

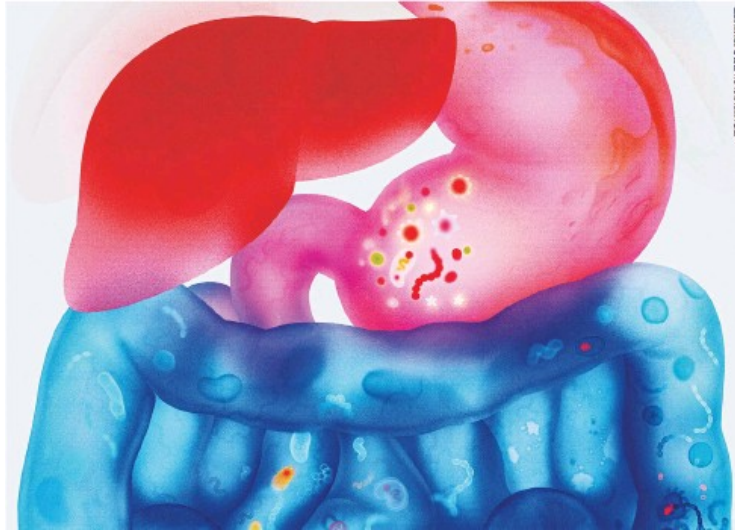
- Digestive system / Digestion

Gut microbiome explainer

A guided tour of the microbiome down there and how to avoid misery

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How healthy is your gut microbiome? Could the bloating or discomfort you feel after eating or drinking be a sign that something in your intestinal tract is amiss?



We compiled the top 15 questions people have about what's going on inside their guts. Then we turned to some of the leading experts in nutrition and gastroenterology for answers. We tackled everything from heartburn, stress, spicy foods and colon cleanses to antibiotics and more. So grab a kombucha, get comfortable and read on for everything you've wanted to know about the wild world inside your gut.

How can I tell if my gut is healthy? And what are some warning signs that it isn't?

The simplest sign of a smoothly running gastrointestinal tract is also the most boring one — your gut should chug along quietly and with little complaint. Eating or drinking should not cause more than occasional bloating or discomfort, and you should have regular, well-formed bowel movements every one to three days that pass without much straining, said Dr Folasade May, a gastroenterologist and associate professor of medicine at the David Geffen School of Medicine at UCLA.

If you regularly have discomfort or pain from symptoms like acid reflux, bloating, constipation or diarrhoea, that could be a sign that your gut is not working optimally, May said. And it might be worth thinking about whether simple tweaks to your diet and other lifestyle factors would help. (More on this below.)

If your symptoms persist or affect your quality of life, you should see a primary care provider or a gastroenterologist, May said. And seek care right away if you have what she called “red flag” symptoms such as nausea and vomiting, recurrent abdominal pain, infrequent or painful stools, or blood in your stool — these symptoms could indicate a serious condition, like an infection, inflammatory bowel disease or even cancer.

How does my gut affect the rest of my body?

Aside from your gut's obvious job of digesting food and absorbing nutrients, research has shown that the trillions of bacteria, viruses and fungi that inhabit your intestinal tract (also known as the gut microbiome) can “influence virtually all aspects of our biology”, said Justin Sonnenburg, a professor of microbiology and immunology at Stanford Medicine.

Much of your immune system resides in your gut, for example, and its resident microbes influence how that system functions, he said. And your gut microbes produce a variety of small molecules that have been shown to affect metabolism, inflammation and appetite, with possible links to certain diseases including obesity, heart disease and even some types of cancer.

“The gut also influences what’s happening in the brain,” said Dr William Chey, a professor of gastroenterology and nutritional sciences at Michigan Medicine. One study published in 2016, for example, found that transferring gut microbes from humans with depression into rats induced depressive and anxious behaviours in the rodents. Some human studies have also shown that taking certain gut bacteria as probiotic supplements may improve anxiety and depression, but it’s too early to recommend probiotics to improve mental health, Chey said.

What are some simple things I can do to improve my gut health?

Unsurprisingly, the best way to care for your gut is to feed yourself — and by extension, your gut microbes — well.

Prioritising foods rich in fibre (such as vegetables, whole grains, nuts, seeds, beans and lentils) is one main way to boost gut health because fibre is an important source of nutrients for those bacteria, said Emily Haller, a registered dietitian nutritionist at Michigan Medicine.

Consuming a variety of plant-based foods can also help to diversify the types of microbes in your gut, which is associated with better health, Haller said. One study published in 2018, for instance, found that people who ate more than 30 types of plant foods per week had a more diverse gut microbiome than those who ate up to 10 types of plant foods per week.

Adding more fermented foods such as yoghurt, kefir, kombucha, sauerkraut or kimchi to your diet can also be a safe (and tasty) way to boost the diversity of your microbiome and decrease inflammation, Sonnenburg said. Though more research is needed to confirm those links and to determine how much fermented food you must eat to obtain those benefits.

