

# TALKING DRESSAGE

ISSUE 6 2011



## From the editor...

Welcome to our 6th issue of Talking Dressage. We received many appreciative comments about the topics discussed in previous issues.

In this issue, we discuss the basics of feeding to help give your horse the impulsion and 'oomph' you would like, whilst still keeping him calm and focused on his work. Dressage horses are often not thought of as equine athletes as compared to racing and other team horse sport activities, but it takes effort and a focused mind by both horse and rider to remain agile, coordinated, calm and fit for competition, especially for higher levels of the sport. Many upper level horses are also nearing middle age as it takes many years of training to achieve higher skills and that too can make them more likely to tire and recover more slowly after a few days of travel and competition.

We also discuss cooling out after training or competition.

All the best and a safe and relaxing festive season to you all.

*Dr John Kohnke BVSc. RDA*

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## FEEDING FOR DRESSAGE -

### Impulsion, Flare and Harmony

Dressage horses in training must be provided with an adequate and balanced diet relevant to their specific needs to ensure that they have the energy to train and compete without tiring, exhibit 'oomph' and impulsion, as well as maintain themselves in optimum condition with vitality and health. The diet should keep the horse quiet and manageable with its mind focused on the job. Even a horse with a well-mannered temperament can become 'hot' and 'fizzy' if it is given excess feed, particularly starches from grain, relative to its daily needs.

The majority of Warmbloods and their crossbreeds are generally 'good doers' on hard feed and paddock 'hoovers' when turned out to pasture for a relaxing green pick. In some cases, it is a battle to keep them in an ideal moderate to fleshy, trim and fit condition suitable for training.

On the other hand, such a horse should not be fed poor quality feed or given less than it needs, so that it becomes less energetic and loses weight. Dressage horses require energy for impulsion without being too energetic and hard to handle because of their strength developed during dressage training. Older horses over 16 years of age in dressage training also have special needs, including increased amounts of calcium and protein in their diets to offset reduced absorption and utilisation which can occur as a horse ages. Feed costs account for up to 60-70% of the total outlay of maintaining a horse for a 12 month period, with worming, shoeing and rugs contributing to the remaining 'upkeep' expenses. Formulating an economical, but adequate ration, will help maintain costs within the horse keeping budget.

On the next 2 pages I will discuss many of the common feed-related questions asked by owners of dressage horses.

### In this issue...

- \* Feeding for Dressage - impulsion, flare and harmony
- \* Cooling out - taking out the heat!

**Plus handy hints and lots more!**

#### Handy Hint 1 : Avoiding Static Shocks When Taking off a Synthetic Rug

Synthetic and cotton rug material can generate static electricity as the rug is pulled off a horse's body when it is warm or you are getting ready to saddle up for training. The electricity is generated as rug material slides over the horse's hair, which then provides a spark of electricity from the horse's body to the rug as it leaves the rump or sides of the horse. It is estimated that as many as 10,000 volts of static electricity can be generated by the friction of the rug sliding over the hair, which is similar to an electric fence shock to you or your horse! If you remove the rug in a dark stable at night, you may see and hear the 'crack' of the spark as it jumps from the rug back onto the horse as the rug is removed. This can give the horse an uncomfortable and frightening electrical shock, which can make the horse jump and possibly even kick out at you and the rug as it slides off. Even if you virtually gather up and lift the rug off, static electricity can still be generated on a dry horse. The generation of this electrical charge can be eliminated as you slide off the rug by keeping one hand on the horse as you remove the rug. This allows the charge to go to ground through the horse's body as it is generated, rather than being accumulated as a full voltage shock as the final edge of the rug leaves the horse's body. The static electricity is also reduced if the rug is washed in fabric conditioner, which eliminates the friction between the rug and the horse's hair as the rug is removed. (These hints are courtesy of Zilco Rugs). Also, washing your horse once weekly in Kohnke's Own Kleen-Sheen shampoo which contains a built-in hair conditioner, will also minimise the static electricity produced as you slide off the horse's rug. It also helps to repel dust and stains for up to a week.

