LIVAMOL® FEED OPTIMISER™ PELLETS

Vitamins, Minerals (Organic Trace, Macro & Electrolyte), Amino Acids, Anti-Oxidants, Omega 3 and 6 Fatty Acids, Glucosamine with Advanced Gut Health

Now with Pro(N8)ure®
See page 17

*The **science** of horse feed made easy, build YOUR own!*

Feeding Made Simple

Simple THE FOUR STEP PLAN...

1. ROUGHAGE,
such as chaff, hay and pasture

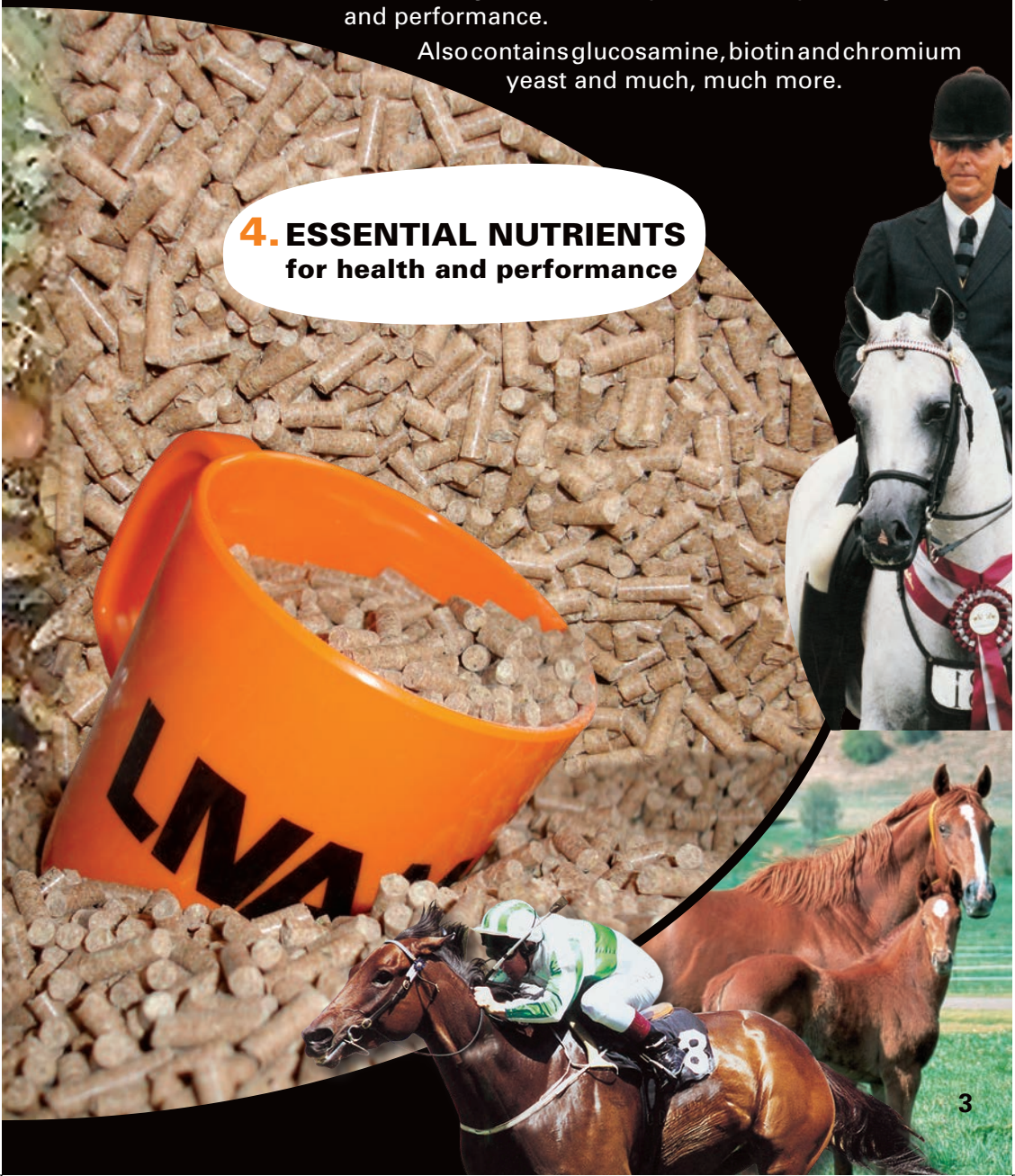
2. An ENERGY source
such as grain or a non-grain alternative

3. High quality PROTEIN
for topline and coat condition

LIVAMOL FEED OPTIMISER Pellets

Scientifically formulated for Australian conditions and fortified with essential vitamins, minerals (including organic trace, macro & electrolyte), amino acids, omega 3 and 6 fatty acids for optimal growth and performance.

Also contains glucosamine, biotin and chromium yeast and much, much more.



