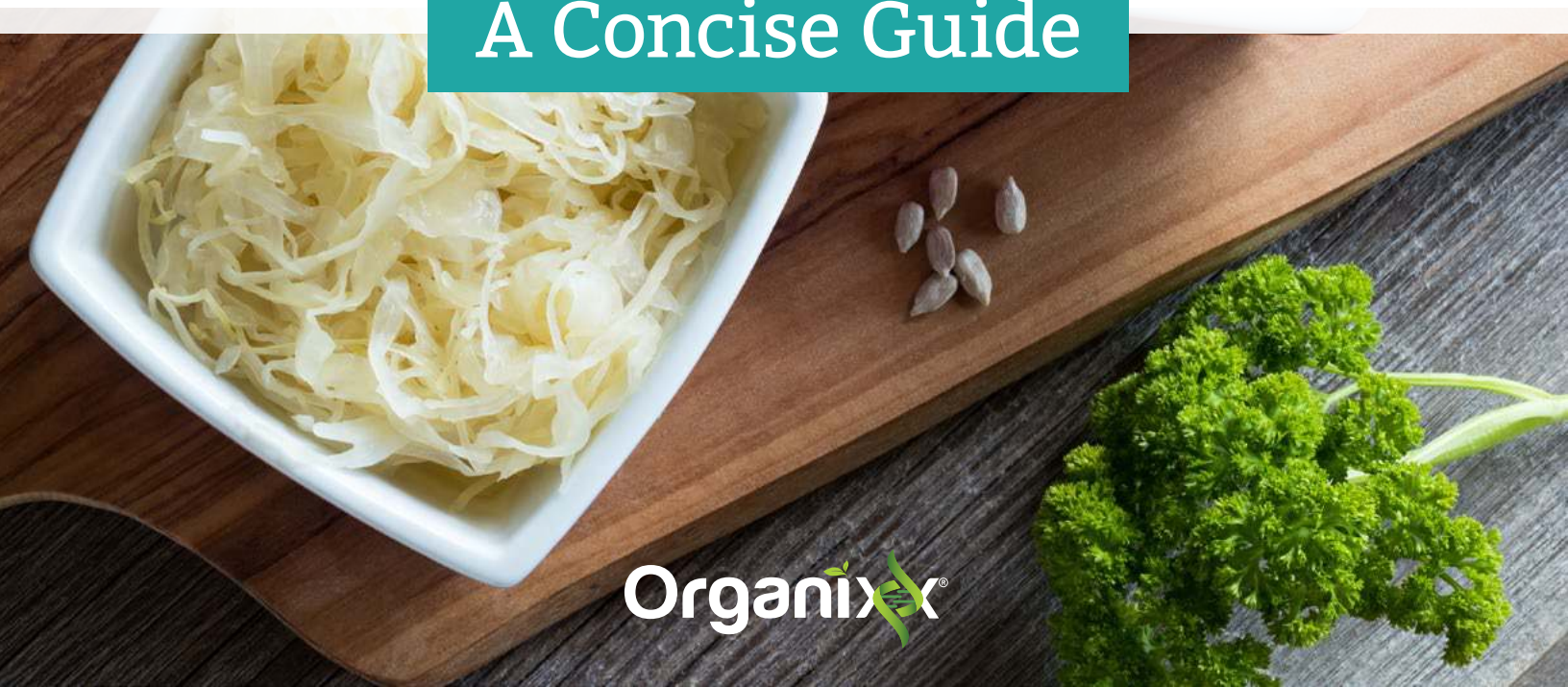




PROBIOTIC SUPPLEMENTS, FOODS, AND BENEFITS:

A Concise Guide



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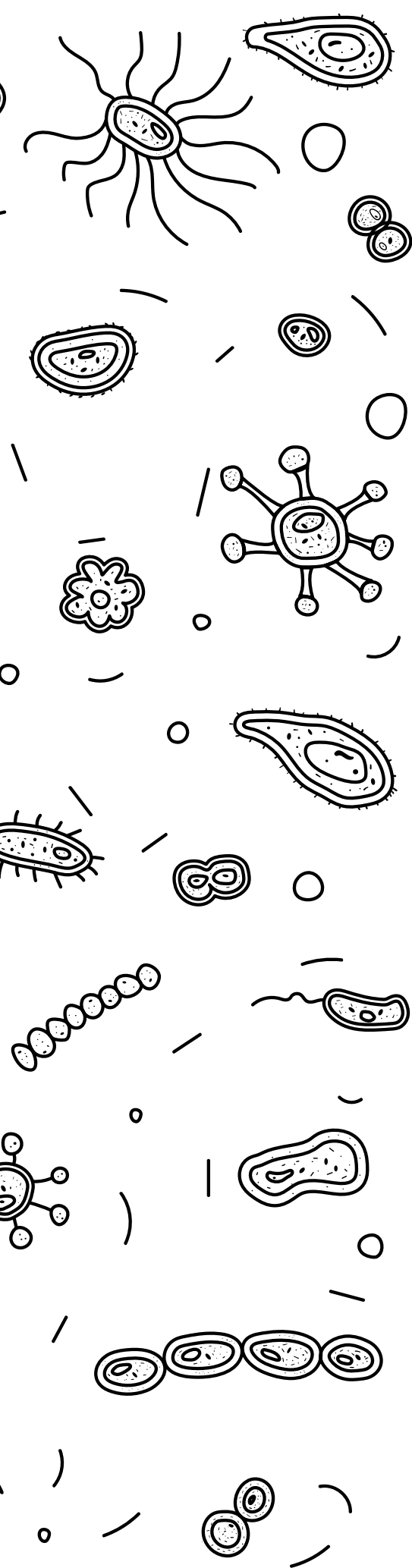
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The Secret Weapon for Health & Wellness: **BALANCED GUT BACTERIA**

A lot of fuss has been made about our gut bacteria in recent years. But in the ever-changing face of science, is it really that big a deal? Was it ever?

