

Bacteria, Your Gut, and Your Health

According to current science, about 90% of our body is bacteria -- around 100 trillion organisms -- leaving only about 10% of actual human cells. These organisms are what we collectively call the microbiome. This bacteria is responsible for large portions of cellular and bodily functions, including the proper functioning of the immune system. Without the right bacteria, your immune system doesn't stand a chance against the barrage of bad bacteria and viruses that we're exposed to daily.

We establish our gut bacteria as infants from two places: the birth canal and through breastfeeding. In the birth canal, infants ingest the bacteria of their mothers, and later continue to populate their systems through breastfeeding. The mother's microbiome is transferred to the child; one reason why health problems tend to run in families. Ailments such as allergies are not technically genetic rather ailments are passed down from the mother via her gut bacteria.

Children born via cesarean section miss the opportunity for that first gulp of bacteria, and instead obtain their gut bacteria from the air and breast milk. If the children are not breastfeeding, then their gut bacteria is obtained from the air and their first foods, these options being far inferior to maternal bacterial sources. Only recently have some infant formulas begun to include probiotics, or bacteria, in their products. While better than nothing, these are much lesser in quality and variety than gut bacteria obtained through maternal sources.

Bacteria can be both beneficial and harmful. Harmful bacteria is what causes many common health problems today, such as colds, the flu, ear infections, food poisoning, and yeast infections.

Bacteria play an important role in all bodily functions, especially in the digestive tract -- the gut. Beneficial bacteria serves many purposes within the digestive system. The most basic allows the digestive system to work properly to both digest food, assimilate nutrients into the body, and fight off food-borne bacteria (i.e., food poisoning). As far as digestion is concerned, consider it a constant battle in your stomach between the good and bad bacteria. When the digestive system is absorbing and eliminating without problems, things are going smoothly; the good bacteria is winning. If you've ever had food poisoning, you well know the experience of bad bacteria winning the battle. There are a wide range of middle-ground issues from gas, constipation, acid reflux, diarrhea and others.

Gut bacteria plays an even more important role than simply digestion. The connection between gut bacteria and brain function is a new field. Current research shows there is a connection between disorders that affect mental capacity and behavior, such as autism, schizophrenia, epilepsy, dyspraxia and the gut. The brain and the gut communicate constantly through the nervous and immune systems and through hormones. The release of neurotransmitters by the microbiome speak to the brain in a particular language, similar to what human neurons do to control our brain function. The quality of the gut bacteria is imperative to getting the right

messages to the brain. When the wrong messages get relayed from harmful gut bacteria, that's when we start to see mental-capacity disorders.

The gut microbiome plays a large role in regulating the immune system's response to stress. The level of stress in one's life plays a key role in levels of inflammation in the body, as inflammation is the body's natural reaction to cope with stress. Inflammation is helpful in fighting off disease during stressful times. However, a constant state of inflammation can lead to a wide range of chronic and auto-immune diseases. How one handles stress, both consciously and unconsciously, plays a large role in the level of inflammation in the body. Gut bacteria is a major factor in the level and duration of inflammation your body experiences.

If harmful bacteria is dominant in the body, the immune system does not function properly, nor does the digestive system. Conversely, if beneficial bacteria is abundant, we can enjoy robust health. The simultaneous failure of the immune systems and digestion can lead to a wide range of long-term health problems.

Limiting use of antibiotics is key for good gut health and the health of microbiome. Since most antibiotic medications prescribed today are broad-spectrum, meaning they kill a range of bacteria including beneficial and harmful, damage is done to immune-boosting good bacteria. This may be one reason why children suffer from recurring ear-infections. After the first infection is eliminated, there is little good bacteria left in the immune system to fight off another infection. This becomes a cyclical problem with many children, and may lead to detrimental long-term effects on the body and the immune system.

The antidote to harmful bacteria, then, is beneficial bacteria. We are under a wide range of emotional, situational, and environmental stresses at a more constant rate. Deliberately increasing our intake of beneficial bacteria can go a long way towards supporting the immune system and our overall health and help our bodies develop a strong microbiome to keep us healthy.

Antibiotics, baby formula, birth control pills, hormone replacement therapy, alcohol, stress, drugs, smoking, and sugar are among the many factors that reduce good bacteria in the body. Since there is hardly anyone free of these influences, the importance of adding good bacteria into the diet on a regular basis cannot be overstressed.

How do you get good bacteria into your body? The answer may be to let us all get a little bit dirtier. That's not to say going around un-showered or not washing our fruits and vegetables, but rather allowing our food to develop their own bacteria for us to eat.

Fruits and vegetables all have natural, beneficial bacteria in them. The air around us is full of bacteria. However, fruit and vegetables left unpreserved will simply rot when exposed to air. Preserving these vegetables via fermentation allows the good bacteria to proliferate without the food spoiling.

Think about civilization before refrigeration. Traditional cultures worldwide preserved food through the growth of good bacteria, such as in pickles and kimchi. Vegetables naturally contain bacteria; through the proper methods the food will keep for days, months, or even years on end. This held true for dairy products, also. Kefir, yogurt, and sour cream are all fermented dairy products infused with good bacteria to preserve the product for later consumption.

I suggest that fermented foods be eaten every day, preferably at every meal. This will ensure proper digestion, elimination, and boost the immune system.

What's currently increasing in popularity is probiotic pills, powders or tablets. These are widely available at most supermarkets, and there is a range of quality differences between brands. Probiotic pills are helpful in a pinch; however, they are inherently limited. A fermented food has billions of bacteria and an infinite number of strains since the bacteria originates in the soil and the plant itself. A probiotic pill has a finite amount of bacterial strains and cells. While a pill is certainly better than nothing, it can't begin to match the potency of fermented foods.

The fermentation movement is gaining momentum. It's now common to find fermentation classes at churches, farms, schools, and in private homes. This year Boston held its' second annual Fermentation Festival in Jamaica Plain, and word is indeed getting out that fermentation is the next food craze. If you're interested in learning more about fermentation, contact me or your favorite holistic practitioner and join us down the path to vibrant health!

Basic Recipe for At-Home Fermentation

The basic formula for fermentation is simple, but can be expanded upon in a variety of ways. A simple online search for your desired vegetable along with the word "fermentation" will render hundreds of results. Some methods use whey, in addition to salt, but this is purely optional.

The basic recipe below will work with any vegetable you choose though more watery vegetables such as zucchini may not work as well as other, denser vegetables such as cabbage.

- One mason jar's worth of vegetable (about 2-3 cups), shredded and massaged with clean hands until juice comes out of vegetables
- 2 tablespoons of salt

Pack vegetables and salt tightly into a clean mason jar. Juice from the massaged vegetables should rise to the top and cover all contents when pressed down. If it the juice does not cover the vegetables, top with a bit of filtered water to ensure all vegetables are submerged.

Some of my favorite combinations for fermenting are:

- Carrots & Ginger
- Cabbage, dill and garlic
- Cabbage, carrots, hot peppers, onions, garlic
- Cauliflower, cabbage, onions and curry powder

Enjoy!

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