Horse Nutrition Can Be Simple

How often do you ask your clients about horse nutrition? Here are seven simple rules to help guide you through educating them on this topic.

The simple rules when feeding all horses are:

1. Ad lib roughage
2. Low starch/sugar concentrates and feeds
3. Appropriate quality and quantity of protein
4. Omega 3 fatty acids are important for all horses
5. Vitamin E supports immune function
6. Hooves and feet of many horses benefit from biotin
7. Supplements can cause clinical and sub-clinical problems

1. PLENTY or ad lib Roughage:

Feed 1.5% to 3% of bodyweight as hay, pasture, chaff, beet pulp, hayage, hulls or other fibre.

2. Low starch, sugar and NSC feeds:

Pregnant mares develop IR at around 28 weeks gestation - which is linked to DOD.[1,2] Exaggerated glucose/insulin responses should be avoided >200 days gestation, in horses under 12 months of age and older horses.

Creep feed became the norm in the 1960's when it was found milk did not meet foal requirements after 3 months. High energy feeds were introduced and the first reports of unusual foal lameness began to appear in the literature. DOD is 25% genetics and 75% environment. Most hock lesions are present at 1 month of age; there is evidence they can develop during gestation. Stifle lesions appear between 3 and 5 months and are correlated with weight gain in the 3rd to 5th months.

Weanlings: Several unwanted behaviours are linked to feeds and feeding strategies. Crib-biting increases 4-fold in weanlings on low-forage or high-starch/grain diets – which are also linked to increased stress, aggressive behaviour, stomach ulcers and coprophagy. Gastric ulcers occur in 60% of crib-biting foals compared to 20% of non-crib-biting foals. Before and for up to 10 months after weaning, foals on fibre/oil supplements have lower heart rates and cortisol.

At 2 months after weaning, they were less flighty; less reactive to pressure, noise and visual stimuli. Similar behaviour was observed in foals of mares fed fibre/oil supplements in their last trimester.

Young horses: Hyperglycemia and/or hyperinsulinemia[3] has been correlated with OCD. The response is more severe in horses <14 months old and occurs within 3 months on starch/grain-rich feeds. Magnesium is also implicated and supplementing foals with 4g of Mg from birth to 12 months resulted in a 50% reduction in OC of the hock and fetlock at 5 months and a 14% reduction in stifle OC at 12 months.[4]

Aged horses often exhibit hyperglycaemia and hyperinsulinaemia following a glucose challenge.[5] Exercise improves skeletal muscle insulin signalling and when combined with a low NSC diet can help the EMS and older horse control glucose and insulin metabolism.[6]

Horses with recurrent exertional rhabdomyolysis and PSSM (1 or 2) limiting NSC intake underpins management.[7-9] Current recommendations are less than

Adiposity and obesity are associated with hyperinsulinaemia, hyperleptinaemia, IR and raised inflammatory cytokines.[10, 11] Increased TNF-α has been found in visceral adipose tissue in IR horses and increased mRNA coding for interleukin-1ß and IL-6 has been found in neck crest fat.

PPID and EMS: Dietary restriction and exercise can improve insulin dysregulation in horses with EMS but may be less successful in horses with PPID. Even when ACTH has normalised, horses with advanced PPID and insulin dysregulation can be difficult to manage and careful attention to nutrition is often necessary.[12]

Weight management: Reduction in postprandial hyperinsulinaemia is central to EMS management and requires removal of grains, pellets or mixes NSC>12%. Forage only diets rarely provide adequate protein, minerals or vitamins and recommendations are 125-500g of a balancer comprising quality protein be fed with a forage diet.

Grazing time should be limited to when NSC is lowest (5am to 10am). Horses with no pasture access should be fed soaked hay with an appropriate vitamin-mineral-amino acid balancer pellet.

Body condition score (BCS) is of limited use for weight management and nomograms and weight tapes are more sensitive measures of weight loss. Information on weight management, nomograms and weight tapes is available on our website www.jenquine.com

RESTRICT Grains and grain by-products in at-risk horses: Commercial feeds based on millrun or other grain by-products can be high in starch/sugar. Starch/sugar/ NSC in various feeds is summarised in the table below.

