



MITAVITE®

LEADERS IN EQUINE NUTRITION

The Vitamite Range of Stabilized Rice Feeds for Horses

The potential to manipulate equine health and performance through nutrition is immense and will undoubtedly be a major focal point in research and development for the feed industry this century. Significant changes have already occurred over the last 5 years, leading to a greater understanding of diet-related health conditions and improved feeding practices. The very genetic basis of many diseases is being unraveled, leading to the identification of horses at risk of developing certain conditions. Far more attention is placed on health, resulting in 'functional foods' which, when consumed as part of a normal diet, offer significant benefits.

There has been a movement within academia and the industry to reduce the reliance on grain starch in equine diets. Functional foods and their place in a balanced diet have become increasingly important and rice bran has attained greater significance following publication of clinical studies in the veterinary literature. Accordingly, feed development and clinical testing increases apace and a dedication to equine nutrition enables MITAVITE to continually evolve and advance the feeding options available to horse owners and breeders.

VITAMITE has a rich tradition in formulating and producing feeds that meet the unique requirements of horses. The only aim must be the horse's welfare. Our challenge is to develop species-specific, health-promoting nutrition to ensure a long, well-fed and productive life. New research into the effects of different feedstuffs on biochemistry, metabolic conditions, immune function, energetic efficiency, performance and digestive disorders associated with diet, underpins the development of VITAMITE rice-based feed.

There are many reasons to consider VITAMITE rice-based feeds.....

1. Grains and health:

There is unequivocal evidence that grain feeding and hindgut starch fermentation impact upon equine health, performance and behavior. Colic, laminitis, gastric ulcers, developmental orthopedic disease, feed

allergies, behavioral problems and muscle disorders result from the inability of the equine small intestine to digest grain starch. Feeding mistakes and mismanagement are the number one cause of colic. For example, clinical studies have shown the ingestion of grain can cause changes in gut contents sufficient to increase the risk of tympany (gas) and large intestinal displacement. At least 13 of the 16 recommendations for horse owners on prevention of colic deal with factors that influence the ecology of the intestine.

The ecology of microflora in the hindgut is important for the digestive process, to stimulate normal gut development, detoxify compounds and prevent build-up of harmful bacteria. It is important not to forget a fundamental principle of equine nutrition – feeding the micro flora properly – this is critical to the health of the horse. High grain intake can create a more acidic environment than desired, resulting in death of beneficial bacteria and an overgrowth of pathogenic bacteria - a range of metabolic and pathological conditions may then ensue. In addition, fermentation of starch in the hindgut depresses the digestion and utilization of roughage in the caecum and colon, further contributing to acidosis and associated behavioral problems - anxiety, wood chewing and wind-sucking.

Oats are approximately 47 - 50% starch, corn and barley between 65 and 70%. Laminitis associated with starch overload is well-documented, but recent research links high grain diets to a sub-clinical form of laminitis, manifested as low grade discomfort, poor performance, chronic and recurrent hoof problems and pedal osteitis. Grain processing can improve the small intestinal digestion of cereal grain starch, with extrusion and micronization appearing to be the most effective methods. Rice bran is only 20% starch and because VITAMITE feeds are extruded, the starch is almost completely digested.

2. Stomach ulcers:

Gastric ulcers affect 60 and 90% of thoroughbred racehorses and 50 to 60% of show ponies, stabled yearlings, eventing, endurance and dressage

horses. The prevalence and severity is dependent upon several factors, however exposure of the stomach to gastric acid is thought to be the primary cause. Nutritional influences include diet composition and the ulcerogenic effects of starch fermentation. Feeding lower starch, higher oil concentrates is beneficial especially for hard working horses with high energy requirements. 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.

3. Tying up:

Chronic tying up commonly results from one of two forms of inherited muscular disease: polysaccharide storage myopathy (PSSM) and recurrent exertional rhabdomyolysis (RER). Quarter Horses, Paints, Warmbloods, Appaloosas, and Drafts tie-up due to PSSM, and RER which usually affects Thoroughbreds, Standardbreds and Arabian horses, results from a stress-related disorder in muscle calcium regulation. Despite the different causes of these two conditions, dietary fat supplementation has specific protective effects for both - recent findings show a lower serum CK after exercise within one week of horses commencing a rice bran-based low-starch/high-fat feed, and a reduction in both clinical and subclinical tying-up. Although no single diet change prevents tying-up, recommendations to reduce the severity and frequency of attacks include replacing most of the grain in the diet with a high-fat, low-starch feed.

4. Glycaemic response and insulin resistance:

Glycemic response has been studied in horses with two main areas of interest - its effect on performance and its effect on bone development. The glycemic response is a metabolic reflection of blood sugar and insulin responses to a meal. Insulin resistance is a hormonal condition where blood glucose does not decline in response to insulin release. In the continuously grazing horse, these metabolic and hormonal changes do not occur. A high glycemic response increases the risk of insulin resistance which is linked to

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obesity, aberrant behaviour, colic, laminitis, developmental orthopedic disease and tying-up. The highest glycaemic response follows meals of sweet feed, oats or corn. Increasing the oil in grain diets decreases the glycemic response, however, extruded rice bran is considerably more stable than oil in warm temperatures and surveys have demonstrated that owners and trainers prefer to use rice bran compared to oil. Rice bran contains many compounds beneficial for the regulation of blood glucose and stabilization of insulin. In addition, because rice bran is rich in oil, it causes a shift from carbohydrate to fat oxidation during exercise – resulting in sparing of muscle glycogen and 50% less heat generation during work – a significant advantage to the performance horse.

