

# Prebiotics and Probiotics

*In horses, stress, illness, and antibiotics can kill the “good bugs” in a horse’s gut; some products can help*

## Overview

Prebiotics and probiotics are dietary supplements given to horses in an effort to prevent or treat certain illnesses or simply to promote a healthy gastrointestinal (GI) system. A healthy GI system is thought to reduce gas and/or colic, improve digestion and absorption of nutrients, benefit the immune system, protect the horse against infection (e.g., by diarrhea-causing organisms such as *Salmonella* or *Clostridium*), and minimize the occurrence of laminitis.

Prebiotics and probiotics are different types of supplements that have unique mechanisms of action. In the simplest terms, probiotics are a source of “good” microbes and bacteria, and prebiotics are the foods used to feed those good microbes and bacteria.

Microbes in the horse’s hindgut (large intestine and cecum) help the GI tract break down and ferment the fibrous portions of grass and hay. This process results in volatile fatty acids that provide a significant energy source to the horse.

Microbes also create B vitamins and other nutrients essential to the health of the horse, and the “good” microbes (such as yeasts, bacteria, protozoa, and fungi) keep the “bad” microbes (such as the bacteria *Salmonella* and *Clostridium difficile*) from overpopulating the gut and causing illness.

## Prebiotics: Definition and Examples

In specific terms, prebiotics are defined as non-digestible (by the host) food ingredients that stimulate the growth or activity of digestive system bacteria that are beneficial to the health of the body. In other words these products “feed” the good bugs.

Most (but not all) prebiotics are carbohydrates—long chains of sugar molecules bound together. Common examples of prebiotics include fructooligosaccharides (FOS), xylooligosaccharides (XOS), polydextrose, mannoooligosaccharides (MOS), and galactooligosaccharides (GOS). These



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The stress of shipping and showing an athletic horse can disrupt the natural “good” bacteria in a horse’s gut; prebiotics and probiotics are two products that might help resolve those issues.

prebiotics are fed to the horse to be digested by the “good” microorganisms in the horse’s GI tract to increase the number or activity of these good microorganisms, such as the bacteria *Bifidobacterium bifidum* and *Lactobacillus acidophilus*.

## Probiotics: Definition and Examples

Probiotics are live microorganisms that when administered in adequate amounts confer a health benefit on the host. To be considered a probiotic, the bacteria must be alive when administered to the horse; must 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 in addition to the yeast *Saccharomyces boulardii*.

## How They Benefit Horses

In humans, prebiotics and probiotics are used for various reasons, including treatment/management of infectious diarrhea, inflammatory bowel disease (e.g.,

ulcerative colitis, Crohn’s disease), irritable bowel syndrome, *Helicobacter pylori* infection (which causes ulcers in humans), gastric ulceration; tooth decay/periodontal disease, vaginal infections, skin infections, and even in the treatment of certain cancers. MOS can also bind pathogens.

In the equine industry, prebiotics and probiotics are primarily administered for GI-related concerns (such as 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 changes in feeding, and infection with *Clostridium* spp. or *Salmonella* spp. can potentially alter the populations of the normal microbes 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 some other stressful event.

Owners also elect to feed prebiotics and probiotics to “hard keepers,” geriatric and

older horses, or high-end performance horses. These products are inexpensive, easy to administer, and can potentially have a profound beneficial impact.

Scientific evidence supporting the use of these supplements remains scant. Nonetheless, there is some data to support the use of these products in horses. A study published in 2005 supports the use of orally administered *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.

A separate study on the administration of short-chain fructooligosaccharides in horses (published in 2008) concluded that prebiotic was effective in reducing disruptions in the microbial populations colonizing the equine hindgut under stressful situations (e.g., acute starch overloads).

#### Caveats for Use

Like other nutritional supplements, one of the concerns associated with the use of prebiotics and probiotics in horses relates to the dearth of research in equines.

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 Good Manufacturing Practices). This means poor-quality products are available to unsuspecting consumers. One study evaluating probiotic-containing pet foods found only very low levels of probiotics were present in the feeds. There are no studies evaluating equine feeds or supplements containing prebiotics or probiotics. This points to the need for consumers to deal with reputable companies.

Prebiotics and probiotics are widely considered 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. In one human study a probiotic cocktail was associated with an increased rate of death in patients with acute pancreatitis.

## FAST FACTS

- Prebiotics and probiotics are dietary supplements offered to horses to prevent or treat certain illnesses or simply to support their horses' general well-being.
- Prebiotics are non-digestible (by the host) food ingredients that stimulate the growth or activity of bacteria in the digestive system which are beneficial to the health of the body.
- Probiotics are live microorganisms, which, when administered in adequate amounts, confer a health benefit on the host.
- Like all nutritional supplements, concerns regarding the dearth of scientific research supporting the use of these products and the lack of quality assurance/quality control and government regulation should be considered.
- These products should be administered under the guidance of a licensed veterinarian.

Horse owners should discuss use of pre- and probiotics with their veterinarians prior to using them. The American Veterinary Medical Association and the American Association of Equine Practitioners recommend nutritional supplements be used under the guidance of a veterinarian. 🐾

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