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PREBIOTICS & PROBIOTICS

What are they?

*Article written for Equus by Hannah Botha
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In short, Probiotics are live or "good" micro-organisms, such as bacteria and yeast. At present, there are no specific equine bacteria approved, as it is still unclear whether bacterial forms of probiotics can survive the acid and enzymes found in the stomach and small intestine during digestion.

A product described as a probiotic is therefore more than likely to contain live yeast. It is important to note that when referring to yeast, this is referring to viable yeast cultures containing strains such as *Saccharomyces cerevisiae*, not simply Brewers yeast.

Brewers yeast is a byproduct of the brewing industry and is a dead yeast used as a protein source in feed rather than for its digestive benefits. Viable yeast cultures are cultures that have been shown to interact with microbes and help increase the digestive efficiency of the gut.

Prebiotics feed the probiotics. Examples of prebiotics included in equine supplements are:

fructooligosaccharides (FOS), xylooligosaccharides (XOS), mannoooligosaccharides (MOS), galactooligosaccharides (GOS), pectin and psyllium.

A horse's GI tract does not digest these food ingredients but they are digested by the "good" micro-organisms and probiotics in the horse's digestive system to increase their numbers or activity. If bad bacteria can't establish themselves within the gut, the horse stays healthy. In terms of research, the prebiotic that has shown to be most beneficial to horse hindgut health and which has the most extensive research backing, is mannoooligosaccharides (MOS). MOS is part of the yeast cell wall and helps clear the horse's hindgut of pathogens and also aids in immune system health.

When prebiotics and probiotics are supplemented together, the products are referred to as synbiotics because they work synergistically and thus are generally recommended together.



In humans pre and pro biotics have been shown to help with:

- Infectious diarrhoea
- Inflammatory bowel disease
- Gastric ulceration
- Tooth decay/periodontal disease
- Skin infections and atopic dermatitis (chronic itchy, scaly skin)
- Weight loss

It is generally felt that the same should be true of horses. However, veterinarians primarily recommend prebiotics and probiotics to encourage growth of the good microbes and to reduce the invasion and growth of disease-causing bacteria.

Studies have shown specifically that probiotics such as yeast help the horse's GI tract break down and ferment grass and hay better than when not provided. This fermentation process results in the production of volatile fatty acids that provide a significant energy source to the horse which allows the horse to get more energy from their roughage component. This generally means less concentrates will need to be fed, which in itself has positive effects on the gut. Probiotics also produce B vitamins (such as biotin, which is needed for maintaining healthy hooves) and other nutrients essential to the horse's overall health.

Yeasts are considered to be additives and should be approved under legislation. To gain approval, scientific evidence supporting the effectiveness, safety and quality of the product has to be provided.

At Equus and Epol we include the Alltech Yea-Sacc® yeast culture based on *Saccharomyces cerevisiae* 1026, a strain specifically selected for its influence on animal performance. With a low inclusion rate and a large body of research clarifying its performance responses, it also promotes greater digestion of fiber, enhancing the uptake of energy.

Which horses could benefit from Pre and Probiotics?

- Apart from good doers, all horses will benefit from being able to get more from the fibre that they consume as this means needing less cereal-based feed. Manufactures of quality foods are thus including them in a wide range of products.
- Horses vulnerable to digestive upsets, such as the young and the old.
- Horses with diarrhoea, colic or really foul smelling or loose droppings.
- Underweight horses.
- Horses that get excited or stressed when they compete or travel often urinate more frequently and some also develop very loose droppings. They may also come back from a show all tucked-up and pre- and probiotics are sometimes able to help this.
- Starved horses – bacteria are alive and like any other living organism need a food supply. If a horse has been starved then it is likely that the friendly bacteria will have been too.
- Injured or sick horses on box rest. This often means a sudden change of diet and many also require antibiotics/medications, all of which makes them vulnerable to digestive upsets.
- Horse with gastric ulcers or nutrition-related laminitis. Pre- and Probiotics will not cure the disease but they may help to reduce the risk of further problems such as colic.

