

## Feeding Young Horses for Sound Growth

**R**aising a foal can be both rewarding and challenging. You spent a great deal of time researching stallion prospects for breeding, invested money in stallion fees and patiently cared for your mare during her 11-month pregnancy. When the product of your efforts finally hits the ground in the spring, you hope the foal will grow up to be a strong, sound and athletic horse.

Nutrition plays a significant role in producing a strong, sound horse. Your foal must receive a diet adequate in energy, protein, vitamins and minerals in order to grow properly and achieve its full genetic potential.

When you plan a feeding program for your young horses, several factors are very important to recognize:

- The nutrient requirements of young horses are high.
- The young horse's anatomically small digestive system prevents it from being able to utilize large amounts of bulky, low quality feeds.
- High quality forages, grains and feeds should be used to provide more concentrated sources of energy, protein, vitamins and minerals (The younger the horse, the more nutrient-dense the diet needs to be.)
- Protein *quality* is just as important as the *quantity* of protein included in a young horse's diet. High quality protein sources, including soybean meal, canola meal, alfalfa meal and dried milk products, provide more of the amino acid lysine, which is essential for growth.

### Sound growth

A major concern for the growth of young horses is the occurrence of bone and joint disorders, commonly called developmental orthopedic disease (DOD). The DOD

complex includes epiphysitis, osteochondrosis, angular limb deformities, contracted tendons and wobbler's syndrome.

Common symptoms of DOD include enlargements and deformities of the ankles, knees and hocks, as well as "pulling up" in the pasterns (contracted tendons). If left unattended, severe cases of DOD may ultimately affect the future soundness and serviceability of the horse.

Many factors are thought to contribute to the development of DOD, including the foal's genetic predisposition, rapid growth, trauma, overly excessive or restrictive exercise and poor nutrition. More often than not, several of these factors are involved simultaneously.

*Growing horses should receive a well-balanced diet*

Nutritional causes of DOD include excess dietary energy (excess calories), an unsteady growth rate (periods of slow, restricted growth, followed by rapid, compensatory growth) and inadequate or imbalanced mineral supplementation.

A common misconception is that high protein diets also contribute to DOD; however, this is not the case.

To reduce the risk of DOD, care should be taken to ensure the foal receives a balanced diet throughout the first two years of its life. In addition, there is less risk of DOD if young horses are fed for a moderate rate of growth and kept in moderate body condition (condition score of 5).

Overweight foals place more stress on their bones and joints. Encourage a steady rate of growth by using high quality feeds to provide the nutrients your young horse needs. Avoid causing undue stress, which decreases feed intake resulting in growth slumps (which are usually followed by unwanted growth spurts).

## Reaching mature size

Growth is a combination of skeletal development and weight gain. The first year of the young horse's life is the most critical for growth, since they achieve 90 per cent of their mature height and 65 per cent of their mature weight during that time (Figure 1).

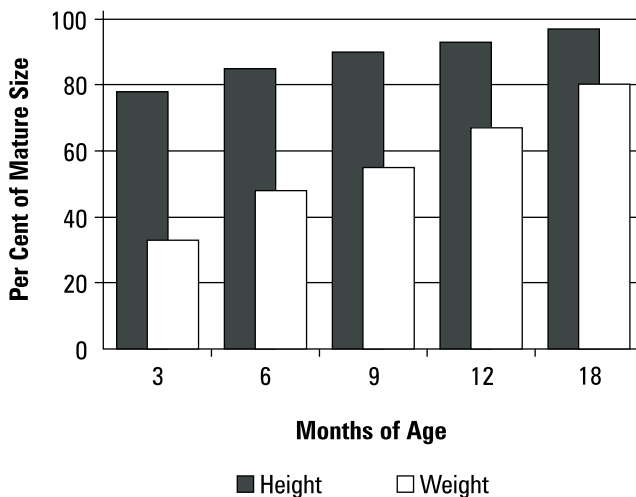


Figure 1. Per cent of mature height and mature weight achieved by young horses from 3 to 18 months of age.

Although the rate of growth will slow over time, young horses will continue to grow until they are approximately three- to four-years-old. At a moderate rate of growth, mature height will not be reached until they are two-years-old, whereas filling out to their mature weight may take an additional one to two years.

## Nursing foals

Foals will meet their nutritional requirements in their first two to three months with mare's milk. However, in the third month of lactation, the mare's milk production drops while the foal's nutritional needs keep increasing. This drop creates a gap between nutrients supplied in milk and those demanded by the growing foal.

Although foals may also be nibbling on pasture, most late summer pastures in Alberta have insufficient protein and mineral levels. Therefore, the foal is trying to satisfy its nutrient requirements from two rapidly ebbing feed sources: the dam's milk and the pasture supply.

### Creep feeding

Creep feeding can provide the foal with extra nutrients to fill this gap. In simplest terms, creep feeding is the practice of supplying feed to the foal in such a way that the mare cannot get to the feed.