In a word... yes! In fact, ever more compelling science is emerging about our gut flora (also known as intestinal flora). This research is revealing ways the balance of this environment inside your digestive system not only deeply affects your health, but, essentially, is connected to almost every other function in your body – including your brain.¹

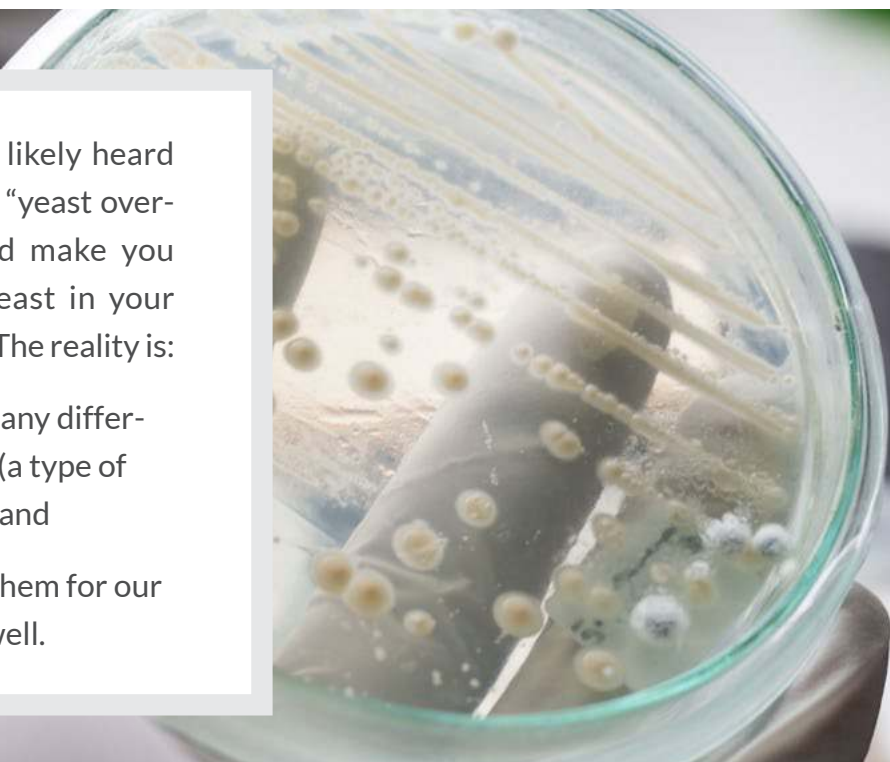
Having a healthy ecosystem within your gut is vital to fighting disease, healthy aging, and lifelong wellness. Nowadays though, intestinal flora (or gut bacteria) is called microbiota, and the biological system comprising these trillions of organisms is referred to as your microbiome. In other words, you have trillions of microbiota in your microbiome, which resides in your GI tract, or gut.²

You may have heard in popular media that your microbiota outnumbers your human cells at a ratio of 10:1. Newer research has put that figure at closer to 3:1 and even 1:1.³ But no matter what the exact ratio, you've still got trillions of these microbial organisms inhabiting your body. So, just what are they?

What's in Your Microbiome?

MICROBIOTA

The trillions of microbes that comprise your microbiome are a collection of near countless strains of viruses, fungi, and bacteria. Each of these microbiota serves a purpose of some kind, and in general is labeled as either “good” or “bad.” However, it is an entirely symbiotic relationship, so it’s important for there to be a balance in the microbiota that supports the proper organic processes within your body.^{4,5}



For example, you’ve likely heard of someone having a “yeast overgrowth.” That would make you think that having yeast in your microbiome is “bad.” The reality is:

1. There are many, many different types of yeast (a type of fungi) in the body, and
2. We need most of them for our body to function well.

One example of a “good” or beneficial (aka probiotic) yeast is *S. boulardii* which, among its benefits, boosts your immune system by stimulating your body’s production of antibodies. Other yeasts serve as food for the many strains of bacteria living inside us, or help ferment the foods we eat, thus aiding in absorption of nutrients.⁶

The same principle applies to the bacteria residing in your bowels: The bacteria all serve a purpose. The “good,” beneficial (probiotic) bacteria, such as *Acidophilus*, *Lactobacillus*, *Bifidobacteria*, and *Bacillus coagulans*, carry out or participate in biological processes such as aiding digestion by assisting in fermentation or creating enzymes (or enhancing their function), as well as by fighting off harmful bacteria and keeping yeast in check.⁷

There are also bacteria in your microbiome that if allowed to flourish are harmful to the body. These can lead to conditions such as diarrhea, constipation, gas, bloating, abdominal pain, or IBS.^{8,9} A few of these would include *Clostridium difficile*, *Citrobacter*, *Klebsiella*, *Enterobacter*, *Proteus*, *Pseudomonas*, and *Serratia*. Then there are those bacteria that, if able to overcome a GI tract, are life threatening. Examples include *Salmonella* and certain strains of *E. coli*.^{10,11}

So why do you need so-called “bad” bacteria? A very in-depth, 2011 article published in *BMC Medicine* about the microbiome and necessity of a healthy gut, says it best:

“The mucosal immune system of the GI tract both controls the GI microbiome and depends on it. The permanent challenge of bacterial antigens to the mucosal immune system is required for its normal development and function.”¹²

The most important thing to take away from that quote is that all the microbiota in your GI tract have purpose. Ideally, it’s a beautiful symphony of microbes with everything in balance. To give you a metaphor, if the horn section of an orchestra suddenly starts playing any note it wants, in any rhythm and key, while overpowering all the other instruments to the point of drowning them out, there is not only dissonance (disharmony), there’s chaos! Whereas, when each instrument (microbe) is performing its job, in the right quantities, the result is perfect harmony.



WHY Is the Gut So Important to Your Health?

An easier question would be why don't we need a microbiome that's in harmony? The plain truth is scientists continue to discover and outline precise reasons the gut (gastrointestinal system or GI tract) is one of the most important biological systems in the human body.

