

# Probiotics

## Introduction

The human body is not sterile. As soon as you were born and started to nurse, bacteria and other microorganisms settled in for the duration of your life. There are an estimated 100 trillion microorganisms in us and on us ... in the nose, in the mouth, in the ear canals, on the skin, in the intestines and colon and in the vagina. There are an estimated 10 trillion cells in your body so we are hosts to ten times as many bacteria, fungus, viruses and yeast as we have cells! Fortunately, they are much smaller than our cells. It is also estimated that you have from three to six pounds of bacteria in your intestines at any one time. One third of your stool is bacteria.

Most of the time, we live in harmony with these microorganisms and shouldn't be concerned about them. We can't be sterile and we shouldn't try to be. Our current mania for antibacterial everything is not necessarily good or achievable. However, there are times when the normal balance is upset and we need to restore it.

## What do bacteria do for us?

*Lactobacilli* bacteria live in the vagina and produce a mild, common acid called lactic acid. This acid creates an environment that is hostile to yeast, preventing their growth.

There are 400 to 500 species of bacteria, fungi, viruses and yeasts that can live and thrive in the intestines and colon. At any one time, 35 to 40 species of bacteria predominate, probably a different mix in everyone. As you might guess, some of the microorganisms are harmful and cause illness but some are beneficial. The good ones are called **PROBIOTICS** (pro-life as opposed to **ANTIBIOTICS** or anti-life). They ...

- Digest and ferment fiber which releases minerals such as calcium, zinc and iron for us to absorb.
- Digest and ferment fiber to make short-chain fatty acids, the major food to keep colon cells healthy.
- Make acids and natural antibodies that prevent bad bacteria from growing.
- Make acids that prevent your body from reabsorbing cholesterol thus lowering your cholesterol level.
- Physically crowd out bad bacteria.

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- Make chemicals to enhance the immune system. Eating yogurt daily increases the body's production of gamma interferon (an immune chemical) four-fold.
  - Increase the volume and weight of stool to help with constipation.
  - Make vitamin K and the B vitamins niacin, folic acid, biotin, and B6.
  - Chemically alter beneficial isoflavones (from soy) so they can be absorbed. (Thus, people with the right combination of bacteria may benefit from soy more than others with the wrong combination.)
  - Increase colon acidity and neutralize compounds that are thought to lead to colon cancer. (Though only a theory, it may turn out that colon cancer is related to having the wrong bacteria in your colon.)
  - Process hormones such as estrogen. (This is the mechanism by which antibiotics weaken the effectiveness of birth control pills.)
  - Help us digest protein, carbohydrates, fats and such foods as lactose in milk.
  - May limit the growth of *H. Pylori* the bacteria associated with stomach ulcers.
- By one estimate I found, you can maintain your health if you have 85% good bacteria in your colon and only 15% harmful bacteria. Most people in America have the reverse.

## What happens when the balance is upset?

Here are three common and familiar examples of an upset balance of microorganisms in your body. There are many more.

- **Vaginal yeast infection** - The vagina is colonized with "*lactobacilli*" a species of bacteria that naturally produce a mild common acid called lactic acid. This acid helps maintain the health of the vagina by preventing yeast and other bacteria from growing. If this colony of lactobacilli is disturbed ... for example by taking an antibiotic that kills them ... then the lactic acid disappears and yeast can grow causing the typical pain, swelling, itching and discharge of a yeast infection.
- **Bacterial vaginosis** - The second example also involves the vagina. If the lactobacilli are replaced by a different species of bacteria, the woman can develop a vaginal discharge. This condition, called bacterial vaginosis, is not an infection but a *dysbiosis*, a change in the normal flora that can cause unpleasant symptoms. Bacterial vaginosis is the most common cause of an abnormal female discharge.

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- **Diarrhea** – Many bacteria, fungi, viruses and yeasts produce toxic chemicals that the body does not like. Some can also directly invade the wall of the intestines and cause infection. The body responds to this infection with either vomiting or diarrhea. If the infection is in the stomach and upper intestines you will vomit. If the infection is in the rest of the intestines or colon, the body adds fluid to the intestinal contents, activates the intestinal muscles, churns everything up and forces the fluid out rapidly as diarrhea. It flushes the system and tries to reset the balance.

## What else might happen if the balance is upset?

Some people feel that an overgrowth of the wrong bacteria in your intestines can contribute to feeling tired and worn out. The immune system of the intestines is spending much of your energy reacting to the bacteria.

An overgrowth of a bad bacteria may cause irritable bowel syndrome. Your body alternates between constipation and diarrhea as the bowels try to get rid of the invader. The diarrhea purges most but not all of the bacteria and then, over time, they grow back ... only to repeat the cycle. Stress worsens this.

The following is a list of conditions that may improve with taking probiotics. The top three definitely improve with supplementation while the others have less research to prove their worth.

- Diarrhea
- Vaginal yeast infections
- Excess abdominal gas
- Recurrent urinary tract infections
- Irritable bowel syndrome
- Eczema and atopic dermatitis (use *L. rhamnosus*)
- Food allergies such as to cow's milk
- Lactose intolerance
- A weak immune system
- Bad breath
- Some interesting conditions that have at least some evidence relating them to a gut dysbiosis are headaches, rheumatoid arthritis and kidney stones (not enough *Oxalobacter formigenes* which breaks down calcium oxalate before it can form crystals that evolve into kidney stones).

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## Why would the balance be upset?

