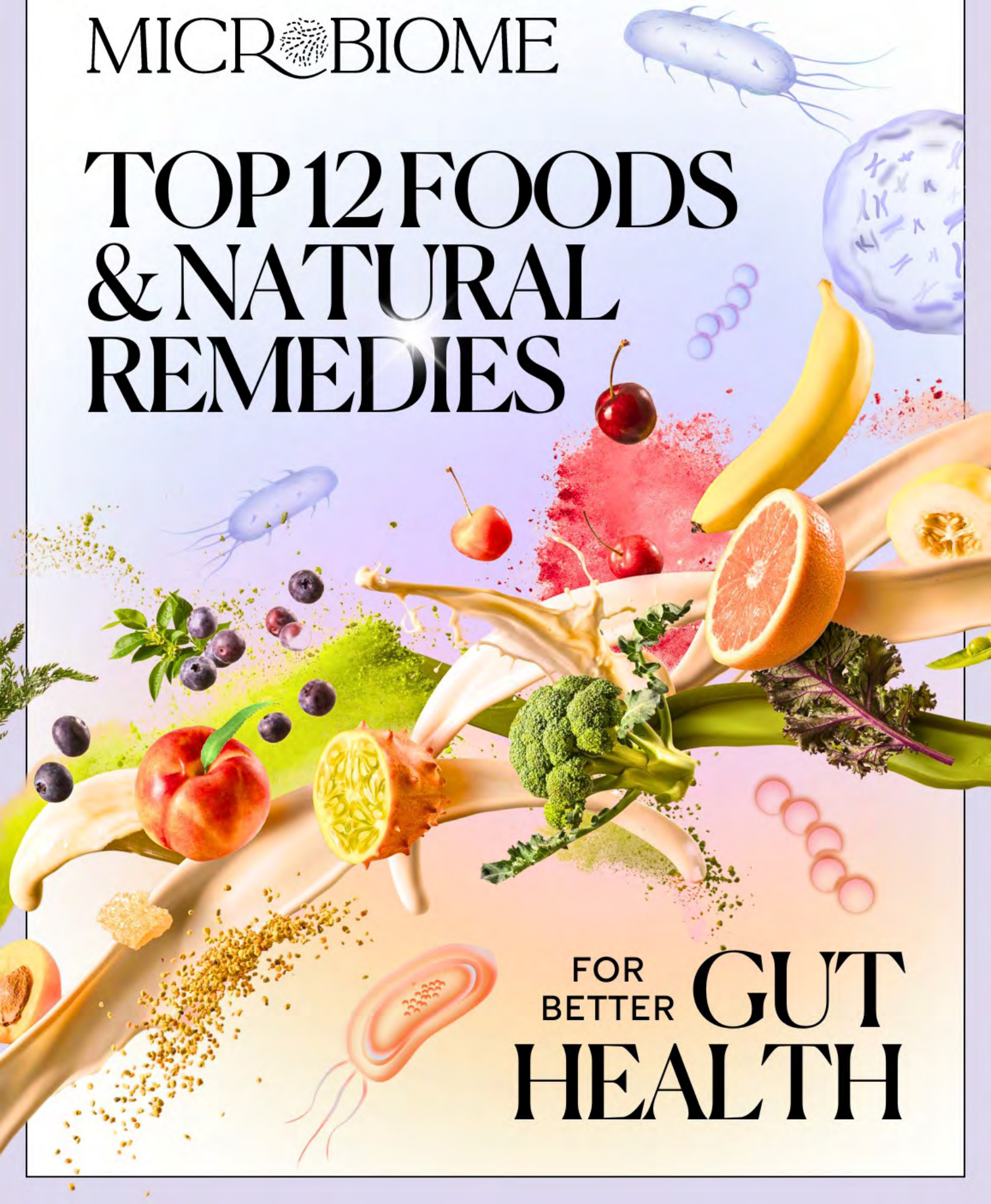
MICROBIOME

TOP 12 FOODS & NATURAL REMEDIES



FOR BETTER GUT HEALTH

Contents

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Introduction

One of, if not *the* most important factor that influences your overall health, is in fact, your gut, or more specifically, the ***microbes*** that live within your gut.

While your body includes about 22,000 human genes, it also hosts as many as 3.3 million microbial genes, 150 times more genes than our own genome.[1]

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[1] "Human gut microbiome: the second genome of human body." Aug. 2010, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4875195/. Accessed 5 Dec. 2022.

These critters, in return for lodging in your body, pay their rent by working in harmony with your cells and tissues. In fact, your gut microbiome directly influences every major body system.

They help you to digest your meals, make essential nutrients that you are unable to produce on your own, influence the expression of your DNA, and protect you from disease.[2]

> In fact, 70% of your entire immune system is located within your gut![3]

These microbes also play a critical role in your appetite regulation, allergies, metabolism, and even neurological function and behavior.[4],[5]

In short, they can have a huge impact on the way you feel.