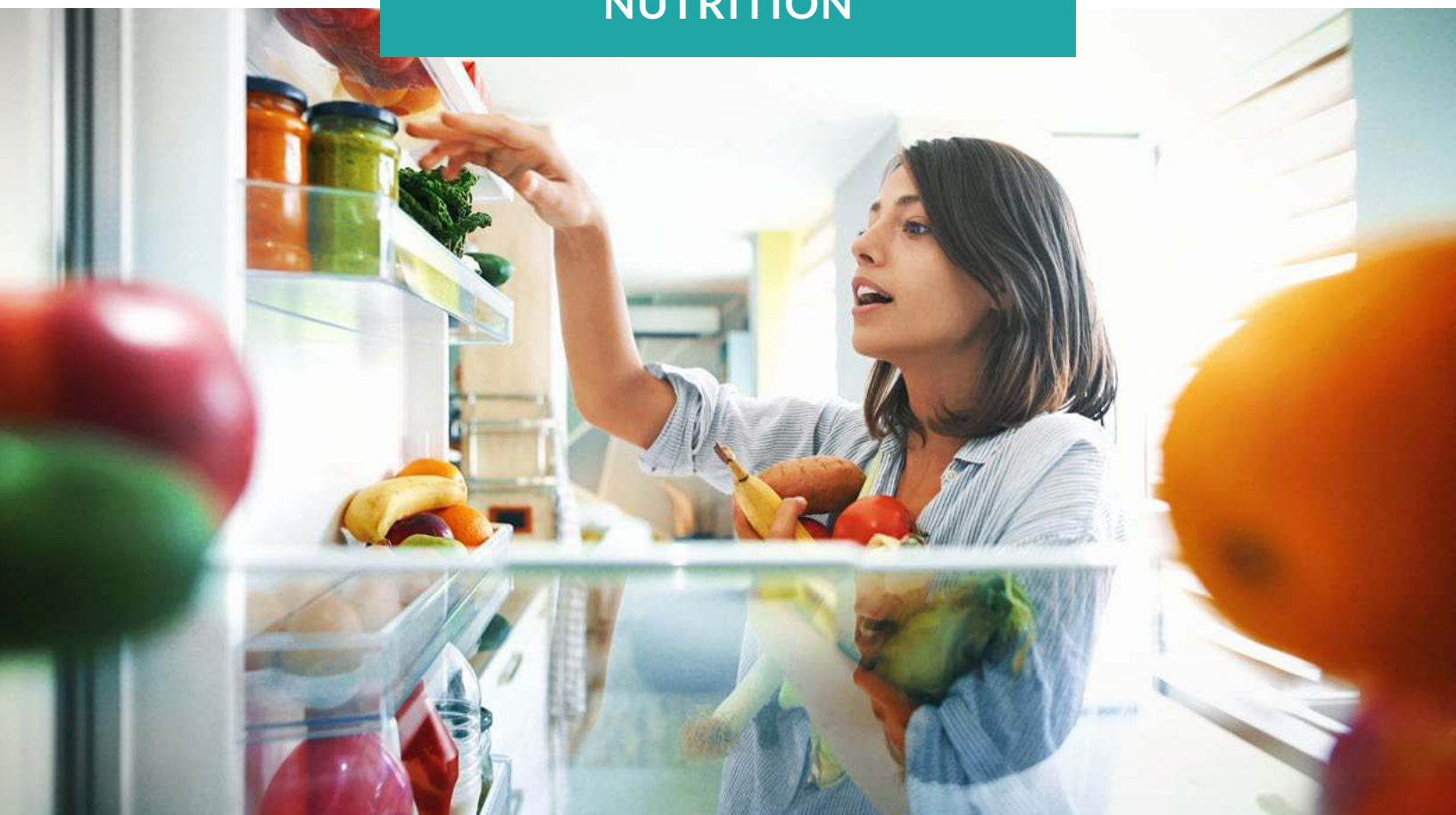
A few points about the importance of your gut:

- ▶ The majority of nutrient and water absorption takes place in the gut.
- ▶ Around 20 hormone processes are connected to or have processes in the gut.
- ▶ The GI tract contains more than 1 billion nerve endings and has more surface area than that of your external skin. These neurotransmitters, known as the enteric nervous system (ENS), are so involved in your body's processes that scientists have nicknamed the gut the "second brain."
- ▶ There are over 100 million neurons in the ENS; more than the spinal cord, or the peripheral (outside of the brain or spinal cord) nervous system.
- ▶ The brain doesn't need to operate the GI system. The second brain can act independently. In some cases the ENS sends signals to the brain, not the other way around.¹³
- ▶ The "gut-brain axis" describes the influence the gut, microbiome, and ENS have on the brain, including both emotional and cognitive functions.¹⁴
- ▶ The gut contains 70% to 80% of your body's immune cells.
- ▶ The GI microbiome prevents colonization by potentially pathogenic microorganisms, provides energy for the gut wall from undigested food (e.g., carbohydrates and other nutrients), and regulates the mucosal immune system.¹⁵
- ▶ GI microbiota contribute to energy homeostasis (stability), prevent mucosal infections, and, importantly, contribute to the maintenance of an intact GI barrier, which seems to be closely related to infectious, inflammatory, and allergic diseases.¹⁶
- ▶ Any disruption to the harmony of the GI microbiome affects the function of the host's (body's) defense systems.

What Happens When Your Gut Is **NOT** in Harmony

Earlier we used a metaphor describing the chaos of an orchestra not working together. Just like that orchestra, when your microbiome is out of balance or not in harmony (also known as dysbiosis), the results are chaos within the body. Let's explore some reasons why...

NUTRITION



Nutrition is an obvious one. If your body is unable to absorb the maximum amount of nutrients and water, your cells cannot run at optimal levels. This, in turn, compromises the body.¹⁷⁻¹⁹

There are simply too many processes to list that each could be affected, but they would include: kidney and liver function, hormone balance, bone density, healthy growth in children and teens (including brain development), tissue/skin health, allergic and autoimmune disease, brain chemistry, overall immunity, and, in terms of how cells are programmed to function, even the development of cancer.²⁰

IMMUNITY



It's fair to say that your immune system is likely the most important aspect of your body that is compromised by a microbiome that is out of balance.

A 2008 publication in *Clinical and Experimental Immunology*, a journal of the British Society for Immunology states,

“The gastrointestinal system plays a central role in immune system homeostasis... The crucial position of [this system] is testified by the huge amount of immune cells that reside within it. Indeed, gut-associated lymphoid tissue (GALT) is the prominent part of mucosal-associated lymphoid tissue (MALT) and represents almost 70% of the entire immune system; moreover, about 80% of plasma cells [mainly immunoglobulin A (IgA)- bearing cells] reside in GALT.”²¹

To put it in simpler terms, GALT (gut-associated lymphoid tissue) is a vital part of your immune system. As its name implies, it is actually part of your lymphatic system and works to protect your body from invasion. GALT surrounds the intestines and is made up of immune cells.

Diseases thought to be associated with GI barrier and GI microbiota

Location	Diseases for which the GI barrier plays a central role in pathogenesis	Diseases associated with an altered composition or function of the GI microbiota
Intestinal	<ul style="list-style-type: none"> ▶ Infectious diarrhea ▶ Inflammatory bowel disease ▶ Celiac disease ▶ Irritable bowel syndrome 	<ul style="list-style-type: none"> ▶ Inflammatory bowel disease ▶ Celiac disease ▶ Irritable bowel syndrome
Extraintestinal (meaning outside of the intestines)	<ul style="list-style-type: none"> ▶ Allergic diseases ▶ Autoimmune diseases and arthritis ▶ Obesity, fatty liver disease, and nonalcoholic steatohepatitis (NASH) ▶ Systemic inflammatory response syndrome (SIRS) and sepsis in ICU patients ▶ Malnutrition 	<ul style="list-style-type: none"> ▶ Allergic diseases ▶ Arthritis ▶ Obesity

Source: <https://bmcmmedicine.biomedcentral.com/articles/10.1186/1741-7015-9-24>

One of the primary functions of your GI tract is to eliminate unnecessary, or unwanted matter. If your body is unable to properly expel waste, this delicate system of cells, neurons, and tubes gets backed up. What needs to be eliminated becomes reabsorbed instead. Eventually it will even push through the intestinal wall and be sent back into your bloodstream. This taxes your defense systems, which will see this matter as toxic and attack.

