



Probiotic Eleven

Stock #1510-1 (90 capsules)

Probiotic Eleven is a nutritional supplement that provides 11 different strains of healthy intestinal flora. These important and beneficial bacteria are "friendly" microorganisms that naturally inhabit the intestinal tract, aiding digestion, improving the absorption of nutrients, enhancing immune function and protecting against harmful bacteria, viruses and fungi. Probiotic Eleven is designed to help re-establish a healthy balance of beneficial bacteria in the gastrointestinal tract and can be used for both therapeutic purposes and preventative maintenance.

Probiotics are defined as live microorganisms that, once ingested, demonstrate a beneficial effect upon the body by improving the balance of the intestinal flora. The most reliable and well-researched probiotic organisms belong to either the lactobacillus or bifidobacteria genera—lactobacillus bacteria reside mainly in the small intestine and bifidobacteria colonize the large intestine. Probiotics inhibit the growth of harmful microorganisms, boost immune function, increase resistance to infection and promote healthy digestion. However,

antibiotic use and alcohol, as well as disease and aging, can disrupt the balance of intestinal microflora, thus negatively affecting the beneficial role these important microorganisms play.¹⁻⁶

Much of the research on probiotics has focused on diarrhea prevention and intestinal health, stomach ulcers, immunity and women's urogenital health. However, promising data also exists on the use of probiotics for combating *Helicobacter pylori* stomach infections, modulating mucosal immunity (the first line of defense against foreign invaders), reducing the risk of certain cancers, minimizing surgical complications, and decreasing serum cholesterol and oxaluria—the excess of calcium oxalate in the urine, which contributes to the formation of kidney stones. Furthermore, preliminary human studies suggest that probiotics have a positive effect in the treatment of colitis (inflammation of the colon), also known as irritable bowel disease (IBD)—a general term for a group of diseases involving intestinal-wall inflammation and characterized by recurrent crampy abdominal pain and diarrhea, including Crohn's disease and ulcerative colitis.^{1,4-11}

Each serving of Probiotic Eleven contains 1.6 billion *Lactobacillus rhamnosus*, 1.2 billion *Bifidobacterium bifidus*, 1.2 billion *Lactobacillus acidophilus*, 1.2 billion *Lactobacillus brevis*, 1.2 billion *Lactobacillus bulgaricus*, 1.2 billion *Lactobacillus plantarum*, 1.2 billion *Streptococcus thermophilus*, 800 million *Bifidobacterium infantis*, 800 million *Bifidobacterium longum*, 800 million *Lactobacillus casei*, and 800 million *Lactobacillus salivarius* cultures, along with fructooligosaccharides (FOS)—a dietary fiber that assists proliferation of these important bacteria.

Lactobacillus rhamnosus has been shown to enhance systemic cellular immune responses in healthy volunteers. Studies have found that *L. rhamnosus* also alleviates clinical symptoms of gastrointestinal inflammation and atopic dermatitis, and significantly reduces the occurrence of atopic eczema (an inflammatory skin condition characterized by redness, itching and oozing lesions that become scaly, crusted or hardened) in children. In addition, two separate studies involving children (ages 1 to 36 months) showed that *L. rhamnosus* significantly shortened the duration of acute-onset rotavirus diarrhea compared to placebo. Furthermore, a one-month trial involving 10 infants with food-allergy-related dermatitis showed that *L. rhamnosus* provided significant clinical improvements in the infants' conditions, compared to those given a placebo.^{4,5,12-19}

Lactobacillus acidophilus has demonstrated significant antioxidant activity and has been shown to prevent several intestinal pathogens (disease-causing microorganisms) from attaching to human intestinal cells, including *Escherichia coli*, *Yersinia pseudotuberculosis* and *Salmonella typhimurium*. *L. acidophilus* also inhibits the growth of *Helicobacter pylori* and has been proven effective in reducing the duration of acute diarrhea in children. In addition, *L. acidophilus* regarded as a successful natural treatment for bacterial vaginosis (vaginal infection), particularly in pregnant women, due to the lack of systemic side effects. Furthermore, a controlled clinical study found that *L. acidophilus* can reduce serum cholesterol and thus, demonstrates the potential for reducing the risk of coronary heart disease.^{9,20-26}

Lactobacillus brevis has been shown to alter the immunological responses in humans. For example, a study found that oral intake of *L. brevis* significantly increased the interferon-alpha (IFN-alpha) producing capacity of apparently healthy subjects and was especially beneficial in those with initially low levels of IFN-alpha production—IFN-alpha is a protein that exhibits pronounced antiviral activity and causes the activation of natural killer cells. Other research has shown that *L. brevis* inhibits the activity of potentially harmful microorganisms, including *Bacillus cereus*—a bacteria that causes food poisoning. *L. brevis* has also been shown to efficiently induce apoptosis (programmed cell death) in vitro in Jurkat cells—human T-leukemia cells that are used to test the effects of anticancer drugs and radiation.²⁷⁻²⁹

