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# *A CHIEVING THEIR FULL POTENTIAL*

*A STUD FEEDING GUIDE*

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HOW TO ADD VALUE TO  
YOUR PROGENY

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DOD - COLIC - ULCERS - TYING UP  
AND LAMINITIS ALL HAVE ONE  
COMMON FACTOR  
NUTRITION

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BRAND IMAGE  
DO YOU KNOW  
HOW YOUR  
CUSTOMERS  
PERCEIVE  
YOU?

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**SAVE UP TO 30% OFF YOUR FEED BILL**

# FEEDING FOR PROFIT, HEALTH & WELLBEING

The purpose of this brochure is to assist stud managers in improving the health and wellbeing of their breeding and performance horses whilst making savings of up to 30% off their feed bill. This brochure outlines common feeding practices that undermine business value and profits and we outline how studs can feed for overall commercial success.

## SIGNS OF IMPROPER NUTRITION

Unfortunately, the presenting signs of improper nutrition and management are so common that they are often deemed to be normal or in some cases they are dismissed. In reality, improper nutrition and management reduces profit, performance and horse welfare.

- Infertility
- Tying up
- Polysaccharide Storage Myopathy (PSSM)
- Developmental Orthopaedic Disease (DOD)
- Laminitis
- Nutritional Secondary Hyperparathyroidism (Bighead, Bran Disease)
- Gastric Ulcer Syndrome
- Colic
- Entrolithiasis (Intestinal Calculi)
- Poor doer / poor feed conversion
- Poor hoof quality
- Poor coat
- Decreased resistance to infection
- Nervous / excitable behaviour
- Reduced performance
- Anaemic
- Picky eater
- Suppressed / reduced appetite
- Eating hay in preference to hard feed
- Eating bedding, dirt, timber
- Cribbing
- Windsucking
- Weaving
- Training off
- Aggression at feed time
- Teeth grinding
- White sweat
- Strong ammonia smelling urine

## COMMON FEEDING PRACTICES THAT UNDERMINE THE VALUE AND PROFITS OF YOUR BUSINESS

### Loss of income and medical expenses

Poor nutrition and management costs Australian studs millions of dollars a year in lost income and veterinary expenses.

#### Infertility

Infertility can indicate a nutritional problem in the diet. A low body condition score, inadequate supply of selenium or Vitamin E can result in infertility. Supplying adequate nutrients is critical to ensure offspring reach their genetic potential, broodmares cycle properly, become pregnant and carry foals to term. A commercial stud mix fed at recommended levels should supply adequate selenium and Vitamin

E in the diet. When feeding less than recommended levels or when feeding predominantly roughage, a broad spectrum supplement like Equilibrium or Lexvet is recommended. These supplements contain both selenium and Vitamin E.

#### Developmental Orthopedic Disease (DOD)

Musculoskeletal abnormalities include:

- Angular Limb Deformities (ALD, Crooked Legged Foals)
  - Phytitis
  - Subchondral Bone Cysts
  - Osteochondrosis (OC)
  - Flexural Limb Deformities (Contracted Tendons excluding congenital contracted tendons)
- 80% of Thoroughbred foals born in Australia have some

degree of ALD (Aldred, 1998). Incorrect management of the diet and husbandry of the foal can exacerbate development of osteochondral problems. Factors that contribute to bone growth disorders include genetics, trauma, pre and post natal nutrition.

**Osteochondrosis (OC)** is the failure of or abnormal cartilage maturation.

**Osteochondrosis dissecans (OCD)** is when abnormalities of joint cartilage and subcondral bone has progressed to cracks and fissures in the cartilage. OCD is more advanced than that seen in OC.

**Phytitis (Epiphysitis)** is inflammation of the physis, or metaphyseal growth plate. It is

generally considered to be a manifestation of OCD although it is believed that it can also result from excessive exercise, excessive weight or poor conformation placing stress on the immature bone.

**Angular Limb Deformities (ALD)** exists when the limb deviates axially from the normal vertical plane. Congenital ALD are present at birth and are generally believed to be as a result of malpositioning of the uterus, joint laxity or incomplete ossification of the small bones in the knee or hock (commonly found in premature foals). Acquired ALD are apparent within the first few months of life and can result from OCD in the physis causing asymmetric growth, the result of trauma or uneven weight distribution across the joint.

**Flexural Deformities** result in the inability to straighten or extend the leg with a knuckled over or upright appearance to the limb. Causes include infections or toxins during development of embryo, positioning of uterus, genetic factors, pain resulting from phytitis, OCD or other injuries or a difference in bone growth and tendon development.

**Subchondral Cystic Lesions** is a cyst like structure in subchondral bone. Lesions can be secondary to OCD or result of trauma to weight bearing joint surfaces.