4. ESSENTIAL NUTRIENTS
for health and performance

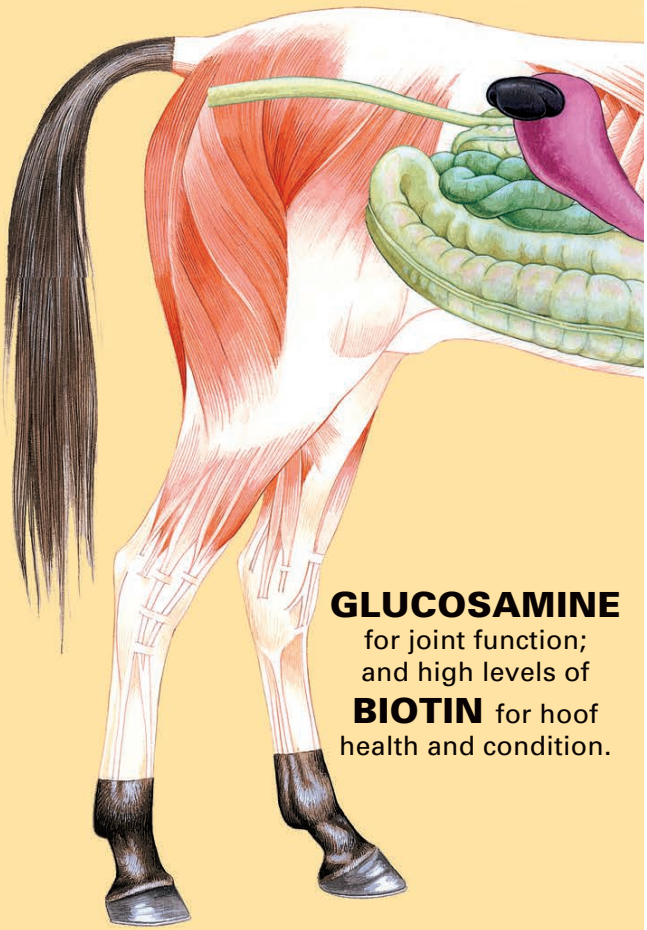
Introducing

LIVAMOL®

FEED OPTIMISER™ PELLETS FOR HORSES

High quality **PROTEIN**
fortified with essential **AMINO ACIDS**
for growth and physical activity.

CHROMIUM YEAST
to assist in maintaining normal blood sugar levels and improving digestion and physical condition; and
TRIMETHYLGLYCINE
to assist in lactate metabolism.

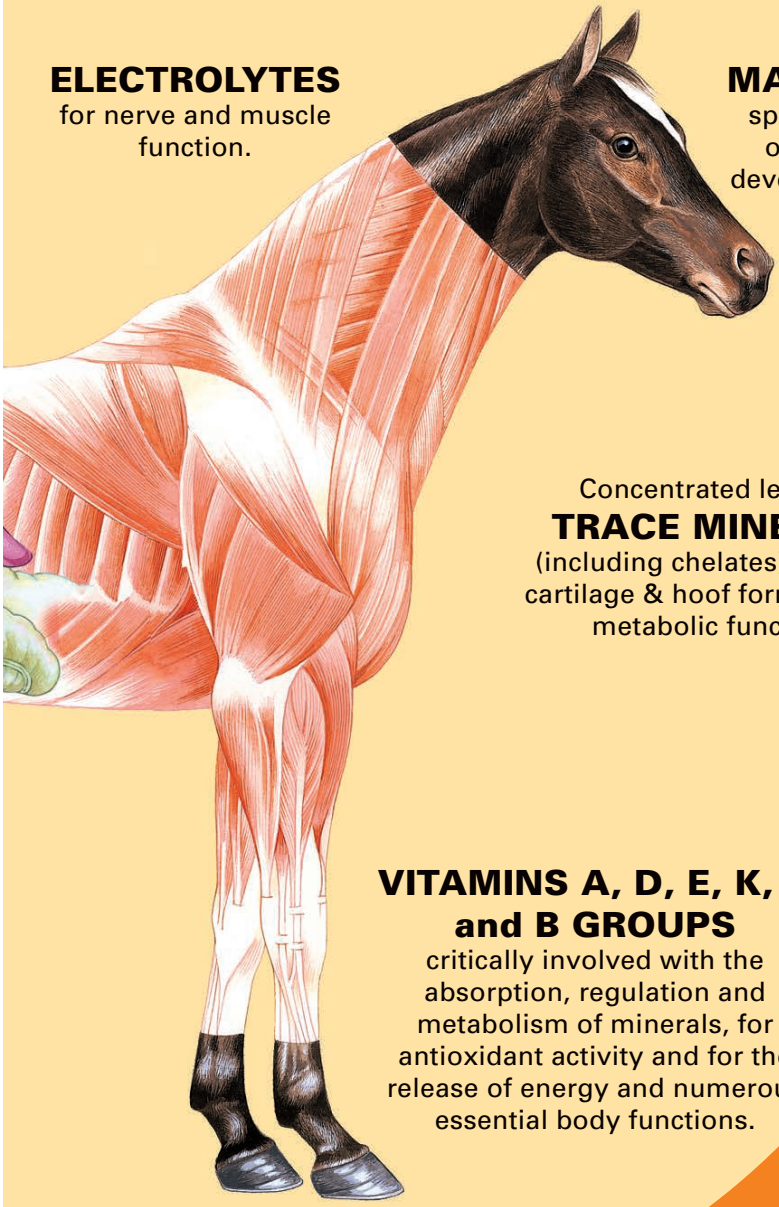


GLUCOSAMINE
for joint function;
and high levels of
BIOTIN for hoof health and condition.

PREMIUM NUTRITION FOR OPTIMAL HORSE HEALTH, GROWTH AND PERFORMANCE

ELECTROLYTES
for nerve and muscle function.

MAJOR MINERALS
specifically balanced for optimal bone growth, development and strength.



Concentrated levels of
TRACE MINERALS
(including chelates) for bone, cartilage & hoof formation and metabolic functions.

VITAMINS A, D, E, K, C and B GROUPS
critically involved with the absorption, regulation and metabolism of minerals, for antioxidant activity and for the release of energy and numerous essential body functions.

