feed. Listed below are some parameters that form an index of a foal's development designed to grow to 1,100-to-1,300 pounds at a moderate growth rate:

4 months of age: Weight = 37% of mature body weight; gain .5% of Body Weight daily
6 months of age: Weight = 45% of mature body weight; gain .4% of Body Weight daily
7 months of age: Weight = 50% of mature body weight; gain .37% of Body Weight daily
12 months of age: Weight = 65% of mature body weight; gain .2% of Body Weight daily
18 months of age: Weight = 80% of mature body weight; gain .07% of Body Weight daily
24 months of age: Weight = 90% of mature body weight; gain .03% of Body Weight daily

Exercise management is extremely important. Recent research has shown that stall confinement of as little as two weeks will lower bone density. If there is not sufficient exercise ("bone loading"), there will be an increased risk of DOD. Forced exercise at too early an age has been incriminated, as has exercising on too hard a surface. Exercising in a round pen where the surface is soft and deep has also been incriminated as contributing to Osteochondrosis.

In summary one must realize that foal nutrition is critical to the success as a future athlete. It starts with the pregnant mare and does not end until skeletal growth is complete at about three years of age. A balanced diet and proper exercise management are key components to that success.