MITAVITE®
LEADERS IN EQUINE NUTRITION

Advances in Feeding for Cool Performance

The effectiveness of the diet is measured in terms of metabolic efficiency - that is, maximum power output with minimum production of undesirable products, such as heat and acid. Diet also has profound effects on the power: weight ratio (the ratio of muscle to fat), thermoregulation (heat production and hydration) and mental attitude – all of which impact on performance and fatigue. The feed provides the raw materials needed by the working muscle and both the type and quality of the raw materials plays a central role in muscle metabolism and muscle fuel levels. To increase power for work, the diets for performance horses must be designed to influence muscle fuel levels – and because different feeds contain different nutrients and raw materials, correct feed selection is of ultimate importance for optimum performance. There are several ways in which these nutritional goals can be achieved.

Ongoing research into exercise science and nutrition has shed light on the importance of the glycaemic index (GI) of the feed. The glycaemic index (or glycaemic response) measures the effect the feed has on blood glucose and insulin – a high glycaemic index means the feed produces a rapid rise in glucose and insulin, followed by a rapid fall in blood glucose. The reason this is important is because a drop in blood glucose indicates a lack of glucose availability for the muscle and brain, and this has a deleterious effect on performance. Raw grain causes a large increase in blood glucose and insulin. This predisposes the horse to early fatigue as blood glucose and carbohydrate stores in muscle are rapidly used up and fat utilization is inhibited. A low glycaemic index means the feed causes a slow and sustained rise in blood glucose.

Glycemic response to different diets has been studied in horses – the highest glycemic response occurs with sweet feed, followed by oats and corn.Oils have a low GI, meaning the rise in blood glucose they produce is long and sustained. Rice bran is also low GI and this, combined with its high oil content; make it the ideal feeding strategy for maintaining blood glucose in performance horses. A recent study showed that feeding a diet with a total oil content of 10%, resulted in 2% less heat during the event, 5% less heat during the day, 12% (6 liters) lower water losses in manure and sweat 22% less feed intake and 31% less manure and gut ballast - representing a substantial power: weight advantage. The high Energy density of rice bran and oil mean less feed is required to meet the demands of training and competing – this is important not only for gut ballast and waste heat production, but is also a major advantage for horses with reduced appetites.

Fuelling the muscle is critical for performance, as is maximising muscle development and size – Both power output and endurance depend on the total mass of working muscle. To build muscle, the amino acid composition of the feed is important – by monitoring carbohydrate intake (starch, grains, pollard) and fine-tuning protein intake (soybean meal, protein meals) we can reduce fat and build muscle mass. To achieve this, there are several important facts to consider.

Firstly, the feed must be highly digestible in the small intestine. Feeds not easily digested are degraded to ammonia - increasing urea and ammonia levels and wasting amino acids. Second, the amino acid profile must match the amino acid demands of the muscle – the most important amino acids are lysine and threonine, found in high levels in vegetable protein meals and rice. Third the amount of protein must meet requirements – most performance horses require around 1kg of protein a day. To calculate the total daily amount of protein the diet is supplying, the % protein of each feed is multiplied by the weight of the feed fed.

In addition, rice bran supplemented horses show lower lactate levels and lower heart rates during exercise compared with corn oil, giving an added edge. Lactic acid accumulation after exercise can limit performance, and any factor that can lower lactate production can enhance performance. There is unequivocal evidence that the acid generated by grain starch fermentation increases the incidence of colic, laminitis, gastric ulcers, feed allergies, behavioural problems and muscle disorders. Oats are approximately 47 - 50% starch, corn and barley between 65 and 70%. Rice bran is only 20% starch and extrusion ensures the starch is almost completely digested. Grains are also implicated in feed allergies. The use of rice-based feed facilitates a decrease in reliance on grains and sweet feed for energy - decreasing the risk factors for ulcers and digestive disturbances associated with high starch intake.
Other body systems also benefit from the removal of raw grains from the stable – Although stable air quality differs within a country and world-wide, respiratory disease remains a major source of wastage. Hypersensitivity to grain dust is now firmly linked to mucoid accumulation and lower airway disease - both of which compromise the ability of the lung immune system to handle streptococcal infections.

There is strong evidence of the damaging effects of free radicals on the immune system, muscle and cell membranes and in the pathogenesis of delayed muscle soreness. For immune function and the anti-oxidant defence systems, the horse has an absolute requirement for vitamins A, E and C, glutathione, selenium, copper, manganese and Zinc - the levels of which naturally present in most feed stuffs, are low. Ferulic acid, a phytochemical naturally-occurring in rice bran, exhibits a wide range of beneficial activity, due in part to its strong anti-oxidant properties. Rice bran is also one of the best natural sources of the powerful, trace-mineral, anti-oxidant selenium – which is also essential for thyroid function. Benefits of selenium supplementation include fewer infections, improved wound healing, better stress tolerance and a reduction in exercise-associated muscle problems.
If the diet doesn't master the fundamentals of supplying the required raw materials, little will be accomplished and supplementation will not correct inherent dietary deficiencies and imbalances. Because of the problems with supplementing individual nutrients, a more effective strategy is to use a complete feed formulated to provide the precursor raw materials in the correct amount, and let the body do the rest. Ideally, vitamin, mineral and amino acid levels in the total diet should be known - this avoids excesses of individual nutrients and is one of the major benefits of correctly-formulated complete feeds.

Although there are many rice bran-based products available, there are important differences between them in terms of vitamin levels, mineral balance and amino acids.
Many feeds require additional supplementation to produce a balanced diet. VITAMITE COOL PERFORMER has been formulated and manufactured to bring to the performance horse, the combined benefits of rice bran, rice bran oil and extrusion, with the basic raw materials in the form of chelated minerals, amino acids, heat-stable vitamins, to create a balanced diet.

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