These microbes are fungi, bacteria, and other single-celled organisms. Some of these microbes reside on the skin and internal surfaces of the body, but most take up residence in your digestive tract.

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[2] *"Gut Microbiome: Profound Implications for Diet and Disease." Jul. 2019, https://pubmed.ncbi.nlm.nih.gov/31315227/. Accessed 5 Dec. 2022.*

[3] *"The Interplay between the Gut Microbiome and the Immune System in the Context of Infectious Diseases throughout Life and the Role of Nutrition in Optimizing Treatment Strategies." Mar. 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8001875/. Accessed 5 Dec. 2022.*

[4] *"gut microbiota-derived metabolites as key regulators - PubMed." 20 Jul. 2021, https://pubmed.ncbi.nlm.nih.gov/34284827/. Accessed 6 Dec. 2022.*

[5] *"The role of the microbiome for human health: from basic science to clinical applications." May 2018, https://pubmed.ncbi.nlm.nih.gov/29748817/. Accessed 5 Dec. 2022.*

So as you can imagine, with all the functions they play, if these microbes are out of balance, it can lead to some serious problems and increase your risk of developing a host of chronic diseases such as diabetes, inflammatory bowel disease, and autoimmune disease, as well as neuropsychiatric illnesses like schizophrenia, ADHD, obsessive-compulsive disorder, and chronic fatigue syndrome.[6],[7],[8],[9]

Gut problems are also super common.

In fact, in a large-scale multinational study published in 2020, researchers found that over 40% of people worldwide have functional gastrointestinal disorders.[10]

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[6] "Association Between Long-term Oral Contraceptive Use and Risk of ...." 23 Feb. 2016, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4928680/. Accessed 6 Dec. 2022.

[7] "The microbiome in autoimmune diseases - PMC - NCBI." https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6300652/. Accessed 6 Dec. 2022.

[8] "Does the microbiome and virome contribute to myalgic encephalomyelitis/chronic fatigue syndrome?" Mar. 2018, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5843715/. Accessed 5 Dec. 2022.

[9] "The Microbiota/Microbiome and the Gut–Brain Axis: How Much Do ...." 28 Jul. 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8401073/. Accessed 6 Dec. 2022.

[10] "Worldwide Prevalence and Burden of Functional Gastrointestinal Disorders, Results of Rome Foundation Global Study." Jan. 2021, https://pubmed.ncbi.nlm.nih.gov/32294476/. Accessed 5 Dec. 2022.

The study found that 11.7% of people have functional constipation, 7.2% have functional dyspepsia, 4.7% have diarrhea, and 4.1% have IBS.

In the US, 20 million Americans suffer from chronic digestive diseases and digestive diseases necessitate 25% of all surgical operations.[11]

Gut symptoms such as diarrhea, constipation, abdominal pain, and bloating, are normal from time to time. But if these symptoms are a common occurrence in your life, they are warning signs of bigger problems, or at least problems that will become bigger down the track if they are not addressed.

These symptoms can be easy to brush off, but they should be taken seriously!

These gut symptoms are also inconvenient, uncomfortable, and can even be painful at times. They can severely affect your quality of life, from your performance at work to your social interactions.

The good news is that you can do something about it!

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[11] "Digestive Disease Continues to Rise Among Americans - GI Alliance." 23 Feb. 2021, https://gialliance.com/gastroenterology-blog/digestive-disease-continues-to-rise-among-americans. Accessed 6 Dec. 2022.

Addressing your gut problems can be a game-changer, and you will regret not having addressed them sooner!

The gut is super adaptive. Sometimes, it's just the small changes that you make that can yield big results. And because the gut is so interconnected with all your other organs, addressing your gut health has flow-on effects for your whole body.

Therefore, making small changes in your digestive health can improve your energy, skin, and mental health, not to mention save you from serious health problems down the road.

The question is, *where to start? What can you introduce in your life and what small changes can you make which will have enormous benefits for your gut health and overall health?*

Wonder no more!

Here are the top twelve things that you can introduce that will do wonders for your gut health. Aim to introduce or address just one new thing per week and by the end of just twelve weeks, you should see vast improvements in your health.

#1. High-Fiber Foods

When it comes to restoring health to our gut microbiome, fiber is the first and potentially the most powerful solution.

Fiber is found in the cell walls of plants, where it provides the structure for the plant. It's a group of complex carbohydrates that, when you eat, your body cannot digest. Instead, it remains untarnished as it passes through your mouth, stomach, and small intestines, and by the time it reaches your colon, it's the same molecule that went into your mouth.

For that reason, it doesn't provide a direct calorie source, but it does act as fuel for healthy bacteria in your gut.[12]

And that is one of the reasons it's critical for optimal health.

