

# Prebiotics and Probiotics

*These popular nutritional supplements often are administered to horses with gastrointestinal concerns*

## Overview

Nutritional supplements are extremely popular among horse owners, and those designed for digestion are the second most commonly administered type behind joint supplements.<sup>1</sup> This statistic is not surprising considering how sensitive the equine digestive system is and that a horse's overall health relies upon optimal functioning of the gastrointestinal (GI) tract. Researchers and veterinarians believe a healthy GI system reduces gas and/or colic, improves digestion and absorption of nutrients, benefits the immune system, protects the horse against infection (e.g., by diarrhea-causing organisms such as *Salmonella* or *Clostridium*), and minimizes the occurrence of laminitis.

Supplements marketed for digestive health typically contain a variety of ingredients such as digestive enzymes, amino acids, and several herbs or other ingredients (e.g., slippery elm, marshmallow root, meadowsweet herb, cramp bark, stem bark, bruised milk thistle seed, licorice root, gotu kola leaf, etc.). But prebiotics and probiotics are some of the most common ingredients in digestive health products.

Despite the similarity in their names, prebiotics and probiotics are not just two different forms of a similar supplement. They are actually two completely different types of supplements with unique mechanisms of action. In the simplest terms, probiotics are “good” microbes and bacteria, and prebiotics are the foods that feed those good microbes and bacteria.

The microbes and bacteria included in probiotics are important to horses because they help the horse's GI tract break down and ferment grass and hay. This fermentation process results in the production of volatile fatty acids that provide a significant



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energy source to the horse. These microbes also produce B vitamins and other nutrients essential to the overall health of the horse. Finally, the “good” microbes—yeasts, bacteria, protozoa, and fungi—keep the “bad” microbes (such as *Salmonella* and *Clostridium difficile*) from overpopulating the intestines and causing diarrhea and illness.

## Prebiotics: Definition and Examples

As indicated above, prebiotics are food ingredients that stimulate the growth or activity of bacteria that live in the horse's gastrointestinal tract. The horse does not digest these food ingredients; they are instead “fed” to the good bugs.<sup>2</sup>

Prebiotics are most commonly carbohydrates—long chains of sugar molecules bound together. Some of the most common prebiotics used in equine supplements include fructooligosaccharides, xylooligosaccharides, polydextrose, mannoooligosaccharides (MOS), galactooligosaccharides, pectin, and psyllium. These prebiotics are digested by the “good” microorganisms in the horse's digestive system to increase their numbers or activity. Two of the best known “good” bacteria are *Bifidobacterium bifidum* and *Lactobacillus acidophilus*.

## Probiotics: Definition and Examples

Probiotics are the live microorganisms themselves. When administered in adequate amounts, these microorganisms confer a health benefit on the horse. To be considered a probiotic, the bacteria included in the supplement must:

- Be alive when administered;
- Contain a taxonomically defined microbe(s), including genus, species, and strain; and
- Be safe for the intended use.

Typical equine probiotics include *Lactobacillus* and *Bifidobacterium* species of bacteria and/or the yeast *Saccharomyces boulardii*.<sup>2</sup>

## How Pre- and Probiotics Benefit Horses

Humans use prebiotics and probiotics for various reasons, including treatment/management of infectious diarrhea, inflammatory bowel disease (e.g., ulcerative colitis), gastric ulceration, tooth decay/periodontal disease, vaginal infections, skin infections, and even in the treatment of certain cancers.<sup>3</sup>

Horse owners and veterinarians administer prebiotics and probiotics to horses primarily for GI-related concerns (i.e., diarrhea), to encourage the growth of the good microbes, and to minimize the invasion and growth of disease-causing bacteria.

For example, antibiotic administration, stress, transport, abrupt dietary changes, and *Clostridium* spp. or *Salmonella* spp. infections can potentially alter the normal microbe population in a horse's large intestine. Some owners therefore elect to administer prebiotics and/or probiotics to horses that are being treated with systemic antibiotics, have developed diarrhea, are off feed, and prior to shipping or another stressful event.

Owners also elect to feed prebiotics and probiotics to "hard keepers," older horses, or high-end performance horses. These products are generally inexpensive, easy to administer, and can potentially have a profound beneficial impact.

Scientific evidence supporting the use of these supplements in horses, however, remains scant. Nonetheless, some data exists: A study published in 2005 supports oral administration of the bacterium *S. boulardii* to hospitalized horses with acute enterocolitis (diarrhea). Treated horses experienced a significant decrease in both the severity and duration of disease compared to horses that received only a placebo.<sup>3</sup>

A separate study about the administration of short-chain fructooligosaccharides in horses (published in 2008) concluded that the prebiotic effectively reduced disruptions in the microbial populations that colonize the equine hindgut under stressful situations (e.g., acute starch overloads).<sup>4</sup>

#### Caveats for Use

Like other nutritional supplements, little scientific data exists to demonstrate

the safety and efficacy of prebiotics and probiotics in horses. In addition, prebiotics and probiotics are not drugs and are not required to be manufactured like drugs (using government-designated quality assurance/quality control techniques or current Good Manufacturing Practices). This means a number of poor-quality products are available to unsuspecting consumers.

Prebiotics and probiotics are widely considered to be safe, but there is evidence in both human and veterinary medicine that probiotics might not be suitable for use in some situations. For example, one study in horses reported that when *Lactobacillus pentosus* WE7 was given preventively to neonatal foals, administration caused diarrhea in some foals and necessitated veterinary intervention.<sup>6</sup>

The American Veterinary Medical Association and the American Association of Equine Practitioners both recommend veterinary guidance when using nutritional supplements. Owners are encouraged to discuss the use of these (or any) nutritional supplements prior to their administration. Finally, consider using the ACCLAIM

system, initially described for selecting oral joint health supplements, to help select a quality supplement.<sup>8</sup> 🐾

#### KEY REFERENCES

1. Packaged Facts. Pet supplements and nutraceutical treats in the U.S. February 2008.
2. National Institutes of Health National Center for Complementary and Alternative Medicine. Available at <http://nccam.nih.gov/health/probiotics>.
3. Desrochers AM, Dolente BA, Roy MF, et al. Efficacy of *Saccharomyces boulardii* for treatment of horses with acute enterocolitis. *J Am Vet Med Assoc.* 2005;227:954-9.
4. Respondek F, Goachet AG, Julliard V. Effects of dietary short-chain fructooligosaccharides on the intestinal microflora of horses subjected to a sudden change in diet. *J Anim Sci.* 2008;86:316-23.
5. Weese JS, Arroyo L. Bacteriological evaluation of dog and cat diets that claim to contain probiotics. *Can Vet J.* 2003;44:212-6.
6. Weese JS, Rousseau J. Evaluation of *Lactobacillus pentosus* WE7 for prevention of diarrhea in neonatal foals. *J Am Vet Med Assoc.* 2005;226:2031-4.
7. Probiotics May Be Harmful For Patients With Acute Pancreatitis. Available at [www.medicalnewstoday.com/articles/97757.php](http://www.medicalnewstoday.com/articles/97757.php).
8. Oke S. Oral joint supplements for horses. [www.TheHorse.com/11958](http://www.TheHorse.com/11958).

Further reading and free horse health e-newsletter: [www.TheHorse.com/Nutrition](http://www.TheHorse.com/Nutrition).

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