

Feeding Young Horses for Future Soundness

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The developmental stage from 3 - 9 months, corresponding to phase of growth between weaning and yearling age, is one of the most critical periods within a young horse's first formative year.

A steady growth rate, fuelled by balanced nutrition, and complemented by adequate exercise, will help to set the foundation for the eventual physical stature and soundness of the adult racing, equestrian and sporting horse.

A large percentage of breakdown and unsoundness in racing, sport and working horses can be traced back to skeletal growth disorders occurring in their first year of life.

The desire to breed "best to best", and give young horses every opportunity to grow to their full potential for sale or owner training and racing, increases the risk of them developing leg abnormalities. Bone and joint disorders, such as "apple joints", "big knees", contacted tendons, and "the wobbles" are all conditions can be minimised by a combination of good nutrition and adequate exercise.

Condition Standard

Recent studies suggest that it is much safer to raise foals by slightly under-feeding in energy, but maintaining an adequate intake of good quality protein, calcium and trace-minerals to aim at a steady, moderate rate of growth and thus slightly prolong their development and growing time, than to maximise growth rates by overfeeding them with concentrated feeds and restricting their opportunity for exercise.

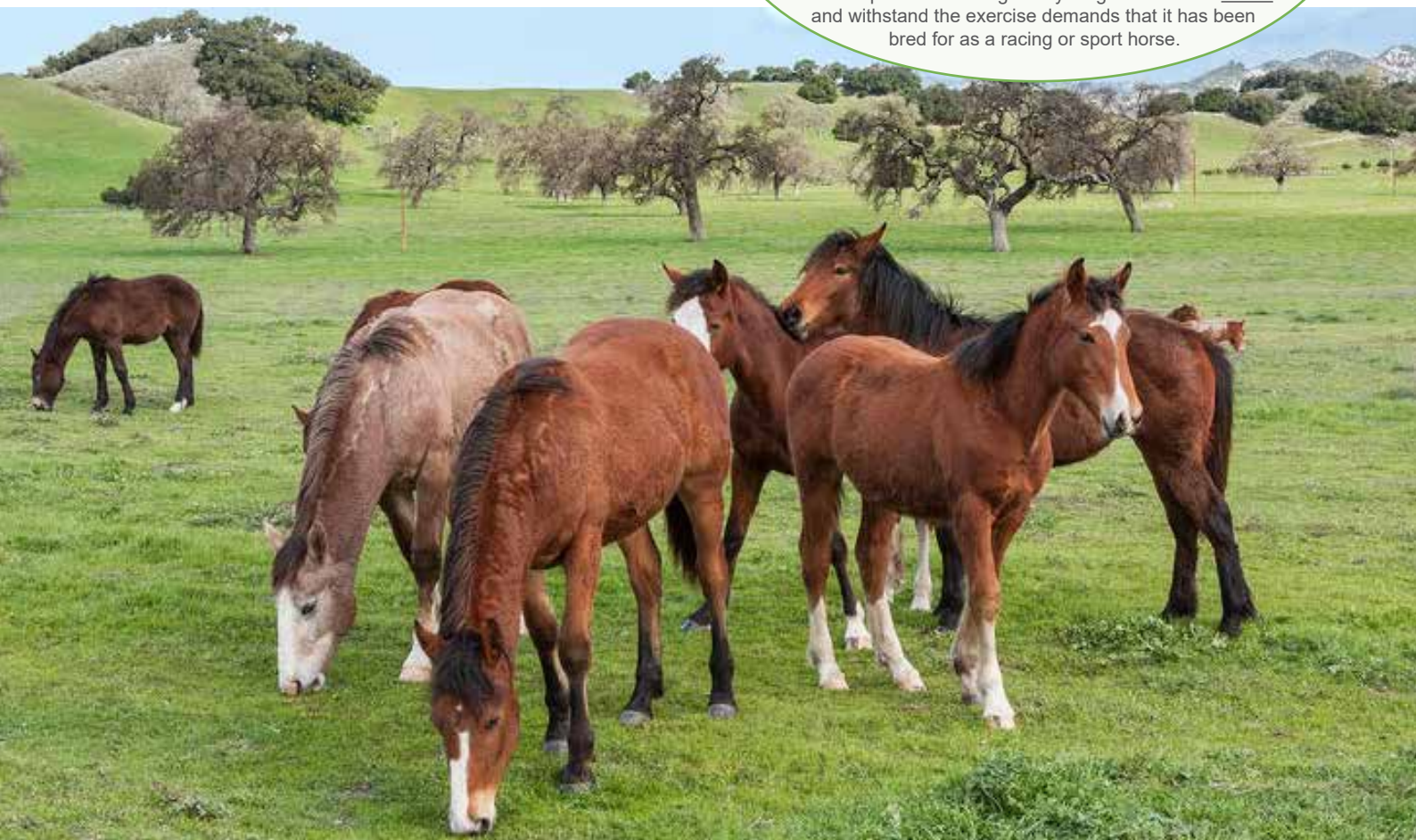
Did You Know That...