Lactobacillus bulgaricus has demonstrated strong immunopotentiating activity and has been shown to induce

significant increases in interleukin-6 (IL-6) production by macrophages—IL-6 is a protein that stimulates the growth and differentiation of human B-cells (a type of white blood cell that fights viral infections). *L. bulgaricus* has also been shown to significantly inhibit intestinal carcinogenesis (the formation of cancer) in rats by decreasing the occurrence and number of tumors. In addition, two double-blind controlled studies have confirmed the effectiveness of *L. acidophilus* and *L. bulgaricus* against antibiotic-associated diarrhea.³⁰⁻³³

Lactobacillus plantarum appears to be an effective treatment for irritable bowel syndrome (IBS), as demonstrated by its ability to reduce flatulence (gas) and abdominal pain. In addition, a double-blind study found that *L. plantarum* significantly reduced fibrinogen—a suspected independent risk factor for thrombosis—and LDL-cholesterol concentrations in serum of men with moderately elevated cholesterol. A follow-up controlled, randomized, double-blind trial determined that *L. plantarum* intake also led to a decrease in cardiovascular disease risk factors, including significant reductions in systolic blood pressure, and thus, could be useful in the prevention of atherosclerosis in smokers. Furthermore, *L. plantarum* has been shown to minimize surgical complications, including post-operative infections.^{4,18,34-38}

Streptococcus thermophilus, a beneficial bacteria frequently found in yogurt, exhibits antioxidant activity and the ability to inhibit the oxidation of low-density lipoproteins (LDL). *S. thermophilus* has also demonstrated iron-chelating abilities. In addition, *S. thermophilus* exhibited antitumor activity in mice and reduced the incidence of large, chemically-induced intestinal tumors in rats. Furthermore, the intake of yogurt fermented with *Lactobacillus bulgaricus* and *S. thermophilus* produced a clinically relevant decrease in stool frequency and duration of acute diarrhea in children.^{5,39-43}

Bifidobacterium infantis has shown antimicrobial activity against *Clostridium difficile*—one of the most common causes of infection of the colon. *B. infantis* has also been shown to greatly inhibit the growth of *Bacteroides vulgatus* in mice—*B. vulgatus* is a bacteria that may be responsible for, or at least contribute to, the development of inflammatory bowel disease (IBD). In addition, a prospective clinical study found the oral intake of *L. acidophilus* and *B. infantis* statistically improved the frequency of diarrhea in children with acute diarrhea on the first and second day of treatment, as well as decreased the duration of diarrhea.⁴⁴⁻⁴⁷

Bifidobacterium longum exhibited protective effects against invasion of the intestinal mucosa by dietary antigens, as well as significantly suppressed colon tumor incidence in animal studies. *B. longum* has also demonstrated significant antioxidant activity. In addition, a randomized, double-blind trial found that *B. longum* improved lactose digestion in 15 lactose malabsorbers, as evidenced by reduced symptoms of flatulence. Furthermore, a study involving 32 patients with borderline to high cholesterol showed that *B. longum* reduced total cholesterol in approximately 50% of treated patients, with significant decreases among those with total cholesterol levels greater than 240 mg/dl.^{20,48-51}

Lactobacillus casei significantly increased natural killer (NK) cell activity in healthy volunteers, particularly those exhibiting low NK activity. In addition, a controlled pilot study showed that *L. casei* reduced the duration of winter infections (gastrointestinal and respiratory) by 20% in elderly people. Furthermore, a 4-month double-blind, randomized trial involving 928 children (ages 6 to 24 months) found that *L. casei* significantly reduced the frequency of diarrhea.⁵²⁻⁵⁴

Lactobacillus salivarius completely inhibited the growth of *Helicobacter pylori* (*H. pylori*) in vitro and also suppressed *H. pylori* and reduced the associated inflammatory response in vivo. In addition, a placebo-controlled trial found that *L. salivarius* intake was associated with reduced prevalence of colon cancer and mucosal inflammatory activity in mice. Furthermore, both *L. brevis* and *L. salivarius* exhibited properties that researchers found would make them good alternatives to antibiotics for the probiotic prophylaxis (prevention) and treatment of human vaginal infections, including their ability to adhere to epithelial cells and displace vaginal pathogens; their production of high levels of hydrogen peroxide (H₂O₂), which makes the intestinal pH more acidic and thus, inhospitable for pathogens; and their ability to inhibit the growth of *Gardnerella vaginalis*, which is implicated in the cause of bacterial vaginosis—a vaginal infection characterized by excessive, sometimes unpleasant-smelling discharge.⁵⁵⁻⁵⁷

Fructooligosaccharides are a type of nondigestible fiber, derived from foods such as asparagus, garlic, Jerusalem artichoke and onion, that can be considered a prebiotic—a nutritional substance that stimulates the growth of probiotic organisms, leading to a beneficial balance of healthy and harmful intestinal flora. FOS specifically stimulate bifidobacteria growth, while suppressing the growth of potentially harmful pathogens such as *Clostridium perfringens* (a common infectious cause of outbreaks of food-borne illness) in the colon. In addition, FOS enhance magnesium absorption in humans and have been shown to reduce colon tumor development in animal studies.^{5,9,58-64}

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