

## Prebiotics and Probiotics for Horses

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Horses have a unique digestive system. The front portion of the digestive system, the stomach and small intestine, utilizes enzyme digestion to break down food material. The bag portion of the digestive system, the cecum and colon, have a microbial population (bacteria, yeast, fungi) that ferment and breakdown fiber. Without micro-organisms in the hindgut, horses would not be able to digest and utilize plant material such as hay and pasture. These microbes in the hindgut break down and ferment fiber, producing volatile fatty acids that serve as a significant energy source. During this fermentation of plant fiber microbes also synthesize B vitamins and other nutrients essential to the health and wellbeing of the horse. In order to efficiently digest fiber, the microbial population of the hindgut must be healthy and their numbers at appropriate levels. There are additives that can be added to feed or used as supplements that may assist in keeping the microbes in the hindgut healthy and primed for proper digestion.

### Probiotics –

The term “Probiotic” is opposite to “Antibiotic”. An antibiotic is a product that will actually kill or destroy certain bacteria. A probiotic is an organism thought to be beneficial to the host organism. According to the currently adopted definition by the food and agricultural organization, probiotics are: "Live microorganisms which when administered in adequate amounts confer a health benefit on the host". In this case, the host can be either bacteria within the digestive tract or the horse. Bacteria such as *Lactobacillus acidophilus*, *Enterococcus* or *Streptococcus faecium* are the most common types of microbes used as probiotics in horses; but certain yeasts are also be used. dac<sup>®</sup> utilizes Yea-Sacc<sup>1026</sup> which is a live yeast culture based on *Saccharomyces cerevisiae* strain <sup>1026</sup>, a yeast strain specifically selected for its influence on animal performance. Another common term used for probiotics is direct fed microbials (DFM)

Many horse owners use supplements or commercial feeds containing some or all of these microorganisms with the purpose of keeping the hindgut microbial population stabilized. Any stress such as an abrupt change in feed, the stress of putting a horse in a trailer and taking him somewhere, a visit by the veterinarian or farrier, a strenuous showing or work schedule, can disrupt the gut. A high-grain, high-concentrate, low-fiber diet may also damage or destroy microbes in the hindgut.

Small amounts of these important probiotics added to the diet on a daily basis may be beneficial, as there are a myriad of things that can stress horses. It's easy to change the gut microbes very quickly; the life cycle of some of the microbes is as short as 15 minutes. Thus it's a good idea to include them in the ration. It's an inexpensive insurance policy.

Research on Yea Sacc<sup>1026</sup> in horses has shown increased fiber digestion and phosphorus digestion in horses supplemented Yea Sacc<sup>1026</sup>. This led to further studies showing increased whither heights in foals from dams supplemented with Yea Sacc<sup>1026</sup> throughout gestation.

Since these are living organisms, the question often comes up about shelf life of the products, and whether the microbes actually make it to the hindgut when fed— can they withstand the digestive process through the first part of the digestive tract or withstand the temperatures involved in feed processing? dac<sup>®</sup> has carefully selected specific probiotics such as Yea Sacc<sup>1026</sup> because of its ability to withstand feed processing temperatures. Its microencapsulated technology enables it to travel unharmed to the hindgut where it is most effective.

Prebiotics –

Prebiotics are non-digestible food ingredients that stimulate the growth or activity of bacteria in the digestive system. Most (but not all) prebiotics are carbohydrates— long chains of sugar molecules bound together. Common examples of prebiotics include fructooligosaccharides (FOS), xylooligosaccharides (XOS), polydextrose, manooligosaccharides (MOS), and galactooligosaccharides (GOS).

MOS is a non-digestible sugar that has the same binding site on its surface as the small intestine. Many pathogens bind to the wall of the intestine and this is how they gain access to start their damage and the disease process. When you feed the horse prebiotics such as MOS the bad bacteria adhere to these sugars. Since these sugars (prebiotics) are non-digestible, the harmful pathogens are carried on through the digestive tract rather than causing disease.

dac<sup>®</sup> utilizes a MOS known as Bio-Mos<sup>®</sup> as it is particularly effective at binding pathogens. Bio-Mos<sup>®</sup> is derived from the cell wall of *Saccharomyces cerevisiae*<sup>1026</sup>. Bio-Mos<sup>®</sup> is the original natural solution to intestinal issues. It promotes good bacteria and builds natural defenses thereby maximizing animal performance and profitability.

Research has shown that Bio-Mos<sup>®</sup> can boost immunoglobulin's in colostrum by supplementing the dam with Bio-Mos<sup>®</sup> prior to foaling. Other research on Bio-Mos<sup>®</sup> has shown an increase in vaccination titers with certain vaccines

Use of Probiotics and Prebiotics –

Horse owners who use their animals in strenuous careers often use these products in the horses' daily ration. This can help make a difference in keeping a high end performance horse functioning at their best.

Young and aged horses also benefit from probiotic and prebiotic use because their intestinal tracts usually are not functioning at peak efficiency. Foals lack a fully balanced level of bacteria in their systems and thus cannot completely and effectively digest food.

Aged horse can have diminished intestinal function or other conditions that make it difficult for them to digest and absorb their food. dac® has recognized these weaknesses, and have included Yea Sacc<sup>1026</sup> and Bio-Mos® in their supplements designed for young and aged horses.

Other scenarios where use for these products may be important is re-establishing proper gut function after the horse has been ill, off feed, or treated with oral antibiotics that killed some of the beneficial microbes in the hindgut. Medications that kill pathogenic bacteria also kill good ones. If the gut has been compromised by stress, illness, antibiotic treatment or the horse not eating, it is critical to quickly re-establish these good microbial populations. In Europe where the use of antibiotics in animals is strictly controlled, Bio-Mos® has been used successfully to eliminate bad bacteria and has replaced the use of antibiotics.

Therefore, the use of probiotics and prebiotics in horse feed is a valid, research based approach to keeping horses healthy. This is yet another way that supplement and feed manufacturers such as dac® Vitamins and Minerals can utilize technology to help keep your horse healthy.