- The normal young horse grows at a rate of about five times that of a human, in one tenth of the time (2 years instead of 21 years), with the limb bones adapting to take a bodyweight increase of 1500g daily during the first month of life reducing to 600g daily by yearling age in a horse maturing to 500kg in bodyweight.
- A young foal should double its birth weight by the time it is one month old, and double that weight again by 4 months of age, taking a further 6 months to almost yearling age to double it again.
- The unborn foal doubles its size in the last 3 months before birth, requiring more nutrients for growth than during the whole of early pregnancy.
- Overfeeding of energy to fuel growth, and imbalance of important trace minerals, as well as calcium, are the main underlying causes for skeletal and joint abnormalities in young, growing horses.

Handy Hint

Avoid Feeding to cause Overweight Body Condition in Young Horses

The outline of the last two ribs, and a fleshy, fit looking condition as a result of adequate, but not excessive, exercise is a working guideline for raising young horses. It is better to err on the side of caution, rather than to feed to demand, appetite or to achieve a "pumped up" young horse with bent limbs, upright pasterns and enlarged joint. The aim is to produce a well grown young horse that is sound and withstand the exercise demands that it has been bred for as a racing or sport horse.



Bone Growth Disorders

In the mid 1980's, recurring skeletal development abnormalities, with a rising incidence of early breakdown and high wastage rates due to joint and bone orthopaedic problems, increased the focus on skeletal and joint abnormalities in young growing horses.

The term “**Developmental Orthopaedic Disease**”, or **DOD** for short, was coined in 1986 by **Dr. Wayne McIlwraith** of **Colorado State University**, to encompass all bone growth related orthopaedic problems found in the growing horse.

Alternative names used over recent years include **Developmental Skeletal Problems (DODs)**, **Bone Growth Disorders**, **Metabolic Bone Disease (BMD)**, or simply, “**Crook Legs**”.

The types of problems that are commonly attributed to DOD type syndromes are often associated with bone growth abnormalities, joint cartilage defects, or overload stress on developing bones and joints.

The conditions are referred to as:

Did You Know That...

- Angular Limb Deformities (bent legs or ‘knocked’ knees) account for up to 47.7% of limb growth abnormalities.
- Physisitis (such as Epiphysitis) in the knee joints, contribute a further 33.2% of these problems.
- This indicates that bent legs and enlarged epiphyscal growth plates accounted for over 80% of the DOD related problems in young growing horses.
- Studies indicate that up to 10.8% of foals had more than one type of DOD.
- Research has shown that joint and tendon formation is complete by 5 months of age and careful feeding and exercise management will help the development of sound joints and strong tendons.
- A mild ephysitis or enlargement of the upper growth plate (radial epiphysis) of the knees of a young horse often occurs as a result of the seasonal flush in spring. However, if the fetlocks also develop enlarged growth plates, then this is a more serious DOD related condition and must be corrected by dietary and exercise management.