As toxicity increases, the cells do not receive adequate oxidation, leading to a further compromised immune system.

The other side of the coin is that a microbiome in disharmony has the potential to create its own overgrowth of toxins. There is a supremely complex relationship between your trillions of microbiota. Without homeostasis (balance), processes that involve or create what would normally be an innocuous or harmless amount of toxins, become greater than the body can easily tolerate. Then if you also have improper elimination, the issue exacerbates. In addition, too many toxins can prevent proper nutrition. It's a vicious cycle that can rob you of your vitality and health.

YOUR BRAIN

Earlier we discussed the ENS – the enteric nervous system that is also called the “second brain.” However, there is also an aspect of GI function and the microbiome known as the “gut-brain axis” or GBA.

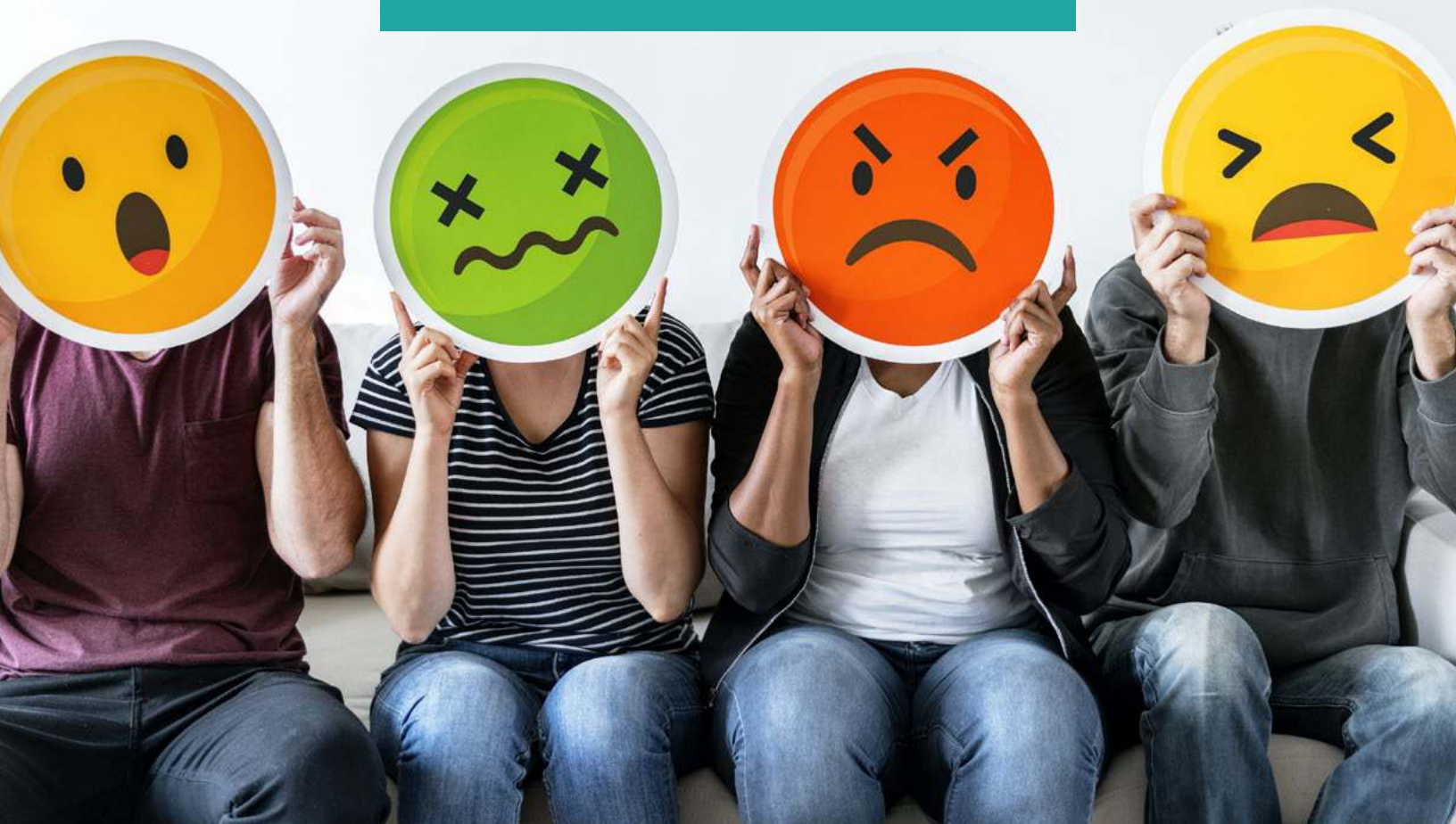
A 2015 scientific review published in *Annals of gastroenterology: A quarterly publication of the Hellenic Society of Gastroenterology*, in Greece, explains it well:

“The gut-brain axis (GBA) consists of bidirectional communication between the central and the enteric nervous system, linking emotional and cognitive centers of the brain with peripheral intestinal functions. Recent advances in research have described the importance of gut microbiota in influencing these interactions. This interaction between microbiota and GBA appears to be bidirectional, namely through signaling from gut-microbiota to brain and from brain to gut-microbiota by means of neural, endocrine, immune, and humoral links.”²²

Thus, not only is the microbiome (and gut) sending signals to the brain, and often controlling itself as a GI unit, it’s a major player in how the body functions, telling the brain what to do with hormone levels, emotions, and even thinking. Not the other way around!²³

In fact, “emerging data support the role of microbiota in influencing anxiety and depressive-like behaviors” as well as connecting dysbiosis (microbiome imbalance) to autism. The same Greek review notes, “autistic patients present specific microbiota alterations according to the severity of the disease.”²⁴

MOOD AND PSYCHOLOGY



Probably the most surprising effect the GBA and microbiome have on your body has to do with mood.²⁵

Science has long-recognized that much of your supply of neurochemicals originates in the intestines. Most of your serotonin is made there,²⁶ as well as approximately 50% of your dopamine. However, it's only recently that serious consideration has been given to the role our microbiota play in creating those chemicals.^{27,28}

A 2015 story in the *New York Times* shares interviews and quotes with several scientists on the cutting edge of this area of research, including one of the first to propose the neurochemical aspects of the gut-brain axis – Mark Lyte, a microbiologist at the Texas Tech University Health Sciences Center.²⁹

Lyte and other researchers have found that among the many chemicals secreted by our microbiota, some are identical to the substances “used by our neurons to communicate and regulate mood, like dopamine, serotonin and gamma-aminobutyric acid (GABA). These, in turn, appear to play a function in intestinal disorders, which coincide with high levels of major depression and anxiety.”³⁰

For example, in 2014 a group of Norwegians studied the feces of 55 people. They noted that depressive patients had certain bacteria in common. It's due to this type of research that it's becoming more commonly accepted that anxiety, depression, and several pediatric disorders (including autism and hyperactivity) are linked to gastrointestinal abnormalities.³¹

It was once thought that stress caused the immune system to be weakened, which in turn affected how bacteria in our microbiome behaved. Now, somewhat revolutionarily, research indicates that certain bacteria actually *cause* stress, which then impairs the immune system.