Bone Strength and Development

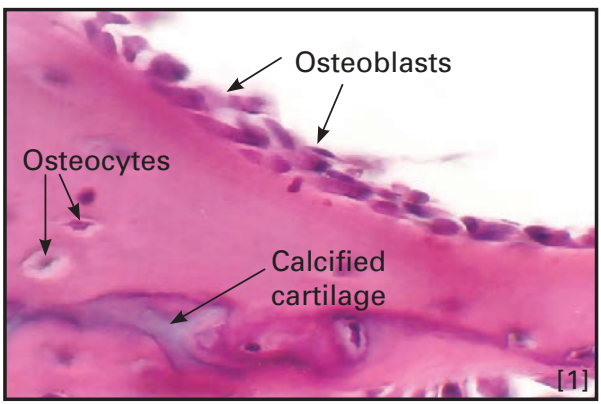
"MODELLING" STRONG BONES

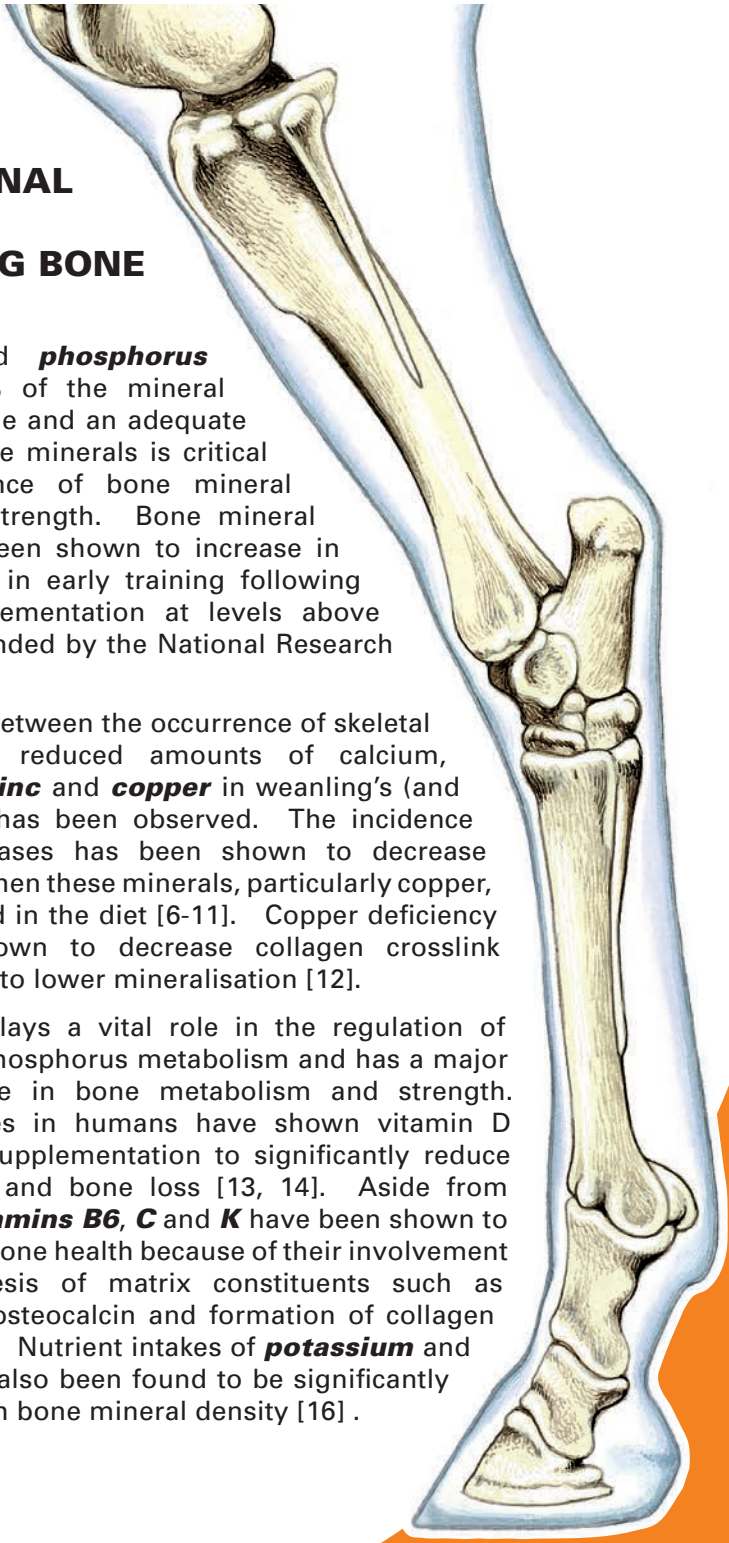
Bone is a dynamic tissue that is constantly undergoing change in an attempt to maximise its strength in the face of changing demands. The basic structure of the bone includes osteoblast cells which direct the hardening of the bone and osteoclasts which break down and reabsorb bone.

Bone modelling is the term given to the growth (lengthwise) and shaping of bones. This process allows bone to maintain its shape and proportions as it grows. More than 5% of total bone mass is "turned over" each year by the process of remodelling.

The relative balance of activity by osteoblasts and osteoclasts will govern whether there is a net gain or loss in bone mass – i.e. whether there is a balance in bone modelling/remodelling. Imbalances in bone modelling/remodelling may result in ***chip fractures***, ***shin soreness*** and ***stress fractures***.

Bone mineral content (which is a measure of the amount of mineral in a bone) is an important determinant of bone strength during the development phase of an animals life [2, 3]. In rapidly growing horses, bone development and maturity may fail to keep pace with overall growth, thereby generating excess physical load and predisposing bone to deformity and fragility.





NUTRITIONAL FACTORS AFFECTING BONE HEALTH

Calcium and ***phosphorus*** comprise 70% of the mineral content of bone and an adequate supply of these minerals is critical for maintenance of bone mineral content and strength. Bone mineral content has been shown to increase in young horses in early training following calcium supplementation at levels above that recommended by the National Research Council [4, 5].

