

Fine tuning digestion with Yea-Sacc®¹⁰²⁶ inside

Nutrition is a critical aspect of the management of both performance and breeding horses. Meeting the nutrient requirements of these horses is vital to maintain optimum growth, development and performance over a long and hopefully successful athletic career. However, there are other important management tools to help maintain horses in optimal health and retain that essential competitive edge. One of the most important of these relates to the efficient functioning of the digestive system. This is often overlooked. The significance of a digestive system in good working order cannot be overstated, as this has important implications for the long term performance and health of the horse itself, including aiding immune support. Efficient digestive function, in turn, depends largely upon the correct microbial balance and environmental conditions within the hindgut. Stress of work and competition and the feeding of high levels of concentrates are known to wreak havoc on the equine digestive system, particularly the hindgut. This can have detrimental effects on the horse's performance. Maintaining optimal function of the digestive tract is also essential for promoting gut motility, providing energy giving substrates and acting as a reservoir for electrolytes.

All horses are non-ruminant herbivores whose digestive system has evolved over millions of years to ferment plant fiber. The horse's unique digestive system contains millions of microbes within the hindgut which break down plant fiber (cellulose and hemicellulose from the plant cell walls) by fermentation, producing valuable nutrients including energy supplying substrates known as Volatile Fatty Acids (VFA). The volatile fatty acids are absorbed across the wall of the large intestine and their metabolism in horses is similar to that in ruminants. Two of the volatile fatty acids, namely acetate and butyrate, are used within the energy producing system of cells via pyruvate, whereas another VFA called propionate can be directly converted to glucose. These are therefore major energy sources which are used by horses from the fermentation of fiber within the hindgut. Many horse owners are unaware of the large amount of energy produced by fermentation and of the fact that if fiber digestion in the hindgut is compromised, energy supply from this source will be drastically reduced.

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This has significant implications for the management of early lactating mares and working horses. Maintaining energy production from fiber fermentation will help athletic and breeding horses to fuel work and growth and also maintain condition, contributing greatly to the horse's energy balance.

The delicate stability of this diverse microbial population is particularly vulnerable to sudden dietary change and/or oversupply of starch and soluble carbohydrates. This can frequently lead to problems including subclinical acidosis. This may then result in loss of performance and also health problems such as reduced appetite, mild colic symptoms, diarrhoea and eventually laminitis.

Fine-tuning of the digestive system therefore involves the provision of and, perhaps more importantly, the maintenance of an optimum hindgut environment for the beneficial microbes to thrive in. Providing this stable hindgut microbial environment is also vital for optimal feed efficiency, that is to say, horses are able to get the most nutrients from the feed ingested and this has important financial implications. Horses with inefficient digestive systems will also tend to lose weight and condition more easily as energy supplied by fiber fermentation is reduced. Ironically, these horses are often fed even greater quantities of high energy feed to try and improve condition. This actually leads to more disruption of the hindgut microflora, further exacerbating the problem.

The addition of Yea-Sacc¹⁰²⁶ to the horse's diet has been scientifically proven to help stabilize hindgut pH, in addition to its many other significant beneficial effects. Yea-Sacc¹⁰²⁶ is a highly concentrated, viable yeast culture based on the *Saccharomyces cerevisiae* 1026 strain. Following feeding, yeast cells are found within the hind gut as soon as four hours post feeding and although the cells survive here, they do not colonize. Therefore, Yea-Sacc¹⁰²⁶ should be fed daily to maximize the beneficial digestive effects. Yea-Sacc¹⁰²⁶ increases the digestibility of the fiber (cellulose and hemicellulose) part of the diet allowing additional higher energy feeds to be fed with less risk of hindgut dysbiosis and the problems associated with this.

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This is of great value where high calorie rations are fed to meet increased energy demands for example, for early lactating mares and horses in hard work. According to the research, Yea-Sacc¹⁰²⁶ supplemented horses had: higher levels of cellulolytic anaerobic bacteria (fiber digesting); lactate utilizing bacteria and protozoa in the caecum; decreased gas production; and reduced acetate in the colon. All of these result in improved fiber digestion and therefore increased energy supply from the hind gut. Yea-Sacc¹⁰²⁶ is also known to stabilize the gut microflora as it has the ability to prevent the accumulation of lactic acid, helping to buffer pH thereby preventing hindgut acidosis and enabling increased uptake of key nutrients from the diet. This is an added bonus in the diets of performance and breeding horses.

Horses supplemented with Yea-Sacc¹⁰²⁶ had increased nutrient uptake, with greater digestibility of Dry Matter (DM), Acid Detergent Fiber (ADF), Neutral Detergent Fiber (NDF), hemicellulose and ash. All of these were significantly higher for Yea-Sacc¹⁰²⁶ fed horses than controls in research trials. Yea-Sacc¹⁰²⁶ also tended to increase the digestibility of crude protein and fat, with phosphorus utilization significantly higher in the yeast fed treatment group. In fact, Yea-Sacc¹⁰²⁶ significantly increases apparent absorption of both calcium and phosphorus, potentially leading to increased supply for bone and muscle metabolism. For performance and breeding horses this increase in calcium and phosphorus absorption is very important as it helps to increase bone strength and maintain muscle function.

Calcium and phosphorus provide strength to the skeleton as both these minerals are found in the compound hydroxyapatite - $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, the bone hardening compound. Bone also acts as a reserve for ionic calcium in fluids within the horse's body and calcium is vital for continuous muscle contraction in working horses.

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In addition, feeding Yea-Sacc¹⁰²⁶ has been shown to alter circulating amino acids within the blood with more essential amino acids available for renewal and repair of worn tissues in the mature working horse and for growth and development of youngstock. This is further fine-tuning of the digestive system in that more nutrients can be extracted from the same amount of feed.

When lactating mares were fed a yeast culture supplement, an increase in milk production was shown within the short term and analysis of the milk showed improved nutrient content, further resulting in improved growth of foals. These nutrients included gross energy and protein within the milk supply. In addition, performance horses fed a supplementary yeast culture also showed a reduction in blood lactic acid levels during exercise recovery following standard exercise tests.

To summarize, there are many advantages to feeding Yea-Sacc¹⁰²⁶ to performance and breeding horses. Although feeding concentrates to these horses is necessary to meet the high-energy requirements, reducing the risk of hindgut acidosis and the resulting health problems is essential. In addition, maintaining the delicate microbial balance in the hindgut and the most beneficial conditions for them will result in improved feed efficiency with greater amounts of important nutrients available to the horse from fiber digestion.

Feeding Yea-Sacc¹⁰²⁶ therefore helps to fine tune the digestive system, optimizing hindgut function and therefore energy production and nutrient extraction from forage.