

# TECHNICAL MONOGRAPH

PRODUCT NAME: PROBIOplus

CONSTITUENTS:	Common Name	Scientific Name
	amylase	
	Bacillus coagulans	<i>Bacillus coagulans</i>
	beta-glucanase	
	Bifidobacterium animalis	<i>Bacillus coagulans</i>
	Enterococcus faecium	<i>Enterococcus faecium</i>
	flaxseed	<i>Linus usitatissimum</i>
	Lactobacillus acidophilus	<i>Lactobacillus acidophilus</i>
	protease	
	Yeast, nutritional	<i>Saccharomyces cerevisiae</i>

## INTENDED PURPOSE

PROBIOplus is design to improve digestion and to promote healthy fore- and hindgut environments. Digestive enzymes (amylase, beta-glucanase) help to breakdown dietary starch. Beneficial for horses that have been treated with antibiotics (these destroy beneficial caecal and hindgut bacteria), are underweight, or recovering from laminitis.

## EVIDENCE FOR EFFICACY

- **Amylase** is a digestive enzyme found in saliva and the upper part of the digestive system. It is important in the breakdown of starches present within feeds. Adding amylase to the diet can assist in the breakdown of starches, increasing the amount of digestible energy that can be absorbed from dietary fibre in all portions of the gastro-intestinal tract (Noziere et al. 2014; Vargas-Rodriguez et al. 2014).
- **Bacillus coagulans** is a probiotic bacterium that can transiently colonize the lower gastro-intestinal tract. It is provided to the animal as a dietary supplement in its spore form. After the spores germinate, the bacterial cells produce the metabolically important and beneficial L-lactic acid. The bacterium helps promote a healthy gut environment by improving the quantity and quality of desirable microorganisms and inhibiting pathogenic bacteria and fungi. This bacterium also produces short chain fatty acids that help to nourish the cells lining the intestinal tract (Jurenka et al. 2012; Rolfe 2000).
- **BETA GLUCANASE** IS A DIGESTIVE ENZYME NORMALLY FOUND IN THE LOWER DIGESTIVE SYSTEM THAT BREAKS DOWN BETA-GLUCAN BONDS WITHIN GLUCOSE POLYSACCHARIDES (A TYPE OF STARCH) THAT ARE PRESENT IN GRAINS SUCH AS BARLEY, WHEAT, CORN AND SOYBEANS. ADDING BETA GLUCANASE TO THE DIET CAN ASSIST WITH THE BREAKDOWN OF STARCHES IN THE GUT, INCREASING THE AMOUNT OF DIGESTIBLE ENERGY PROVIDED TO THE ANIMAL (COZANNET ET AL. 2012; KONG AND ADEOLA 2012; OWUSU ET AL. 2012).
- **Bifidobacterium animalis lactis** is one of the anti-inflammatory probiotic bacteria strains found in the healthy gut. The mode of action appears to be a decrease in hindgut lipopolysaccharide concentrations, which might reduce the proinflammatory tone. This strain of *B. animalis* also produces antibiotics or bacteriocins that inhibit the bacteria causing clostridial enteric disease. Some strains also result in enhanced immune function in healthy subjects (Rodes et al. 2013; Schoster et al. 2013; Roessler et al. 2008).
- **Enterococcus faecium** is one of many lactic acid – producing, probiotic bacteria. When ingested in high numbers, it can be used to treat or prevent diarrhoea, to

- Roessler et al. 2008).
- **Enterococcus faecium** is one of many lactic acid – producing, probiotic bacteria. When ingested in high numbers, it can be used to treat or prevent diarrhoea, to enhance immunity and to improve growth. Some strains are capable of increasing the absorptive and secretory capacity of the upper intestinal tract and enhance the intestinal barrier to pathogens (Franz et al. 2011; Klingspor et al. 2013).
  - **Lactobacillus acidophilus** is one of the probiotic, lactic acid - producing bacteria. Adequate dietary intake is associated with enhancing intestinal flora and immune system function. New research indicates that this bacteria also has effective anti-inflammatory and antioxidant properties in an experimental model of arthritis. (Amdekar et al. 2013; de Vrese and Schrezenmeir 2008).
  - **LINUS USITATISSIMUM (FLAXSEED)** IS RICH IN OMEGA-3, OMEGA-6 OILS, ALPHA-LINOLEIC ACID, DIETARY FIBERS, SECOISOLARICRESINOL DIGLUCOSIDE, PROTEIN AND MINERALS. ITS HEALTH BENEFITS INCLUDE BEING AN ANTIOXIDANT AGENT, PREVENTIVES AGAINST CARDIOVASCULAR DISEASES, CANCER, DIABETES AND ENHANCEMENT OF SPATIAL MEMORY. **FLAXSEED** ALSO HAS DEMONSTRATED ANTI-INFLAMMATORY ACTIVITY WHEN FED TO HORSES FOR 70 DAYS (VINEYARD ET AL. 2010; AKHTAR ET AL. 2013).
  - **Proteases** are enzymes that break down dietary proteins into peptides and amino acids. Many peptides are beneficial nutrients, and many amino acids produced in this way are essential (cannot be synthesized within the body). Proteases aid in the digestion of protein within forages and feeds (Kitts and Weiler 2003; Correa et al. 2011).
  - **Saccharomyces cerevisiae** (nutritional yeast) is a probiotic that can be provided in high numbers as a live cell culture or as a dried product in the diet. Its benefits in horses and other animals include modifying intestinal flora in the large intestine and hindgut to improve starch digestibility (Medina et al. 2002; Jouany et al. 2009). There is the potential for enzymes involved in plant cell wall digestion to be increased with repeated ingestion of this yeast, resulting in improved digestion of fiber in horses (Jouany et al. 2008; Mackenthun et al. 2013).

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