#### Handy Hint 2: Keeping Flies Away When Riding Your Horse

A sweaty, warm horse on a still sunny day will often attract hordes of small house flies (*Musca domestica*) which can be annoying, distract the horse and get under the rim of your helmet and around your eyes when riding. Smearing on a combined sunscreen and fly repellent cream before you ride can help keep them away from your own face and arms, but they can still annoy your horse! There is a simple remedy. Apply a long acting oily fly repellent preparation, such as Vetsense Flygon in no-noise pump pack, to key areas of your horse after saddling up. Apply one small squirt to each elbow, each hock, under the front of the chest, and a two larger squirts to a tissue and carefully wipe over the forelock, forehead and down the mane. And lastly, apply some to the end brush of the tail - simply gather the end hairs of the tail up as a bundle and apply 3 squirts of the repellent! As the horse works, he will swish his tail around to the areas where flies are landing or annoying him and apply the repellent to the hair himself. It remains for up to 2 days, even on a wet horse in a paddock. It is slightly oily so as to extend its action, so it can stain rugs a little and attract dust, but the oily residue is easily sponged off with warm, soapy water.

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# FEEDING FOR DRESSAGE - Impulsion, Flare and Harmony cont...

## How much should a horse be fed each day?

The weight or amount of food which a horse in dressage training can eat each day is dependent on its body weight, appetite and gut capacity, as well as the duration and intensity of work performed. All diets should be based on an adequate intake of good quality roughage, provided by chaff and hay, or where available access to pasture each day, contributing between 60-70% of the horse's total intake in weight of feed each day.

Horses are well adapted to digesting good quality roughage and only require grain or a concentrate hard feed if they are being worked for more than 30-60 minutes a day. However, where pasture grazing is limited and prone to seasonal variations in quality, or for horses in advanced dressage training, particularly if confined to stables and yards, there will be more reliance on hard feeds to provide the major source of energy and other nutrients required to meet the daily requirements in a volume or 'bulk' that they can consume.

The average daily weight of dry feed (10% moisture as fed) required to **maintain** a 600kg Warmblood is around 10 kg daily. Therefore, theoretically, a horse at rest or in light work can comfortably consume 5 biscuits of hay at **2kg** each in weight and **15 litres** in volume, to fill its gut capacity of 55-65 litres, and meet its basic energy and nutrient needs. However, once the horse is put into heavier training it is likely to reduce its appetite and therefore require added concentrates to meet its energy needs in a bulk it can consume.

A dressage horse working for 60-90 minutes daily will require around 2% of its bodyweight in weight of feed, or roughly 12kg of hard feed by **weight** for a 600kg horse to satisfy its exercise requirements, but within the same **volume** of feed. Some 'good doers' may maintain their 'oomph' and condition for dressage on less weight of hard feed.

### Handy Hint 3: Keep Feeding Simple

Diets do not have to be complicated mixtures of a large number of ingredients in order to be adequate and meet a horse's basic nutritional requirements. Some owners use prepared feeds as an energy base for convenience and to save time mixing their own feeds, whilst others prefer to mix their own feeds and adjust them to their horses individual likes and dislikes, temperament and day to day work load. Normally one or two sources of energy provided by a cereal grain (eg steamed rolled barley with added corn as an energy boost prior to a training day or competition day), one source of protein (lupins, sunflower seeds, full fat soyabean and lucerne hay/chaff), all provided with a good quality fibre base of chaff, hay or grazing, will normally satisfy the basic needs for energy, protein and fat for horses in day to day dressage training.

### Handy Hint 4: Match Feed Intake to Each Individual Horse

Ration composition should be tailored to each horse's individual temperament, willingness to work, appetite, food conversion' (eg a 'good doer' or a 'poor doer'), work effort, as well as age, build and body condition. Often a Warmblood of the same height, condition and work effort in training, will only require 70% of the grain based hard feed to maintain its body weight and energy levels as compared to a Thoroughbred or crossbred. A thin horse coming into training after an over winter rest at pasture, may initially require more concentrate feed and protein to help build it up to a suitable condition and then a reduced amount to maintain it relative to its training effort once it reaches fitness for competition. A 'sluggish' or lazy horse may benefit from an additional 1-1½ kg of steam-rolled barley daily to improve its 'oomph' and willingness to work, compared to a willing or energetic horse doing the same training. A weak horse may benefit from extra strength training by daily uphill work (10-15% gradient) over 300-400 metres at the trot, as well as supplement of **Kohnke's Own Muscle XL**, given within 15 minutes after daily exercise in a small feed before its larger feed, for 10-14 days, to provide high quality branched chain amino acids and other nutrients which have a role in protein synthesis and energy production to help build topline and muscle bulk for strength and impulsion in preparation for competition.

