

# NHP GI Health – What You Need to Know

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**P**romoting a healthy gut is important for the complete well-being of non-human primates. Bio-Serv offers a line of products that supports GI health and balance for these species.

**Idiopathic chronic diarrhea of nonhuman primates is a major gastrointestinal disorder and a leading cause of serious morbidity in nonhuman primates kept in captivity. Marmoset wasting syndrome is one of the leading causes of morbidity and mortality in captive marmosets. Many of these animals are not responsive to traditional treatments. Millions of dollars are spent annually on diagnosis and supportive care of these animals. Bio-Serv offers a whole line of products that can help to reduce the incidence of diarrhea in captive nonhuman primates by supporting the natural microflora in the gut.**

Bio-Serv's SD Pro™ products are nonhuman primate-specific live probiotics containing the nonhuman primate-derived probiotic bacterium *Lactobacillus reuteri*, a digestive commensal species in the nonhuman primate. *L. reuteri* is a gram-positive bacterium and a natural inhabitant of the gastrointestinal tract of mammals and birds. *L. reuteri* produces reuterin, an antimicrobial compound, which has been demonstrated to inhibit the growth of specific harmful bacteria while keeping the normal gut microflora intact, thereby having desired antimicrobial effects in the gut. *L. reuteri* also modulates and enhances the immune system. *L. reuteri* interacts directly with other bacteria in the gut as well as the host immune system to prevent colonization of invasive bacteria. Clinical trials in humans have shown that *L. reuteri* administration is safe and can reduce the incidence and the severity of diarrhea in young children.

Unlike traditional probiotics, the *L. reuteri* in our SD Pro products has been harvested and cultured from the gut of a nonhuman primate. Recent research has identified the importance of host specificity in bacterial probiotics effectively colonizing the gastrointestinal tract of the animal. Specifically, *L. reuteri* strains isolated from different animal species expressed host-specific genes, some of which were responsible for microbe attachment to the host gut surface. The nonhuman primate host specificity of SD Pro supports the colonization of the probiotic in the gastrointestinal tract of the primate, conferring the benefits of probiotics in supporting and restoring gastrointestinal health.

The SD Pro products have the added benefit of containing the non-pathogenic live yeast *Saccharomyces boulardii*. *S. boulardii* is also characterized as a probiotic and helps to maintain the natural microbial flora in the intestine and prevent the colonization of pathogenic bacteria. *S. boulardii* has been prescribed for prophylaxis and treatment of diarrheal diseases caused by bacteria. Of significance, *S. boulardii* has shown both clinical and experimental effectiveness in gastrointestinal diseases with an inflammatory component, demonstrating the role of this probiotic in interfering with molecular pathways common to many inflammatory conditions. Additionally, *S. boulardii* can be given in conjunction with antibiotic therapy since it is a yeast and not a bacterial microbe.

Glutamine is also included in the formula of the SD Pro products as it is a beneficial amino acid that is important for rapidly dividing cells such as enterocytes. Glutamine supplementation has been shown to promote GI health in the face of major physiologic stress. GI distress can blunt enterocytes, lead to leaky gut and allow translocation of pathogens or toxins into the body. Glutamine enhances enterocyte proliferation and repair, preserves the gut barrier and enhances GI immunologic responses. It is an important



amino acid in the nutraceutical arsenal to help restore GI normalcy.

Bio-Serv has expanded the SD Pro product line to include Magic Tablets and Mini MD's for tiny monkeys such as marmosets. The Magic Tablets are a cocktail of the SD Pro ingredients with the addition of bismuth subsalicylate and potassium. Coined "Magic Tabs," they are an all-in-one tasty tablet conferring similar benefits as bananas and Pepto Bismol™ support. The Mini Primate MD's™ will be an expanding line of smaller tablets similar to the Primate MD's™ tablets. The first additions to the Mini Primate MD's will be the SD Pro Mini MD, SD Pro Mini Magic Tablet and Mini Primate MD containing Budesonide 0.5 gm/Tablet.

Probiotics interact directly with the bacteria in the gut and can also interact with the immune system; therefore, only live microorganisms have a beneficial function because they can colonize the gastrointestinal tract and interact with host cells and pathogens. The MD's tablets are offered as a highly delicious treat and a no-stress dosing option. The powder can be used in a group-housing environment by top-dressing biscuits for ease in dosing of a large group of animals. The powder can also be mixed into semi-soft food ingredients such as yogurt, applesauce or peanut butter or added to liquids such as Prang™ or fruit juice for easy delivery.

The choice of a high-quality probiotic is an important determinant of the product's efficacy. The quality of probiotics from different manufacturers can vary, and many of the available products may lack routine testing and quality-assurance programs to guarantee the levels of live probiotics in the product<sup>11</sup>. Bio-Serv's SD Pro™ Products are routinely tested by an independent laboratory to assure they contain the level of live bacteria stated on the label. The cold dry manufacturing process of the tablets and the proper carriers in the powder provide a stable format for the live bacteria to survive.

Primate intestinal microflora is easily imbalanced by stress, medications, disease, dietary changes and research protocols. By delivering a source of live probiotics, SD Pro™ products provide natural fortification of the gastrointestinal tract. SD Pro™ products can help support and normalize the gastrointestinal flora to maintain a healthy balanced gut and improve digestion.

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MD's tablet (left) and Mini MD's tablet (right)



MD's Magic tablet (left), and Mini Magic tablet (right)

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Advancing Science. Enriching Animals