Condition	Cause	Result	Common Name
Osteochondrosis	Primary defect in cartilage or secondary injury to developing growth plate. The last 3 months of pregnancy has been identified as the initial high risk period in unborn foals..	Defect in calcification of the growth plate cartilage in joints. The cartilage does not have an adequate blood supply, or a deficiency of copper, zinc or manganese, which can affect the quality of cartilage formed.	Apple-like joints (fetlocks and knees usually).
Osteochondritis dissecans (OCD)	Weight bearing stress on devitalised cartilage – a flap of cartilage lifts off to expose underlying bone and results in lameness.	‘Bent limbs’ or ‘knock knees’ in young horses must be recognised early to ensure effective correction.	OCD in shoulder and stifle in rapidly growing young horses.
Physisitis (and epiphysitis)	Growth plate enlargement due to swelling and thickening of the growth plate. Underlying bone is susceptible to structural overload during exercise.	Lumpy appearance at ends of bones forming lower limb, knees, hocks and stifle joints, giving an “open” appearance of the joint.	Big knees, Bent Legs, Open Knees, Big Joints, Apple Joints (knees, hocks and fetlocks).
Subchondral bone Cysts	Abnormal cartilage growth/ maturation or poor blood supply results in loss of bone in pockets under the cartilage.	Formation of cavities or cysts under the cartilage layer, with collapse of the cartilage and bone	Bone Cysts or ‘Lollipops’ Fetlock, pastern and coffin joints, occasionally stifle.
Cuboidal Bone Malformation	Delay in calcification inside knee and hock joints, with the small cube-like bones in knee and hock due to low thyroid function.	Collapse of bones on exercise with permanent joint damage, especially in horses over 3-4 years of age.	Not common, but can result in high degree of wastage and future breakdown.
Cervical Vertebral Malformation	Bone and cartilage disease in lower neck (C5) vertebrae. May have an inherited risk in some bloodlines of Thoroughbreds.	Collapses and pinches on spinal cord to cause hind limb incoordination – ‘the wobbles’.	Wobbler Syndrome (up to 2% of Thoroughbred yearlings).
Juvenile Degenerative Joint Disease	Abnormal cartilage formation leads to joint wear, bone spurs and osteoarthritis within all limb joints.	Arthritis of joints with bony changes, spurs and degeneration of immature bone.	Juvenile Arthritis (knees, hocks and fetlocks) in 12-24 month old horses.
Contracted Tendons	A <u>secondary</u> condition to primary DOD – joint pain results in more weight carried by tendons – fetlock joints more upright or straighter than normal.	Reduced fetlock angle, upright pastern due to continual loading on tendons to take weight off painful DOD affected joints.	‘Up on the pasterns’ ‘Up on the fetlocks’ ‘Contracted Tendons’

Predisposing Causes of DOD

Despite a number of expensive and long term research projects, mainly carried out in the USA, the underlying bone development abnormalities that result in DOD are still poorly understood. It is known that a number of influences contribute to the various syndromes associated with DOD in young, rapidly growing horses, suggesting multiple causes related to **nutrition, exercise and genetic factors**. **Rapid growth, genetic predisposition, nutritional imbalances or excesses, and exercise imposed concussion and high loading** onto the immature cartilage have all been suspected of causing DOD in young growing horses.

Low Risk Factors

1. Growth and Body Size

This is a commonly claimed cause of limb related “DOD” in young growing horses. Over the years, many breeders have observed that large framed “good doers”, and other young horses that grow more rapidly compared to an average young horse on standard diets, appear to be prone to DOD. However, there have been no specific field studies to confirm this association. More recent studies designed to investigate the influences of a low dietary intake of copper on joint disease, failed to link growth rate and body size directly to DOD problems. Compensatory growth following a set back due to injury or other illness (not poor nutrition) does not lead to typical DOD type lesions in young growing horses in the “catch-up” phase if nutrition is adequate but not excessive. However, where dietary inadequacies of cartilage forming trace-minerals (**copper, zinc and manganese, iodine and possibly selenium**) occur, then a compensatory growth ‘spurt’ by increasing energy intake, may lead to poor cartilage and subchondral bone development and maturation from 5-18 months of age.

2. Mechanical Stress and Injury

The influence of concussion and weight bearing forces on DOD is also questioned as an underlying cause for primary DOD changes, but they are certainly involved in speeding up pathological changes and development of clinical signs in affected young horses. Therefore, the initiating factor(s) which produce defective cartilage must be present before the “wear and tear” of exercise can overload the growth plates, to result in cartilage erosion and lameness.

Medium Risk Factors

1. Genetic Influences

Although a link between DOD in man, and also in pigs, has been established between family genetic influenced growth rates, the relationship is not as well defined in horses.

2. Hormone Influences

Higher than normal cortisone, thyroid hormone and insulin hormone triggered by hot weather, stress or high carbohydrate diets, have been associated with cartilage and joint growth plate lesions in young horses, often related to overfeeding of starch based grain or extruded feeds (See High Risk Factors).