The balance is a constantly changing, dynamic interplay between the species. Common symptoms of imbalance include flatulence, constipation and diarrhea. Many things might alter the bacteria in your bowels:

- First and foremost is the overuse of antibiotics by doctors and patients. Antibiotics (anti-life) kill bacteria indiscriminately ... both the good and the bad. It is a race to see which grows back in the intestines first.
- Antibiotic exposure occurs in our food supply. Cows, pigs, chickens and turkeys are fed antibiotics to prevent illness and some is left in the flesh.
- Foods may contain pesticides, insecticides & herbicides that kill good bacteria.
- Meats, dairy, eggs and other foods are commonly contaminated with harmful bacteria.
- Low fiber diets, common to Americans, deprive the good bacteria of a good energy source ... fiber.
- Food poisoning with a sudden overdose of a bad bacteria or virus.
- Overuse or misuse of laxatives and enemas.
- Chemotherapy and radiation treatments.
- Stress, traveling and alcohol can upset the balance.

## So how do I restore the balance?

There are several ways to increase the number of good bacteria in your bowels.

- Avoid the use of antibiotics whenever possible.
- Eats lots of natural fiber and feed the good bacteria.
- Take *inulin* (not insulin) and *fructooligosaccharides* (*FOS*) supplements. This can be found in health food stores and sometimes come with the probiotics.
- Swallow good bacteria ... no, I don't mean eat dirt.
  - Eat yogurt with live, active cultures. The two most common bacteria used to ferment milk into yogurt are *lactobacillus bulgaricus* and *streptococcus thermophilus*. Some brands use only *lactobacillus acidophilus*. Stonyfield Farm uses four types of bacteria together. Look for brands that state "live active cultures" Yogurts that have been heat treated or pasteurized after culturing contain no live bacteria. Cooking with yogurt kills the bacteria. Buy the freshest containers as the bacteria die with age.

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- Swallow high quality preparations of the bacteria. Just like yeast are cultivated, dried and packaged for baking, some 20 different good bacteria are cultivated, freeze dried and encapsulated for consumption. Such use of probiotics has been customary in veterinary practice for decades.

## Where do I find Probiotic capsules?

Probiotic capsules and liquids can be found in *General Nutrition Center* (GNC) stores and health food stores such as *The Good Foods Grocery* in The Stony Point Shopping center (Huguenot and Buford Roads) and at *Ellwood Thompsons* in Cary Town. I don't recommend the GNC store though because they don't have a refrigerated case but Good Foods Grocery and Ellwood Thompsons do.

Probiotics are fragile and harmed by heat, light, moisture and time. The best products are refrigerated until sold and have expiration dates on them. Probiotics on a conventional store shelf lose their potency much more rapidly than refrigerated probiotics.

## Which ones should I take?

Most preparations feature the most familiar probiotic, *lactobacillus acidophilus*. They assume that this one probiotic can fix everything. As stated before, there is usually a complex mix of 35 to 40 species in your bowels so you need more than *acidophilus* and there are many other *lactobacillus* species which help in different ways. The *lactobacillus* species thrive in the intestines and *bifidobacterium* species thrive in the colon.

Some of the names of the good bacteria are:

- *Lactobacillus* (abbreviated *L.*) *acidophilus* (produces natural antibodies)
- *L. reuteri* (may protect against *salmonella* and *e. coli* food poisoning.)
- *L. casei*, *L. rhamnosus*, *L. salivarius*, *L. plantarum*, *L. paracasei*, *L. intantis*. *L. brevis* and *Lactobacillus GG*
- *Bifidobacterium* (abbreviated *B.*) *bifidum*, *B. longum*, *B. lactis*
- *Streptococcus thermophilus*
- *Enterococcus faecium*
- *Saccharomyces boulardii*

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For diarrhea and bowel problems, it is better to take a mix of probiotics rather than one species and it should contain one or more of each category. If the brand also contains FOS or inulin, this is even better. An additional reason for not using acidophilus only is that it is a transient ... that is, it passes through the intestines but does not colonize well. Other species of lactobacillus (*rhamnosus* and *plantarum*) do take up residence, multiply and don't have to be taken as often.

Some brands that I recommend are:

- *Primadophilus Bifidus* - A standard I have recommended for years.
- *Suprema-Dophilus* - Excellent
- *Primal Defense* (this may be the best)
- *PB8* - Excellent
- There are many products available over the Internet.

For vagina problems you only need the *acidophilus* since only lactobacilli are resident there. A good preparation is *Na Tren Flora*, a ten day course for vaginal health. There are many other fine preparations of just *acidophilus*.

High potency products will contain 4 billion organisms per gram.

## How much should I take?

When treating a problem such as diarrhea or irritable bowel syndrome or when preventing a problem while taking an antibiotic, you should take 2 capsules three times a day with meals. Stomach acid can kill most of what you take. Food helps more of the bacteria to survive to the intestines. A few preparations have coatings that protect the bacteria from stomach acid.

Take for as long as you have symptoms ... and a few days longer. When taking an antibiotic, continue for several days after finishing the antibiotic (and don't take within two hours of taking the antibiotic.)

If you are taking probiotics for general health and maintenance, just take one capsule per day with a meal. This is the usual dosage on the bottle.

## Other sources of information?

A good on-line resource listing of probiotic articles is

<http://qualitycounts.com/fplacto.html>

A simple Google search on "*Probiotics*" will find 10s of thousands of articles.