The truly exciting aspect of all this science is work that Lyte and his peers are doing in the realm of *reversing* disorders. Thus, using the secretions of certain bacteria to relieve anxiety and elevate mood, by putting the microbiome back into harmony – proposing probiotics (beneficial, life-giving organisms) can be tailored to treat psychological disorders. These are somewhat flippantly being referred to as “psychobiotics.”³²

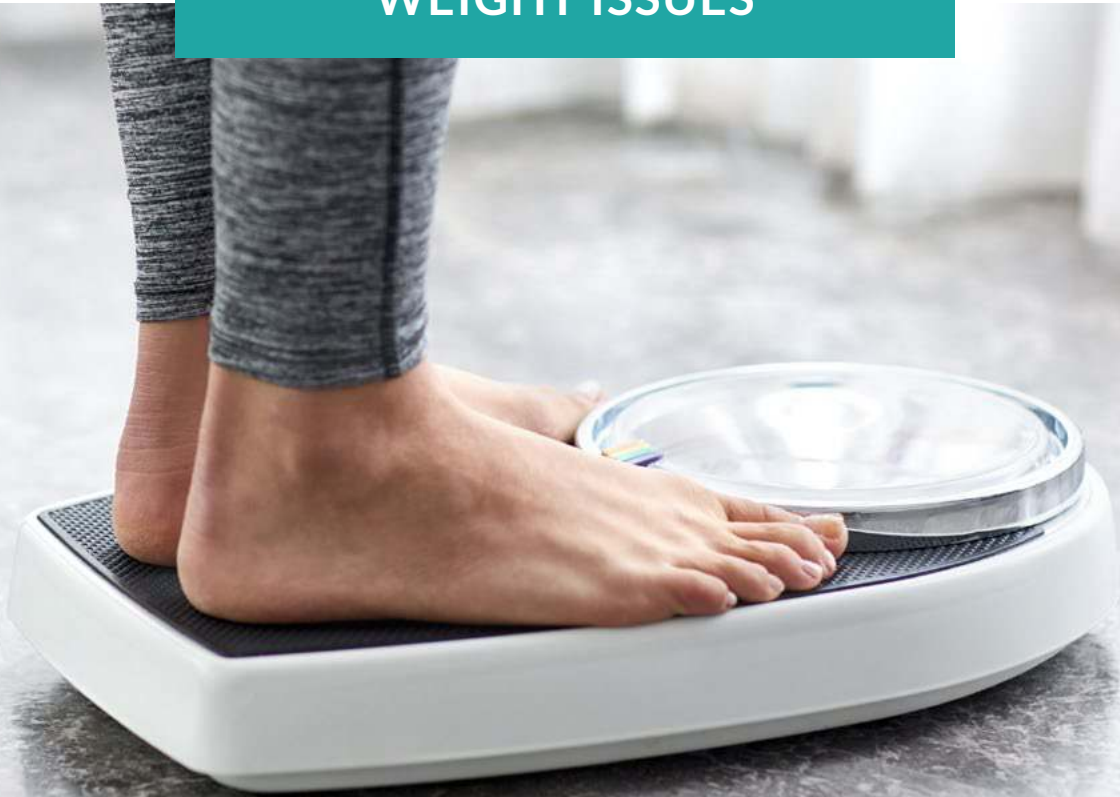
One exciting study carried out in Sweden found that mice raised without microbes were far more active outside. Not only that, the microbe-free mice were observed to have less anxiety and be more daring overall.

Serotonin (one of the “feel good” chemicals your body produces) is a known factor in mood, anxiety, and depression, to name a few of its functions.^{33,34} The connection to the manufacturing and body's use of this essential chemical (some consider it a hormone) is gaining increasing attention. Or, as a 2015 publication in *Behavioural Brain Research* stated,

“The brain-gut axis is a bidirectional communication system between the central nervous system and the gastrointestinal tract. Serotonin functions as a key neurotransmitter at both terminals of this network. Accumulating evidence points to a critical role for the gut microbiome in regulating normal functioning of this axis... There is also substantial overlap between behaviours influenced by the gut microbiota and those which rely on intact serotonergic neurotransmission.”³⁵

More research is being done to identify the precise processes occurring, but it's certainly becoming crystal clear that the health of your microbiome is essential for even your mental and emotional well-being.³⁶

WEIGHT ISSUES



The balance of our intestinal flora has even been linked to weight problems.³⁷⁻³⁹ A fascinating article in *Scientific American* investigating this phenomenon stated,

“New evidence indicates that gut bacteria alter the way we store fat, how we balance levels of glucose in the blood, and how we respond to hormones that make us feel hungry or full. The wrong mix of microbes, it seems, can help set the stage for obesity and diabetes from the moment of birth.”⁴⁰

One study observed that healthy mice born microbe-free, then later implanted with the microbiota of people who were obese, will become obese, though eating the same diet and amounts of food as the “lean” mice in the control group.⁴¹

Later experiments found that these obese-microbe transplant mice, when sharing cages with healthy, lean mice with healthy microbiomes, remained lean and healthy. They did not become overweight.