### Handy Hint 5: Feed Dampened Lucerne Chaff to Buffer Stomach Acidity

Feeding a small feed of 500g (4 litres) of dampened lucerne chaff with 3 scoopsful of **Kohnke's Own Gastro-Coat™** and 40g (2 tablespoonsful) of powdered limestone (Ag-Lime) about 30 mins before travelling, at planned rest stops and again on arrival will help maintain normal stomach conditions by buffering gastric acid and encouraging salivation as the horse consumes the chaff. Providing dampened lucerne hay in a hay net (to minimise dust inhalation into the lungs), at below chest height during extended trips, will also help keep a horse more contented. If a horse is an anxious traveller, then supplementation with organic magnesium to correct low feed levels may help it to travel in a more unfazed manner, for example **Kohnke's Own Mag-E**.

## How much bulk can the average horse consume each day?

Horses, by way of their nature and digestive layout, always appear to be hungry as they are continuous eaters and do not have a gall bladder, so bile is produced by the liver continuously to allow for 'trickle feeding' and steady digestion throughout the day. They normally graze for up to 21 hours per day when grazing is available, but they have a limited gut capacity of around **10-12 litres** for each 100kg body weight for dry, hard feed, or roughly 50-60 litres (2 x 20 litre plastic buckets full of grain mix and chaff, including 1 biscuit of hay per day). The average 100mm (4") thick slice, wafer or biscuit of lucerne or meadow hay has a volume of approximately 15 litres, with an average weight of 1.8-2.0kg.

If a horse has adapted to a hay based diet or grazing at pasture, the gut capacity may be increased to 15 litres/100kg body weight per day due to the need to expand the hindgut volume to digest larger amounts of fibrous feeds. Too much low energy grassy hay can extend the hindgut and result in 'hay belly'.

Once a horse is brought into a stable and fed on dry hard feed grains or pellets, the hindgut usually reduces in volume and the horse's appetite limit adjusts accordingly as the fibre content of the ration and bulk of pasture is reduced.

The physical 'appetite limit' of around 55-65 litres per day for a 600kg horse, spread over 2-3 feeds, means that as the energy requirement increases with training, the diet has to be made more 'energy' dense. This is important to meet energy needs to avoid weight and condition loss, whilst still providing no more than **55-65 litres in total feed volume or 'bulk'** of feed. This requires the addition of higher calorie or 'energy' dense feeds, such as cereal grains, lupins, sunflower seeds or vegetable oil to concentrate the diet into a bulk which the horse can readily consume over a full day.

The 'appetite limit', which is the amount of bulk a horse can readily consume within a day, is often reduced when a horse loses its appetite and decreases its food consumption, usually due to stress or fatigue associated with hard or prolonged work and travelling, especially when trained every day without rest days. Many dressage horses develop acid burn on their stomach lining and low grade gastric ulcers when not fed prior to exercise each day or when travelled over long distances. See Handy Hint 5 below.

## What ratio of concentrate to roughage should make up ration?

All diets should be based on roughage, with concentrates only fed as required. The amount of concentrate, such as cereal grains (starches) and oil seeds (proteins and fats), is directly influenced by the energy requirement related to work effort and/or duration of work. A horse which is resting or doing up to 60 minutes of walking a day can obtain its total energy requirements from good quality hay and a minimal amount of a grain and chaff based hard feed if stabled. However a horse performing moderate work for 30-120 minutes a day at the walk, trot or canter, will require a more energy dense ration provided by corn, barley or oil rather than fibrous bulky oats, to meet its needs, with up to 30-40% as concentrate and 60-70% roughage as hay, chaff or pasture by **weight**.

## When should a horse be fed its concentrate feed?

Stabled horses which are worked in the mornings are best fed about **half of their concentrates** and **one third of their chaff** (if required relative to work) in the **morning feed**, with **hay or chaff at lunch time**. If they have been worked for more than half an hour, a **proportional amount of grain in the evening meal should be provided** to restore muscle energy levels, with chaff and hay to provide bulk overnight. This helps to provide a bulk feed to maintain digestive function and reduce boredom in the 12 hour gap between the evening and the following morning meal.

