

# ***THE HUMAN INTESTINAL MICROFLORA AND PROBIOTICS***

By

Alan Simon, R.Ph.

Poor digestion can result in more than just a stomachache, gas, bloating, or diarrhea. Digestion is the process that powers the body to convert food into energy to create health and vitality. Interference with the digestive process can contribute to fatigue, inflammation, skin and hair problems, allergies, and health problems associated with toxicities.

The human intestinal microflora is a complex ecosystem that is involved in a critical role in overall health of an individual. Recognition that the intestinal terrain affects much more than the gastrointestinal environment cannot be over stated! The relative balance of “beneficial bacteria” in the gut ecology influences the functioning of the endocrine system, digestion, absorption, assimilation of nutrients, vitamin production, hormonal activity, detoxification, and the strength and function of the immune system.

The human intestinal microflora is an enormous “ecosystem” that is estimated to contain 100 billion organisms containing up of 400 species of bacteria and yeast living in harmony. If the balance between “beneficial” or “friendly” bacteria and the “pathogenic” or “bad” bacteria in this ecosystem is upset, a condition called “dysbiosis” can develop. Dysbiosis is a condition that promotes the increased state of pathogenic, disordered, dysfunctional or lack of beneficial intestinal microflora which can promote ill health or disease. A primary cause of dysbiosis is the use of antibiotics which creates a deficiency of “friendly bacteria”. Other causes of dysbiosis are low stomach acid, birth control pills, steroids, chemotherapy, radiation, and poor diet.

The “beneficial bacteria” are not present in the developing fetus. At birth, the infant is exposed to the mother’s microflora in the birth canal, and again by breastfeeding. This is how mothers pass their “friendly bacteria” to their newborns. Babies that are delivered by cesarean section do not receive mom’s “friendly bacteria”. Expecting mothers who have taken antibiotics in their 3<sup>rd</sup> trimester may not have any “friendly bacteria” to give. Antibiotics kill both “bad” and “good” bacteria “. The lack of “friendly bacteria” (dysbiosis) in the infant’s intestinal tract could be a contributing factor for colic, diarrhea, food allergies, and atopic dermatitis.

The way to correct dysbiosis is to recolonize or repopulate the intestinal tract with “Probiotics” (the friendly bacteria). The two most important species of “beneficial bacteria” in the human ecosystem are *Lactobacillus acidophilus* and *Bifidobacterium bifidus*. *Lactobacillus* bacteria primarily colonize the small intestine, while the *Bifidobacteria* are anaerobic (without oxygen) bacteria that colonize in the large intestine. In a healthy intestinal environment, these “beneficial bacteria” attach themselves to the surface of the intestinal tract where they multiply and become an important part of the immune system.

*Lactobacillus* bacteria provide a number of important health-related benefits that affect not only the health of the small intestine, but also the general health of an individual. They work in several ways to prevent pathological bacteria, yeast, molds, and fungi from proliferating in our GI tract. When *Lactobacillus* bacteria feed on carbohydrates in our intestines, lactic acid is an important byproduct of their metabolism. By producing lactic acid, *lactobacilli* are able to maintain an acidic intestinal pH balance. This acidic environment inhibits the growth of pathogenic acid-sensitive bacteria, which are only able to proliferate and produce their toxic metabolites in a more alkaline (basic) environment. *Lactobacillus* bacteria produce the enzyme “lactase”, which aids in the digestion of lactase (milk sugar). These bacteria produce a variety of natural antibiotics that can suppress harmful bacterial growth and enhance the immune system. *Lactobacilli* play an important role in regulating cholesterol. These “friendly bacteria” convert cholesterol to a less soluble substance called coprostanol, which is excreted. This can help to stabilize cholesterol levels. *Lactobacillus* function like little vitamin factories, and their metabolic processes produce B vitamins and vitamin K in the intestinal tract. They also are involved in the assimilation of calcium and iron.

*Bifidobacteria* are found in the large intestine and lower portion of the small intestine. The health of the colon is dependent upon adequate colonization of these organisms. They produce short-chain fatty acids, including acetic, propionic, butyric, lactic, and formic acids. Acetic acid exerts a wide range of antimicrobial activity against yeast, molds, and bacteria. Butyric acid provides an energy source to the colon for peristalsis (colon contractions). These bacteria synthesize B vitamins, inhibit the colonization of “*Candida*”, and help to detoxify bile.

The importance of good digestion, assimilation, elimination, and general intestinal health is becoming widely accepted by health care professionals as one of the keys to good health and longevity.