Are there any foods I should limit for the sake of my gut health?

Generally speaking, highly processed foods tend to contain little fibre for gut microbes to eat. Some processed foods also contain certain synthetic emulsifiers (added to improve texture and shelf life) that have been shown in mice and limited human studies to harm the gut by reducing the diversity of the gut microbiome, degrading the gut lining and increasing inflammation, said Jens Walter, a professor of ecology, food and the microbiome at University College Cork in Ireland.

Alcohol as well as processed and red meats has also been associated with greater risk of colorectal cancer, so it’s best to limit them, health experts say. But don’t stress about the occasional hot dog or beer, Haller said. What’s more important is to make sure that what you eat overall, “for days and weeks and years”, contains more whole plant foods and less processed foods. That “really is going to have the strongest impact on our health, including gut health”, she said.

I often feel heartburn after I eat. Why is that and what can I do to stop it?

When the sphincter muscle that connects the bottom of your oesophagus to your stomach opens more than it should and allows too much stomach acid to enter, or if acid from your stomach lingers in your oesophagus for too long, that can cause heartburn or other symptoms of acid reflux, said Dr Rena Yadlapati, a gastroenterologist and associate professor of clinical medicine at the University of California, San Diego. Some people have more sensitive nerve endings in their oesophagus, so they sense burning and pain even in response to a normal amount of acid, especially when they are stressed or anxious.

“There are so many nerve endings in the oesophagus, and those are closely related to the brain,” Yadlapati said. “And so during times of stress, anxiety, hormonal changes or in some people just at baseline,” she said, those feelings can be “incredibly heightened”.

Wearing loose clothing during and after meals, reducing the size of your portions, chewing gum after eating and waiting three hours between eating and reclining or lying down can all help with reflux symptoms, Yadlapati said, as can quitting smoking and maintaining a healthy weight. You can also limit

irritating foods and drinks — common ones include coffee, alcohol, chocolate, tomatoes or spicy or greasy foods — though everyone's triggers are different, she said.

Am I at risk for an ulcer if I am constantly stressed and eat a lot of spicy food?

In short, no, Chey said.

Peptic ulcers occur when open sores form in the stomach's protective lining or in the beginning of the small intestine. They are caused by either infection with the *Helicobacter pylori* bacteria or the use of nonsteroidal anti-inflammatory drugs (or NSAIDs) such as aspirin, ibuprofen and naproxen, especially when taken at higher doses or for long periods of time, though individual sensitivities can vary. Over time, both *H. pylori* and NSAIDs can break down the mucosal barrier of the gut lining, eventually causing an ulcer to develop.

Ulcers caused by *H. pylori* infections are treated with antibiotics, and those caused by NSAIDs are treated by stopping their use. (If you need over-the-counter pain medication in the interim, your doctor might recommend an alternative such as acetaminophen.) Proton pump inhibitor medications that reduce the secretion of stomach acid (like Prilosec) are also prescribed in the short term to allow ulcers to heal, or for the long term if you need to take NSAIDs regularly.

What can the shape, type and frequency of my stool tell me about my health?

If your stool looks like something in the range of a smooth snake or a sausage with a cracked surface, that is considered healthy, May said. "The analogy I use is toothpaste, like squeezing toothpaste out of a tube. That's what your stool should look like," she added.

If your stool looks more like small, separate pieces or pellets, or resembles lumpy sausage shapes, that could indicate constipation, she said. And if you have loose stools that look like soft blobs, ragged pieces or watery liquid, that signals diarrhoea. Occasional diarrhoea is common, but if it is ongoing then it is worth seeing your doctor to rule out a possible infection, food intolerance or a condition like celiac disease or irritable bowel syndrome.

Frequency is less important than stool appearance, May said. "A lot of people are obsessed with the concept of having a bowel movement every day, and it does not have to be every day." It can be normal to go three times per week or three times per day, she said.

What actually works to prevent constipation?

As with most things related to the gut, following a healthy, fibre-rich diet can help. And if you're not exercising regularly and drinking enough water, increasing your physical activity and fluid intake can reduce constipation issues, Chey said. Some studies have also shown that eating prunes or kiwis can alleviate chronic constipation. Psyllium fibre supplements can also be taken daily if needed — just be sure to drink plenty of water with them, he said.

Eating breakfast, Haller added, as well as drinking coffee can often help maintain regular bowel movements. She also recommended using a Squatty Potty or other toilet stool to improve your posture on the toilet. By bringing your knees above your hips, "it's putting your body in a more optimal position to have a complete bowel movement", she said.

Poor co-ordination or weakness of the pelvic floor muscles can also contribute to constipation. If this is the case, pelvic floor physical therapy has been shown to help.