**Cuboidal Bone Malformation** occurs when there is a delay in the endochondral ossification of the cuboidal bones in the knee. The causes of this include prematurity, hypothyroidism or variations in normal rate of ossification. Generally presents shortly after birth as bones collapse under weightbearing stress.

**Causes of DOD** include trauma, rapid growth rates, large body size, hormonal aberrations, genetic predisposition and nutrition.

Nutrition is considered one of the major causes of DOD and includes:

- Excess energy intake
- Inadequate protein
- Calcium and Phosphorus imbalance

- Inadequate trace minerals

**Excess energy intake**, particularly in the form of soluble carbohydrates will consistently produce lesions of OCD (Aldred, 1998). A study showed horses fed 29% more energy than recommended by the National Research Council (NRC) resulted in 11 out of 12 foals with numerous OCD lesions with only 1 of 12 foals on a diet consistent with NRC recommendations showing OCD lesions. The foals on the high energy diet had more lesions with greater severity than the one foal on the NRC diet. Overfeeding a pregnant broodmare may also effect the incidence of DOD in her foals. Anecdotally overfat mares are more likely to have offspring develop DOD than mares in optimum condition. It is believed that overfat mares predispose to foetal malpositioning that results in congenital flexural deformities and ALD.

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*It is estimated that 50% of stud farms supply excess energy in the diet of young horses which is then directly linked to Developmental Orthopaedic Disease*

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**Protein deficiency** combined with an adequate energy intake may cause reduced bone growth without affecting weight gain, and this may predispose to DOD (Gibbs et al 1989).

A **Calcium and Phosphorus imbalance** can cause DOD and both are required for normal bone development. A deficiency or imbalance causes impaired endochondral ossification, decreased bone mineralisation and results in a wide range of problems including lameness, decreased bone density, fractures and DOD. The calcium to phosphorus ratio should be maintained between 1.1:1 to 2:1. An inverted ratio (calcium

less than phosphorus) results in nutritional hyperparathyroidism also known as bighead or bran disease. Experimentally a diet with a calcium to phosphorus ratio of 1:2.1 has shown to cause DOD with 5 out of 6 foals developing multiple OCD lesions (Savage et al 1993).

**Copper deficiency** has been linked to stud farms with high incidences of OCD (Gabel et al 1986). Experimentally low copper diets have shown to increase rate of OCD, phytitis, ALD and flexural deformities (Hurtig et al 1993).

**Zinc deficiency** in an unpublished study in the USA found foals fed 152ppm of zinc had less cartilage defects than those fed 42ppm. Further research is required to confirm this finding.

### **Exertional Rhabdomyolysis Syndrom (Tying Up)**

**E**xertional rhabdomyolysis (ER) is muscle pain and cramping generally associated with exercise. It can be described as sporadic (infrequent) or chronic where there are repeated episodes. Chronic exertional rhabdomyolysis is described as recurrent exertional rhabdomyolysis (RER), which commonly affects Thoroughbreds, Standardbreds and Arabians. It also occurs in horses with polysaccharide storage myopathy (PSSM) which predominantly affects Quarter horses but also Paints, Warmbloods, Appaloosas, Morgan horses and Draft breeds. Nutritional causes linked to ER include electrolyte imbalances or deficiencies, mineral imbalances or deficiencies, vitamin deficiencies and excess grain, starch or sugar in the diet. Oversupplementation can cause mineral and electrolyte imbalances therefore a broad spectrum macro mineral, trace mineral, electrolyte, vitamin and salt supplement is recommended. Horse owners and trainers of horses that have suffered ER should aim for a 100% roughage diet. If concentrates are required, high fibre and high fat products should be fed in preference to starch or sugar feeds.

## Secondary Nutritional Hyperparathyroidism - (Bighead, Bran Disease, Oxalate containing plants)

This is a complex nutritional problem that has its origins in a calcium - phosphorus imbalance in the diet. It is different to an absolute lack of calcium in the diet which results in different clinical signs.

Calcium and phosphorus are present in bone in a ratio of approximately 2:1 and bone is a reservoir of these minerals for a period of time if the diet is deficient. Blood levels of calcium are rigidly maintained whereas phosphorus has a far wider range of measured values in the blood with no adverse effects.

Bran has ten times more phosphorus than calcium which immediately upsets the required ratio; in addition the phytic acid in bran binds calcium and phosphorus and decreases absorption from the gut. Copper, zinc and manganese absorption are also affected by phytic acid so that big head becomes a multifactorial mineral imbalance. Grain also has high phosphorus and low calcium levels and contains phytic acid.