The bacteria feed on this fiber and produce short-chain fatty acids (SCFAs) such as butyrate, which is your cells' primary source of energy.

> If you don't have enough butyrate, you suffer from inflammation which triggers leaky gut.[13]

Leaky gut, otherwise known as intestinal hyperpermeability, not only plays a role in various gastrointestinal conditions such as celiac disease, inflammatory bowel disease, and irritable bowel syndrome but it is also associated with autoimmune diseases, allergies, asthma, obesity, and even mental health disorders.

In fact, one meta-analysis that included 17 studies and nearly one million participants, found that there was a 10% reduction in risk for death for every 10 grams of fiber consumed per day. Those who consumed the most fiber were 19% less likely to die over a decade, compared to those who ate the least.[14]

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[12] "Review article: dietary fibre-microbiota interactions." Jul. 2015, https://pubmed.ncbi.nlm.nih.gov/26011307/. Accessed 5 Dec. 2022.
[13] "Butyrate: A Double-Edged Sword for Health?" Jan. 2018, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6333934/. Accessed 5 Dec. 2022.
[14] "Association between dietary fiber and lower risk of all-cause mortality." https://pubmed.ncbi.nlm.nih.gov/25552267/. Accessed 7 Dec. 2022.

#2. Prebiotic Fiber Supplements

Eating more fiber-rich foods isn't always easy for those who are highly reactive to fermentable fibers such as those with irritable bowel syndrome (IBS) or small intestinal bacterial overgrowth (SIBO).

Large amounts of fiber provide an abundance of food for a range of gut bacteria. This can result in an excess of gas in the intestine, causing abdominal pain and discomfort.

This is where supplementation with a well-tolerated, shorter-chain prebiotic fiber is a great addition.

In fact, ***Dr. Will Bulsiewicz*** says that when it comes to healing leaky gut:

> "I start with prebiotics first. If I can only have one supplement, it's going to be a prebiotic supplement. That's where I begin."

Prebiotics are important as they feed the friendly bacteria in your gastrointestinal tract. Without prebiotics, your gut bacteria won't be able to perform the host of functions they play in your health, including reducing inflammation and improving your immune system.

When you feed your gut microbes prebiotic fibers, they produce short-chain fatty acids (SCFAs) which promote the growth of beneficial bacteria such as *Lactobacillus* and *Bifidobacterium.*[15]

Some easily obtainable prebiotic supplements include:

- → *Partially hydrolyzed guar gum (PHGG)*
- → *D-mannose*
- → *Acacia Fiber*
- → *Glucomannan*
- → *Larch Arabinogalactans*
- → *Green Banana Flour*
- → *Fucoidan*

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*[15] "Short-chain fatty acids: a link between prebiotics and microbiota in chronic kidney disease." Nov. 2017, **https://pubmed.ncbi.nlm.nih.gov/29027814/**. Accessed 5 Dec. 2022.*

#3. Fermented Foods

In recent years, there has been a surge in the popularity of fermented foods such as sauerkraut, kimchi, and kombucha, largely due to their health benefits and an increasing interest in gut health.

The process of fermentation makes foods more nutritionally rich by creating probiotics and prebiotics and making vitamins and amino acids more bioavailable. Fermentation thus enhances protein quality and increases the absorption of B vitamins, magnesium, and zinc, all of which are important for mental health.

Molecules formed during the fermentation process offer numerous health benefits. For example, lactic acid bacteria generate many bioactive peptides that promote cardiovascular, immune, and metabolic health.[16]

Fermentation can activate certain compounds. For example, some bacteria convert flavonoids to other metabolites that have high bioavailability and biological activity, improving the nutritional value of the fermented food.[17]

Lastly, fermentation can reduce toxins and anti-nutrients.[18]

For example, the fermentation of soybeans can reduce the concentration of phytic acid, an anti-nutrient factor that can reduce the absorption of certain minerals.[19]

Another example is sourdough fermentation, which can reduce the content of fermentable carbohydrates and reduce undesirable symptoms in people with irritable bowel syndrome.[20]

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*[16] "Bioactive Molecules Released in Food by Lactic Acid Bacteria: Encrypted Peptides and Biogenic Amines." Jun. 2016, **https://pubmed.ncbi.nlm.nih.gov/27375596/**. Accessed 5 Dec. 2022.*

*[17] "Metabolism of phenolic compounds by Lactobacillus spp. during fermentation of cherry juice and broccoli puree." Apr. 2015, **https://pubmed.ncbi.nlm.nih.gov/25475296/**. Accessed 5 Dec. 2022.*

*[18] "Effect of fermentation on antinutrients, and total and extractable minerals of high and low phytate corn genotypes." Oct. 2014, **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4190255/**. Accessed 5 Dec. 2022.*