Although they are generally inexpensive, easy to administer and can potentially have a beneficial impact, only a limited amount of research has been conducted in horses. There is evidence in both human and veterinary medicine that probiotics might not be suitable for use in all situations. As with any nutritional supplement, the quality of the product must be evaluated and whether any claims related to the product are supported by proper scientific research or are just anecdotal.

Always seek guidance when using nutritional supplements.

FEEDING RACEHORSES WITH THE DIGESTIVE TRACT IN MIND

The racehorse is bred, born, and trained to run. But even an animal bred for speed, needs fuel to get to the finish line. The challenge is that providing enough energy in the form of calories can put the horse's digestive tract at risk of upset, which can have detrimental effects on not only performance but also the animal's quality of life. Fortunately, there are ways to avoid such issues.

At the seventh Welfare and Safety of the Racehorse Summit, held June 28 at the Keeneland Race Course, in Lexington, Kentucky, Bob Coleman, PhD, and Laurie Lawrence, PhD, reviewed the equine digestive tract and how to keep it healthy while providing the racehorse the fuel he needs to perform at the top of his game.

Racehorses need dietary energy to perform, but they also need a healthy digestive tract. The challenge comes with the fact that, to obtain the energy, many racehorses consume large amounts of food in just two meals per day. Horses evolved to graze almost continuously throughout the day, resulting in a steady stream of digesta migrating through the gastrointestinal (GI) tract. As such, eating fewer, larger meals can increase the risk of gastric ulcers and other forms of digestive upset, which can diminish performance.

For that reason, it's important to focus a feeding program on maintaining a normal gastrointestinal tract as well as meeting nutrient needs, Lawrence said.

GI Tract Anatomy

The horse's GI tract begins with his mouth, where the lips select feed, the teeth reduce particle size (making the nutrients more accessible to digestive enzymes), and the saliva wets the feed. Horses' saliva—which the horse produces when he chews—also contains buffers that, when swallowed, help protect the stomach's sensitive lining from the acid produced continually. That acid can cause gastric ulcers to develop when not buffered properly.

The stomach—food's next stop in the GI tract—is small compared to the horse's body size and is divided into two sections: the upper nonglandular portion and the lower glandular portion. Stomach acid is secreted in the glandular portion, which is coated with a protective mucus and bicarbonate layer. The nonglandular portion has less protection from mucus and bicarbonate, making it more prone to gastric ulcer development. The buffering saliva can help protect the nonglandular portion, but only if the horse is chewing.

Next up on food's journey through the GI tract is the small intestine. The small intestine is where enzymatic digestion of protein, fats,



and starch occurs, but with some limitations. Starch—a storage carbohydrate in grains and seeds that's high in energy—is well-digested in small amounts. When horses ingest larger amounts, however, the small intestine's digestive efficacy decreases, she said. When starch digestive efficacy decreases, the horse loses out on useful calories in the food he consumes—a problem for racehorses that expend many calories in racing and training. It was also noted that certain starches are more digestible than others—choosing grains that have been ground or processed can improve digestion.

Next up, is the large intestine (or hindgut), where a diverse microbial ecosystem ferments fiber (such as hay and grass). Any starch that went undigested in the small intestine also passes to the large intestine. While starch can be fermented, she said, there are issues that can arise, including a reduction in large intestine pH and changes in the hindgut's microbial community. Both can reduce digestive efficiency. A normal microbial community in the gastrointestinal tract is important for defense against pathogens that can result in digestive disorders.

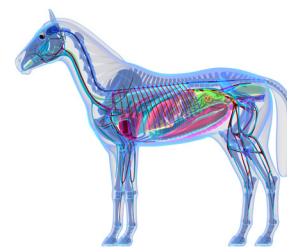
Designing the Diet

Now that we've made our way through the GI tract, it's time to design a feeding program with it in mind. The two main considerations, are:

- What nutrients does the horse need?
- How will they be supplied?

