

FEEDING INJURED HORSES©
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Providing correct nutrition is an essential component of caring for injured horses. Nutrient intake affects all metabolic processes, but those body systems that have high rates of metabolism are more rapidly impaired by nutrient imbalances. The immune system is important in healing injuries and fighting infections. Nutrient deficiencies can compromise immune function in as short a time as 3 to 5 days. Infection, malnutrition and deficiencies of vitamins C and K and zinc have a direct effect on wound healing and increase the risk of infection.

For minor wounds, infection is the most important factor that affects wound repair. For more serious injuries, pain, shock and haemorrhage may be present and intensive veterinary management will be required to minimise the potential disastrous consequences. Laminitis and tetanus are ever-present dangers. Because of the serendipitous nature of these cruel diseases all care must be taken to reduce the risks. In the case of foot or leg injuries that reduce weight-bearing on the affected limb, most of the weight is transferred to the other leg, placing the healthy limb at risk for laminitis. Preventing laminitis is often as important as preventing infection and promoting injury repair.

The use of antibiotics and phenylbutazone should not be undertaken without veterinary advice. The administration of the wrong antibiotic, the use of incompatible drugs, incorrect dosage and either excess or insufficient 'bute', can precipitate laminitis, diarrhoea, kidney problems, gastric ulcers and destruction of the bone marrow which results in anaemia and suppression of the immune system. Similarly, an inadequate diet can hinder healing and increase the risk of laminitis, infection and other secondary complications. If there has been a serious or extensive skin and/or muscle wound, considerable protein loss can occur, in addition to blood loss. To repair such injuries and rebuild red cell numbers requires increased protein, vitamin and mineral intake and adequate energy in the diet. To assess the protein value of a feed, 4 factors need to be considered: percent protein of the feed and the weight fed; the amino acid quality of the dietary protein; the digestibility of the feed and the amount of energy in the diet.

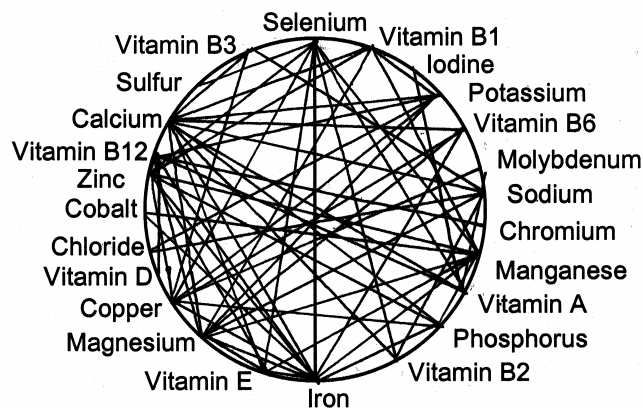
Firstly, horses require a certain number of grams of protein a day, not a percent. To determine protein intake, the percent must be multiplied by the weight of feed given to obtain the protein intake in grams. Second, even if the amount of protein is correct, horses may still be protein-starved if the amino acids in the protein are not balanced. The horse cannot synthesize body proteins for tissue repair if there is an amino acid deficiency, so the feed must contain correct amounts of essential amino acids such as lysine and methionine.

The digestibility of the feed is important because all protein consumed by the horse must be broken down into their constituent amino acids for absorption to occur. Protein digestion occurs in the small intestine and any protein not digested there passes into the caecum where it is fermented and degraded to ammonia. Horses cannot use ammonia to synthesize essential amino acids. So even if a feed is balanced for amino acids, they will be unavailable to the horse if the feed is not digested in the small intestine. Horsemen have long boiled, crushed, cracked, rolled and pelleted feed in an attempt to increase the digestibility. These old methods of processing have been superseded by steam-extrusion. Whilst dry-extrusion can damage essential amino acids, steam-extrusion improves digestion to over 90% and releases natural goodness that was previously unavailable. Steam-extrusion advances and fine-tunes time-honoured cooking practises and has the additional benefit of reducing the influx of semi- and undigested feed into the caecum – a major risk factor for colic, diarrhoea and laminitis. Steam-extruded feeds also stimulate saliva production, which has a protective effect against stomach ulcers, and because steam-extruded feeds are eaten more slowly than pellets, the incidence of choke, colic and stomach rupture is reduced when horses are changed from a pelleted to a steam-extruded feed. The amount of energy in the diet also determines protein availability. If the diet is deficient in energy, the horse must convert protein to energy just to maintain life processes and so the amount of protein available for wound healing and tissue repair will be reduced.

