

During the 20th century keeping harmful bacteria in check decidedly improved human health. According to new research, during the 21st century cultivating healthy bacteria may well be even more beneficial!

The human microbiome includes all of the bacteria, viruses, and yeast that live in and on human beings. There are trillions of organisms making up the microbiome for each and every one of us. The majority of these microbes live in the gastrointestinal tract. Most are beneficial; in fact, many are essential for human health. The more diverse the bacteria are in an individual's microbiome the healthier and more resilient they are likely to be.

Understanding this microscopic ecosystem in depth is considered so important to public health that the National Institute of Health recently undertook the Human Microbiome Project. This is a multiyear, multimillion-dollar program designed to classify all of the organisms living together with human beings.

A richly diverse gastrointestinal microbiome provides an essential line of defense against a myriad of infections and assists in the absorption of vitamins and nutrients. It also reduces inflammation and the risk of several medical conditions including, asthma, allergy, colitis, diabetes, heart disease, multiple sclerosis, and rheumatoid arthritis, to name only a few. There are so many important functions of the microbiome in health that it is now considered one of the most important "organs" in the human body.

A healthy microbiome begins at birth. When the baby moves through the birth canal it is inoculated with the mother's bacteria. Breastfeeding adds more health promoting bacteria to the baby's developing microbiome. This transfer of healthy bacteria, from mother to child, provides the foundation for the baby's immune health. Children who are born vaginally and breastfed develop asthma, allergies, diabetes, eczema, and obesity at lower rates than children who are not.

Recent research surprisingly showed that children with older siblings, pets, or who live on a farm have less asthma, allergy, and eczema. The research teaches us that exposure to a wide array of bacteria early in life acts to regulate the immune system, lessening the risk of allergic conditions.

To maintain an optimal immune system throughout life we need to protect our gastrointestinal microbiome. The keys to doing so are to limit exposure to antibiotics and to eat an assortment of plants and fermented foods. Antibiotic exposure comes from both prescription antibiotics and from the routine use of antibiotics in animal husbandry and therefore in the dairy, meats, and poultry that we consume. It is good to have a discussion with your physician whether an antibiotic is absolutely necessary when prescribed. Also select antibiotic-free foods whenever possible.

Vegetables, whole grains, and fruits have a wide range of plant fibers that feed the beneficial gut bacteria. These fibers act like fertilizer promoting the growth of a diverse and favorable microbiome. Fermented foods like sauerkraut, yogurt, and kefir provide probiotics, which are additional health promoting bacteria. When purchasing these products look for varieties that contain live cultures.

For most of us eating a medley of plants and adding fermented foods may be all that is needed to sustain a healthy microbiome. For some, adding probiotic supplements may be helpful to prevent and treat certain medical conditions. These are available in capsules and in powdered forms. Probiotic bacteria are counted and described as colony-forming units, CFUs. Each CFU constitutes one bacterium. A typical probiotic capsule will have 1 - 30 billion or more CFUs. Probiotics are best taken with meals and apart from antibiotics by a few hours. There are several medical conditions where science has demonstrated probiotics may be beneficial. A few are listed below:

- **Preventing asthma and allergy in children** – Probiotics given to mothers during the third trimester of pregnancy and then to the baby for the first 6 months after delivery, significantly lessen the chance of developing allergic conditions throughout childhood. Lactobacillus GG is the bacteria most often used for this purpose. It is given to both the mother and the baby. A common brand name is Culturelle. It is available at local pharmacies and health food stores.
- **Decreasing gastrointestinal and respiratory infections in children in day care** - Probiotics given to children in day care promote enhanced immune function helping the children to be more resistant to infections. Bifidobacteria and Lactobacillus are often used in combination for this purpose. Align, Culturelle, and other products are available at local pharmacies and health food stores.

- **Reducing irritable bowel syndrome symptoms in adults** - Probiotics can help to improve gastrointestinal function reducing both diarrhea and/or constipation. Align, Culturelle, and other products are available for this use.
- **Limiting antibiotic associated diarrhea** - Probiotics when taken during the time a person is on a course of antibiotics may decrease distressing and at times serious causes of diarrhea. Saccharomyces boulardii, brand name Florastor, is particularly helpful in limiting this type of diarrhea. This too is available at local pharmacies and health food stores.

In the previous century keeping harmful bacteria in check improved human health. In the 21st century it is clear that in addition to controlling harmful bacteria cultivating healthy bacteria is one of the most important ways to protect our health. To cultivate this amazing and protective microbiome eat a colorful array of plants, avoid antibiotics, and enjoy fermented foods. These foods will feed and protect you and support the wonderful and health promoting microorganisms within!