

Probiotics

“What Are Probiotics” - and - “Why Do We Need Them”

While antibiotics means “*against life*”, probiotics means “*promoting life*”, or “*for life*”. Probiotics refers to organisms that are incorporated into foods or supplements with the aim of re-establishing a healthy intestinal flora. A more recent definition of the term states: “*A mono, or mixed, culture of live micro-organisms, which, applied to man or animal, affects beneficially the host animal by improving intestinal microbial balance*”. The micro-organisms commonly used as probiotics for humans are the lactic acid bacteria. Our general health status depends, to a large extent, upon the presence, number and relationship of the normal, friendly bacteria of the gastrointestinal (GI) tract. The recognized ability of the intestinal microflora and probiotic micro-organisms to exert a wide number of beneficial and potentially therapeutic effects, without the side effects normally encountered by traditional drug therapies, has created a great deal of interest in the use of probiotic bacteria as a potential bio-therapeutic.

Probiotics are living organisms – also known as “good bacteria” or “good flora” – that colonize and flourish in a healthy tissue. These friendly bacteria are vital to health and to the proper functioning of the intestinal tract. In fact, a healthy intestine contains approximately three (3) pounds of friendly flora. Over 100 types of bacteria inhabit our digestive tract; some of these organisms are permanent residents, while others are transient in nature. These organisms could either be anaerobic or aerobic, or both. Within a few days of birth, the GI tract is colonized by bacteria that enter the system through the mouth. The pattern of birth and type of feeding strongly influences the type of bacteria, which establishes itself either as transient or permanent in the intestinal system. During the first two days of life, the large intestine of neonates fed with breast milk and supplementary cow’s milk is colonized by *enterobacteriaceae*, *streptococci*, (*including enterococci*) and *clostridia*. By day seven, bifido-bacteria become predominant, while the other groups decrease significantly in number. It is interesting to note that a dramatic shift has been observed in the species and strains of colonic microflora found in breast-fed infants worldwide. It has been suggested that a possible explanation for the change in the colonization patterns may be a consequence of increasing contamination of the human environment including air, water, and foods (antibiotics, chemicals, petrol, pesticides, toxic substances, etc.), coupled with a decline in numbers of strains of bifido-bacteria in breast-fed babies and a rise in the levels of undesirable pathogenic organisms. Probiotics colonize in the colon, burrow behind and dislodge putrefaction, and restore bacterial balance by “outnumbering” the “bad” bacteria.

Common dietary and lifestyle factors destroy friendly bacteria in the intestinal tract. Stress is to blame for much of the probiotic depletion. Probiotics are also diminished by strong antibacterial herbs, cortisone, carbonated drinks, laxatives, birth control pills and lack of sleep. Poor diet, toxins in the blood stream and natural aging further rob the body of the flora it needs. Studies show that most North Americans have less than half the amount of flora needed for optimal health. Friendly flora are crucially important for the healthy functioning of the bowel.

Antibiotic treatments not only kill the bad bacteria, they also wipe out the good strains. Females may be all too familiar with this vicious cycle. How many women have gone to the doctor because they had a cold, flu, or an ear infection, and were given an antibiotic? Within a few weeks they had to go back to the doctor because this time they have a yeast infection! The antibiotic may have done its job of killing the bacteria that caused the cold or ear infection, but at the same time, it depleted the stores of friendly flora that keep yeast overgrowth in check. Still, antibiotics are often prescribed indiscriminately, even for minor ailments,

without any regard as to whether they are really necessary for that situation. However, do not think that because you haven't taken an antibiotic lately, your probiotic supply is fine. Even if you have not had a prescription for antibiotics, chances are you have taken significant amounts of antibiotics during the past few months. Here is the reason: Animals (cows, pigs and chickens) are fed antibiotics in order to keep them well and promote growth. In fact, in North America, half of the antibiotics produced – over 20 million pounds per year – are fed to animals. Dairy products, as well, contain high levels of antibiotics.

What is the answer, then – if our lifestyles and environmental factors are robbing our supply of friendly flora? Probiotic supplementation. But, there is a good reason for everyone to be educated before selecting a probiotic product. Many products on the market (i.e., acidophilus or salivarius supplements) are single-strain products, so they do not provide the combination of benefits that can come from a blend of several different strains. Look for stabilized strains of bacteria when selecting a probiotic supplement. Stabilized bacteria are hearty and resilient, and are able to survive the many changes in pH and temperature encountered before reaching the lower intestine.

Keep your intestinal tract ~ “parking spaces” ~ filled with good, friendly bacteria – Probiotics. The disease-causing bacteria will have no host, and will have nowhere to go to set up housekeeping.

Area of Application of Probiotics for Humans

Established and Postulated Functions of Colonic Microflora

The intestinal flora is made up of different bacterial species, and therefore, able to produce a variety of enzymes and metabolites which perform the various types of metabolism in the intestine and influence the host's health and resistance to diseases. Within the intestine, the bacteria are implicated in the conversion of various substances that produce beneficial products to the host. In addition, bacterial cell components produced by some bacterial species modify the host's immune response by enhancing immune function. The beneficial intestinal microflora protects the intestinal tract from proliferation or infection by harmful bacteria. The microflora of the intestinal system has the potential to be of significant benefit in various areas of human health. A summary of these benefits are:

- Improvement in lactose intolerance
- Control and reduction in blood cholesterol levels
- Significant anti-tumor activity
- Reduction in the risk of colon cancer
- Reduction in levels of fecal enzymes associated with colon cancer
- Prevention, or reduction, of constipation
- Prevention and treatment of diarrhea
- Prevention and reduction of irritable bowel syndrome
- Detoxification of chemicals and carcinogenic substances
- Manufacture of vitamins and co-factors, such as Biotin, B3, B6, and Folic Acid
- Enhanced resistance against pathogens by producing natural antibiotic substances, such as Acidophilin, Factolin, and Acidolin
- Enhanced resistance against pathogens by producing natural organic acids, such as Lactic, Acetic, and Formic Acids – which strongly inhibit harmful bacteria and microorganisms that are incapable of thriving in an acidic environment.