*[19] "Reduction of Phytate in Soy Drink by Fermentation with Lactobacillus casei Expressing Phytases From Bifidobacteria." Sep. 2015, **https://pubmed.ncbi.nlm.nih.gov/26003176/**. Accessed 5 Dec, 2022.*

*[20] "Randomised clinical trial: low-FODMAP rye bread vs. regular rye bread to relieve the symptoms of irritable bowel syndrome." Sep 2016, **https://pubmed.ncbi.nlm.nih.gov/27417338/**. Accessed 5 Dec. 2022.*

#4. Probiotic Supplements

Another way to replenish your gut bacteria is through probiotic supplementation. Recent research has shown that probiotic supplementation triggers positive shifts in the microbiome by making the environment more hospitable to beneficial species.[21]

Probiotics do a lot more for the gut than improve the composition of the microbiome. ***They play a key role in:***

- → *Regulating bowel transit time to prevent constipation*[22]
- → *Reducing inflammation in the gut*[23]
- → *Healing colon tissue and strengthening the intestinal barrier to prevent leaky gut*[24]

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[21] "Probiotics-induced changes in gut microbial composition and its effects on cognitive performance after stress: exploratory analyses." May 2021, ***https://www.nature.com/articles/s41398-021-01404-9#citeas****. Accessed 5 Dec. 2022.*

[22] "Alteration of gut microbiota and efficacy of probiotics in functional constipation." Jan. 2015, ***https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4288092/****. Accessed 5 Dec. 2022.*

[23] "Probiotic mixture reduces gut inflammation and microbial dysbiosis in children with atopic dermatitis." Aug. 2021, ***https://pubmed.ncbi.nlm.nih.gov/34110005/****. Accessed 5 Dec. 2022.*

[24] "Probiotics: what are they? What are their effects on gut physiology?" Oct. 2003, ***https://pubmed.ncbi.nlm.nih.gov/14507583/****. Accessed 5 Dec. 2022.*

- → *Stimulating short-chain fatty acid production*[25]
- → *Lowering gut pH*[26]
- → *Binding to viruses such as rotavirus and reducing their effects*[27]
- → *Decreasing the effects of bacterial toxins such as Clostridium difficile*[28]
- → *Dampening the overactivity of the immune system in conditions such as eczema, allergic rhinitis, and food allergies*[29]

While they are helpful in treating gut-related conditions, they also support a myriad of conditions not directly related to the gastrointestinal tract. These include type 2 diabetes, obesity, cardiovascular disease, anxiety, depression, endometriosis, eczema, and inflammatory, autoimmune conditions such as psoriasis, fibromyalgia, and lupus to name a few.[30],[31],[32],[33]

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[25] "Health benefits of probiotics: a review." Jan. 2013, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4045285/. Accessed 5 Dec. 2022.

[26] "Gastroesophageal Reflux Disease and Probiotics: A Systematic ...." 2 Jan. 2020, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7019778/. Accessed 7 Dec. 2022.

[27] "Probiotics against Digestive Tract Viral Infections." Oct. 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7150011/. Accessed 5 Dec. 2022.

[28] "Probiotics and Clostridium Difficile: A Review of Dysbiosis and the Rehabilitation of Gut Microbiota." Jul. 2019, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6721914/. Accessed 5 Dec. 2022.

[29] "Probiotics as a Possible Strategy for the Prevention and Treatment of Allergies." Mar. 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064452/. Accessed 5 Dec. 2022.

[30] "Adipose tissue inflammation and metabolic syndrome. The proactive ...." 24 Jul. 2018, https://link.springer.com/article/10.1007/s00394-018-1790-2. Accessed 7 Dec. 2022.

[31] "The gastrointestinal tract microbiome, probiotics, and mood." 30 Sep. 2014, https://link.springer.com/article/10.1007/s10787-014-0216-x. Accessed 7 Dec. 2022.

[32] "Beneficial Effects of Oral Lactobacillus on Pain Severity in Women ...." 14 Jul. 2019, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6642422/. Accessed 7 Dec. 2022.

[33] "Anti-Inflammatory and Immunomodulatory Effects of Probiotics in Gut ...." 26 Feb. 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7953067/. Accessed 7 Dec. 2022.

As different probiotics have different actions in the body, it is important to make sure you have the right strain that is specific to your individual needs. Some of the most common strains include *Lactobacillus rhamnosus, Lactobacillus acidophilus,* and *Bifidobacterium lactis.*

#5. L-Glutamine

> L-Glutamine is the most abundant amino acid in the human body. It is the main source of energy for the cells of the small intestine, and is a key molecule in the formation of new tissue.

