Go With Your Gut: Understanding Microbiota and Prebiotics

Wendy J. Dahl and Volker Mai

What is our microbiota?
All of us have friendly bacteria all over our bodies. A large population of bacteria lives in our gastrointestinal tract, residing mostly in the colon (large intestine). This is known as our gut microbiota.

If we were able to count the bacteria in and on our bodies, they would add up to about 100 trillion. That's 100,000,000,000,000—about 10 times more bacterial cells than human cells making up our body!(1) If we could weigh all the bacteria in our colon, it would amount to about 2 or 3 pounds.

What does our microbiota do for us?
Our microbiota helps defend against disease—collectively, these resident bacteria help to develop and maintain our immune system's defenses against illness introduced by less friendly, disease-causing bacteria. The bacteria of our microbiota can also make vitamins, such as vitamin K.

The bacteria in our colon break down food residue that escapes digestion in our small intestine. For example, some of the starch and protein we eat, as well as all of the dietary fiber in foods, is not digested and ends up in our colon.

Figure 1. FISH image of gut microbiota
Credits: Courtesy of the Department of Microbiology and Cell Science and the Emerging Pathogens Institute, University of Florida.

The bacteria in the colon break down the food residue for energy and growth. This process is known as fermentation.

We benefit from the fermentation of fiber and starch. Fermentation provides us with some energy (calories) and also helps to keep the colon healthy.(2)
Can microbiota cause disease?
Our microbiota remains quite stable in adulthood. However, the balance of bacteria in our gastrointestinal tract may be disturbed by changes in diet, diarrhea due to contaminated food, stress, antibiotics, and aging. IBD (inflammatory bowel disease) and most forms of diarrhea are linked to changes in our gut microbiota. Our gut microbiota may also be related to our health beyond the gut. Research is being carried out to explore possible connections between microbiota and allergies and other conditions.

What is a prebiotic?
A prebiotic is a fiber that benefits health by stimulating the growth or activity of beneficial bacteria in the colon. Prebiotics are found in high amounts in breast milk and work to optimize the numbers of beneficial bacteria in the baby's intestine. Prebiotic fibers are also found naturally in wheat, onions, chicory root, Jerusalem artichoke, and beans. The most well known prebiotic fiber is inulin, also known as chicory root fiber. Inulin is added to many foods, including snack bars, yogurts, and beverages.

How can we keep our microbiota in balance?
One of the most important things we can do to maintain our normal microbiota is to eat a well-balanced diet. A diet high in fiber from fruits, vegetables, beans, whole grains, and nuts may promote a well-balanced microbiota. Probiotics (good bacteria), taken as capsules or in supplemented foods, also may help maintain or restore microbiota.

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2 Go With Your Gut: Understanding Probiotics [http://edis.ifas.ufl.edu/fs170](http://edis.ifas.ufl.edu/fs170)

2 Various publications on food safety [http://edis.ifas.ufl.edu/topic_food](http://edis.ifas.ufl.edu/topic_food)

Endnotes

