LACTIC BACTERIA

ESSENTIAL COMPANIONS FOR HUMAN BEINGS

Lactic bacteria include *Acidophilus*, which exists from the upper part of the small intestine to the lower part of the small intestine and *Bifidobacterium*, which exists from the lower part of the small intestine to the large intestine. These microorganisms have the specific property of transforming sugars almost exclusively into lactic acid and acetic acid that decrease the pH (increasing the acidity) of the intestines and produce substances that suppress harmful bacteria. They are abundant in nature and are essential for human and animal survival. They are normally present in the skin, the digestive system and in the vaginal mucosa where they fulfill numerous functions and assure the protection of tissues against the action of harmful microbes. These functions are so important that we designate lactic bacteria as “Probiotic” or agents that protect life.

LACTIC BACTERIA IN PROPHYLAXIS AND IN THERAPEUTIC TREATMENT

The normal intestinal flora is constituted from groups of microorganisms among which lactic bacteria perform essential functions:

- Transforms glucose into lactic acid, creating a favorable environment for the desirable microbial balance
- Limits the action of putrefactive microbes
- Inhibits the development of pathogenic bacteria
- Hydrolyses lactose and eliminates the intolerance of the organism toward this sugar.
- Contributes to intestinal peristalsis and accelerates the evacuation of excrements.
- Coats the intestinal mucosa and protects it against the invasion of harmful microorganisms
- Activates macrophages (immune cells) which suppress harmful bacteria and thus protect the intestines

A fragile balance:

Many factors can modify the desirable harmony of the intestinal flora. Disease, stress, the abundance of food proteins, the consumption of contaminated food and the taking of antibiotics can favour the implantation and development of putrefactive and infectious microorganisms to the detriment of desirable bacteria. The prolonged use of antibiotics not only has the effect of destroying lactic bacteria from the digestive system, leaving it without defense, but it provokes the development and predominance of harmful microorganisms such as coliforms and pathogenic staphylococci.

GASTRO – INTESTINAL INFECTIONS:

Gastro-intestinal infections originating from bacteria are generally due to a restricted number of species of bacteria belonging to Escherichia, Shigella, Salmonella, Klabsiella, Proteus and Staphylococcus. These infections are more frequently found in children and can be the result of accidental contamination from impure water or food or from the transmission of infectious microbes from other individuals or from infected places.

An important source of infectious bacteria is made by the creation of resistant pathogenic colonies due to the prolonged administration of weak doses of antibiotics. This particular resistance present in Escherichia coli can be genetically transmitted to other kinds of enterobacteria belonging to the Shigelia, Salmonella,
Klabsiella and Proteus. These genetic modifications take on considerable importance because they multiply the possibilities for infection and complicate the administration of effective medication.

**VAGINITIS:**

Lactic bacteria assure the protection of the vagina, especially by lactobacilli. They were originally designated by the name Doderlein bacillus, but we now know that this bacterium belongs to several species, that include Lactobacillus acidophilus, L. bifidus, L. rhamnosus, L. fermenti, L. plantarum, etc. For many reasons, the administration of antibiotics, hormonal troubles, inadequate enemas, contacts with contaminated individuals, lack of resistance, vaginitis due to Candida Albicans, to Trichonomas vaginitis or to infectious bacteria may develop. One of the successful treatments utilizes appropriate lactobacilli. Introduced by an enema, it restores the normal lactic flora, lowers the pH of vaginal secretions to a desirable level (4.5) and inhibits the existing infection.

**INTESTINAL PUTREFACTION:**

After more than 90 years of hesitation and of denial by orthodox medicine, it is now recognized that Metchnikoff was right when he stated that intestinal putrefaction was the source of many diseases and constituted an attack more or less rapid on the vitality and longevity of the human being.

The intestinal putrefaction, resulting from the activity of putrefactive bacteria, expresses itself by the development of a great variety of toxic substances that include several acids, ammonia, hydrogen sulfide, amides, methylated amines, methane, indole, phenol, mercaptans, etc....