For the pregnant mare, diets high in fat and fiber (rice bran) are superior to sugar and starch concentrates (grains and molasses) and influence milk composition in ways that improve foal health. Providing a fat and fiber supplement designed to complement the pasture increases immunoglobulin-G and linoleic acid in mares' milk and avoids the spring slump in growth of yearlings. Although more work is needed, these studies indicate that the risk of certain digestive disorders is reduced in broodmares on a fat-fiber feed in place of grain. And in weanlings, there was a strong positive correlation between the incidence of OCD and the glycemic index of the feed used. These studies suggest it wise to feed foals concentrates that produce low glycemic responses and that rice bran achieves this.

5. Feed allergies:

Gluten, one of the most widespread plant proteins, is the major cause of feed sensitivity and allergies in humans and animals. A direct link has been established between gluten and diseases such as obesity, diabetes, rheumatoid arthritis, chronic digestive disorders, dermatitis, psoriasis, autism, ADHD, depression, schizophrenia, chronic fatigue syndrome and certain cancers.

Within each grain, gluten forms an impenetrable matrix around the starch (figure 1), limiting access of starch-degrading enzymes and reducing starch digestibility. Grain treatments such as steam-flaking, boiling, crushing and pelleting can improve starch digestion - however, gluten proteins are resistant to both heat and digestive enzymes. Such resistant proteins account for up to 70% of the protein in corn and about 50% of the protein in wheat, oats, rye and barley.

There is evidence that these proteins trigger the development of an allergic response which impacts on gut health and nutrient availability. There are differences in the ability to digest grain starch between horses and differences in starch digestibility between grains types. Due to dietary intolerance to gluten, grains are unsuitable for many horses. Rice does not contain gluten and its use in clinical cases, during recovery from many gastro-intestinal and other diseases, and in horses with behavioural problems, is well known.

6. Behaviour:

Even though the reasons why are not thoroughly understood, high-calorie, high-starch diets are known to make horses nervous. Horses on rice-based feed have lower resting heart rates and lactate accumulation, and are more tractable. Studies in normal horses have demonstrated lower cortisol concentrations in fat-fed horses, further indication of decreased psychological stress. This was thought to be due to neuro-hormonal changes resulting in a calmer demeanor – making rice-based feed a valuable adjunct in the successful management of tying-up and stress-related behavioural abnormalities.

7. Respiratory Health:

Airborne particles in stables are a complex mixture of dirt, dust, bacteria, viruses, fungi, spores, parts of insects, rodents and birds and their faeces, plant materials and noxious gases. Stable environments differ widely both within a country and world-wide. In Australia, despite climatic conditions being milder compared to parts of North America and Europe, respiratory disease remains a major source of wastage. Traditionally most respiratory disease in horses was associated with viral or bacterial agents. However, many horses with mild to moderate airway disease, do not culture positive for micro-organisms, and hypersensitivity to grain dust is now firmly linked to mucoid accumulation and lower airway disease - both of which compromise the ability of the lung to handle streptococcal infections.

It is hard to quantify the indirect advantages to respiratory health of extruded rice bran increased stability of feed, reduced dust, moisture, bacteria, fungal spores, insect pests and other respirable particles making clean feeds and improving air quality. In addition, rice bran extracts have potent anti-allergenic activities and the potential to protect against allergic diseases such as hay fever and asthma in humans and airway hypersensitivity in horses.

8. Ferulic Acid and Selenium :

Phytochemicals are naturally-occurring substances found in plants. Ferulic acid(FA), a phytochemical found in rice bran, exhibits a wide range of therapeutic effects against various diseases including cancer, diabetes, cardiovascular and neurodegenerative conditions. This wide spectrum of beneficial activity is due in part to its strong anti-oxidant properties and it has been approved in many countries for its therapeutic role. Rice bran is also one of the best natural sources of selenium – a powerful trace-mineral anti-oxidant and 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.

9. Gammaoryzanol:

Gammaoryzanol has a clearcut anabolic effect. In a trial in Australia of 40 thoroughbreds in full training, horses supplemented daily with gammaoryzanol showed improved muscle to fat ratio, appetite, weight gain, coat quality and stamina while receiving less grain, compared to the control group. It was thought that the rice bran enabled the horses to digest and/or use their feed more efficiently.

VITAMITE has evaluated the benefits of rice bran and improvements in health have been confirmed. There are opportunities for regulating digestive function, protecting gut processes, enhancing digestive function and protecting against disease. This research field is fertile and the future exciting and VITAMITE rice-based feeds serve to underscore the biological importance of these factors in equine nutrition. Rice bran and its products are palatable to most horses and contain 20% fat, as well as vitamin E.

Owners should understand that it is actually beneficial when horses consume rice bran at a slower rate than a concentrate such as sweet feed, because it reduces rapid absorption of starch. Based on results from the steady progress in equine research and after extensive clinical and field trials, the VITAMITE range of stabilised rice feeds has been added to the Mitavite stable. When you are feeding horses, you must make certain the microflora are happy and for this, the control of pH (acid) is essential. The popularity of VITAMITE rice bran feeds is a consequence of an emphasis on ecological benefits as well as growth and performance responses.

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