Some pasture plants contain oxalic acid which binds calcium in the plant to form calcium oxalate which is stored in the leaf and stem. This insoluble form of calcium oxalate means very little calcium is available in the plant for the horse to utilise. Some oxalate plants contain a large amount of calcium and if the calcium to oxalate ratio is 0.5:1 then it is relatively safe to graze.

Chronically low blood calcium levels due to inadequate calcium intake results in the release of parathyroid hormone. This hormone stimulates the release of calcium from bones to increase the levels in the blood stream. Over time as the bones become demineralised there is lameness, weight loss, swelling of the lower jaw bone, stiffness and short stepping. As the condition progresses both jaw bones and facial bones increase in size due

to the laying down of fibrous tissue in place of bone. Arthritis develops and the parathyroid glands become enlarged - hence the correct name for this condition is secondary nutritional hyperparathyroidism.

Native pasture plants do not contain oxalates - the problem is with the subtropical pasture grasses introduced for cattle. If horses are on these pastures, make grassy hay a predominant part of their diet and place the horses on a well balanced multi-mineral vitamin supplement - and where possible, reseed pastures to non oxalic acid containing plants. Equilibrium and LexveT supplements are recommended to be fed at a higher dosage when horses graze oxalate pastures. Supplement ponies with 105g per day, galloways/cobs 140g and horses 210g per day. For more information contact your local Equilibrium or LexveT office

### Laminitis

Also known as founder or foot fever, it is an extremely painful and debilitating condition of the hoof. Blood flow in the hoof is compromised leading to breakdown and degeneration of the union between the horny and sensitive layers of the laminae.

It is a symptom of a generalised metabolic disturbance and can be classified as acute (very severe),

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*Up to 50% of apparently sound racehorses suffer from subclinical laminitis*

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subacute (severe), or chronic (milder signs). Rotation of the pedal bone within the hoof may occur in longstanding chronic cases and can even perforate the sole of the foot.

The most common causes are excess carbohydrates (grain overload) or grazing lush pastures. Excess sugars and starches ferment in the hind gut leading to lactic acid buildup killing normal gut

bacteria and releasing endotoxins. The endotoxins are absorbed into the bloodstream and travel to the hoof where they interfere with normal blood flow. The blood flow is dramatically reduced with sludging and emboli occurring in the capillaries. The reduced oxygen perfusions means that the hoof wall starts to degenerate and break down, resulting in the clinical signs of laminitis.

To prevent grain overload, all horses should be fed roughage adlib and minimal concentrates added when required. For horses susceptible to pasture induced laminitis download our laminitis fact sheet from our website.

### Gastric Ulcer Syndrome

Equine gastric ulcer syndrome (EGUS) refers to a group of distinctive disorders that include neonatal gastric ulceration, gastroduodenal ulcer disease of suckling foals, gastric glandular ulceration, and squamous mucosal ulceration.

There are several factors that cause EGUS which include diet, feeding regime, exercise, confinement, temperament, transport and stress.

Horses produce stomach acid constantly and they are meant to be constantly processing small quantities of roughage throughout the day and night. A horse's stomach takes 20-45 minutes to process food and become empty. Feeding long stemmed roughage (hay/pasture) slows digestion and will result in feed being in the stomach longer. Horses worked on an empty stomach will have acid splash up into the non-glandular region and cause ulcers.

Prevention and treatment strategies include:

- Minimise stress by providing a social paddock environment
- Adlib roughage
- Feed long stemmed (hay, pasture) as opposed to cut roughage to encourage chewing and saliva production buffering stomach acid
- Avoid horses being restricted

from food for more than 45 minutes.

- Feed long stemmed roughage before, during (where possible) and after transport.
- Feed long stemmed roughage before and after exercise, and avoid (where possible) exercise being longer than 45 minutes.

## Colic

Defined as acute abdominal pain, it is the most frequent cause of emergency treatment and death in horses. Risk factors include diet, feeding characteristics, internal parasitism, intrinsic (eg sex, age, breed), medical history, management and weather-related factors. Diet and feeding characteristics are associated with the greatest risk of colic, eg a change in feeding program, amount of concentrate fed, access to pasture, type of forage and water intake. Horses fed more than 2.5kg of concentrates per day are five times more likely to colic than horses on 100% roughage diets (Tinker et al., 1997) A decrease in pasture availability (either no pasture, reduction in paddock size or reduction in time on pasture) tripled the risk of colic (Hudson et al. 2001). Meal feeding concentrates exaggerates fermentation, resulting in decreased pH and altering fluid balance, resulting in intestinal distention or impaction colic (Clarke et al, 1990). Studies have shown implementing high roughage minimal concentrate feeding programs will reduce the risk of colic.