The organism is not always able to defend itself against the activities of harmful microorganisms. Several organs may be attacked. The secretion of digestive enzymes is hindered, the kidneys become impervious, the endocrine system weakens, and the suprarenal are attacked. This results in serious and diversified organic disorders that may lead to debility, atherosclerosis and early senility.

Recently, it has been shown that a tangible effect from intestinal putrefaction is recognizing that hepatic encephalophathy was caused by the breakdown of nitrogenous substances in the lower intestine and the absorption of toxic products, especially ammonia and amines. The orthodox treatment of this sickness is by enemas and laxatives, administration of antibiotics and even surgical removal of the colon... with the goal of interrupting the activity of putrefactive bacteria. A group of scientists has attempted to modify the intestinal flora of patients attacked by hepatic encephalophathy by administrating to them Lactobacillus acidophilus. In suppressing the harmful flora, there was a reduction in phenomena of deamination and the level of ammonia in the blood of the patients. Many other scientists have confirmed these discoveries subsequently.

*Reduces gas and bloating:*

Lactic acid bacteria have been shown to inhibit the growth of pathogenic bacteria and their production of toxins and gas. Antibiotics, on the other hand, that can destroy both good and bad bacteria have been shown to increase gas production.

**INHIBITS THE GROWTH OF PATHOGENIC BACTERIA:**

Lactic acid bacteria inhibit the growth of pathogenic bacteria and their production of toxins. *Acidophilus* bacteria have a superior capability of producing lactic acid as well as anti-bacterial substances, thus suppressing harmful bacteria. *Bifidobacterium* particularly protect the body from harmful bacteria by adhering to the intestinal mucosa (cells lining the intestines), by producing acetic acid and by activating macrophages (immune cells) that also produce substances that suppress harmful bacteria.
Decreases the production of toxic and cancer-causing compounds in the intestinal tract:

*Acidophilus* bacteria suppress the production of harmful substances such as ammonia, indole and hydrogen sulfide that are hazardous to the human body. *Bifidobacterium* helps to decrease the amount of toxins going to the liver. Gut bacteria “recycle” toxins such as ammonia by using it as an important source of nitrogen for their own protein synthesis during their growth phase. *Bifidobacterium* and *Acidophilus* bacteria decompose nitrosamines (cancer causing compounds) and can also suppress the production of nitrosamines in the intestines.

**HAVE AN IMPACT ON CHOLESTEROL:**

*Bifidobacterium* and *L. Acidophilus* may play an important role in cholesterol metabolism of their host. Intestinal bacteria convert cholesterol into a less absorbable form (coprostanol) thus hampering its absorption from the intestinal tract. Several human and animal studies have suggested a cholesterol lowering effect from lactic acid bacteria.

**Produce vitamins and other nutritional factors:**

Bifidobacterium have shown an ability to produce vitamin B1, whereas acidophilus bacteria have been shown to suppress the growth of bacteria that decompose vitamin B1. Bifidobacterium are also capable of producing B6, folacin, B12 and several amino acids.

**LACTIC BACTERIA IN THE PREVENTION AND THE TREATMENT OF DISEASES:**

There are numerous lactic bacteria useful in the prevention and the treatment of diseases. Among the most important there are: *Lactobacillus acidophilus, L. bifidus, L. bulgaricus, L casei, L. rhamnosus, L. plantarum, L. fermentum, L. salivarius, Streptococcus thermophilus and Streptococcus faecium*. These bacteria inhibit the proliferation and the activities of putrefactive and pathogenic bacteria in several ways.

**By the production of lactic acid:**

The putrefactive and pathogenic bacteria do not develop in an acidic environment.

**By the production of specific antibiotics:**

Lactobacillus acidophilus produces acidophiline, *L bulgaricus* produces bulgarican, other lactobacilli produce lactocidine, lactobacilline, hydrogen peroxide, bacterial peptides, lactic streptococci produce nisin and streptococcins.