If a horse is **not worked** on a particular day because of a planned rest day, poor weather, illness, lameness, etc. then the evening concentrate grain portion should be reduced to a minimum only for taste and acceptance (eg remove the grain but dampen the chaff with molasses etc), with the extra bulk made up with either chaff or hay. This practice will help reduce the risk of a horse becoming 'hard to handle' or 'tying up' on

the following day if it is given concentrate and not worked to utilise the stored energy.



### How should feed be measured?

Ideally, the concentrate ingredients in particular, should be measured out by **weight** rather than volume to ensure a more constant energy, protein and other nutrient intake. However, most horse owners measure feed by dippers or ice-cream containers. Prepared, ready-mixed feeds or pellets are usually more uniform in density or weight to volume ratio, so that measuring by volume is within 5% of average weight. Oats and other grains can vary by 10% in weight and energy value from season to season, or bag to bag, so ideally each new delivery of grain should be compared with the remaining grain for kernel size etc. Where necessary, grains should be weighed to adjust the volume to obtain the same weight of grain to make up the concentrate portion of the ration. Weighing grain is essential for horses in hard work where poor quality grain may reduce the total energy intake by 10-15%, which in time could adversely affect performance or result in a gradual weight loss.

Hay can vary in weight due to leaf content, moisture levels at baling and compression in the bale. With experience, adjustment made at the time of feeding can compensate for variations in quality and weight. Chaff is usually within +5% by weight, to volume measurement, keeping in mind the appetite limit of 55-65 litres for a 600kg horse, is normally accurate enough for moderately worked horses. A horse which is a 'good doer' may require 10-15% less in weight of concentrates to ensure it maintains an ideal body condition for dressage, without becoming over weight and 'sluggish' during training.

### How much grain to chaff should be fed in each hard feed?

The maximum amount of grain or concentrate mix that a 600kg horse in hard training should be limited to in any one meal is 3.0-3.5kg of oats, corn or steamed rolled barley, or a prepared sweet feed or grain based pellet feed. Large volumes of chaff mixed with grain can have a 'smothering' effect on the digestive process in the small intestine, reducing digestive enzyme attack on starch and protein. Therefore, small amounts of grain up to 1kg mixed through a feed can be bulked out by 5-10 times the volume of chaff. However, where the limit of 3kg grain is provided in any meal to a horse in training, the volume of chaff should be restricted in volume to **no more than two to three parts of chaff to one part by volume of grain or concentrate mix. This will help ensure optimum digestion and utilisation, in a volume the horse can consume each day.**

When high energy pellets are being fed, at least a 50:50 volume of pellets and chaff should be provided to prevent too rapid ingestion of pellets, which can result in reduced time feeding, digestive upsets and more time waiting between meals when a horse can become bored and chew rails etc.

In a working horse, providing large quantities of poor quality roughage (eg mature, stemmy, woody lucerne hay with little leaf content and high content of flower heads), not only increases the amount in volume of poorly digested fibre that is consumed, but also causes an expansion of hindgut capacity (termed 'grass belly'), causing discomfort when a horse is ridden.

**It is counter-productive to provide more hay to improve condition of a horse in dressage training, as the bulk of hay passing through the digestive tract can actually reduce the efficiency of digestion of concentrates in the small intestine and not achieve the desired increase in condition. It is better to limit the hay to 6 kg daily (3 biscuits maximum) and increase the concentrates, such as adding 1-1½ kg of extra steam-rolled barley daily which will normally not 'heat' the horse's temperament, but will help improve its overall condition and energy for training.**

### Do horses require a mineral, trace-mineral or vitamin supplement?

Mature horses that are resting at pasture or ridden occasionally and given hay to meet their daily energy and protein needs, should obtain the majority of their micronutrient (trace-minerals and vitamins) needs from their diet. For a horse in moderate work, around 3kg of lucerne provided as hay or chaff, should contain sufficient calcium and major minerals to meet its needs. Once a horse is worked on a regular basis, especially without access to green pasture, a supplement of trace-minerals (zinc, manganese, copper, iron, iodine and selenium - especially in areas known to have selenium deficient soils), along with Vitamin A and Vitamin E as the two essential vitamins that cannot be synthesised by microbial fermentation in the hindgut, may be necessary to maintain exercise capacity. Prepared feeds (sweet feeds, muesli mixes or pellets) may have additional minerals and vitamins incorporated into the mix. However, the stability and uptake of vitamins and some trace-minerals that can become bound as complexes in a stored, damp feed, may be compromised and an additional supplement may be beneficial in hard working horses.

