PREBIOTICS AND PROBIOTICS: THEIR IMPACT AND ROLE ON YOUR HORSE'S DIGESTIVE HEALTH

The health benefits of prebiotics and probiotics have become all the rage. For the past several years, probiotics have been added to many different kinds of yogurt, juices, and other food products found in the grocery store. It is increasingly common to find prebiotic and probiotic capsules in natural health food stores or pharmacies. But what do they contain for our four-hooved friends? How can pre and probiotics help horses?

Let's begin with a brief overview of the equine digestive system. Like humans, horses are mono gastric and possess a single stomach. That said, since horses are herbivores, their digestive systems are closer to those of cows. A horse's digestion system operates within two main sections, beginning with the stomach and small intestine and ending with the large intestine. In the stomach and small intestine, digestive enzymes do most of the work to digest the feed and assimilate the majority of nutrients. Next, in the large intestine, which includes the caecum and colon, the hay will be exposed to beneficial microorganisms and broken down through the fermentation process.

The large intestine contains billions of bacteria, protozoa, and fungi required to successfully carry out digestion (Sadet-Bourgeteau, 2012). Any source of digestive stress, including a change in food (either hay or feed), an increase in stress levels or a course of antibiotics can destroy good bacteria and stimulate lactic acid production, causing pH levels to drop. All this will lead to an imbalance of intestinal flora. Disrupted intestinal flora can trigger a wide range of problems including the taking over of pathogenic bacteria (e.g. Salmonella), founder, diarrhea and gas colic.

Knowing this, how can we maintain the health of our horse's intestinal flora? The answer lies in the gut: prebiotics and probiotics. But what exactly is a prebiotic? Basically, it's a sugar (e.g. oligosaccharide, polysaccharide) which the horse does not break down. The sugar acts as a substrate that promotes the growth of certain bacteria in the colon. When added to food, prebiotics are not digested by the small intestine. Instead, they travel to the colon where they play a key role in ensuring the proliferation of beneficial bacteria within the intestinal flora. In short, prebiotics are substances that serve as food for good bacteria (Thomas 2009). Prebiotics, which include MOS's (mannan oligosaccharides), act indirectly on intestinal flora health. When prescribed as a preventative measure, prebiotics reduce the harmful effects of pathogenic bacteria such as E. Coli and Salmonella by preventing their adhesion to cells of the intestinal epithelium (NRC 2007). To further promote intestinal health, prebiotics also stimulate the proliferation of beneficial bacteria (Thomas, 2009). Additionally, when horses ingest grain or hay containing mycotoxins, MOS binds to the toxin and prevents the horse from absorbing the harmful substances (NRC, 2007). Studies have also shown that foals born from mothers who have been given prebiotic supplements possess increased levels of antibodies, especially the immunoglobulin M (NRC, 2007).

Now let's have a look at probiotics. According to the World Health Organization (WHO), probiotics are living microorganisms that are beneficial to the host's health when administered in sufficient quantities. For our purposes, the host is our horse. The Association of American Feed Control Officials (AAFCO) uses the term *direct fed microbials (DFM)* to designate several types of bacteria (probiotics) including *Lactobacillus acidophilus, Lactobacillus casei, Bifido bacterium bifidium* and *Enterococcus faecium.* Among their many functions, these probiotics work to improve digestive health by promoting the digestion and absorption of nutrients. This way the food the horses consume will be much more effective. By reducing variations in pH levels, DFM's also decrease the risk of the intestinal flora going

out of balance due to a change in exercise or diet, especially for horses whose food intake is composed primarily of starch. Similar to prebiotics, probiotics prevent and combat pathogenic bacteria (NRC, 2007). By adhering to the intestinal membrane, probiotics prevent E. Coli, Salmonella and Clostridium from attaching to the intestinal lining and gradually destroying it. Probiotics also play a major role in breeding horses. By increasing nutrient absorption, they help to boost the mare's milk production. As the nursing foal's energy goes towards developing its gastrointestinal and immune system, it is common for it to suffer from intestinal imbalances. Foals can begin to take probiotics as early as a few weeks into life, thereby decreasing their incidence of diarrhea.

Because probiotics are living organisms, they need to be protected from the production process when they are included in a feed's ingredients. For this reason, they are not added to extruded horse feeds since they would be destroyed by the high temperatures required for extrusion.

How should we use prebiotics and probiotics? According to studies, consistent supplementation produces better results than intermittent use.

When is my horse likely to require support from probiotics? The many examples include during a stressful situation, a major athletic feat, a long journey, following a course of antibiotics, when an older horse has difficulty maintaining its body condition, when the ration being served is high in grains, or when the gastrointestinal tract is overloaded. Thus, foals, brooding mares and older horses alike can all benefit from probiotics.

Where can I find probiotics?

Purina horse feed contains all the benefits of pre and probiotics!

Look for the following icons on our packaging!

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