**By the colonization of intestinal mucosa:**

Modern methods of investigation have demonstrated the intense colonization of intestinal mucosa by lactic bacteria, in particular by Streptococcus faecium. This colonization protects the intestinal wall by creating a barrier against infectious microbes.

**The supply of lactic bacteria:**

A proper diet favours the presence of lactic bacteria in normal quantities in the digestive tract. In the case of gastro-intestinal problems, vaginal infection and the use of antibiotics, it is necessary to have recourse to a reliable supply of lactic bacteria. Human strains of lactic bacteria are preferred over dairy sources.
**Difference between lactic bacteria derived from humans and those derived from dairy:**

The major anticipated effect of lactic acid bacteria is that they will stay and grow in the intestines, suppressing harmful bacteria and thus normalizing the intestinal bacteria flora. (Consequently, supplemental lactic acid bacteria are more effective when the intestinal bacteria flora is disturbed whether human or non-human strains are used). The best strains for supplementation are those that are typically permanent residents of the human intestinal tract and those that are safe. Bacteria strains may show host specificity. Strains that are effective in one species of an animal may not necessarily be effective in another species. Lactic acid bacteria, such as *Acidophilus* and *Bifidobacterium* are normal residents of the gastrointestinal tract of humans. On the other hand, *L. bulgaricus* and *S. thermophilus*, strains commonly used to culture yogurt, have been shown to be absent from the flora of humans and apparently do not colonize the intestinal tract. Various yogurt strains may not resist stomach acid and therefore may not survive to reach the lower intestinal tract though they may afford brief, transitory benefits. On the other hand, human strains have been shown to resist stomach acid when consumed with food and are more adapted to the environment (bile acids, anaerobic conditions, etc.) of the human intestinal tract and may be the bacteria of choice for supplementation since they are more likely to survive and colonize the human intestinal tract.

**SUPPLEMENTING THE DIET WITH PROBIOTICS:**

An adequate and consistent supply of lactic acid bacteria (Probiotics), like vitamins, minerals and enzymes, is necessary for long-term good health. In our modern world, it is almost impossible to obtain optimum levels of these essential nutrients without some form of supplementation. Like vitamins, minerals and enzymes, lactic acid bacteria should be consumed with food. The acids in an empty stomach are very strong and few strains can withstand this harsh acidity (pH of 1 to 2) for extended periods. Less than 10^3/ml *Bifidobacterium* are found in an empty stomach. However, after a meal is consumed, the stomach contents become less acidic due to their dilution by food (about pH 4), thus allowing for the survival of the bacteria. The survival of *L. acidophilus* was found to be much lower in fasted subjects than in non-fasted subjects. Further, the decreased acidity following the consumption of food was found to allow for the population of *Bifidobacterium* to double in size (10^4 to 10^8 ml).

The protection of the organism against dangerous microbes by regular consumption of friendly bacteria is a preventative habit that is important not to neglect. This protection is particularly important when traveling and during and after the administration of antibiotics. These alter or destroy the lactic intestinal flora that must be replaced rapidly. Travelers are particularly vulnerable for several reasons: Fatigue, change of food, ingestion of contaminated foods, lack of hygiene, promiscuity.

The best probiotic supplements are stable at room temperature (refrigeration is not required) and contain several strains found in the human intestine. One of the best available forms is The Friendly Trio® from Wakunaga Pharmaceuticals. This form, used in over 30,000 hospitals and medical clinics worldwide, is also used as the probiotic of choice, in Vitex’s SOURCE GREENS.

1. Elie Metchnikoff (1845-1916), Russian biologist: The founding father of modern immunology. Authored and championed the theory that phagocytic cells actively defend the host body against pathogens and diseased cells: Co-winner of the 1908 Nobel Prize in medicine along with Paul Ehrlich, for their work on the theory of immunity.