Besides supplementing the declining quality of the dam's milk, creep feeding can help supplement foals nursing mares that are poor milk producers. Creep feeding can also reduce the strain of lactation on mares in poor body condition. In addition, creep feeding will also teach the foal to eat grain before weaning, helping to reduce stress and prevent post-weaning slumps in growth.

Creep feeding should begin when foals are two to three months of age, or at least one month before weaning. Feed can be provided in a creep feeder placed in the pasture or in special foal feeders placed in a stall. Alternatively, you can tie the mare in her stall while the foal is eating. Regardless of the feeding system you choose, it should allow free access to foals, but not to mares.

A pasture creep feeder can be built to accommodate several foals at the same time. Allow 40 to 50 square feet (3.7 to 4.7 square metres) per foal. This type of creep feeder pen should also have several entrances high enough for the foals to go under, but too low for the mares. Entrances about 2 feet (0.6 m) wide with an adjustable height work best. For building plans, see Alberta Agriculture's *Horse Handling Facilities* publication (Agdex 460/722-1).

Nutrient concentrations needed in a creep feed are shown in Table 1. You can purchase a commercial feed designed to be fed to young foals, or you can create a mix of 7 parts oats to 3 parts 30 per cent protein supplement.

**Table 1. Recommended composition of creep feed for foals**

Nutrient	Recommended level
Crude protein	16 to 18%*
Calcium	0.8 to 1.0%*
Phosphorus	0.6 to 0.8%
Copper	10 to 30 mg/kg
Zinc	40 to 120 mg/kg

- \* Use the higher levels of protein and calcium with grass forage.
- \* Use the lower levels of protein and calcium with alfalfa forage.

Fresh creep feed should be provided every day. Feed the creep feed at a rate of 0.5 to 1.0 per cent of the foal's body weight per day (1 pound per 100 pounds of body weight or 1 kg/100 kg body weight) up to a maximum of 4 to 5 pounds (1.8 to 2.2 kg). For most foals of light horse breeding, this amount of feed is approximately 1 pound (0.5 kg) of feed per month of age.

The purpose of creep feeding is to compensate for nutritional deficiencies in the mare's milk. Maximum growth and overly fat foals are not goals of a creep feeding program because of the associated risk of DOD.

# Weanlings

Weaning can be a stressful time for the foal. It is not uncommon to see a decrease in their growth performance in the two to three weeks following separation from the dam. Because this post-weaning “slump” may contribute to DOD, you should take steps to make the weaning transition as stress-free as possible. Creep feeding before weaning helps the foal learn to eat solid feeds, thereby helping to reduce stress.

Research has shown that the method you choose to wean foals from their dams may also contribute to stress. Consider:

- Allowing visual contact with mares for a short time after weaning is actually less stressful to foals than complete, abrupt separation. Consider placing weaned foals in a pasture next to their dams for the first week after weaning.
- Stall weaning has also been shown to be more stressful than pasture weaning; try to avoid using stalls as part of your weaning process.
- Relocate your mares, rather than relocating your foals. Foals are less likely to be stressed if they remain in a familiar environment.
- If weaning only one or two foals, consider placing a gentle old gelding or dry mare with them as a “foal-sitter.” This foal-sitter should be introduced to the foals before they are weaned. Foal sitters should be calm and patient, which will serve as an example for the traumatized foal.

Nutrient concentrations needed by weanlings in the total diet are presented in Table 2.

Age	Protein %	Lysine %	Calcium %	Phosphorus %
Weanling	15	0.6	0.65	0.35
Yearling	13	0.5	0.45	0.25
2-yr old	11	0.4	0.35	0.20

\* Note that nutrient concentrations needed in the total diet are lower than those suggested for a grain mix. Producing a grain mix higher in nutrients allows us to meet the requirements of the young horse when the grain is paired with hay (which usually has a lower nutrient content than the grain mix). The grain mix plus the hay averages out the nutrient content of the total ration.

Weanlings should be fed a high quality forage, and they should have access to all the hay they will consume. Alfalfa/grass mix hay works best. Good quality grass hays can also be fed successfully, but weanlings will likely need to be supplemented with more grain. The higher the quality of the forage, the less grain is needed.

Weanlings will also need to be supplemented with a well-balanced grain mixture with adequate protein and minerals. The formulation used for creep feeding can be used after weaning (see Table 1). Continue the feeding level of 1.0 per cent of body weight per day (or 1 pound (0.5 kg) per month of age) up to 5 to 6 pounds (2.2 to 2.7 kg) per day. See Table 3 for example weanling diets.

Plain oats and hay do NOT provide an adequate ration for weanlings. A diet of plain oats and hay provides lots of energy, but not enough protein, lysine or minerals needed for growth. An imbalanced diet of plain oats and hay may lead to skeletal problems. Instead, oats should be combined with a protein/vitamin/mineral supplement (Table 3).