## The Hidden Costs

### Brand Image

This is the subjective perception a buyer has developed over time from direct or indirect associations with a stud. A client is not just purchasing a horse they are also purchasing your brand that is associated with the horse. The decision to purchase is based on three key benefits:

1. FUNCTIONAL– this is the horse (product) and includes

the suitability to the customers individual requirement - i.e temperament, conformation, trainability, health status and soundness of the horse.

2. EMOTIONAL – this is how the buyer feels about the decision, it is about the personal touch and connectedness that makes them feel better and more supportive of the reason to purchase. A poorly presented property, inadequate conditioning of breeding stock, dangerous or inadequately maintained fencing is likely to result in a negative emotional benefit and will detract from the brand image.
3. RATIONAL – this is based on believability, that the horse is what you say it is. The results of similar bred horses, other progeny from the stud and the experience and success of the stud will all contribute to justifying the decision.

Improving these key benefits will develop a superior brand that translates into more financial success.

### Longevity

So how does this fit in with nutrition? Good nutrition results in less nutritionally related diseases and improved overall health status and soundness. Horses achieve 90% of their mature height in their first 18 months of life and this time is critical to ensure appropriate balanced nutrients are provided. Ensuring horses have the best start to life and educating buyers about appropriate feeding programs will increase the longevity of the horse in their sport.

So why does this matter? Longevity means you can leverage off the results of those horses for years to come. A poor feeding program increases the risk of horses breaking down prematurely and being retired from their sport. If longevity is a priority then you will have more horses representing your brand at any given time.

In the business world, word of mouth

advertising is recognised as the cheapest and most effective form of advertising. In the horse world there is another form of effective advertising -the results from stud progeny and horses carrying your bloodlines. Exceptional results will increase your brand awareness, the demand for your progeny and sale price. Poor results or lack of results means studs will need to spend more money to market their progeny which reduces profit margins.

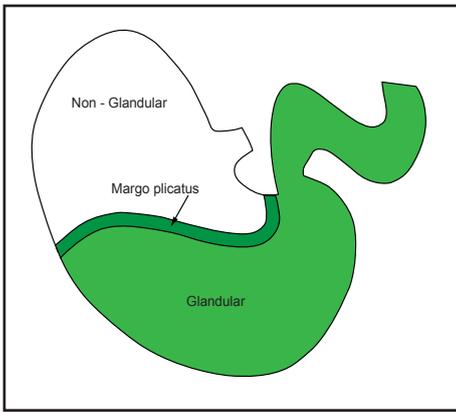
Word of mouth can be a positive marketing tool but can also be detrimental to your business if not managed correctly. Presentation of all stock including brood mares, stallions and progeny for sale will impact on your brand. The preparation of stock for sales and auctions is intensive. The good news is, unrugged and ungroomed breeding stock can look as amazing and shiny as your intensively prepared horses for sale given that they are on a good feeding program. The benefits of a good feeding program for breeding stock aren't just limited to shiny, well conditioned horses for buyers to view. Inadequate or imbalanced feeding programs can result in fertility issues and premature retirement of broodmares.

The Equilibrium and LexveT Feeding Program is designed to promote optimal digestive health, in turn horses look a picture of health without intensive work (bathing, grooming, show products).

## The Feed Bill

One of the biggest expenses incurred by studs and producers is the feed bill. Horses evolved to graze on low to medium quality roughage and to graze constantly throughout the day. Roughage should form the basis of feeding all horses. Horses are designed to have food in their stomach at all times. If the stomach is empty, the acid erodes the upper stomach lining (the non glandular region - which is not protected against the acid) and results in painful ulcers.

Marketing of branded feeds and



supplements have turned our attention away from the food source horses evolved on - roughage. It is concerning that some owners consider roughage as a gut filler, a 'side salad' or an optional extra. This is not the case. Roughage is an excellent source of carbohydrates and protein. High performance horses, can thrive on 100% roughage diets. Horses that require high energy diets should be fed high quality roughage sources. The grass species is less important than stage of growth. Leafy immature roughage is highly digestible and contains more protein and is recommended for horses in hard work, lactating mares and growing horses. Low quality roughage (mature grass, lower leaf to stem ratio) is acceptable for many horses in light work or breeds that are known to be good doers. Roughage should be provided ad lib to prevent conditions such as colic, acidosis and ulcers. The vitamin and mineral content in roughage is variable therefore it is recommended to add a broad spectrum supplement to top up any deficiencies and to rebalance the diet.

### Over Supplementation

Over supplementation is the result of adding incompatible feeds and/or supplements where overlaps occur resulting in excessive intake of one or more nutrients. Over supplementation results in a higher feed bill but also negatively impacts health, wellbeing and/or performance.