A correlation between the occurrence of skeletal diseases and reduced amounts of calcium, phosphorus, ***zinc*** and ***copper*** in weanling's (and mare's) diets has been observed. The incidence of these diseases has been shown to decrease significantly when these minerals, particularly copper, were increased in the diet [6-11]. Copper deficiency has been shown to decrease collagen crosslink formation and to lower mineralisation [12].

Vitamin D plays a vital role in the regulation of calcium and phosphorus metabolism and has a major regulatory role in bone metabolism and strength. Several studies in humans have shown vitamin D and calcium supplementation to significantly reduce fracture rates and bone loss [13, 14]. Aside from vitamin D, ***vitamins B6***, ***C*** and ***K*** have been shown to be integral to bone health because of their involvement in the synthesis of matrix constituents such as collagen and osteocalcin and formation of collagen crosslinks [15]. Nutrient intakes of ***potassium*** and ***protein*** have also been found to be significantly associated with bone mineral density [16] .

Muscle Growth, Development & Recovery

THE IMPORTANCE OF PROTEIN & AMINO ACIDS

Both the amount of protein and its quality, or amino acid content are important for ***growth***, ***reproduction***, ***lactation*** and ***performance***.

Different types of proteins consist of different combinations and numbers of amino acids. Proteins composed of a high proportion of "essential" amino acids (i.e. need to be supplied in the feed) are referred to as ***high-quality proteins***. The essential amino acids in horse diets include lysine, methionine, threonine, arginine, histidine, isoleucine, leucine, phenylalanine, tryptophan and valine.

Both the amount of protein and its quality, or amino acid content are important for growth, breeding and performance.

- A greater amount of the essential amino acid lysine is needed by the young horse for growth than is available from microorganisms in its intestinal tract and than is present in many feeds.
- Methionine is also present in low quantities in cereal grains.
- If the forage consumed is grass, intake of the amino acid threonine may be marginal.
- Athletic horses may require additional protein due to increased muscle development and mass with increased physical condition and nitrogen lost in sweat.
- If feeds are offered which do not contain adequate lysine, growth rate and feed efficiency will be reduced.

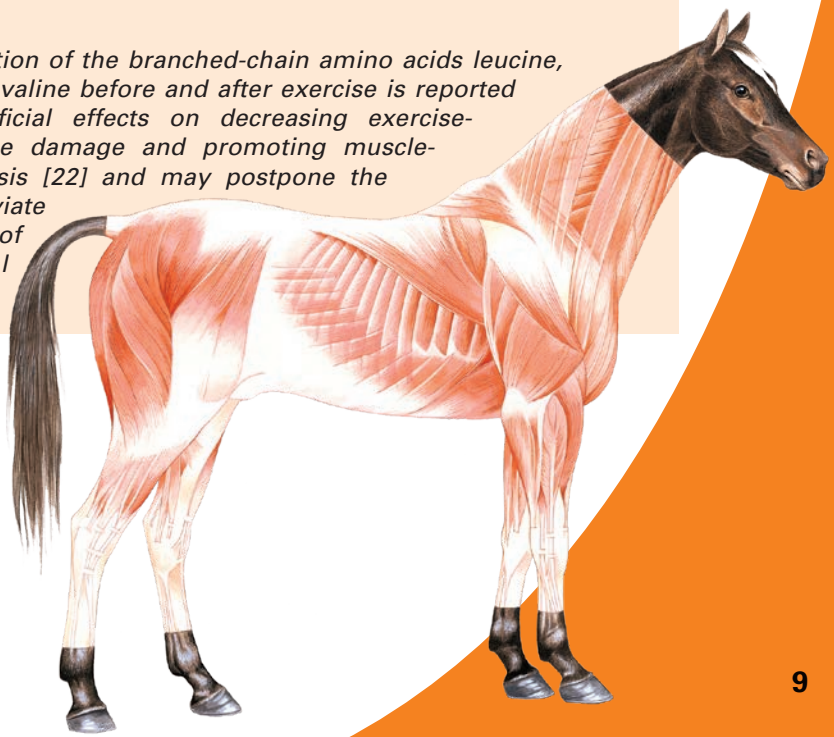
PROTEIN QUALITY NOT QUANTITY

Feeds high in protein (e.g. soyabean meal) are generally expensive, so the key is to design a diet that provides required levels of amino acids for optimal growth and performance while minimising excess "crude" protein. This may be achieved by supplying a small but concentrated protein source such as **LIVAMOL FEED OPTIMISER** which is fortified with essential amino acids commonly low in horse feed sources.

• Supplementation of lysine has been reported to improve average daily gain in growing horses [17, 18]. Other researchers have demonstrated improvements in growth in yearlings [19, 20] and a reduction in muscle mass loss in adult horses following supplementation with lysine and threonine.

• In one study, mares fed high quality protein containing lysine and methionine prior to and following foaling produced milk with higher protein content during the first month of foaling compared to mares who were not on the supplemented feed. Foals born from these supplemented mares also had significantly higher growth rates during the first 7 weeks of life compared to foals born from unsupplemented mares [21].

• Supplementation of the branched-chain amino acids leucine, isoleucine and valine before and after exercise is reported to have beneficial effects on decreasing exercise-induced muscle damage and promoting muscle-protein synthesis [22] and may postpone the onset or alleviate the severity of post-exertional myopathy [23].