Because of this, it is the most popular and effective supplement for healing leaky gut. Supplemental L-glutamine gives the gut the energy it needs to repair and maintain its barrier function.[34]

L-Glutamine also helps to relieve diarrhea, constipation and other undesirable digestive complaints such as abdominal pain, gas, and bloating.

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[34] "Role of Glutamine in Protection of Intestinal Epithelial Tight Junctions." Jan. 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4369670/. Accessed 5 Dec. 2022.

It is a precursor for making the body's "master antioxidant," glutathione, which plays a key role in reducing inflammation and oxidative stress.

L-glutamine also supports good blood circulation and perfusion of exercising muscles. Deficiency of L-glutamine is linked with inflammation, oxidative stress, and immune system dysfunction.[35],[36]

After injury, the demand for glutamine increases, therefore supplementing can be beneficial for recovery and immune health.

#6. Digestive Enzymes

Digestive enzymes are proteins that your body produces to control chemical reactions. They are essential for the absorption of nutrients as they speed up the breakdown of food into their building blocks.

The process of absorption starts in the mouth when you begin to chew your food. Your saliva contains ***amylase*** enzymes that begin to break down starches and carbohydrates and ***lipase*** enzymes that begin to break down fats. The process continues in the stomach where it is important to have

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*[35] "Prevalence of glutamine deficiency in ICU patients: a cross-sectional ...." 2 Aug. 2016, **https://pubmed.ncbi.nlm.nih.gov/27485319/**. Accessed 7 Dec. 2022.*

*[36] "Acute effects of decreased glutamine supply on protein and amino acid metabolism in hepatic tissue: a study using isolated perfused rat liver." Aug. 2003, **https://pubmed.ncbi.nlm.nih.gov/12898474/**. Accessed 5 Dec. 2022.*

enough ***hydrochloric acid*** and ***protease*** to begin to break down proteins.

A big player in this process is the pancreas which supplies pancreatic enzymes in the form of proteases to break down proteins into amino acids, lipase to break down fats into fatty acids, and amylase to breakdown carbohydrates into simple sugars like glucose and fructose. The nutrients are then transported to your liver where they are distributed from there to other parts of your body.

A number of different factors can lead to low digestive enzymes. For example, your body naturally produces fewer digestive enzymes as you age. Stress and the use of antacids can also lead to a deficiency in digestive enzymes.

Another important thing to bear in mind is that plant-based diets require fewer enzymes than meat-based diets as they are not taxing the body's capacity to digest protein and fat. Heavy meat-based diets require significant acid and enzyme production to digest, and this, over time, may lead to inflammation.

Besides going plant-based, digestive enzyme supplementation can help out when your enzymes are low. Supplementation of digestive enzymes has been used extensively to treat various disorders such as metabolic disorders, obesity, diabetes, and intestinal disorders and inflammation.[37],[38],[39]

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*[37] "The role of lipid and carbohydrate digestive enzyme inhibitors in the ...." 10 May. 2010, **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3047983/**. Accessed 7 Dec. 2022.*

*[38] "(PDF) Diabetes mellitus and multiple therapeutic approaches of ...." 5 Jul. 2022, Accessed 7 Dec. 2022. **https://www.researchgate.net/publication/239529162_Diabetes_mellitus_and_multiple_therapeutic_approaches_of_phytochemical_Present_status_and_future_prospects**.*

*[39] "The role of enzyme supplementation in digestive disorders." Dec. 2008, **https://pubmed.ncbi.nlm.nih.gov/19152478/**. Accessed 5 Dec. 2022.*

There are also some very simple diet and lifestyle changes that you can make to help stimulate your body's own production of digestive enzymes such as chewing your food properly, avoiding fluid with your meals, consuming bitter foods such as endive and apple cider vinegar, and addressing food intolerances.

#7. Testing

When it comes to treating digestive problems, often the first step to take is testing. Testing eliminates the guesswork and helps to formulate an effective treatment plan that is aimed at addressing the underlying problems. There are many different tests that help to identify underlying drivers of ill gut health. ***The common ones include:***

→ *Comprehensive Stool Analysis*

The integrity of the gut wall is closely related to the composition of the microbiome. A comprehensive stool analysis quantifies the levels of beneficial bacteria, measures inflammation in the gut, and detects the presence of pathogenic species of bacteria, yeast, and parasites.

→ *Complete Microbiome Mapping Test*

This test assesses the microbiome with particular attention to microbes that cause disease or that disrupt normal microbial balance. It is a comprehensive collection of microbial targets as well as immune, inflammation and digestive markers. It screens for pathogenic bacteria, commensal bacteria, opportunistic pathogens, fungi, viruses, and parasites.

→ *Organic Acids Test*

Damage to the gut lining compromises our capacity to absorb nutrients from the foods we eat. The organic acids test measures nutrient deficiencies, along with the presence of pathogenic species, that are associated with leaky gut.