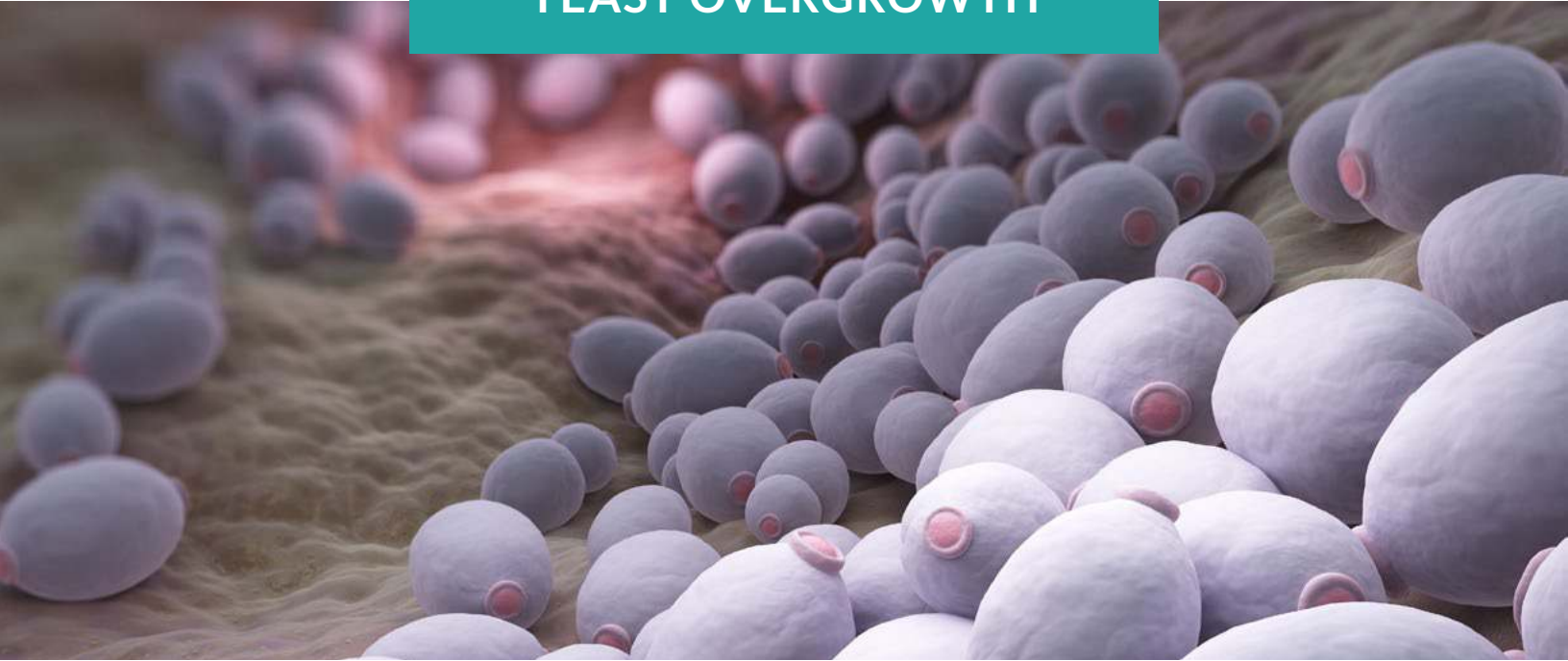
To really make their point, researchers in this same study transplanted 54 varieties of microbes from the healthy, lean mice into those that were destined to become obese. But this time the mice did not become obese, even in their own cages. They remained healthy and lean.

While this was not a human trial, this demonstrates a striking possible correlation between the passing of microbes between people in proximity to each other. However, it's also important to note that when the obese-microbe mice were put in cages with healthy microbiome mice but ate an unhealthy diet, the obese-microbe mice did not remain lean. It was as if "the unhealthy diet somehow prevented the virtuous bacteria from moving in and flourishing" as they had previously.⁴²

The author of that study, Jeffrey Gordon of Washington University in St. Louis, told *Scientific American*, "Taken together, these experiments provide pretty compelling proof that there is a cause-and-effect relationship and that it was possible to prevent the development of obesity."⁴³



YEAST OVERGROWTH



Probably one of the most well-known, but severely underestimated imbalances that can occur in a damaged microbiome, is yeast overgrowth. The yeast and other fungi in the gut serve a multitude of useful purposes, as mentioned earlier, and are too numerous to list here. While we do need a variety of these microbes to be healthy and ward off disease, problems arise when they are allowed to flourish. Or, more specifically, when the “wrong” microbes are allowed to flourish, real damage can occur.⁴⁴

One particularly disturbing phenomena is described in the book *The Fungus Link, Volume 2*, by authors Dr. Dave Holland and Doug Kaufmann who describe the action of yeast in the body:

“They can use their tendrils, or hyphae, to literally poke holes through the lining of your intestinal wall.”⁴⁵

While the above image is certainly unappealing, it’s the effect on your body that is most worrisome. To put it simply, your GI barriers are designed to protect the rest of your body from a host of microbes, bacteria, toxins, parasites, etc. Punching holes in that system can result in some very undesirable consequences for your health.

Yeast and fungi are coming under increasing scrutiny as roots of disease, even for chronic conditions such as sinus infections,^{46,47} upper respiratory infections, and UTIs (urinary tract infections). Sadly, it’s starting to appear as those are the tip of the iceberg in terms of what these microbes can do to systemically damage your body.

AUTOIMMUNE ISSUES



There are over 80 health issues categorized as “autoimmune disease.”⁴⁸ Some are very common, while others are extremely rare. The range is quite broad, but the defining factor is that a person’s immune system begins producing an inappropriate response against its own cells, organs, or tissues, which results in inflammation and damage.

Some better-known examples of autoimmune diseases include: multiple sclerosis, autoimmune thyroid disease, type 1 diabetes, lupus, and rheumatoid arthritis. Leaky gut is considered to fall into this category as well. Recently even type 2 diabetes has been classified as an autoimmune disorder.⁴⁹

With regard to the microbiome, scientists studying the connection between our microbiota and our health are finding that upsets in the balance of bacteria and other microbes (such as yeast) are creating a perfect storm of sorts. Ultimately these upsets result in chronic inflammation which either contributes to or is the root cause of conditions such as allergic disease, autoimmune disease, and inflammatory bowel disease, among others.⁵⁰⁻⁵⁴

What Puts a System OUT OF BALANCE?

There are two major players affecting your microbiome: **diet**⁵⁵ and **antibiotics**.⁵⁶ Let's take a closer look at the impact they have on your microbiome.

DIET

Just like the ecosystem of this beautiful earth we live on, the fragile harmony of your digestive tract can be altered by toxins, drugs, chemicals like chlorine or fluoride in the water supply, food additives, and preservatives. Likewise, stimulants such as energy drinks, foods with inadequate nutrition, or that are too difficult to digest, cause problems for our delicate microbiome.

The good news is that this is the area over which you have the most control.



Some of the ways you may be putting your microbiota out of balance and taxing your digestive system include:

- ▶ Lack of fermented foods in the diet
- ▶ Lack of probiotics in the diet^{57,58}
- ▶ Lack of prebiotics in the diet⁵⁹
- ▶ Insufficient enzyme-rich foods
- ▶ Diet high in carbohydrates and sugar^{60,61}
- ▶ Diet high in poor quality fats⁶²
- ▶ Alcohol⁶³
- ▶ Lack of polyphenols and resveratrol
- ▶ Too many inflammatory foods
- ▶ Too few anti-inflammatory foods and substances⁶⁴
- ▶ Foods laden with antibiotics,^{65,66} preservatives, toxins, and chemicals⁶⁷
- ▶ Too few antioxidants, such as berries containing phenolic compounds that aid detoxification processes in the colon

A 2009 study on mice lays out very simply the harm of a typical Western diet. In this study titled, *The Effect of Diet on the Human Gut Microbiome*, scientists transplanted human fecal microbe communities into germ-free mice. Once stabilized and “humanized” (their microbiome was stable, in balance, and acting like a human microbiome), they took the mice off a low-fat, plant-rich diet and switched to a high-fat, high-sugar “Western” diet. The results were profound.