### Handy Hint 6: Add A Supplement of Mixed Salts during Hard Work or Hot Weather

For horses in full training on a daily basis, a wide range salt mix, containing potassium, magnesium, chloride as well as sodium, will help maintain adequate water intake, correct daily shortfalls from sweat loss and help maintain normal blood and muscle levels of essential salts. Although there are many such salt mixes available, most contain a high content of salt (sodium and chloride) relative to the total recommended dose. You could be paying \$10 per kg for a product which is high in salt! Plain salt is a cheap feed source of sodium and chloride to help replace sweat losses. The Kohnke's Own salt mixes, **Cell-Salts** (and **Tropo-Salts** for hot weather and poorly sweating horses), are especially formulated as concentrates of potassium and magnesium (with added Vitamin E and Vitamin C in **Tropo-Salts**), in a sustained release form, to which you add your own salt on a 'scoop for scoop' basis to make up the sodium and chloride at a much more economical cost per dose.

### How much salt should be provided each day?

Salt, composed of sodium and chloride, is an important 'electrolyte' required for nerve function and fluid balance in the body, as significant amounts can be lost in working horses relative to the type and duration of the exercise, the ambient temperature and sweat losses. Other electrolytes including potassium, magnesium and calcium are also lost relative to sweat and urinary losses. Sweat losses vary from 3-6 litres per hour of exercise in horses in dressage training, relative to the exercise intensity and the ambient temperature.

A supplement of 20g salt (1 tablespoon) daily for horses in light work under cool to moderate conditions, increasing to 40g (2 tablespoonsful) daily for horses in moderate work or temperatures above 30°C during the day, and 60g (3 tablespoonsful) for horses in hard work and hot weather with heavy sweat loss will normally meet the need for sodium and chloride and ensure an adequate intake of water to prevent dehydration.

### Handy Hint 7: Providing Extra 'oomph'

Some dressage horses begin to lack energy and impulsion when trained or competed for a number of consecutive days. In some cases, lower energy 'cool' feeds are fed to reduce the risk of a horse being too energetic during training. Many of these 'cool' feeds are based on bran, fibre and low GI feed ingredients to help keep a horse calm and less energetic, but because a horse takes up to 48 hours to replenish its muscle energy stores after an exhaustive work out (as compared to 12 hours for a human athlete or greyhound), a horse can suffer from a lack of impulsion and appear tired during subsequent training or competition days. In this case, feeding a slow release starch energy feed, such as 1-1½ kg of steam-rolled barley on the 2 days leading up to a weekend competition, or even 1kg of freshly cracked corn (maize), will help replenish and improve muscle energy stores to ensure that the horse maintains 'oomph', impulsion and 'flare' in its work. Some larger breeds may require more than the 1½ kg of extra steam-rolled barley to give them the energy to train and compete. Steam-rolled barley delivers a sustained, slower uptake of sugars, as compared to oats (which may be a useful energy boost at the same rate in a particularly 'sluggish' horse). It is an ideal 'cool' energy supplement for hard training days, eg for lessons and for the days before and during competition. It can be reduced or taken out of the ration once the horse returns to normal training, as well as on planned rest days. If a horse gets too energetic, reduce the amount in 500g steps at 3-5 day intervals under a constant exercise program until the horse retains the 'oomph' you require, but is not hard to handle.