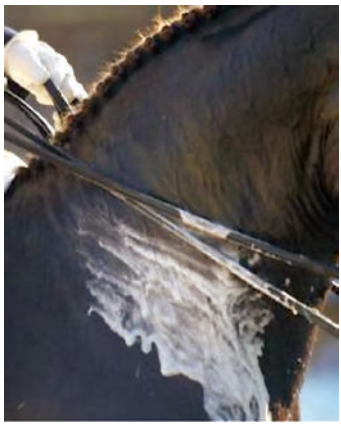


Optimal Health

Performance

ELECTROLYTE BALANCE

The key electrolytes ***sodium***, ***potassium*** and ***chloride*** are included in **LIVAMOL FEED OPTIMISER** to assist in maintaining and restoring normal electrolyte balance in body tissues. These minerals are also critically involved in normal nerve and muscle function and carbohydrate digestion and are often low in equine rations.



FATTY ACIDS

Dietary fats and oils are well utilised by horses and have a range of beneficial effects on health and performance. These include improving glucose tolerance which may decrease colic, tying up and laminitis risks, and the promotion of intramuscular and hepatic fat metabolism, ultimately increasing performance. Each oil or fat has a blend of different fatty acids (Omega-3, Omega-6) in its triglyceride content and a correct ratio of these is essential. The high quality protein meals used in **LIVAMOL FEED OPTIMISER** have been selected to provide an appropriate ratio of both of these fatty acids allowing for improved function and strength of blood vessels and body cells while also promoting a noticeable coat conditioning effect.

ENERGY PRODUCTION

In a review of over 300 equestrian rations, over 60% were found to be low in at least one B group vitamin [24]. This is because natural forms of B Group Vitamins are generally low in diets consisting mostly of dried hay, chaff and grains. In light of this research, **LIVAMOL FEED OPTIMISER** provides a concentrated source of the ***"Vitamin B Complex"*** i.e. thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folic acid and cyanocobalamin. In combination, these vitamins may help to:

- ✓ Support and increase the rate of metabolism;
- ✓ Maintain healthy skin and muscle tone;
- ✓ Enhance the immune and nervous system;
- ✓ Improve red blood cell counts and reduce the risk of anaemia.

All B Group Vitamins are water soluble and must therefore be replenished daily.

ANTI-OXIDANTS PROTECTING OF CELLS FROM DAMAGE

Vitamin E is an essential fat soluble vitamin essential for optimum function of the reproductive, muscular, circulatory, nervous and immune systems. Working hand-in-hand with ***Vitamin C*** and ***Selenium***, these nutrients are a critical part of the cellular antioxidant defense mechanism , battling harmful free radicals by reducing their activity.

Joint health

GLUCOSAMINE: Joint function

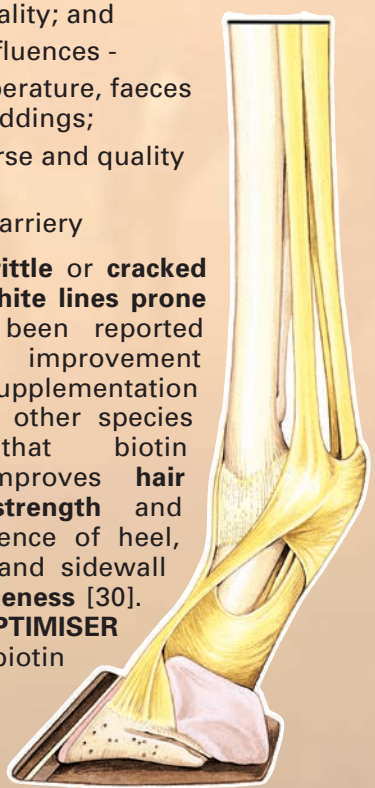
Oral glucosamine is commonly used for the treatment of **osteoarthritis**. Supplemental glucosamine may help to rebuild cartilage and treat arthritis with studies indicating beneficial effects on pain and functional impairment. Laboratory work has established that glucosamine can prevent cartilage degradation [25,26] providing support for the use of glucosamine in the **treatment or prevention of cartilage loss** in athletic horses.

Hoof condition

BIOTIN: Hoof condition

There are three main influences on the condition of the horses hoof:

1. Genetics - Influence on horn production, horn quality and hoof form;
2. Nutrition - Influence on horn production and hoof horn quality; and
3. Environmental influences -
   - **a.** Humidity, temperature, faeces and urine in beddings;
   - **b.** Work of the horse and quality of the soil;
   - **c.** Hoof care and farriery



Digestion & Insulin Function

Horses with **thin, brittle** or **cracked hooves** and **open white lines prone to infection** have been reported to display marked improvement following biotin supplementation [27-29]. Studies in other species have shown that biotin supplementation improves **hair coat** and **hoof strength** and decreases the incidence of heel, heel-horn junction, and sidewall horn **cracks** and **lameness** [30]. **LIVAMOL FEED OPTIMISER** provides 7.5mg of biotin per 500g dose.

CHROMIUM YEAST:

