



Probiotics Therapy- The Treatment and Prevention of Allergies



The human body, host to hundreds of different microbial species, possesses a heterogeneity of gut microflora that provides many benefits, including: a proper immune response, the inflammatory response, and a decline in the development of allergic diseases, thus making this diversity essential to a reduction of chronic disease. Exposure to certain strains of probiotics in the Bifidobacterium and Lactobacillus genera are thought to decrease the risk of an allergic disease presenting in early childhood, particularly between birth and 36 months of age.

Probiotics and the Immune System

The gut microflora, comprised of a variety of bacteria, viruses, yeasts, fungi, and protozoa, allows for an immune response, in the form of bacterial concentration, which increases with travel through the gastrointestinal (GI) tract until reaching a peak in the large intestine.

In 2014, the International Scientific Association for Probiotics and Prebiotics defined probiotics as living microorganisms that can be beneficial to an individual if taken in proper quantities. These live bacteria can be found naturally occurring in food or taken in supplement form, generally to restore balance to the gut microbiota and diversify the intestinal flora. This restoration becomes increasingly necessary, as chronic illness, environmental factors, and unhealthy lifestyle choices perpetuate inflammation.

A prebiotic is an indigestible substance, such as insoluble fiber, that benefits the gut microbiota by serving as a food source for probiotics. Prebiotics can withstand stomach acid, cannot be absorbed into the GI tract, and are fermented by the microbiota. Prebiotics aid in fermentation in the large intestine and are beneficial components of overall digestive health.

Allergies and Probiotics

● **Food Allergies:** In the United States, 3.9% of infants and children and 6.6% to 10% of adults suffer from some form of food allergy. This percentage has increased over the past several decades and is expected to continue to rise. The most common types of food allergies are cow's milk and eggs in children; and peanuts, tree nuts, wheat, soybeans, and shellfish in adults. Potentially allergenic foods are introduced to the body via skin contact or the GI tract. In the GI tract, the composition of the gut microflora greatly impacts immune function, which suggests that if an individual experiences frequent dysbiosis (disruption to the microbiome), at a young age then food allergies are more

likely to occur.

Current nutritional interventions include breast-feeding when possible, or if not breast-feeding, consumption of a whey-based, partially-hydrolyzed, infant formula. At the four-month mark the recommended intervention involves a complementary diet for high-risk infants to help prevent food allergy. Various immunotherapies and gut microbiome-modifying therapies are also in the research phase, with the goal of determining the specific strains, dosages, immune-modulating nutrients, and delivery methods most effective at treating or preventing food allergies.

Early intake of probiotic-containing foods or probiotic supplements are associated with a reduction in allergy development and symptom severity in certain populations. Allergies occur when the immune system is overstimulated by environmental matter (an allergen) and a physical reaction occurs. The diversity and homeostasis of an individual's intestinal flora effect both the prevention and treatment of certain types of allergies.

● **Allergic Rhinitis:** Nearly one-third of the US population is affected by allergic rhinitis. A combination of a Lactobacillus strain and a Bifidobacterium strain has been shown to be most effective at decreasing the intensity and duration of symptoms. This could lead to a decreased use of medication as treatment.

● **Atopic Dermatitis:** Ten to 20% of children, and one to 3% of adults suffer from the chronic inflammatory skin disease, atopic dermatitis. This condition occurs when a genetically predisposed individual experiences an instantaneous reaction to an environmental or food antigen that stimulates an immune response. Youth with atopic dermatitis tend to have fewer Bifidobacteria present in their microbiota, and a less diverse colony of microflora overall.

Supplementation with Lactobacillus strains and strains of Lactobacillus with Bifidobacterium has been shown to help prevent atopic dermatitis development in both at-risk and general populations.

Therapeutic Dosing of Probiotics

The WHO suggests that in order to confer benefits, probiotics must pass through the GI tract whole, thus ensuring that a minimum therapeutic level of a particular probiotic strain colonizes the gut. Recommendations suggest a minimum dose of 106 CFUs/g (colony forming units per gram) of viable cells. The main way to determine the intact survival and transit of probiotic products is to recover the strain via a stool sample and measure it in a dose-response study. By studying the remaining strain, researchers can determine its hardiness, beneficial effects, and better understand the quantity of probiotics needed to produce a positive response.