Switching from a low-fat, plant polysaccharide-rich diet to a high-fat/high-sugar “Western” diet shifted the structure of the microbiota *within a single day*, changed the representation of metabolic pathways in the microbiome, and altered microbiome gene expression.⁶⁸

ANTIBIOTICS

One of the most damaging things to your microbiota and microbiome is antibiotics.⁶⁹⁻⁷¹ Now, of course we'd never tell you not to take antibiotics. However, it's important to understand how they affect you and your microbiome, and that these health-revolutionizing drugs do real damage that must be mitigated. Or, if you have taken many rounds of antibiotics, you may begin to understand why and how your microbiome is, or could be, out of balance.

To summarize the extensive science, when taking antibiotics to kill off a bacterial infection in the body, the medicine also inadvertently kills off bacteria in the gut. Many have previously thought that taking a course of antibiotics, being temporary, merely compromised the microbiome for a short period of time. However, that's a huge generalization, considering how unique the microbiome is to each person.

What if the system is already out of balance? What if steps are not taken to put it back into homeostasis? What if there are other mitigating factors that make it difficult, or near impossible for the microbiota to reach harmonized levels again, without concerted effort on your part?

Let's take yeast, for example. It's pervasive and opportunistic. It loves to flourish when the bacteria designed to keep it at bay are annihilated by antibiotics. These fungi are also some of the most challenging to kill. Thus, a repeated round of antibiotics, combined with a yeast-promoting diet could mean potentially severe health consequences in predisposed or otherwise immunity-weakened individuals.⁷²



Going back to the brain, you know that there are certain bacteria that excrete chemicals vital to mood and equilibrium. What happens when you zap those with antibiotics? It's hard to say for certain as the results are systemic and entirely dependent on the individual's overall immune, neurological, and physiological health.⁷³ But it's certainly something to think about when filling that prescription for antibiotics.

A 2008 study puts it this way:

“How quickly and unintentionally the GI microbiota can be changed.”⁷⁴ Theirs was a look at the “pervasive effects of an antibiotic on the human gut microbiota,” examining the effects on patients who took the antibiotic Ciprofloxacin. These scientists observed that up to a third of bacteria varieties in the gut were affected, “decreasing the taxonomic richness, diversity, and evenness of the community.”⁷⁵

While most of their study patients' microbiome went back to pre-antibiotic states within four weeks, several were still not re-established after six months. What this tells us is that just one course of antibiotics has the potential to cause dysbiosis that is potentially long-lasting. Imagine the microbiome of those who are routinely taking antibiotics.

In addition, a little-known fact about non-synthetic antibiotics is that they are, technically, mycotoxins – metabolic byproducts of pathogenic fungi. These antibiotics are derived directly from fungal metabolites.⁷⁶ We have already discussed just some of the damage fungi microbiota in dysbiosis can do, so we won't discuss it here. However, the takeaway is that antibiotics – whether those we take to overcome an actual bacterial infection, or those pumped into livestock and then consumed unknowingly – have potentially harmful after-effects that must be considered, and/or proactively mitigated.

A Note on “Superbugs”

You can't talk about antibiotics without discussing superbugs. Likely you are familiar with the fact that across the globe, more and more antibiotic-resistant bacteria are being formed, due to an overuse of antibiotics.⁷⁷

With that in mind, it only makes sense that if taking antibiotics affects the bacteria in your gut, there is potential for creating drug-resistant strains that can then be allowed to overgrow, causing untold damage to your body. Thus, the “harmful” bacteria that excrete inflammation-causing chemicals, or interfere with the uptake of specific hormones, get a stronger hold on your microbiota... and the health of your body suffers even more.^{78,79}

How Can I Put My Microbiome INTO BALANCE for Better Health?

The answer to the question of how to put and keep your microbiota into better harmony really starts with doing the opposite of the damaging actions listed previously. This includes:

- ▶ Adding fermented foods to your diet.
- ▶ Adding good quality probiotics to your diet.⁸⁰⁻⁸²
- ▶ Adding prebiotics to your diet.⁸³⁻⁸⁵
- ▶ Eating a diet low in carbohydrates, unhealthy fats, and sugar.
- ▶ Consuming foods or supplements rich with enzymes, polyphenols, and resveratrol.⁸⁶
- ▶ Avoiding foods laden with antibiotics, preservatives, toxins, and chemicals.⁸⁷⁻⁹⁰
- ▶ Reducing your alcohol intake or cutting it out entirely.⁹¹
- ▶ Consuming more antioxidants and anti-inflammatory ingredients. For example, broccoli sprouts, and medicinal mushrooms such as shiitake and reishi.



All of these in combination will improve your microbiome. However, let's examine a few of the top contenders ("quick hits") for better gut health.

FERMENTED FOODS & SUBSTANCES

Records show humans using fermentation to preserve foods as far back as 6000 years ago. From kimchi to sauerkraut, kefir to apple cider vinegar, kombucha to chutney, these foods have a rich history across most cultures.

What our ancestors would not have known so long ago is that fermenting foods has tremendous benefits for our body and digestion. Firstly, foods fermented in the right way offer your body an exciting array of microbes. And, as you now know, a diverse microbiota is the best for microbiome harmony.

In addition, fermentation can have some distinct benefits in terms of nutrition and ease of digestion. This is because fermentation is actually a kind of “pre-digestion” where the sugars and starches in a food are broken down by bacteria. These are usually the probiotics *Lactobacillus* and *Bifidus* strains, or nutritional yeasts.

Benefits of eating fermented foods include:^{92,93}

- ▶ Making foods easier to digest, and increasing vitamin absorbency.
- ▶ Creating new nutrients, such as B-vitamins.
- ▶ Providing enzymes that assist digestion, as well as helping “good” types of bacteria grow.
- ▶ Helping to boost immunity and warding off cravings for sugary or over-processed foods.
- ▶ Boosting levels of resveratrol and polyphenols, making them more bioavailable.
- ▶ Foods containing lactic acid help healthy microbiota to flourish, among other benefits.^{94,95}
- ▶ Phytic acid (which impairs mineral absorption) is neutralized in fermented grains.