→ *SIBO Breath Test*

It is important to rule in or rule out SIBO, as this will significantly influence your course of treatment. SIBO breath tests measure the presence and abundance of microbes in the small intestine.

→ *IgG Food Sensitivity Test*

There is a tendency for people who suffer from leaky gut to become reactive to an increasing number of foods. If you have multiple food

sensitivities or find yourself becoming sensitive to foods that you once tolerated well, there is a good chance that your gut is leaky.

→ *LPS Testing*

LPS is an endotoxin that is produced by pathogenic bacteria in the gut. It then travels through the bloodstream, causing inflammation throughout the body and impairing the function of the brain. This test is helpful for measuring the degree of permeability in the gut and tracking treatment progress.

→ *Lactulose/Mannitol test*

This test measures the presence of non-metabolized sugars called lactulose and mannitol, which are found in the blood stream when the gut is hyperpermeable. It is both the most commonly used and most reliable test for detecting leaky gut.

#8. Glutathione

Glutathione is the body's master antioxidant. It is needed by every cell to defend itself against free radicals and oxidative damage.[40]

Oxidative stress occurs when there's an imbalance between the production of free radicals and the body's ability to combat them.

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*[40] "Glutathione depletion and oxidative stress." Sep. 2002, **https://pubmed.ncbi.nlm.nih.gov/12217624/**. Accessed 5 Dec. 2022.*

Oxidative stress can lead to inflammation and the development of various diseases including diabetes, cancer, and autoimmune diseases.[41]

It is neuroprotective as the human brain is highly vulnerable to the generation of reactive oxygen species due to its high oxygen consumption.[42]

> In fact, free radicals and the oxidative damage they can cause leads to inflammation and the death of brain cells.

Glutathione is also used in liver detoxification to metabolize toxins and medications.[43]

A number of factors can affect glutathione levels in the body including aging, poor nutrition, exposure to environmental toxins, and stress.

You can boost your levels by consuming glutathione-rich foods like spinach, avocado, asparagus, and okra. You can also supplement glutathione directly (choose the liposomal form of glutathione for optimal absorption) or supplement with the amino acids cysteine, glycine, and glutamine which your body uses to create glutathione.

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*[41] "Glutathione: a key player in autoimmunity." Jul. 2009, **https://pubmed.ncbi.nlm.nih.gov/19393193/**. Accessed 5 Dec. 2022.*

*[42] "Glutathione, oxidative stress and neurodegeneration." Aug. 2000, **https://pubmed.ncbi.nlm.nih.gov/10931172/**. Accessed 5 Dec. 2022.*

*[43] "Glutathione-Mediated Conjugation of Anticancer Drugs: An Overview of Reaction Mechanisms and Biological Significance for Drug Detoxification and Bioactivation." Aug. 2022, **https://pubmed.ncbi.nlm.nih.gov/36014491/**. Accessed 5 Dec. 2022.*

#9. Turmeric

Turmeric is a great remedy for gut health as it is a potent anti-inflammatory and antioxidant. In fact, it is so powerful that it matches the effectiveness of some anti-inflammatory drugs but without the side effects.[44]

Curcumin works by reducing the response of specific protein-cytokines that occur in the process of inflammation.[45]

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[44] "Safety and efficacy of curcumin versus diclofenac in knee osteoarthritis: a randomized open-label parallel-arm study." 2019, https://trialsjournal.biomedcentral.com/articles/10.1186/s13063-019-3327-2. Accessed 5 Dec. 2022.

[45] "Anti-Inflammatory Effects of Curcumin in the Inflammatory Diseases: Status, Limitations and Countermeasures." Nov. 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8572027/. Accessed 5 Dec. 2022.

As an antioxidant, curcumin targets free radicals produced by your body's oxidation process. If free radicals overwhelm the body's ability to combat them, this leads to oxidative stress and subsequent disease. Curcumin neutralizes free radicals, relieving oxidative stress and cell damage.

Curcumin has also been shown to be an effective anti-inflammatory in a range of digestive conditions including irritable bowel syndrome, inflammatory bowel disease, and acid reflux.

In one study, patients with ulcerative colitis, a type of inflammatory bowel disease, were given either curcumin, curcumin in addition to an anti-inflammatory medication, or a placebo in addition to an anti-inflammatory medication.

> The patients treated with curcumin had a 4.7% relapse rate compared to a 21% relapse rate in the placebo group.[46]

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*[46] "Curcumin maintenance therapy for ulcerative colitis: randomized, multicenter, double-blind, placebo-controlled trial." Dec. 2006, **https://pubmed.ncbi.nlm.nih.gov/17101300/**. Accessed 5 Dec. 2022.*

Turmeric also boasts a number of other benefits. It assists in detoxification as it binds to heavy metals in the body, reduces toxin-induced inflammation and increases the production of enzymes required for detoxification.[47],[48],[49],[50]

It fights against pathogens, improves circulation, fights against cancer, and even relieves inflammatory nervous system disorders such as depression.[51]

Curcumin has poor bioavailability as it is poorly absorbed, rapidly metabolized, and rapidly eliminated from the body.[52]

There are multiple components that can be added to turmeric to make it more bioavailable, with piperine, the active component of black pepper, being the most popular option.

