# GUT HEALTH 101

by Janet Lee

*The teeming community of good bugs in your belly may be the key to what ails you.*

Digestion may seem pretty straightforward: food goes in, makes its way through what is essentially a long, hollow tube, and within a day or so goes out. The GI tract is like a chop shop, stripping down whatever you put in—steak, avocado or a doughnut—into "parts," the various nutrients your body needs to survive. It's incredibly nuanced, a finely tuned and timed interplay of a variety of organs, hormones, enzymes and neurotransmitters.

Digestion starts in the mouth and continues in the stomach before it gets sent bit by bit to the small intestine, where the absorption of carbs, fat and protein occurs along a 20-foot stretch. Some food, like fiber, doesn't get broken down in the small intestine; it goes right on through to the 5-foot long stretch of the large intestine. Here, trillions of bacteria munch away on certain types of fiber. The result of that smorgasbord: compounds (sometimes called postbiotics) that affect all sorts of processes in the body. After 12 to 24 hours, whatever remains is shuttled out in the feces (which is mostly water as well as bacteria, protein, carbohydrates and fat).

**Spread your fiber intake throughout the day to avoid gas and bloating.**

## Cross-Talk

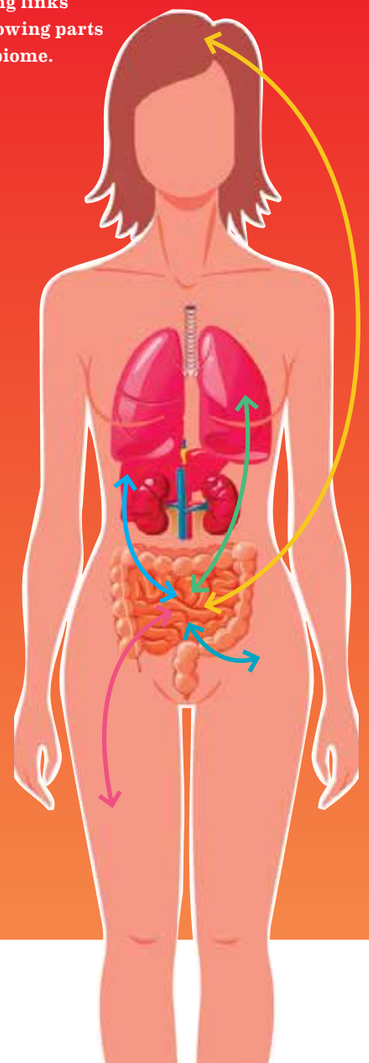
But the biota in your colon aren't just affected by food. Hormonal shifts, stress, allergies, circadian rhythms, drugs and more can all impact the gut and disrupt the population of bugs residing there. Chronically stressed? The signals between your brain and bowel can lead to constipation, abdominal pain and more. Sleep deprived? It throws off the microbiome and makes you crave food that will feed unwelcome bugs. Diets high in sugar and refined foods—and lacking fiber—create "dysbiosis," an imbalance in the good-to-bad bug ratio. That can lead to gas, bloating, stomach upset as well as depression, anxiety, exacerbated stress and more. If things get too bad, the bugs may start munching on the lining of your intestines, leading to what's called intestinal permeability or "leaky gut." That can trigger more systemic issues, like inflammation and autoimmune disorders (see page 72).

"There are so many things that can be impacted by the gut," says Kim Kulp, RDN, a dietitian in private practice in the San Francisco Bay area. "It's those mystery problems that nobody can figure out that can be tied to gut health. I look at what my clients are eating and try to see the connection. Mental health has been shown in the research to be impacted by the gut, as well as autoimmune diseases."

It's not all bad news. Healthy habits like mindfulness, good sleep and exercise—and of course diet—boost the beneficial bug population. These habits are the foundation of good health in general, perhaps because they have such a positive effect on the digestive system.

## The Gut's Connected To...

**Researchers have found strong links (called axes) between the following parts of the body and the GI microbiome.**



### ...the Lungs

Research has shown how microbes in the lungs communicate with those in the gut, and how the latter are key for fighting off bacterial invaders in the lungs, like certain types of pneumonia. Reduced microbiome diversity has been associated with asthma and COPD.

### ...the Liver

Various liver diseases have been linked with dysbiosis, an imbalance in good-to-bad microbes. Rates of nonalcoholic fatty liver disease (NAFLD)—which occurs when fat infiltrates this crucial organ—are rising rapidly among kids and adults.

### ...the Skin

Acne, eczema, dermatitis: These are tip-offs that your bugs are unhappy. A 2018 review in *Frontiers in Microbiology* found that skin issues may be a result of an inflammatory response caused by microbes in the GI tract, where much of the immune system resides.

### ...the Brain

Fascinating research has shown there's an active two-way connection between the brain and belly. The microbiome can trigger changes in the brain via the vagus nerve that lead to depression and anxiety, and these conditions can impact the bugs in your belly as well. Some studies have showed people with Alzheimer's have less microbial diversity than those without dementia.