Commercial Horse Feed*	Starch	Sugar	NSC
Jenquine all-4-feet® (laboratory analysis)	2.1	3	9.5
Stance CoolStance	0.2	9.3	9.5
Omega Weight Gain	9.8	6.4	16.2
Stance GoStance	11.3	12.1	23.4
Barastoc Calm Performer	25.1	5.6	30.7
Mitavite Economix	23.2	8.3	31.5
Mitavite Xtra Cool	25.5	7.5	33
Mitavite Gumnuts	22.3	10.7	33
Horsepower Equestrian	26.7	6.7	33.4
Nutririce Show and Competition	28.7	6.7	35.4
Weightlifter Calm	29.6	10.4	40
Mitavite Formula 3	28.5	13.7	42.2
Pryde's EasiResult	26.3	16.3	42.6
Barastoc Cool Command	37.4	6	43.4
Mi-Feed EasiRider Cool Mix	40.3	5.7	46

*Richards N (2008) Proc. Aust. Equine Sc. Symp., Vol 2:25 THE NON-STRUCTURAL CARBOHYDRATE CONTENT OF SOME COMMERCIALLY AVAILABLE HORSE FEEDS IN AUSTRALIA

Micronised and extruded feeds: Increased small intestinal starch digestion can cause problems and heat processing can increase small intestinal enzyme activities by over 446%[14, 15] which can have a profound impact on insulinaemic responses.

Soaking or steaming hay can reduce NSC but results in significant mineral loss.[16] Teff is low NSC, but can be high in manganese and oxalates. Iron intake also needs to be monitored as increased serum ferritin has been associated with increased serum insulin and insulin resistance.[17]

3. Protein quality and essential amino acids

Regardless of discipline, age, work level or reproductive status, essential amino acids affect hoof integrity, work capacity, body composition, power-to-weight ratio, endurance and reproduction. If the feed meets required levels of 9 essential amino acids, but has only half the tenth, body protein synthesis may be reduced by up to 50%.

A deficiency of any single essential amino acid places a limit on tissue building. Just as the shortest plank in a barrel limits the amount of water the barrel contains, an essential amino acid deficiency places a limit on new cell creation.

Weanlings and yearlings: The amino acid profile of the feed determines body composition. Correctly fed yearlings achieve greater gains in wither height, reaching mature height earlier in life - while depositing less fat. Those that don't have correct amino acids are shorter and fatter.

Older horses and PPID: Ageing horses don't require special 'senior' feeds however mistakes in amino acid intake should be corrected.[18] Horses with PPID can have difficulty maintaining muscle mass due to atrophy of type 2A and 2B fibres, loss of type 2B myofibers and oxidative stress.[19] Adjustment of amino acid intake can reverse and delay muscle loss.

Mares on low quality protein had higher rates of early embryonic loss (35.7%) than mares on a good quality protein (7.3%).[20]

Horses in work and recovery: To increase mitochondria in response to training requires correct amino acid intake. Many feeds fall short in this and to convert the catabolic processes of exercise to the anabolic processes of increasing fitness, requires additional nutrients pre- and post-work.

Article continued overleaf

4. Omega 3 fatty acids are important for all horses

They control microinflammation and have antithrombotic and immunoregulatory properties.[21] Omega 3 benefits mares, colostral[22] and semen quality; ageing horses; insulin sensitivity; older breeding stallions;[23] showjumpers;[24] inflammatory conditions;[25] immune function;[26] endurance horses,[27] and delays exercised-induced decrease in erythrocyte membrane flexibility.[28]

5. Vitamin E

Vitamin E supports immune function – including improved colostral IgG and in older horses, response to vaccination.[29]

6. Hooves and feet

Although the healthy biome synthesizes most B-vitamins, including biotin, many horses show improved hoof wall growth and integrity with additional zinc, methionine and biotin.

7. Supplements can cause problems

60-77 % of horse owners in Australia feed concentrate/ manufactured feeds plus up to five additional supplements.[30] Risk of overlap and subclinical toxicity is high and many horses are being fed in excess of dietary requirements – with some excesses approaching maximum tolerable levels. Some supplements exceed the APVMA regulations and vets are an important source of nutritional information. apvma.gov.au/node/10616

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