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*[47] "The Influence of Curcumin, Quercetin, and Eicosapentaenoic Acid ...." **https://www.tandfonline.com/doi/abs/10.1080/01635581.2012.700994**. Accessed 7 Dec. 2022.*

*[48] "Complexation between Cu(II) and curcumin in the presence of two ...." 31 Dec. 2013, **https://www.sciencedirect.com/science/article/abs/pii/S0301462213001713**. Accessed 7 Dec. 2022.*

*[49] "Oral administration of curcumin (Curcuma longa) can attenuate the ...." **https://www.scielo.br/j/acb/a/g8ZGKmNBcxGjtS7qb8dKRqm/?lang=en**. Accessed 7 Dec. 2022.*

*[50] "The Influence of Curcumin, Quercetin, and Eicosapentaenoic Acid ...." **https://www.tandfonline.com/doi/abs/10.1080/01635581.2012.700994**. Accessed 7 Dec. 2022.*

*[51] "Clinical Use of Curcumin in Depression: A Meta-Analysis." Jun. 2017, **https://pubmed.ncbi.nlm.nih.gov/28236605/**. Accessed 5 Dec. 2022.*

*[52] "Bioavailability of curcumin: problems and promises." Nov-Dec. 2007, **https://pubmed.ncbi.nlm.nih.gov/17999464/**. Accessed 5 Dec. 2022.*

#10. Plant-Based Collagen Builders

Collagen is a type of protein that's found in our connective tissue, cartilage, bone, and tendons. It helps to strengthen skin, as well as maintain elasticity and hydration. It also plays a critical role in supporting the integrity of the gut.

Our body's production of collagen typically declines with age, leading to dry skin and the formation of wrinkles. Other factors such as nutritional deficiencies, smoking, stress, and excess sun exposure may also contribute to collagen breakdown.

Collagen is only found in animal products such as meat, fish, and eggs. However, your body is unable to absorb collagen in this whole form. Rather, your body breaks down the protein into its smaller building blocks of amino acids, which it may then use to build new proteins, and the healthier protein sources with those building blocks are plant-based proteins.[53]

It is less efficient to consume whole collagen that we then have to break down, absorb, and then use to build our own collagen, than it is to just consume healthy foods that supply the nutrients that we need to do so.

The amino acids that are most important for collagen production include glycine, proline, hydroxyproline, and lysine.[54]

> Nuts, seeds, legumes, and mushrooms are some of the best plant-based sources of these amino acids.

Other nutrients that are needed to support collagen production include vitamin C, zinc, copper, iron, vitamin E, and sulfur-containing compounds which are found in the allium family of veggies such as garlic and onions, as well as cruciferous vegetables.

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*[53] "Association Between Plant and Animal Protein Intake and Overall and Cause-Specific Mortality." Sep. 2020, **https://pubmed.ncbi.nlm.nih.gov/32658243/**. Accessed 5 Dec. 2022.*

*[54] "Dietary Collagen – Should Consumers Believe the Hype?" Mar. 2019, **https://www.todaysdietitian.com/newarchives/0319p26.shtml**. Accessed 5 Dec. 2022.*

#11. Melatonin

While melatonin is known primarily as the sleep hormone, it has numerous other roles in the body.

Melatonin is secreted from the pineal gland, where it regulates your body's circadian rhythm. Some melatonin is also synthesized in the intestines by specific cells and gut microbes, where it acts locally rather than entering systemic circulation. Studies have found that there is four

hundred times more melatonin in the gut than in the pineal glands.[55]

The melatonin in the gut supports immune function, promoting a healthy inflammatory response, and supporting antioxidant status.[56]

It directly scavenges reactive species and increases the activities of anti-oxidant enzymes.

Melatonin may also play a role in maintaining a balanced gut microbiota which also functions according to your circadian rhythm.