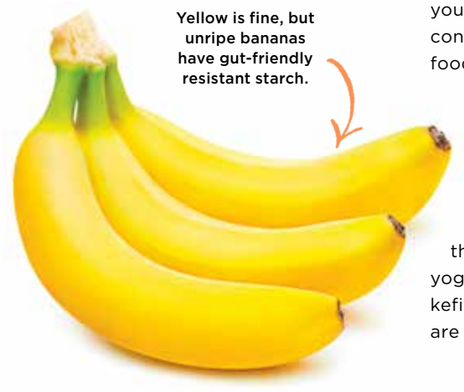
### ...Estrogen and the Reproductive Tract

A 2017 review in *Maturitas* evaluated the many ways microbial dysbiosis negatively impacts estrogen circulation and how this may contribute to cancer, metabolic syndrome, menopausal symptoms like hot flashes, heart disease, PCOS (polycystic ovary syndrome), endometriosis and more.

> "TO BE A 'PROBIOTIC' A FOOD MUST HAVE RESEARCH SHOWING A HEALTH BENEFIT."
> –KIM KULP, RDN

## Feed Your Critters

In order to get good postbiotics, you need to put in good pre- and probiotics. Prebiotics are food for the bacteria that have been shown to have a health benefit, says Kulp. They're primarily dietary fiber, but certain foods are thought to be especially appealing to bugs: Jerusalem artichokes, onion, garlic, bananas, dark leafy greens. "Fruits and vegetables but also whole grains, beans and nuts and seeds—and a variety of all of these—is really what the research is showing works best for producing the greatest variety of gut bugs," she says. "And that's connected to better health."

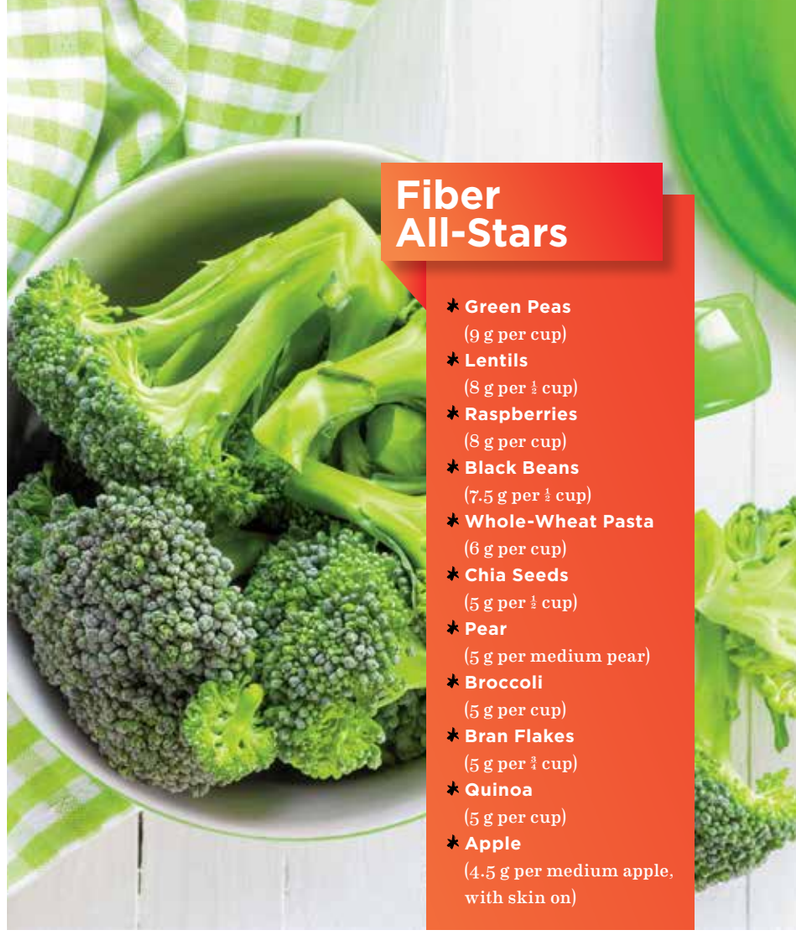


**Yellow is fine, but unripe bananas have gut-friendly resistant starch.**

You've probably heard about probiotic foods, which contain live bacteria that help repopulate the communities in your gut. Probiotics are undoubtedly important, but research is still trying to figure out how they affect the critters inside you. While fermented foods do contain bacteria, "all fermented foods do not automatically contain probiotics," says Kulp. "In order for a food to be considered probiotic, it has to contain live bacteria that clinical research has shown confer a health benefit." Right now there's only research showing yogurt (with live cultures) and kefir (a fermented milk drink) are beneficial, but other types of fermented foods—miso, kimchi, kombucha, sauerkraut and tempeh—may have benefits and are healthy to eat as well.

You can also buy probiotic supplements, but there's just not enough research showing which strains of bacteria work for which people, since everyone has a different microbiome makeup. Some probiotic supplements may not even make it to the large intestine. (For more on supplementing, turn to page 80.)

The gut is still a bit like the wild, wild West. There's so much to look at and it's difficult to do on live people (most gut research is conducted in mice or rats). Lifestyle changes and diet are the easiest ways to try to suss out what may be causing issues and they are likely to be the first things that your doctor will recommend.



## Fiber All-Stars

- **Green Peas** (9 g per cup)
- **Lentils** (8 g per ½ cup)
- **Raspberries** (8 g per cup)
- **Black Beans** (7.5 g per ½ cup)
- **Whole-Wheat Pasta** (6 g per cup)
- **Chia Seeds** (5 g per ½ cup)
- **Pear** (5 g per medium pear)
- **Broccoli** (5 g per cup)
- **Bran Flakes** (5 g per ¾ cup)
- **Quinoa** (5 g per cup)
- **Apple** (4.5 g per medium apple, with skin on)