These benefits can be summarized into four basic functions accomplished by the intestinal microflora probiotics:

1. **METABOLIC FUNCTION:** Metabolic and Biochemical effects of the probiotic bacteria include metabolism of carbohydrates, proteins, bile acids, cholesterol and organic acids. Numerous research studies have shown that probiotics may significantly help lower cholesterol. The “good bacteria” (intestinal flora) helps rebalance the chemistry of the cells, helps rid cells of toxic wastes, and facilitates cellular repair by accelerating the replication of DNA and RNA.
2. **NUTRITIVE FUNCTION:** The intestinal microflora can markedly enhance the nutritional status of the human body through the manufacture of B-Vitamins, such as Biotin, B3, B6, and Folic Acid. In addition, the gut microflora also has an important complementary function in the digestion of dietary components, such as plant polymers. Vitamins, minerals, proteins, pigments, essential fatty acids, organic acids and enzymes can be assimilated much better with the presence of probiotics. Probiotics repair the villi of the small intestine and break down food into its most basic elements.
3. **IMMUNOLOGICAL FUNCTION:** There is accumulating evidence that various Lactic Acid Bacteria (LAB) cell components directly stimulate the immune response of the host. In some cases a synergistic and adjuvant effect has been noted, representing a general enhancement of the immune status of the individual as a result of probiotic dosage. Such a general enhancement may also assist the host in suppressing tumors as indicated by available evidence from extensive animal studies.
4. **PROTECTIVE FUNCTION:** The protective action of the beneficial intestinal microflora and probiotic organisms largely depends on three properties:

1) Anti-Microbial Activity:

The anti-microbial activity of Lactic Acid Bacteria is mediated by the production of Lactic, Acetic, and other organic acids – Diacetyl, Hydrogen Peroxide, and Bacteriocins. These anti-microbial agents suppress the multiplication of pathogenic and putrefying bacteria. Acidophilin, Lactobacillin, and Lactodin are known to display anti-microbial activity against E.Coli, Salmonella, and Shigella. A recent summary of 22 human studies designed to test the effectiveness of probiotics in the treatment of diarrhea showed a significant reduction and/or prevention of diarrhea was recorded.

2) Anti-Mutagenic and Anti-Carcinogenic Activity:

The anti-mutagenic activity of products fermented by Lactic Acid Bacteria (LAB) has been well established *in vitro* against a large spectrum of mutagens. This effect has been detected against a range of mutagens and pro-mutagens in various test systems based on microbial and mammalian cells. It has been suggested that the anti-mutagenic and anti-carcinogenic properties of the LAB may be due to a lowering in fecal enzymes involved in the conversion of pro-

carcinogens to carcinogens. Such probiotic bacteria also lowers levels of harmful enzymes, such as B-glucosidase and B-glucuronidase, that is responsible for the production of harmful nitrosamines.

3) Antioxidant Activity:

Some strains of Lactic Acid Bacteria are known to contain high levels of SuperOxide Dismutase (SOD) activity, and/or high concentrations of manganese, usually one or the other, but not both. Those containing either SOD or Manganese had significant superoxide scavenging ability. The overall destruction of superoxide is assured through a two-step process similar to SOD. The second step of the process requires the manganese to be “complexed”, or linked, to an organic acid. The best organic acid tested for the purpose is Lactic Acid, which is the very acid produced in large quantities by the LAB group of micro-organisms.

The crucial factor of a probiotic is that it should contain living micro-organisms; however, production methods, processing and storage conditions may adversely affect viability. The most commonly used forms of preparation are **liquid/slurry** and **freeze-dried** products. Many commercial preparations fall short in delivering viable preparations of suitable micro-organisms. This very fact alone has been the Achilles Heel of the probiotic industry – the inability to overcome the limited shelf-life and poor survival rates of bacteria in probiotic preparations. Some of the most desirable properties of probiotic bacteria and supplements are described below:

STABILITY AND TECHNICAL PROPERTIES

- Ability to maintain verified viability
- Good acidity profile
- Accurate strain identification and combination
- Stability and no molecular and/or structural damage following preparation
- Maintenance of colonizing properties throughout processing and storage

HEALTH AND CLINICAL PROPERTIES

- Resistance to acid and bile
- Adherence to human intestinal cells

Probiotics Help Stimulate the Body to Produce Powerful Immune-enhancing Chemicals, including:

- **Alpha Interferon** – a key regulator of the immune system and chief anti-viral agent.
- **Lactoferrin** – makes iron that is hard to absorb available to the body for cell growth, while denying it to the “bad” bacteria, yeasts, and viruses; therefore, inhibiting their proliferation.
- **T-Cells** – create a virtual “reserve army” of T-Cells to kill off invading infections and pathogenic agents, such as molds, yeasts, and fungi.
- **Non-Specific Antibodies** – increase B-Lymphocytes, which produce uncoded antibodies; therefore, creating a “second immune system” without Gut Bacteria. The immune system

cannot replace enough of the antibodies that are depleted from our systems through the process of aging, drugs, and modern diet and lifestyle.



. . . To purchase Probiotics.