### Handy Hint 8: Provide a Comprehensive Supplement to Meet Daily Needs

Horses being trained on a daily basis at medium work effort may not take in adequate bone mineral, trace-minerals or vitamins to meet the needs for daily exercise effort to maintain their bones, tissues, joints or metabolic processes for extended periods of training at higher competition levels. Many prepared feeds contain added amounts of these nutrients when the feed type and daily recommended amount is matched to the work effort. However, storage of damp feeds in the bag and especially when tipped out and stored in a feed bin in the stable feed room, under warm conditions for more than a month, can result in loss of key vitamins and complexing of trace-minerals in the moist fines of the mixed feed. In this case, an additional supplement of these nutrients, such as by adding a 30% recommended daily dose of **Kohnke's Own Cell-Vital** or **Aussie Sport** daily, will provide adequate intake to counteract these losses. If you are feeding less than the recommended amount of a prepared feed and topping up with extra steam-rolled barley as an example to improve 'oomph' without risking overly energetic behaviour, then adding any of the **Kohnke's Own** Supplet pellet blended products (eg **Cell-Vital** and **Aussie Sport**) at 10g for each kilogram of extra grain added to the ration, will help make up shortfalls of essential trace-minerals and vitamins not provided by the reduced intake of the pre-mixed feed.



### Handy Hint 9: Control 'Hot' Behaviour by Feeding Rather than Lunging

Lunging is a potentially harmful form of warm-up exercise, even though the weight of rider is not included, as it magnifies the loading on 'cold' joints which have not had an opportunity to improve circulation and cartilage nutrition processes before they are subjected to overloading and high 'wear and tear' bodyweight and centrifugal forces on the circle lunge. If a horse is 'over-energetic' or 'above itself', which makes training difficult for control and comfort, then it is recommended to either walk and trot the horse for 10-15 minutes to 'burn' up excess energy, or to adjust its feed to remove excess starch based feeds. Steam-rolled barley is one of the 'coolest' natural feeds available and most feed companies have a 'cool' slow-release energy feed mix which will provide sustained energy without excessive 'heat'. Feeding an organic magnesium supplement, such as **Kohnke's Own Mag-E**, with organic magnesium for optimum absorption, will help to correct low intake of magnesium from pasture or cereal/grass hay based diets fed to dressage horses for normal nerve and muscle function to assist in managing difficult, 'frisky' and 'nervy' behaviour in horses in training or competition.

### Cooling Out

#### Taking out the heat

Dressage training, especially for advanced level competition and during hot or humid weather conditions, can result in large amounts of heat being produced during exercise, which has to be off-loaded as quickly as possible after exercise to minimise stress, heat damage to muscles and tendons, as well as excessive sweating and panting to dissipate body heat.

**Off-Loading Body Heat** - A working horse's body temperature will normally increase from around 38°C to between 41-42°C after a warm-up period due to heat producing aerobic metabolism in the muscles. The normal cooling mechanisms which include 50% loss of heat from evaporative sweat loss, 30% from convection and airflow over the body during exercise, as well as radiation into cooler air from the body surface and around 20% from heat being expelled in expired air from the lungs. Even during prolonged exercise, the sweat loss and other heat off-loading mechanisms keep the body temperature in the normal safe exercising temperature. In a horse which has a thick coat, or is dehydrated, the body temperature regulation may be less efficient and under hot and humid conditions, the horse may be at risk of over-heating during prolonged exercise and may become exhausted, develop muscle weakness, neurological signs and collapse.

The muscles and limb structures retain heat for up to 4 hours after exercise as it is slowly dissipated into the surrounding air as a horse is cooled out and rests after work. The friction and concussion on the hooves, which is relative to the working surface, body weight and exercise intensity and loading, increases the hoof wall and sole temperatures by 1-1.5°C above the body temperature reached during exercise. The tendons actually generate heat as they stretch (elastic recoil) with repeated loading as the fetlocks are flexed downwards during exercise. Tendon temperatures may reach 44-45°C during hard exercise on a heavy arena or in a large, heavy horse due to loading.

Tendons can retain heat after exercise and may rise by a further 1°C because the cooling effect of the air passing over the tendons is ceased. Also, there is insulating skin covering the flexor tendons and poor blood perfusion due to tension in the tendons, which 'squeezes' the blood supply vessels when a horse is standing, rather than being walked around. The tendons cool down slowly when the horse is tied to a rail in the 5 minutes after exercise as it is being unsaddled.

**Ice packs vs Ice Boots** - If you are training horses on a daily basis, ice boots which surround the hoof, pastern, fetlock up knee (or hock) height are an effective way of cooling the limbs, save time and water as compared to cold water hosing or ice packs.