Table 1 shows how each nutrient can be provided through a variety of products including a commercial stud mix, roughage, chaff, pasture,

cereal grains, oil, protein meal and a variety of supplements.

As table 1 illustrates by adding a supplement to the stud mix can result in over supplementation as the ingredients are duplicated. This table also shows the overlap of ingredients in supplements that target specific areas of the horse. The inherent weakness of products with fixed nutrient ratios means that feeding the recommended quantity a horse may receive an over or undersupply of nutrients, adjusting the feeding ration to suit one nutrient will adjust the intake of the other nutrients. Incorrect levels of protein, excess starch, type of energy source, inadequate minerals and vitamins can lead to various illnesses, costly medical expenses and an unnecessarily high feed bill. The alternative to a stud mix is to provide a meal of straights with a supplement like Equilibrium or LexveT. This allows complete customisation of each horses feed giving managers better control over the diet. As Table 1 illustrates roughage provides all groups of nutrients, cereal grains can be used to top up carbohydrates, oil is used to provide extra fat, soybean meal tops up protein, Equilibrium and LexveT provides a broad range of macro and trace minerals as well as selected vitamins. When horses are fed a roughage based diet with minimal concentrates they are able to produce their own B group vitamins, Vitamin K and Vitamin C.

## FEEDING FOR COMMERCIAL SUCCESS

### The Six Nutrients

There are six nutrients that all horses require:

1. Water
2. Carbohydrate
3. Fibre
4. Fat
5. Minerals
6. Vitamins

The quantities of these nutrients that horses require depend on a

horses size and workload.

An entire stud, including broodmares, stallions, growing horses and performance horses can be supplied with the six nutrients with just five core ingredients and products:

1. Roughage - Hay, pasture and chaff
2. Carbohydrate concentrate
3. Fat concentrate
4. Protein concentrate
5. Broad spectrum mineral and vitamin supplement

Table 2 indicates the common horse ingredients available, the advantages and disadvantages.

### Roughage

Roughage should form the basis of all horses diets. Pasture is generally the most economical source, but when pasture is lacking adlib hay should be fed. Chaff is required when feeding energy or protein concentrates to slow digestion through the gut.

The type of hay and chaff can vary depending on season and local availability. Lucerne (Alfalfa) is more energy and protein dense and can make up to half of the roughage portion of the diet. Lucerne (Alfalfa) is useful for performance, lactating and growing horses. Grass and cereal hay should comprise 50% - 100% of the roughage portion of the diet. Overall a horse consumes 2 - 2.5% of their bodyweight per day (10 - 12.5kg / 500kg horse) It is generally recommended at least 50% of the diet should be comprised of roughage. Given the increased risk of ulcers, tying up, colic and acidosis for horses on low roughage / high concentrate diets we recommend horses are fed at least 75% roughage diets and all owners should work towards 100% roughage diets.

### Carbohydrate Concentrate

Table 2 lists the advantages and disadvantages of various concentrates. These include oats, barley, corn, maize, bran, sugar beet pulp and molasses. Each has their pro's and con's. Most



Harley Before



Harley After

The before and after photos of Harley illustrate how just 70g of Equilibrium (LexveT) Mineral Mix can improve the overall look of a horse. Whilst Harley's owner was feeding him with ablib roughage and supplementation in the before photo, in the after photo the only change was swapping the supplement to Equilibrium (LexveT) Mineral Mix. Overall comments of the

before photo are negative from the public with many people believing he was not fed properly. Whilst this wasn't the case, it doesn't stop people making their judgements based on how a horse looks. This then negatively impacts brand image.

Table 1

	Commercial Stud Mix	Combination of straights satisfying requirements					Targeted Supplementation					
		Roughage, Chaff, Pasture	Cereal Grain	Oil	Full Fat Soybean Meal	Equilibrium and LexveT	Horse produces	Calmer	Blood Building	Hoof	Electrolyte	
<b>Carbohydrate</b>	✓	✓	✓									
<b>Fats &amp; Oils</b>	✓	✓	Limited	✓	✓							
<b>Protein (Amino Acids)</b>	✓	✓	Limited		✓					✓	✓	
<b>Minerals</b>												
Calcium	✓	Variable depending on weather conditions, stage of growth, soil content, pasture type etc.	Imbalanced Ca:P ratio			✓					✓	
Phosphorus	✓					✓			✓			✓
Magnesium	✓			Limited considering quantities required to reach recommended dietary intake			✓	✓		✓		✓
Sodium	✓						✓					✓
Chloride	✓						✓					✓
Potassium	✓						✓					✓
Iron	✓						✓			✓		
Manganese	✓						✓					
Zinc	✓						✓	✓		✓		✓
Copper	✓						✓					
Selenium	✓						✓					
Cobalt	✓						✓					
Iodine	✓					✓						
<b>Vitamins</b>												
Vitamin A	✓	↑ when green				✓						
Vitamin E	✓					✓	✓				✓	
Folic Acid	✓	Variable				✓	✓		✓		✓	
Vitamin B1	✓					✓	✓	✓			✓	
Vitamin B2	✓						✓	✓			✓	
Vitamin B6	✓						✓	✓			✓	
Vitamin B7 (biotin)	✓						✓			✓		
Vitamin B12	✓						✓		✓		✓	
Vitamin D	✓	✓ sun-cured forage					✓					
Vitamin K							✓					
Vitamin C							✓					