The nutrient needs are fairly simple:

- Water;
- Energy (or, calories);
- Crude protein; and
- Vitamins and minerals.



Dear Equus

I just wanted to send you a message, to say I really love your feed.

I have an Anglo arab who used to come in from his training sessions with what I termed "itchy legs" many blood tests late, and lots of money I was at a loss and it was suggested I look at his feed. After talking to Helen for a good few hours we decided to try the Safe n Lite. After making the change and getting back to the same level of training as before, I no longer saw any signs of the so called "itchy legs". With such good results I moved all my horses over to Equus. Weanlings and youngsters on **All Time Balancer** for now, Happy Hackers on **Nice n Easy** and my Endurance horses on **Cool n Perform 12%**. What is a bonus is that the low sugar based feed is always fresh and looks lovely. I just want to eat it myself. Thank you for providing such a super feed and service .

Fay Bowen



The amount of nutrients a horse needs depends on his workload. Nutritionists typically group workloads into five basic categories:

- Maintenance (Coleman said these are the "lawn ornaments" that don't do much, but need to maintain their weight day-to-day);
- Light work (typically pleasure horses or "weekend warriors");
- Moderate work (a school horse, for example);
- Heavy work (a show horse or lower-level sport horse); and
- Intense work (the high-performance horses—racehorses, endurance horses, upper-level eventing horses, etc.).

"Not surprisingly, as workload increases, so does calorie/nutrient requirement."

But, it was stressed that, diets should always be forage-based.

For horses with lower intensity workloads, a diet consisting of mostly forage and some, if any, concentrate might meet their nutrient requirements. A horse in high-intensity work, however, will likely require a diet still based on good-quality forage, but with a larger amount of concentrate.

Hay—regardless of the type—should be free of mold and dust. Hay being fed to high-performance horses, like racehorses, should have a high nutrient content (such hay might be less appropriate for a very easy keeper or a horse needs to lose weight) and be palatable.

When it comes to concentrates, using commercially produced feeds formulated for racehorses are desirable as these products, are designed with racehorses in mind, take advantage of current research on performance horse nutrition, and are fortified with the vitamins and minerals these horses need to succeed. However these products need to be fed at the recommended feeding rate to ensure the horse receives all the nutrients he needs.

Supplemental feeds—such as fats, oils, and supplements—can also benefit some horses. So how much feed does it take to meet a horse's nutrient requirements?

An average racehorse in intense work might require as much as 7kg of hay and 6kg of concentrate per day. It all depends on how much the horse weighs and how much work he's doing.

It is important that the planning of a feeding schedule is based around what the horse actually needs, with concentrates being spread out into several small feedings throughout the day.

The below feeding recommendations will help promote GI health without sacrificing calories:

- Replace some starch with fat—Fat has twice as many calories as starch and is well-digested in the horse's system, but she noted that palatability can be an issue for some horses;
- Replace some starch with fiber—Adding beet pulp, soybean hulls, and other high-calorie fiber sources can help increase chewing time and, thus, saliva production; and
- Use starches that are well-digested in the small intestine—The more efficient the digestion, the less you'll have to feed and the lower the risk of starch reaching the large intestine where it can cause digestive upset.

Take-Home Message

Regardless of what kind of horse you're feeding, strive to maintain normal GI function and health. Base your horse's diet on forage, add concentrate as needed, and choose your feeds carefully. The end result will be a healthy horse performing at his best.

Article taken and adapted from The Horse.com: Erica Larson, News Editor | Jul 18, 2016 | <https://thehorse.com/18164/feeding-racehorses-with-the-digestive-tract-in-mind/>

For an absolutely free consultation with no further obligation contact our professional consultants to schedule a visit to your yard.

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