3. Infection

It is also suggested that blood borne bacterial infections in the young foal can result in fibrous obstruction of blood vessels and tissues, and initiate DOD lesions. Often these young foals have multiple DOD lesions due to disturbed bone growth, and if combined with injury or stress, there is a higher risk of lameness due to DOD.

High Risk Factors

1. Dietary Energy and Protein Levels

The influences of excessive energy alone, or high energy and protein combined, are now more fully understood, and recommendations for preventing DOD are based on restricting dietary intake to ensure steady growth rate and a fleshy, fit condition, with the outline of the last two ribs visible. Early studies indicated that an energy intake exceeding 125% of NRC (1989) recommendations was linked to DOD type cartilage and bone development abnormalities, especially when combined with heavy body weight and less than adequate exercise.

Diets excessively high in energy or high GI readily absorbed starch digested to sugar feeds, such as oats, rather than protein, have been shown to increase the risk of cartilage and growth-plate abnormalities in young growing Thoroughbred horses.

2. Mineral Nutrition

It appears that mineral imbalances and inadequacies are still single most important contributing factor to bone growth disorders over a wide range of DOD type problems. **Earlier studies indicated that low calcium, high phosphorus, low copper and high zinc intakes influenced the primary development of DOD in young horses. Under Australian and New Zealand conditions, copper, zinc, manganese and selenium are the four trace-minerals most likely to be low in feeds.**

Calcium – Studies have shown that too much calcium does not seem to have a direct affect, but a deficiency of calcium is still considered a primary cause of bone weaknesses, particularly if it is imbalanced with phosphorus without adequate vitamin D. **Studies have shown that young horses can tolerate high calcium, provided that phosphorus intake and energy is not excessive, and that adequate trace-minerals such as copper, zinc and manganese are included in the diet. High intakes of calcium in powder form, such as limestone, can reduce the uptake of iron, copper, manganese, zinc and magnesium from the small intestine. A deficiency of one or more of these trace-minerals has a direct affect on cartilage development (see below).**

Phosphorus – Marginal intake of phosphorus relative to calcium does not consistently cause typical DOD problems, except where dietary energy intake is excessive. However, high energy rations containing inadequate calcium, or high phosphorus, can increase the risk of DOD lesions and future unsoundness in young horses.

Copper – A deficiency of dietary copper has been directly associated with the development of weak and retarded cartilage growth in young horses. A level of 30ppm (30mg/kg of feed) for elemental copper was found to reduce the incidence of DOD lesions in a group of young horses. Current recommendations suggest a minimum of 40-50mg copper per kilogram of concentrate feed.

Zinc – A relationship between low copper and high zinc intake seems to increase the risk of DOD in young growing horses, and exposure to high zinc and possibly cadmium on contaminated pastures, has also resulted in clinical forms of DOD as young horse grow to maturity. An intake of 75-100mg per kg of concentrate feed is recommended.

Manganese - This trace-mineral is involved in cartilage growth and anti-inflammatory enzyme activity in joints, and an intake of 75-100mg per kilogram of concentrate feed is deemed adequate.

3. Exercise

Obviously, adequate exercise is an important factor in the growth and development of normal foals, as it encourages maintenance of bone and cartilage quality in the developing joints. Studies have shown that the average young horse walks for 18-25 km daily in a 5 hectare pasture.

Although some studies have suggested that exercise has a “protective” effect, certainly young horses fed on high energy rations without adequate facilities for daily paddock exercise are more prone to DOD type lesions of the joints. However, forced exercise must be avoided in DOD affected young horses.

Avoiding the Risk of DOD in Young Horses

There are a number of important management procedures that must be adapted to minimize the risk of DOD in young horses.

1. Avoid Sudden Overload Exercise - if a young foal is confined to a stable or small yard with its mother because of an injury (eg a wire cut, foot injury etc) for a 14-21 days whilst the injury heals – DO NOT turn it out into a large paddock so that it gallops at full speed for a prolonged period. Turn it out into a large yard for 3-5 days initially. This advice also applies to a weaned foal up to 9 months of age. This will avoid sudden overloading by galloping with excessive loading on the joints and the development of cartilage and growth plate abnormalities.

2. Avoid Galloping Young foals - often young foals and their mothers are galloped along raceways to teasing yards every second day during the breeding season on larger studs. Besides the risk of inhaling dust and inhaling *Rhodococcus equi* (“Rattles”) bacteria into their lungs under dry conditions, galloping can overload the immature joints of young foals.