As you can see a commercial stud mix ticks all the boxes in regards to nutrients. Where these products are not suitable is that it has a fixed energy to protein to vitamin and mineral ratio. This means feeding less than the recommended daily dosage will reduce energy, protein, vitamin and mineral intake. Whilst it may be desirable to lower energy intake it is not desirable to reduce vitamin and mineral intake. At the same time a growing horse is unlikely to require energy concentrates but is likely to require protein concentrates. By separating these nutrients in the ration the feed can then be customised to ensure all requirements are satisfied without over or under dosing in other nutrients.

**TABLE 2 - Common Feeds Explained**

	Product	DE (MJ/kg)	NSC %	Protein %	Advantages	Disadvantages	General	Feed Guidelines
<b>Roughage</b>	Alfalfa	11	av. 9.72 WSC max 10.3	21.25	• Good quality protein and energy source	• Excess can reduce performance and cause enteroliths.	<ul style="list-style-type: none"> <li>• Available as hay</li> <li>• Alfalfa chaff known as green chaff, oaten and wheaten known as white chaff.</li> <li>• Hay Quality - Look for high leaf content, soft to touch, minimal dust, fresh clean smell. Avoid musty smelling hay.</li> </ul>	<ul style="list-style-type: none"> <li>• Alfalfa can comprise up to 50% of the diet, remaining roughage component made up of cereal or grass roughage sources</li> <li>• Always aim for 100% roughage, 75% is realistic goal, absolute minimum 50%</li> <li>• Hard feed to comprise of at least 2 parts chaff to 1 part concentrate.</li> <li>• If ammonia smelling urine or white lathery sweat reduce alfalfa and increase cereal/grass component</li> </ul>
	Oaten	8.3	av. 22.1 WSC max 24.8	8.29	• High fibre low starch	<ul style="list-style-type: none"> <li>• Non Structural Carbohydrate (NSC) highly variable, Water Soluble Content (WSC) main variation due to changes in growing, cutting and storage conditions.</li> </ul>		
	Wheaten	8.6	av. 17.6 WSC max 23.9	10.53	• Good Ca:P balance			
	Barley	8.7	av. 19.1 WSC max 23.6	9.97	• Feeding adlib assists in maintaining proper digestive function			
	Millet	8.4	av. 9.82 WSC max 13.4	11.08				
	Grass Hay	8.4	av. 12.8 WSC max 16.1	10.79				
	Pasture (fresh)	9.4	av. 13.1 WSC max 15.6	15.35				