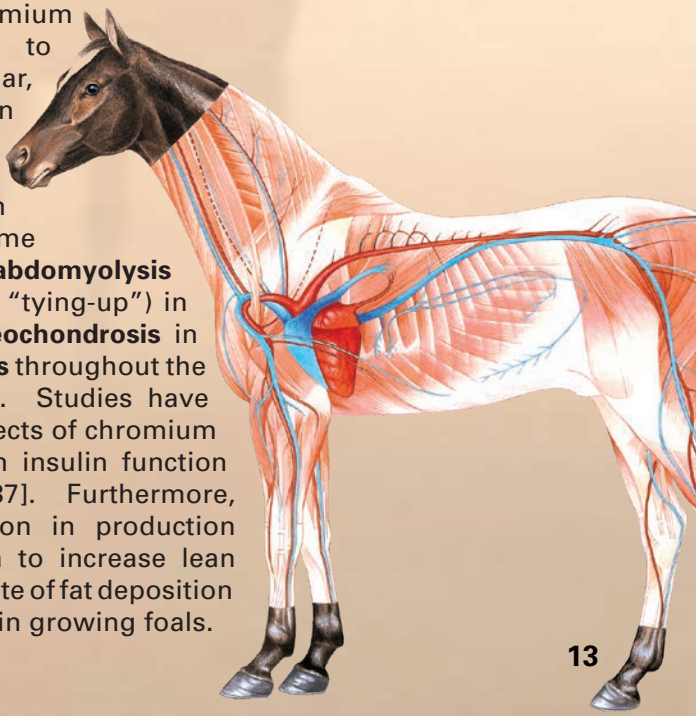
• Digestion

The chromium yeast product used in **LIVAMOL FEED OPTIMISER** is produced from a pure live yeast culture *Saccharomyces cerevisiae*. Supplementation of live yeast preparations has been shown to have several benefits in both performance horses and horses at stud:

- ✓ Reduced caecal **lactic acid** and ammonia concentrations [31];
- ✓ Decreased concentrations of "nasty" **bacteria** in the equine colon [31];
- ✓ Improved **blood parameters** of performance horses [32];
- ✓ Lowered post-exercise **plasma lactate** concentrations [33];
- ✓ Improved **feed efficiency** and **growth** in foals [34-35];
- ✓ Improved milk production and quality in mares [35].

• Insulin function & glucose uptake

The trace element chromium is a central part of Glucose Tolerance Factor (GTF) which improves glucose tolerance and insulin efficacy. It is theorised that chromium enriched yeast helps to normalise blood sugar, potentiating the action of insulin. Changes in insulin sensitivity are associated with certain diseases including some forms of **exertional rhabdomyolysis** (commonly referred to as "tying-up") in performance horses, **osteochondrosis** in growing foals and **laminitis** throughout the general horse population. Studies have demonstrated positive effects of chromium yeast supplementation on insulin function and glucose uptake [36,37]. Furthermore, chromium supplementation in production animals has been shown to increase lean muscle and decrease the rate of fat deposition [38-39] which is desirable in growing foals.



Nutritional Analysis

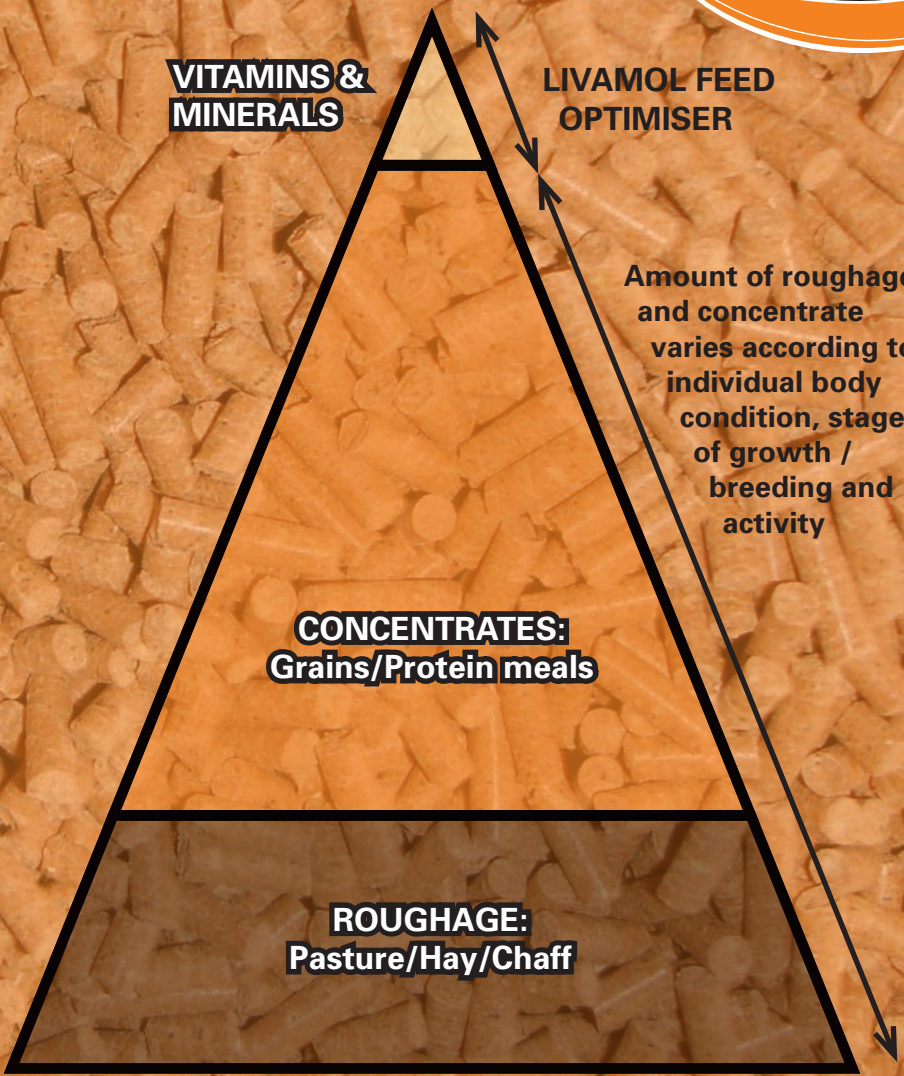
As Fed	%	Min.	Max.
Minimum Crude Protein	20%		
Minimum Crude Fat	8%		
Moisture	7%		
Acid Detergent Fibre (ADF)	8%		
Neutral Detergent Fibre (NDF)	16%		
Starch	1.9%		
Calcium (Ca)		3%	4%
Phosphorus (P)		2%	3%
Salt	6%		
Average Digestible Energy	8 MJ/kg		