It is during sleep, when your body is in its fasting state and no food or drink is coming into the system, that these microbes are triggered to clean out the gut and throughout the body and trigger processes such as mitophagy *(the removal of damaged mitochondria through autophagy)* and autophagy *(the body's way of cleaning out damaged cells, in order to regenerate newer, healthier cells).*

These microbes are critically important to maintaining a healthy gut ecosystem, maintaining a healthy gut lining, and for the repairing of cells during sleep, all of which are essential in the prevention of disease.[57]

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*[55] "Melatonin mediates mucosal immune cells, microbial metabolism, and rhythm crosstalk: A therapeutic target to reduce intestinal inflammation." Mar. 2020, **https://pubmed.ncbi.nlm.nih.gov/31420885/**. Accessed 5 Dec. 2022.*

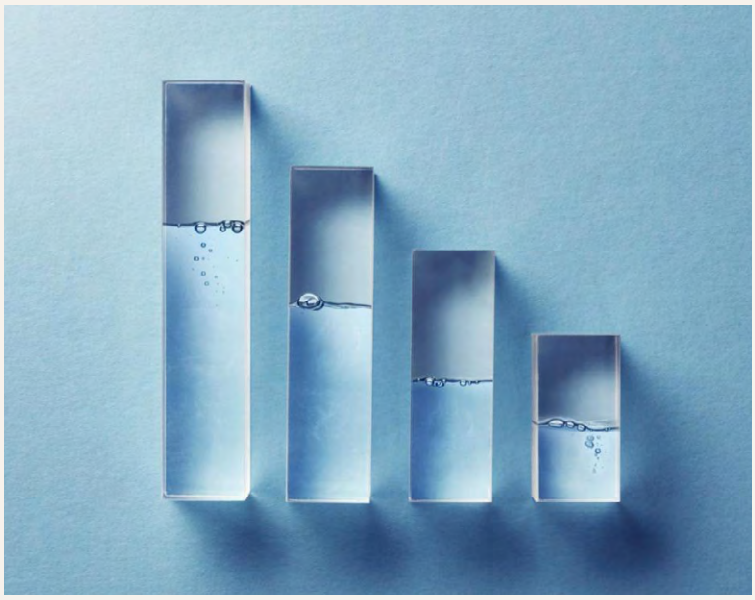
*[56] "Melatonin mediates mucosal immune cells, microbial metabolism, and rhythm crosstalk: A therapeutic target to reduce intestinal inflammation." Mar. 2020, **https://pubmed.ncbi.nlm.nih.gov/31420885/**. Accessed 5 Dec. 2022.*

*[57] "Circadian rhythms and the gut microbiota: from the metabolic syndrome to cancer." Oct. 2020, **https://www.nature.com/articles/s41574-020-00427-4**. Accessed 14 Aug. 2022.*

#12. Water

Water is not just essential to every single cell in our body, it is also essential to the microbes that reside within us.

> Research has shown us that the amount of water you drink every day can have a significant impact on the composition of your gut microbiome.



For example, in a study involving over 3,000 mostly healthy participants from the US and UK, those who drank lots of water had a lower abundance of *Campylobacter* bacteria, which has been linked to gastrointestinal infection, than those who did not.[58]

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*[58] "Drinking Water Source and Intake Are Associated with Distinct Gut Microbiota Signatures in US and UK Populations." Oct. 2021, **https://academic.oup.com/jn/article/152/1/171/6395031**. Accessed 5 Dec. 2022.*

Besides the amount of water that you drink, the mineral content and the actual microbial composition of the water can also influence your microbiota.

> For example, in the same study, those who drank well water had a higher fecal microbiota diversity compared to those who drank bottled, tap, or filtered water.[59]

Water also has a significant influence on gut motility and peristalsis, a series of wave-like muscle contractions that move food through the digestive tract. If you are not drinking enough water, your large intestine will soak up whatever water it can from the food you consume, making it too hard to pass, causing pain and constipation.

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*[59] "Drinking Water Source and Intake Are Associated with Distinct Gut Microbiota Signatures in US and UK Populations." Oct. 2021, **https://academic.oup.com/jn/article/152/1/171/6395031**. Accessed 5 Dec. 2022.*

Conclusion

The health of your gut is paramount. As the gut is a major determiner of every other aspect of your health, when you make sure it is functioning well, you are taking the reins and taking control of your overall health.

Due to the many roles the microbes within your gut play in your body, if they are out of whack, chances are your health is going to be affected. You may begin to feel its effects on your body, from bloating and constipation, to skin rashes, headaches and fatigue.

Inflammation will also result, increasing your risk of developing various chronic diseases.

The good news is that you can do something about it!

Even small changes that you make today can yield big results and save you from serious health problems down the road. By focusing on your gut, you have the power to change your health trajectories for years to come.

We know this can be a lot to take in...

So to help empower you with the resources and knowledge to heal your gut naturally, we've created *MICROBIOME* — a docuseries masterclass with today's leading doctors, researchers, and educators guiding you through this critical information, one step at a time.

Not only will you discover ***how to tell if your gut is compromised,*** but you'll also learn exactly ***what you must do now to protect your health.***

Plus, you'll ***walk away with proven and practical natural remedies you can start using at home right away.***

Be part of MICROBIOME so you can know how to improve your health, reduce your risk of disease, and upgrade your quality of life... and the lives of those you love.