Handy Hint

Observe Foal Behaviour after a Gallop

Early DOD affected foals with joint cartilage pain on the loading area within the fetlock joints and symptoms of ‘contacted tendons’ and up right pasterns caused by developing cartilage damage from over-loading, often attempt to lie down after a hard gallop. Many appear to stand “up on their front limb toes” with due to joint subchondral pain. It is best to walk wet mares and foals in groups to the teasing yards as this helps avoid joint overload and also reduces the risk of “rattles” under dry dusty conditions where the infection is endemic on a stud.

3. Avoid Compensatory or “Catch-Up” Nutrition - do not try to boost a slow growing foal or weaner (eg drought conditions, following infection, weaning stress with prolonged viral respiratory disease) by suddenly increasing the foal’s feed intake, or restricting its exercise. Plan a step wise increase in the well balanced and adequate bone- mineral and trace-mineral diet, combined with limited exercise initially for 2 weeks by confining it to a small paddock rather than turn it out into a large open pasture where it is likely to gallop over a longer distance, will all help to prevent a sudden spurt of growth or increase in body condition.

4. Avoid feeding Calcium mixed into a wet bran topping - if supplementary calcium is provided, do not mix it into a feed top dressing of pure wet bran (bran mash) as some of the calcium will become bound on to the phytic acid in wet bran and its absorption from the small bowel will be reduced. Add calcium to another part of the damp feed.

5. Avoid Grazing pastures high in Oxalates - rapidly growing Kikuyu pasture after rains and fertilisation (eg superphosphate, nitrogen or poultry manure), as well as other tropical grasses in

Did You Know That...

1. Increase weight gain, growth rate and wither height
2. Decrease risk of DOD problems - even on an imbalanced ration.
3. Increase the level of growth hormone in blood by 2-15 times as compared to confined horses.
4. Increase bone density.
5. Encourage leaner body development, but with more muscle mass.
6. No evidence of bone problems or lameness.

Australia, such as buffel, green panic and setaria, contain high levels of oxalate chemicals, which can bind up calcium in the feed as it is released in the small bowel during digestion, or calcium added as a supplement. Always provide good quality lucerne hay under these grazing conditions, and feed a daily hard feed with supplementary calcium and trace-minerals.

As a breeder, you should also ensure that you regularly assess the condition and development of young growing horses. Some of the conditions that you should recognise early in the development phase, or during the critical 3-9 month period in young horses include:-

1. Bent legs at birth - where a foal is born with obvious angular limb deformities (knocked knees, inward deviation of the knee(s)), then it is important to confine the foal to a small yard or stable. If the foal is turned out into a paddock and gallops around, more serious and permanent deviation can develop due to excessive joint loading and ‘squishing’ of the immature joint cartilage on the already deviated side. Use of poly pipes, limb casts, periosteal strips etc and trimming the feet under veterinary supervision usually assists in straightening of the front limbs with 7-10 days.

Recognise bent legs early – do not turn them out, and hope they will straighten – they won’t. Call your vet for advice.

2. Set back in growth or stunted growth - some young horses may suffer a set-back in growth rate due to injury or viral respiratory disease at weaning - increase their ration quality and quantity slowly (ensure a copper intake of 40-50mg/kg of concentrate feed daily) and provide opportunity for paddock exercise for 2-3 hours daily. Do not give anabolic steroids to boost their development or catch-up on lost growth – consult your vet.

Treatment of DOD Limb and Joint Problems

The diagnosis of DOD related joint and limb problems should be carried out by your own veterinarian, including history of diet and of adequacy exercise in the growth phase.

Basically, if the young horse is lame, and X-ray changes of joints show DOD lesions, then the best management is to:

1. Reduce exercise.
2. Administer pain killers under supervision of your veterinarian
3. Adopt dietary modifications as outlined below under preventative management.

If the horse is not lame, or pain is not evident on limb, or there are not X-ray changes:

1. Reduce exercise initially.
2. Re-introduce exercise in a step-wise manner.
3. Adopt dietary modifications as outlined below under preventative management.

Success of Treatment for DOD

If recognized early, and preventative dietary management and exercise modifications are made, then DOD related lameness and lesions may regress over a period of 2-3 months with careful and strict management.

The success of treatment and management is related to the severity and progression of the DOD problem(s), and best results are obtained if the conditions are recognized as early as possible.