Vitamins	Per kg
Vitamin A	40000 IU
Vitamin D3	5000 IU
Vitamin E	1000 IU
Vitamin K	10 mg
Vitamin B1	40 mg
Vitamin B2	60 mg
Vitamin B6	30 mg
Vitamin B12	120 µg
Vitamin C	5 g
Folic acid	20 mg
Biotin	15 mg
Pantothenate	60 mg
Niacin	120 mg
Amino Acids	**Per kg**
Amino acid Lysine	20 g
Amino acid Methionine	3 g
Amino acid Threonine	6 g
Amino acid Trimethylglycine	2 g

Minerals	g/kg
Calcium	30
Phosphorus	20
Magnesium	15
Potassium	20
Sodium	25
Chloride	54
Sulfur	10
Trace Minerals	**mg/kg**
Iron	500
Zinc	600
Copper	350
Manganese	500
Iodine	5
Cobalt	1
Selenium	2.5
Chromium	10

ALSO CONTAINS
- **Chromium yeast,**
- **Mannan Oligosaccharides**
- **Glucosamine**

Creating the dietary balance



Feeding Program Examples using Livamol Feed Optimiser Pellets

Racing, Breeding, and Equestrian Rations

RACEHORSES (per day)

	Early training	Full work	Spelling/ Pretraining
Chaff	1kg	1kg	1kg
Oats*	3.5kg	5kg	1 - 2kg
Corn*	750g	1kg	
Barley*			1 - 3kg
LIVAMOL	2 cups	2 cups	2 cups
FEED OPTIMISER	2 - 3 cups	3 cups	2 cups
Vegetable oil	1 cup	2 cups	1 - 2 cups
Hay	Ad lib	Ad lib	Ad lib

EQUESTRIAN RATIONS (per day)

	Mostly Resting	Light work	Moderate work	Heavy work
Chaff	1kg	1kg	1kg	1kg
Barley*	500g	1kg	2 - 3kg	2 - 4kg
LIVAMOL	1 cup	2 cups	2 cups	2 cups
FEED OPTIMISER	2 cups	2 cups	2 cups	2 cups
Vegetable oil		½ cup	½ - 1 cup	1 - 2 cups
Pasture/Hay	Ad lib	Ad lib	Ad lib	Ad lib

Additional daily supplementation is advised for horses in work:

✓ 1 - 2 scoops (45 - 90g) Electromix Electrolytes and Sweat

✓ 1 - 2 scoops (30 - 60g) Vitam Health & Vitality OR Vitam Plus Health & Vitality

Please be advised feeding rates are intended as a guide only and may need to be altered according to individual horse body condition, requirements and the environment.

** An alternative energy source may be used.*
Please contact IAH Sales or visit our website **www.iahp.com.au** *for individual dietary advice or for the formulation of diets for horses sensitive to grain.*

[t]Ad lib = Free access

HORSES AT STUD (per day)

	Growing foal	Dry mare	Mare late gestation	Mare early lactation
Lucerne chaff	1.5kg	1kg	1kg	1kg
Oats*	2 - 4kg	1 - 2kg	1 - 3kg	2 - 4kg
LIVAMOL	1 - 2 cups	1 cup	2 cups	2 cups
FEED OPTIMISER	2 - 3 cups	2 cups	2 cups	2 cups
Pasture/Hay	Ad lib[t]	Ad lib	Ad lib	Ad lib

	Stallion Off Season	Stallion Breeding
Lucerne chaff	1kg	1kg
Oats*	1kg	3kg
LIVAMOL	2 cups	2 cups
FEED OPTIMISER	2 cups	2 cups
Vegetable oil		1 - 2 cups
Pasture/Hay	Ad lib	Ad lib

The concept behind the Pro(N8)ure® range is to develop, manufacture and market products for livestock like cattle, pigs, poultry, sheep, horses that are efficacious, safe, sustainable and environmentally friendly.

The ingredients used in Pro(N8)ure are selected on the basis that they meet or exceed these criteria:

Efficacious: As with all the actives that we select for our products they must work as stated on the product label. It is important that each dose delivers the right amount to the animal.

Safe: Ingredients selected should be GRAS (Generally Regards As Safe) rated therefore they could for example be used in human food.

Sustainable: Both the actives and other ingredients used within each product need to be capable of being maintained at a constant level without exhausting natural resources or causing severe ecological damage.

Environmentally friendly: Both the actives and other ingredients used within these products need to be safe, non-toxic and residue free to animals, farmers and the environment.

So the types of actives that are used in Pro(N8)ure include; probiotics, prebiotics and enzymes.

Each of the Pro(N8)ure ingredients, has the ability to withstand steam, high temperatures and pressure as used by commercial feedmills to make pellets or mash, loose mixes or premix and supplements.

Each of the Pro(N8)ure ingredients either singularly or collectively are compatible with vitamins, minerals, amino acids, coccidiostats, medications, acidifiers, flavours, colours etc.

Pro(N8)ure®

Combines 3 essential elements:
- Dual-strain Probiotic
- Prebiotic
- Multi-strain Enzyme

These 3 elements form a natural microflora management tool for improved digestion resulting in better performance and good health.

LIVAMOL® Feed Optimiser has been formulated:

1. To make it easy for horse owners to make up their own feeds.
2. For use with Livamol, Australia's Leading Coat Conditioner.
3. To give horse owners flexibility to customise feeds, for individual horses when necessary.

IAH for every need.