**If roughage is not providing sufficient energy, choose ONE fat concentrate AND/OR ONE carbohydrate concentrate**

	Product	DE (MJ/kg)	Starch Av %	Starch Max %	Advantages	Disadvantages	General	Feed Guidelines
<b>Fat</b>	<b>Oil</b>							
	Vegetable Oil Eg. Linseed Corn, Soy, Sunflower	38	NIL		<ul style="list-style-type: none"> <li>• Low GI, good digestibility</li> <li>• Energy without fizz</li> </ul>	<ul style="list-style-type: none"> <li>• Palatability - introduce slowly to find maximum horse will tolerate.</li> </ul>	<ul style="list-style-type: none"> <li>• Corn oil considered most palatable</li> </ul>	<ul style="list-style-type: none"> <li>• Total oil content 1g/kg of body weight</li> <li>• Underweight horses can have oil gradually increased up to 2 cups per day. eg 500g for 500kg horse.</li> </ul>
Fish Oil	38	NIL		<ul style="list-style-type: none"> <li>• Good Omega 3 : 6 ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive</li> </ul>	<ul style="list-style-type: none"> <li>• Pasture has good omega ratio, cereals imbalance ratio.</li> </ul>		
<b>Carbohydrate Concentrates</b>	<b>Cereal Grains</b>							
	Oats	14	43.7	53	<ul style="list-style-type: none"> <li>• Considered most palatable</li> </ul>	<ul style="list-style-type: none"> <li>• ↑ intake causes LI disturbance resulting in tying up, colic, acidosis or laminitis</li> <li>• Poor Ca:P ratio</li> <li>• Untreated corn &amp; barley have poor SI digestibility.</li> </ul>	<ul style="list-style-type: none"> <li>• Oats are most palatable and can be fed whole</li> <li>• Feed extruded or micronised barley or micronised maize to overcome poor SI digestibility</li> </ul>	<ul style="list-style-type: none"> <li>• 500kg horse fed no other cereal grain, coarse mix or pellet. Feed up to 1kg p/day.</li> <li>• If feeding more than 500g of Barley or Maize per day then split into at least two feeds.</li> </ul>
	Barley	15.3	54.4	63	<ul style="list-style-type: none"> <li>• ↑ energy than oats</li> </ul>			
	Maize (Corn)	16.2	69.5	78	<ul style="list-style-type: none"> <li>• ↑ energy than oats and barley</li> </ul>			
	<b>Cereal by-product Bran</b>	13.3	21.2	34	<ul style="list-style-type: none"> <li>• Appetite stimulant</li> </ul>	<ul style="list-style-type: none"> <li>• Poor Ca:P ratio</li> <li>• 'bran' disease</li> </ul>	<ul style="list-style-type: none"> <li>• Low nutritive value</li> </ul>	<ul style="list-style-type: none"> <li>• Can feed up to 1kgp/day</li> </ul>
	<b>Fibrous by-product Sugar beet pulp</b>	13	1.05	3	<ul style="list-style-type: none"> <li>• Good Ca:P ratio</li> <li>• Excellent for topping up energy levels without the fizz</li> </ul>	<ul style="list-style-type: none"> <li>• Can cause choke and stomach distension if not properly soaked prior to feeding</li> </ul>	<ul style="list-style-type: none"> <li>• Available as molassed or unmolassed</li> <li>• Very low risk of LI digestive disturbance</li> </ul>	<ul style="list-style-type: none"> <li>• Follow manufacturers directions. Use to top up energy in ration, do not use as forage replacer</li> </ul>
<b>Molasses</b>	9.5	Negligible		<ul style="list-style-type: none"> <li>• Reduces dust</li> <li>• ↑ palatability</li> <li>• Binds feed</li> </ul>	<ul style="list-style-type: none"> <li>• Unsuitable for laminitis, EMS, PSSM</li> </ul>	<ul style="list-style-type: none"> <li>• Residue following sugar extraction</li> </ul>	<ul style="list-style-type: none"> <li>• Feed minimal to increase palatability or as a treat</li> </ul>	

**If roughage is not providing sufficient protein, choose ONE protein concentrate**

	Product	Protein %	Amino Acids %	DE (MJ/kg)	Advantages	Disadvantages	General	Feed Guidelines	
<b>Protein</b>	<b>Oil By-product</b>								
	Full-fat soybean Meal	38	2.3 lys 0.5 met	20	<ul style="list-style-type: none"> <li>• ↑ quality means ↓ feeding rate</li> </ul>	<ul style="list-style-type: none"> <li>• Excess can reduce performance.</li> </ul>	<ul style="list-style-type: none"> <li>• By-product from extraction of oil from soybean</li> </ul>	<ul style="list-style-type: none"> <li>• 1-2 cups p/day lactating mares, growing horses and horses lacking topline</li> </ul>	
	Copra Meal	20	0.5 lys 0.36 met	15	<ul style="list-style-type: none"> <li>• If fed correctly unlikely to cause LI issues</li> </ul>	<ul style="list-style-type: none"> <li>• To achieve required lysine intake may cause oversupply of protein</li> </ul>	<ul style="list-style-type: none"> <li>• By-product from extraction of oil from coconut</li> </ul>	<ul style="list-style-type: none"> <li>• up to 2kg p/day for 500kg horse</li> </ul>	
	<b>Legume</b>	Lupins	30	1.4 lys 0.22met	15.5	<ul style="list-style-type: none"> <li>• ↑ palatable</li> </ul>	<ul style="list-style-type: none"> <li>• ↓ lysine &amp; methionine</li> </ul>		<ul style="list-style-type: none"> <li>• up to 1kg p/day for 500kg horse</li> </ul>
	Tick Beans	23	1.7 lys 0.2 met	12		<ul style="list-style-type: none"> <li>• ↓ lysine &amp; methionine</li> </ul>	<ul style="list-style-type: none"> <li>• aka Faba, Horse or Broad beans</li> </ul>	<ul style="list-style-type: none"> <li>• Not recommended due to better options being available for protein quality with lower feeding rates</li> </ul>	
Sunflower Seeds	15	0.6 lys 0.4 met	16		<ul style="list-style-type: none"> <li>• Very ↓ lysine</li> </ul>				

**Abbreviations:**

DE (MJ/kg) Digestible Energy (Megajoules per kilogram of dry weight)    NSC Non Structural Carbohydrate    WSC Water Soluble Carbohydrate  
 SI Small Intestine    LI Large Intestine    BW Body Weight    Ca Calcium    P Phosphorus    GI Glycemic Index concentrates  
 ↑ high    ↓ low    lys lysine (first limiting essential amino acid)    met methionine (essential amino acid)

growing horses, spelling horses and broodmares in foal won't need carbohydrate concentrates. Horses that may require carbohydrate concentrates include horses in hard work, lactating broodmares and veterans.