It is the diet and exercise management that is easiest to investigate and modify. A detailed appraisal of dietary intake, pasture blend and mineral supplements provided should be carried out initially, and interpreted in conjunction with possible genetic influences and adequacy of exercise.

If a nursing foal develops joint and lameness syndromes allied to DOD lesions prior to weaning, then the foal should be weaned immediately and fed on a balanced diet incorporating the nutritional recommendations listed below.

It is essential to recognize, and then adopt dietary and exercise guidelines at weaning, to correct any minor DOD problems, rather than wait until clinical signs develop as the animal grows into a yearling.

Managing Early Osteochondrosis

In young horses less than 12 months of age, restricting exercise and reducing the energy intake to slow the growth rate over a 4-6 week period, **without reducing the intake of good quality protein, whilst ensuring the adequacy and optimum balance of essential trace-minerals particularly copper, zinc and manganese**, is the standard conservative approach to reducing osteochondrosis and epiphysitis related conditions. More severe malformation or disruption of the internal joint cartilage, particularly with OCD, may require joint surgery and follow-up joint protective therapy.

Handy Hint

Hoof Trimming to Correct 'Turned-Out' or 'Turned-In' Conformation

If the bone overload is due to conformational abnormalities, the lesions are usually different in each leg, with the angular deformity developing towards the side of the leg with the abnormal weight distribution. Attention to foot balance and correcting conformational "turned-in" or "turned-out" problems in a slow, step-wise series of foot trimmings, (for 'turned-out' conformation, trim the **outside of the heels**, for 'turned-in' conformation, trim the **inside of the heels**, under the supervision of your vet or qualified farrier) will help overcome this type of limb deviation within in the first 9 months of age. This should be done on a regular basis from weaning onwards, and not left to yearling age when the problem is more pronounced, and much more difficult to correct without dietary restriction or increased exercise, which can both complicate bone growth abnormalities.

Handy Hint

Top-Up Diets where Prepared Feeds are Reduced

If a young horse gains too much weight when grazing good quality spring pastures and is being feed on a ready-mixed or processed feed for growing horses and the feeding rate is reduced to avoid further risk of DOD due to excessive energy intake, then the intake of important bone-minerals and trace-minerals will also be reduced and may be inadequate to help correct cartilage and bone growth lesions. A concentrated supplement, such as **Kohnke's Own® Cell-Grow®**, at the recommended dose rate, is recommended to make-up short-falls in the ration and meet the daily needs for important bone and cartilage forming and repair nutrients.

A 7 step Prevention Plan

The control of energy and protein intake, combined with supplementation with copper and other trace-minerals, complemented by adequate but not excessive exercise has helped reduce the risk of osteochondrosis and joint abnormalities in young growing horses.

STEP 1

Provide an optimum, but not excessive, intake of energy from grains and fats to fuel growth, combined with a good quality protein source based on soyabean meal, lupins and lucerne. Ideally, the total ration should provide at least 14-16% crude protein with 0.8-1.0% lysine for weanlings to supply an adequate amount of good quality lysine and other essential amino acids.

A high grain or starch based diet, whilst providing energy for growth, will not provide adequate lysine for optimum development. Studies indicate that twice daily feeding of weanlings and yearlings can avoid the risk of triggering hyperglycaemia and hyperinsulaemia that could result in abnormal cartilage development over a period of time. A single once daily large meal of a grain-based feed may trigger these responses, as well as risk less utilisation of the starch and overload to produce D-lactic acid build-up in the hindgut, which may reduce trace-mineral uptake and utilisation.

Recent observations by Pagan and co-workers in Kentucky indicated that low glycaemic feeds, such as lucerne, steam-rolled barley and good quality protein meals, were preferable to high intakes of oats and other grains as an energy source. Protein sources such as soyabean meal, which contains adequate lysine and other amino acids, lupins, sunflower seeds and canola meal do not contain starch, and provide energy from their protein, fat and fibre content.

Some researchers have also warned against the inclusion of high amounts of cooked or extruded grains with increased available sugars that could trigger the glycaemic response if fed in a single, large meal.

Aim for steady growth patterns - avoid sudden spurts or over-development to "catch up" lost growth, particularly following confinement or periods of reduced exercise.

It is also important to avoid an excessive rate of growth or Average Daily Gain (ADG) above 1000g daily in weanlings and 800g ADG in yearlings by overfeeding. Aim for an optimum steady rate of growth, rather than maximum growth rates and match skeletal or frame size to body weight.