You can use any of the following products with Livamol Feed Optimiser & Livamol:

Bio-Hoof Care & Repair
(For the growth and maintenance of healthy hooves)

D-Scour Paste
(To treat and control scours)

Electromix Electrolytes & Sweat
(Additional electrolytes)

Horsport Rehydration & Recovery
(Sweat loss and recovery after hard work)

KA Cleans & Flushes
(Diuretic and kidney issues like smelly, thick, irregular colour or cloudy urine)

Neutra-Syrup Neutralises & Removes
(To increase thirst, fluid intake or to flush the kidneys)

Manomix
(To improve topline or where additional energy maybe required)

ProN8ure, multi-strain probiotic
(To improve gut function and feed digestibility, treat and control scours, for use as a post antibiotic therapy and to establish or maintain healthy gut microflora)

Snow-E Muscle, Energy & Fertility
(To assist muscle, carbohydrate and creatine metabolism, glycogen balance and reproductive function)

Sootha Nerves & Stress
(Horses with any of these symptoms: Picky eaters, moody, nervous, highly strung, loose manure, horses that sweat up badly before an event, lack concentration or are unwilling to work)

Dietary Evaluation Service

We understand that every horse is an individual and that each horse property will have a unique environment with differing types of pasture and hay available. As a rider, trainer or breeder, you may also have your own preference for certain feeds (e.g. grains or commercial premixes).

The science of feed made easy!

Simply go to: **www.iahp.com.au**

REFERENCES CITED

1. From: http://cellbio.utmb.edu/microanatomy/bone/cartilage_and_bone_cells.htm
2. Shorafa, W.M. et al. (1979). Journal of Animal Science, 49, 979-982.
3. Lawrence, L.A. et al. (1994). Journal of Animal Science, 72, 2617-2623.
4. Porr, C.A. et al. (1998). Journal of Animal Science, 76, 1875-1879.
5. NRC, (2007). Nutrient Requirements of Horses, 6th rev. ed. Washington, DC. National Academy Press.
6. Hurtig, M.B. et al. (1990). American Association of Equine Practitioners Proc., 637-644.
7. Knight, D.A. et al. (1985). American Association of Equine Practitioners Proc., 445-461.
8. Knight, D.A. et al. (1990). Equine Veterinary Journal, 22, 426-432.
9. Pearce, S.G. et al. (1998). Equine Veterinary Journal, 30, 183-185.
10. Spais, A.G. et al. (1976). Proceedings of the World Veterinary Congress, 3, 2103-2106.
11. Van Weeren, P.R. et al. (2003). Equine Veterinary Journal, 35, 67-71.
12. Osphal, W. et al., Journal of Nutrition, 12, 708-716.
13. New, S.A. (1999). British Medical Bulletin, 55, 619-633.
14. Chapuy, M.C. et al. (1992). New England Journal of Medicine, 327, 1637-1642.
15. Weber, P. (1999). International Journal of Vitamin Nutrition Research, 69, 194-197.
16. Stone, K.L. et al. (2001). Journal of Bone Mineral Research, 16, S388.
17. Potter, G.D., Huchton, J.D. (1975). Proceedings of the Fourth Equine Nutrition and Physiology Symposium, 19.
18. Ott, E.A. et al. (1981). Journal of Animal Science, 53, 1496–1503.
19. Graham, et al. (1994). Journal of Animal Science, 72, 380-386.
20. Graham-Thiers, P.M., Kronfeld, D.S. (2005). Journal of Animal Science, 83, 2783-2788.
21. Glade, M.J., Luba, N.K. (1987). Proceedings of the Equine Nutrition and Physiology Society Symposium, 593 – 597.
22. Shimomura, Y. et al. (2004). Journal of Nutrition, 134, 1583–1587S.
23. Glade, M.J. (1991). Equine Athlete, 4, 5–10.
24. Foote, C.E. (2006). Unpublished data.
25. Fenton, J.I. et al. (2000). Osteoarthritis Cartilage, 8, 258-65.
26. Fenton, J.I. et al. (2002). Equine Veterinary Journal Suppl., 34, 219-23.
27. Comben, N. et al. (1984). Veterinary Record, 22/29, 642 – 645.
28. Wintzer, H. (1987). Equine Practice, 9, 4–5.
29. Linden, J. et al. (1993). Proceedings of Equine Nutrition and Physiology Society Symposium, 58–63.
30. Bryant, K.L. et al. (1985). Journal of Animal Science, 60, 154–162.
31. Medina, B. et al. (2002). Journal of Animal Science, 80, 2600-2609.
32. Loch, W.E. et al. (1984). Equine Veterinary Science, 4, 125-127.
33. Campbell, M., Glade, M.J. (1989). Proceedings of Equine Nutrition and Physiology Society Symposium, 120-123.
34. Mason, T.R. (1983). Res Report 1988-1, McNeese State Univ, Lake Charles, LA.
35. Glade, M.J. (1991) Equine Veterinary Science, 11, 89-95.
36. Guan, X. et al. (2000). Journal of Nutrition, 130, 1274-9.
37. Mertz, W. (1993). Journal of Nutrition, 123, 626
38. Mooney, K. W., Cromwell, G.L. (1993). Journal of Animal Science, 71(Suppl. 1), 167.
39. Boleman, S. L., et al., (1994). J. Anim. Sei. 72(Suppl. 1), 273.

International Animal Health Products
THE AUSTRALASIAN COMPANY

IAH Sales Pty Ltd

18 Healey Circuit,
HUNTINGWOOD, NSW 2148 Australia
Telephone: (02) 9672 7944
Facsimile: (02) 9672 7988
Website: www.iahp.com.au
Email: info@iahp.com.au

BROLOH 09/2020