### **Fat Concentrate**

This can be provided in the form of vegetable and/or fish oils (see Table 2). A maximum of 1g per kg of body weight per day (eg 500g for 500kg horse). Oil is an excellent way to increase energy in the diet without causing digestive problems. An oversupply of energy will result in an increase of fat cover which may be desirable.

### **Protein Concentrate**

Lucerne / Alfalfa is an excellent roughage source and also doubles as a good quality protein source. Horses in work will receive sufficient protein by incorporating lucerne / Alfalfa in their feeding program. Lactating broodmares and growing horses have higher protein demands and adding 0.5 - 1g of full fat soy bean meal per kg of mature body weight is beneficial (250 - 500g for a 500kg horse).

### **Broad Spectrum Supplement**

Equilibrium and LexveT supplements contain a broad range of macro minerals, trace minerals, vitamins and salts. The dosage varies according to size and workload. It is recommended for broodmares in foal, lactating mares, growing horses, stallions, performance and pleasure horses and veterans.

### **Customised Feeding Programs**

Equilibrium Australia and LexveT International offers a free nutrition consultation service where we can assist studs and managers in formulating feeding programs taking into account readily available and economical feeds in your area. Our goal is to educate managers so that they can make informed feeding choices and can be confident that their feeding program is achieving optimal health and performance whilst managing the all important

profit margin.

## **WHAT IS EQUILIBRIUM/ LEXVET?**

Our supplements were developed by Dr Lex Wills BVSC MACVSc. Equilibrium Australia is made up of a passionate team of people that strive to cut through the marketing hype and present the factual information so that owners and trainers can make informed decisions. If there is one idea we want you to take away from this brochure, it is that a horses mental and physical health and wellbeing goes hand in hand with the commercial viability and profits of your business. If you don't have one you won't have the other.

## **Our Company**

In Australasia we market under the brand Equilibrium and in Europe and North America it is marketed under the brand LexveT. Our head office is located in Brisbane with our overseas offices located in Auckland, NZ and Newbury, UK. All manufacturing of Equilibrium branded and LexveT branded products takes place in our manufacturing facility in Brisbane and is distributed from there. As a family owned business we continually strive to provide a quality and economical product to tens of thousands of horses each year and are proud to help you improve your horses' health and performance.

Our in house manufacturing facility means no cross contamination with feeds or supplements of other species. Our manufacturing facility has a Quality Control System and every batch is sampled and checked by a Quality Assurance Manager. Where possible we source locally produced raw materials, often with a premium price tag, however we value the quality and consistency of the raw material. When it comes to what goes in the product we do not compromise.

## **Pricing**

The cost of a product depends on many factors including research and development, raw material costs, overheads, marketing etc. Equilibrium Australia was established after much product development. Once our products were released onto the market we quickly gained momentum and our high turnover results in a competitively priced product.

## **Unique**

One of our most unique qualities is that there is only a need for two product lines. Equilibrium / LexveT Mineral Mix is a broad spectrum supplement that contains macro and trace minerals, vitamins and salt. Equilibrium / LexveT Mineral Mix is recommended for all horses. Equilibrium / LexveT B1 Cool Mix has higher levels Magnesium and Vitamin B1 which are both involved in the nervous system. Equilibrium / LexveT B1 Cool Mix is recommended for nervous, fizzy or excitable horses.

## **Availability**

### **AUSTRALIA**

Stocked in over 500 stores Australia wide. Bulk discounts available with your local feed store carrying your account as normal. Contact [sales@equiaustralia.com.au](mailto:sales@equiaustralia.com.au) for more information.

### **NEW ZEALAND**

Stocked in PGG, Farmlands and SRD1 stores in addition to quality independent produce stores and saddleries

### **UNITED KINGDOM**

Visit [www.lexvetsupplements.com](http://www.lexvetsupplements.com) for a list of stockists of to purchase direct for LexveT online.

### **EUROPE, IRELAND (INC NORTHERN IRELAND)**

Visit [www.lexvetsupplements.com](http://www.lexvetsupplements.com) for a list distributor and stockist.