Remember, starch and fats provide energy for growth and sale conditioning, but diets based on adequate intakes of quality protein and calcium are essential for the foundation of skeletal development and height at the withers.

STEP 2

Ensure an adequate intake of important trace-minerals, especially copper, preferably with up to 30% as a bioplexed or chelated form, to provide 25-30 mg/kg of total feed, complemented by zinc and manganese (50 - 65mg/kg of feed), as well as iodine and organic selenium (0.1-0.2mg/kg of feed). Providing 30-50% in 'chelated' or bioplexed form of these trace-minerals, such as in a proteinate or glycinate will help ensure optimum uptake and utilisation.

Remember, an optimum trace-mineral intake should start in the 3rd trimester of pregnancy to ensure the unborn foal has reserves for its rapid growth phase during the first month after foaling.

STEP 3

Avoid excess protein, as excess amino acids can be partitioned to glycogen as energy, leading to fat deposition. Good quality protein (14-16% crude protein (CP)), such as provided by a cooked (micronised or extruded) full fat soyabean (38% CP), and lupins (33% CP) or canola meal (33% CP) is important for growth in wither height as bone is formed, whilst excess energy is converted to fat and “top-line”.

Handy Hint

Reduction of Combined Protein and Bone Nutrient Supplements

Some ‘balancing’ supplements contain protein, bone-minerals and trace-minerals with a recommended daily dose rate of 750-1,000 grams per day for a growing horse. However, if these supplement dosage rates are cut back to reduce protein intake, then the diet should be topped-up with a low dose concentrated supplement, such as **Kohnke’s Own® Cell-Grow®**.

STEP 4

Ensure foals, weanlings and yearlings have access to free paddock exercise for at least 2-3 hours per day, preferably 12-24 hours per day. Reintroduce exercise in a step-wise program if a young horse has been confined because of injury for more than 2-3 weeks. Avoid over exercise in heavy weight young horses to ‘work off’ condition. Reduce the energy intake by 20-25%, whilst maintaining the protein, calcium and trace-mineral intake on a daily basis, and increase walking exercise, rather than hard lungeing exercise to reduce weight.

Heavy condition is often harder to take off as growth rate will slow initially as energy intake is reduced during the weight reduction program. Remember, yearling fillies are more likely to put on excess condition, as compared to colts on the same feed because they are often less active and have higher natural oestrogen levels that promote weight gain. Regular observation at 10-14 day intervals is essential to avoid over growth or excess body weight at any time.

Handy Hint

Balance the Diet with a Well-Formulated Supplement

A cold-pressed, separated nutrient group pelleted, no waste, NRC (2007) and INRA (2012) supplement to the latest recommendations, such as **Kohnke’s Own® Cell-Grow®** with special dosage rates based on rate of growth on the label, is the ideal to balance the calcium and trace-mineral needs of a growing horse.

STEP 5

Do not feed excess calcium and/or phosphorus. High calcium intake can reduce the uptake of zinc, manganese, iron, and phosphorus from the feed. High phosphorus levels in the feed can reduce zinc uptake, and lead to poor joint cartilage development. Beware of the oxalate effects of rapidly growing tropical grasses, including kikuyu, and provide additional calcium and phosphorus, as well as trace-minerals, in a daily hard feed.

Although lucerne hay is a natural source of calcium (13g/kg), high intakes of lucerne hay over 6kg daily, without adequate phosphorus supplementation such as dicalcium calcium phosphate, have been observed to cause epiphysitis in young growing horses.

STEP 6

Avoid breeding from stallions and mares with a family history of limb abnormalities or early osteochondrosis in foals.

STEP 7

Monitor growing horses by regular fortnightly assessment to check for limb problems. Corrective hoof trimming and shoeing should be carried out on a regular basis at 4 week intervals to help improve limb alignment.

Note: Carefully monitor orphaned foals fostered onto nurse mares that have a high milk production - if a young foal starts to develop symptoms of phytitis, epiphysitis or contracted tendons, which indicates fetlock joint pain due to OCD related cartilage damage, then confine it to a stable or small yard for 2-3 weeks with its nurse mother, and if necessary, draw some milk by hand stripping the mare 2 or 3 times daily to reduce the volume of milk the foal is able to drink.



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