Several vitamins have a role in wound healing. Vitamins E and C are both antioxidants and enhance the immune system. Vitamin K is needed for blood clotting. Although adequate levels of vitamin K are found in most pasture grasses and good quality hay, it is usually necessary to supplement vitamins E and C, unless a well-formulated complete feed is used. Vitamins A and D and trace minerals such as zinc, copper, calcium and phosphorus assist in the repair of bone and tendon injuries. When stable rest is required, horses may lose 1% of bone mineral content per week. Because bone mineral content is related to bone strength, rested horses should be reintroduced gradually to work. Double the standard recommendation for calcium is required for bone mineral content to be restored.

If an injured horse is suffering from anaemia secondary to blood loss, an unbalanced diet or anorexia, the diet must contain sufficient iron, copper, cobalt and B-vitamins to support increased red cell production. Unless a scientifically balanced, prepared feed is used, supplementation may be required. But, if several different supplements are used to meet individual vitamin and mineral requirements, caution must be exercised. There are risks in using supplements and the diet should be analysed to ensure excesses and deficiencies are not occurring due to over-supplementation or mineral and vitamin interactions. The chart shows some of the known interactions.

MINERAL AND VITAMIN INTERACTIONS



Although some enhance the uptake and absorption of others, generally the reverse occurs. The exact mineral requirements are determined by a combination of the needs of the horse, whether the mineral is given in a form that is well-absorbed and mineral interactions in the gut. Vitamin D is required for calcium absorption, but excess vitamin D can cause calcium deposits to form in blood vessels and muscles. Vitamin D toxicosis occurs when supplementation is overzealous. Calcium interacts with phosphorus, magnesium and zinc; iron uptake is reduced in the presence of high intakes of calcium, phosphorus, cobalt, zinc, cadmium, copper or manganese; zinc absorption is reduced by high intakes of calcium, phosphorus, copper, cadmium or chromium. Chelation of minerals prevents interactions and increases availability by up to 300% compared to inorganic forms of minerals.

Anorexia causes the gut cells to shrink, reducing digestion and absorption and increasing the risk of infection from bacteria moving into the horses system. If the gut cells have been affected by inadequate nutrient availability, they remain compromised for several days, even if an adequate diet is resumed, so that bacterial overgrowth and diarrhoea are likely consequences. Although all organ systems require adequate energy, protein, vitamins and minerals, the effects of inadequate nutrition on the immune system and the gut cells are reason enough to ensure correct nutritional support for the sick or injured horse. As a general guide, nutritional support should continue for about 2 weeks after minor surgery, 2-4 weeks after uncomplicated trauma or injury and for up to 12 weeks after complicated injuries and infection. Because of the need for diet analysis if supplements are to be used, the cost of providing several supplements and the complexity of mineral interactions, it is often safer, easier and cheaper to use a correctly balanced prepared feed. Mitavite produces a range of muesli-style sweet feeds and steam-extruded complete feeds. Feeds such as Mitavite Promita and Mitavite Athlete are concentrated-base feeds, which include all supplementary vitamins, minerals, biotin and essential amino acids in protected forms.

They can be used to balance traditional grain-based and pasture-based diets. Steam-extruded complete feeds such as Mitavite Breeda and Mitavite Economix provide extra protein and energy if pasture is poor and only require the addition of roughage. Easily softened to a readily digested and gentle mash, Mitavite steam-extruded feeds are scientifically formulated and balanced by equine veterinarians and nutritionists to include protected vitamins, chelated minerals and essential amino acids so important to support a smooth recovery from injury. . For more information on this subject or feeding horses generally contact Mitavite toll free: 1800 025 487. email: mitaviteenquiries@ingham.com.au