**Table 3. Example rations for weanlings**

Feed	Diet A*	Diet B**
Mixed alfalfa/grass hay	10 lbs (4.5 kg)	–
Grass hay	–	8 lbs (3.6)
Oats	4 to 5 lbs (1.8 to 2.2 kg)	5 lbs (2.2 kg)
30% protein supplement	1.25 lbs (0.6 kg)	2 lbs (1 kg)
TM salt	Free choice	Free choice

\* Oats and 30% protein supplement can be replaced by 5 pounds (2.2 kg) of a 16% protein commercial grain mix designed for foals.

\*\* Oats and 30% protein supplement can be replaced by 7 pounds (3.2 kg) of a 16% protein commercial grain mix designed for foals.

Weanlings should be maintained in moderate body condition (condition score 5). Excessive weight gain may put the growing horse at risk for developing bone abnormalities and long-lasting skeletal problems. For more information on body condition scoring, see Alberta Agriculture’s *Body Condition Scoring Your Horse* factsheet (Agdex 460/20-1).

Weanlings should be allowed to have all the free exercise they want. Research has shown that exercise strengthens bone and makes for a more durable athlete. Foals should only be stalled for long periods if recommended by a veterinarian.

## Yearlings

Because their growth rate slows considerably by 12 months, yearlings need lower nutrient concentrations in their ration (Table 2) than weanlings. Essentially, the percentage of protein, calcium and phosphorus required by the yearling is less than that required by the weanling. Their digestive system has also grown, so yearlings can consume more pounds of feed.

If a high quality alfalfa/grass mix hay is fed, or good quality spring and summer pasture is available, yearlings may not need grain supplementation (Table 4). However, they will still need mineral supplementation. If the quality of the hay or pasture is questionable, or grass hay is fed, some grain will also be needed (Table 4).

**Table 4. Example rations for yearlings and two-year-olds not in training**

Feed	Diet A	Diet B*	Diet C**
Mixed alfalfa/grass hay	20 lbs (10 kg)	12 lbs (5.5 kg)	–
Grass hay	–	–	15 lbs (6.8 kg)
Oats	–	5 lbs (2.2 kg)	5 lbs (2.2 kg)
30% protein supplement	–	–	1 lb (0.5 kg)
18:18 mineral***	1 oz (28 g)	1 oz (28 g)	–
TM salt	Free choice	Free choice	Free choice

\* Oats and 18:18 mineral can be replaced by 5 lbs (2.2 kg) of a 12% protein commercial grain mix.

\*\* Oats and 30% protein supplement can be replaced by 6 lbs (2.75 kg) of a 14% protein commercial grain mix.

\*\*\* 18:18 mineral is a livestock mineral containing 18% calcium, 18% phosphorus, trace minerals and vitamins A, D and E.

## Two-year-olds

By the time the young horse is two years old, it has reached its full height and approximately 90 per cent of its full body weight. While growth has slowed considerably at this time, the nutrient requirements of a two-year-old are still higher than a mature, adult horse at maintenance. In addition, many two-year-olds may enter training, thereby adding the nutrients needed for work on top of the nutrients still needed for growth.

Two-year-olds not in training can receive rations similar to yearlings (Table 4). If high quality hays or pasture are available, they will not necessarily need grain supplementation.

Meeting the requirements of two-year-olds in training will usually require grain supplementation. Depending on the level of training, an additional 4 to 10 pounds (1.8 to 4.5 kg) of grain will need to be fed to cover the increased energy, protein and mineral needs of work. Use a 12 per cent protein commercial grain mix if two-year olds are consuming an alfalfa or alfalfa/grass mix hay. If feeding grass hay, use a 14 per cent protein commercial grain mix.

### Keys to sound growth:

- Feed a balanced ration.
- Keep foals in moderate body condition.
- Maintain a steady, moderate growth rate.
- Prevent undue stress and illness.
- Avoid excessive stall confinement; allow plenty of free exercise.
- Be able to recognize developmental problems early.

## When signs of DOD appear

1. Temporarily decrease amount of grain fed.
2. Evaluate diet for imbalances, excesses and deficiencies.
3. Ensure protein, vitamins and minerals are in proportion to the energy content of the diet.
4. Adjust foal slowly to a rebalanced diet.

Do NOT put foals on a “starvation” diet of poor quality hay. Minimum protein, vitamin and mineral needs must always be met. While reducing the energy content (calories) of the ration, starvation diets do not provide enough protein, vitamins and minerals. In addition, the foal will overcompensate for growth when the full, balanced ration is resumed, resulting in the return of DOD.

# Conclusion

Remember, this publication merely gives guidelines for feeding young horses. Because horses have highly individual natures, you need to adjust feed consumption to account for changes in individual condition. Some horses are easier to maintain than others. Therefore, you must combine your knowledge of nutrition, your eye for condition, and your common sense to tailor your feeding program to fit your horse's needs.

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