If a horse has a history of a 'bowed' or injured tendon, investment in a full limb ice boot is worthwhile to hasten cooling and reduce inflammation and fluid retention between tendon core fibres.

### Handy Hint 10: Avoid Feeding Protein in Excess of Daily Requirements

High protein intakes at levels of 50-60% above daily requirements, especially from lucerne hay, can generate more body heat (6 times more heat as compared to starch and fibre overload) in the hindgut as the protein is fermented by hind gut microbes, as well as increase water loss in the droppings and reduce water excretion through the kidneys in a hard working horse. Lucerne contains around 17% crude protein and a heat producing fibre content, which both add to digestive heat production. Whilst during winter or cold weather, the extra heat of fermentation in the hind gut will help to keep the horse warm at night or when grazing, once the summer heat and extra exercise in preparation for competition adds to the overall heat load, the lucerne hay may be cut back by 50% and extra grass or cereal hay provided to reduce the risk of excess protein intake and heat production.

Lucerne hay provides good quality protein and is a useful source of calcium, magnesium, salts and stomach protective mucilage compounds (Refer to Handy Hint 5), as compared to grass hay (which has more sugars and generally better fibre digestion). However, it often causes horses to sweat more heavily in the flanks and under-belly due to the increased heat produced during hind gut digestion. If you notice that your horse is sweating more in the flanks and under-belly, it may be a good idea to reduce the lucerne hay. Mature lucerne fibre also does not hold as much water in its structure as compared to grass or cereal hay. More 'free' water may be passed in the droppings, making them soft and less well formed. In this case, reduce the lucerne initially to check if it is the cause, especially in older horses where hind gut water resorption may be also reduced.

### Handy Hint 11: Cool the Legs After Exercise

On return to the stables, remove any bandages to facilitate radiant heat loss, especially paddock, 'polo' or working bandages. Remove working bandages before loading onto a float for the return trip. Avoid fitting 'floating boots' for at least 10-15 minutes to reduce overall tendon heat. It is best to allow the limbs to cool down for 10-15 minutes following strenuous or prolonged exercise, especially if the ambient temperature is high on a hot day. Hosing off with cold water in the wash bay or applying a large volume ice pack for 5-7 minutes within 5 minutes after exercise will significantly reduce joint, tendon and hoof temperatures in the lower limb. In turn, this may increase the long term overall soundness in a horse in heavy, day to day training.

### Cooling the Body

**and Lower Limbs** - After exercise, the hot blood retained through the muscles is carried quickly into the hind gut wall by the blood stream and then transferred into the large volume of water - up to 60 litres in the hind gut digestive mass, which acts as a 'heat sink' so that the heat cannot damage the muscle cells after exercise has stopped. The heat stored in the hind gut reservoir is then slowly dissipated from the under-belly area back into the blood to continue sweating to evaporate heat for a period after exercise, with up to 30% of the heat being blown off from the highly vascular lung surface in the expired air. This may take up to 4 hours, with a slow return to normal body temperature. A dehydrated or over-heated horse will retain heat for longer, unless it is cooled with cold water applied over the body surface soon after exercise.

Studies have shown that the efficiency of heat removal from the body surface is increased by hosing or sponging the horse's topline and sides, with particular attention to spraying cool water under the belly area where the heat is retained in the hind gut 'heat sink'. In my own experience, hosing a horse down for 1 minute, especially under the belly area, followed by a quick scrape off to remove the 'warm' water, then walking the horse for 1 minute to help redistribute the hind gut heat into the blood and lungs, then hosing again for 30 seconds, followed by a careful scrape off over the body and belly, will help reduce panting and distress in a horse which is hot after exercise.

It is important to scrape off the coat to remove the water trapped in the hair after hosing down, as the water acts as an insulator to reduce the efficiency of cool down. During cold weather, scraping off the coat and under belly, and applying a light rug will help insulate the horse against the cold surroundings as it slowly cools out and will prevent excessive chilling and cold stress after exercise. If it is very hot and humid, standing the horse in a stable breezeway or directing a fan under its belly as it feeds and recovers, will help to improve its rate of cool out within the first 30-60 minutes after exercise.

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