However, the most important way proper fermentation can benefit your microbiome is the microbial gifts they give your body. It starts with the strains used to begin the fermentation process, but ends in a diverse “soup” of useful probiotics that make your microbiome sing. This is due to organisms called *anaerobes*.

Anaerobes are microbes that assist in the fermentation process, at the same time creating bioactive compounds that have anti-cancer, antioxidant, and antihypertensive properties. Anaerobes are also responsible for making nutrients easier to absorb, thus making them more bioavailable to you.⁹⁶



Taken all together, adding the proper fermented foods or supplements with valuable enzymes and nutrients into your daily diet will have a supremely beneficial effect on your microbiome, and thus your overall health.

PREBIOTICS

There's a way to make sure your existing (and added) probiotics (beneficial microbiota) perform at their best, and colonize your microbiome.

Prebiotics are foods and substances that act as food for our probiotics.^{97,98} The probiotics ferment and consume this food source, increasing mineral absorption, protecting the intestinal lining, balancing hormones, assisting with elimination, and promoting the manufacture of short-chain fatty acids.⁹⁹

Probiotics are sensitive to heat and stomach acid. Prebiotics are almost indestructible by the human body, with up to 90% being sent out as waste.¹⁰⁰ That's why you've perhaps seen food bits in the toilet and wondered "why did I bother eating that... it went straight through me." Those hard-to-digest foods are probably one of these probiotic-feeding PRE-biotics, that are so essential to health. By having the ability to travel the length of the intestines, plenty of opportunity is given to your microbiota to feast upon them.

The two primary prebiotics that your body needs are *inulin*¹⁰¹ and *oligofructose*.¹⁰² Foods that contain these life-giving and microbiome-assisting substances include: tubers (yams, potatoes, casava), endives, chicory root, shallots, onions, psyllium husk, asparagus, Jerusalem artichokes, leeks, agave, garlic, dandelion root, bananas, jicama, and whole grain wheat (look for organic, glyphosate-free versions).¹⁰³⁻¹⁰⁵

The consumption of prebiotics has been shown to improve calcium uptake, ease digestion, reduce fasting glucose, HbA1c, oxLDL, LDL, and apolipoprotein B levels in type 2 diabetes patients; improve IBS symptoms, and increase antioxidant activity.¹⁰⁶⁻¹⁰⁸

Prebiotics are the necessary addition to your microbiome, to allow the probiotic microbiota you currently have inside you to improve and flourish, as well as a complement to any active probiotic supplementation or diet changes you make.



PROBIOTICS

You've likely heard of these before, even outside this report. You may even actively consume them. But what are they, and how do you know if you're consuming the right kind?

Put simply, probiotics are the "good" microbes, or microbiota. They promote life.

Since they became the health food item "du jour" in the last decade or so, more and more brands have been popping up on shelves. That's industry responding to where the demand (money) is, which is not a bad thing in terms of choice and sometimes economics. More variety means more options, which keeps prices down for the most part.

However, not all probiotics are created equally.

Let's take yogurt as an example. Probably you are aware that yogurt contains bacteria that is probiotic. The most common strains are *Lactobacillus bulgaricus*, *Streptococcus thermophiles*, *Lactobacillus acidophilus*, *Lactobacillus casei*, and *Bifidus*.

While yogurt can be an effective source of positive microbiota that do indeed assist your microbiome, there are some important facts to know about mass market preparations, and store-bought yogurt in general.



The following issues are summarized from research done in the U.K. and published by Glenn Gibson, professor of food microbiology at the University of Reading, together with Dr. Sandra McFarlane, a microbiologist at Dundee University, and Professor Christine Edwards, head of human nutrition at Glasgow University. It applies to many products advertised as “probiotic” that are commonly available:¹⁰⁹

They May Not Be Potent

A high percentage (as high as 50%) of products do not contain the probiotics that they claim to have or contain far too few of them – much less than they claim. Those that do are unlikely to have the ideal mix of healthy microbiota that can help repopulate the microbiome.

They May Not Be Effective

They may not be prepared in a way that best permits the most beneficial microbes (both bacteria and yeasts) to thrive in your digestive system. In addition, if they survive the harsh environment of your stomach acids, they may not be the type of probiotics that can rebalance your microbiome.

They May Be Too Processed

Heating, over-processing, and using ingredients that are too far from nature (such as powdered skim milk versus real milk), then adding extra ingredients like sugar, fructose, corn starch, and modified corn starch make a product claiming to be “healthy” a poster child for “marketing exaggeration.” (That’s a nice way of saying that they are pretty much lying.) Besides any product claiming “live cultures” that are then heated (i.e., pasteurized) is a flat out fib. Heating kills live cultures and the sugars and other extras in the product actually *feed* the harmful microbes in your gut, thus contributing to the imbalance even more.



The same can be said for many probiotic preparations, sadly.¹¹⁰ That's why finding a truly top-quality probiotic¹¹¹ is essential. Here are some things to look out for:

Dairy-Sourced Bacteria Strains Have to Be Refrigerated

Even if you buy an expensive brand with all the right microbes, you have little control over the shipping, handling, and storage of the bottle from factory to floor. Thus, that extra hour the pallet of bottles sat on the warehouse floor, or in the hot sun could, effectively, kill off all or most of the microbes you are trying to acquire.

Plant- and Soil-Based Microbes Are Better Choices

Choose plant- and soil-based microbes for full, probiotic effect because they don't require special handling, they withstand stomach acid (and thus actually get into your intestines), they assist with digestion by helping break down foods, they boost immunity, and aid in the elimination of toxins – even stronger heavy metals like mercury.¹¹²

Look For a Supplement Containing *Lactobacillus plantarum*

Lactobacillus plantarum (*L. plantarum*) is a “superstar” in the probiotic world. It's a highly desirable strain of bacteria found naturally in many plants and foods, including cultured vegetables.^{113,114}

Part of what makes *L. plantarum* so beneficial is its hardy nature. It's resistant to most commonly prescribed antibiotics and can withstand a wide range of temperatures (approx. 33-140°F). It has the ability to adhere to the intestinal wall, creating a healthy barrier that prevents pathogenic bacteria such as *E. coli* from penetrating the lining of the gastrointestinal tract and entering the bloodstream. Not only that, *L. plantarum* supports the body's detoxification activities and the absorption of nutrients.

Lactic Acid

Lactic acid is a naturally occurring compound found during (and sometimes assisting with) the fermentation of foods, created when sugars break down. It has a bad reputation with runners and other athletes, who have been told it's the reason for muscle pain during strenuous exercise (though nowadays it's being seen in its true light: another source of fuel for working muscles). Lactic acid bacteria (e.g., *Lactobacillus*) are also indicated in improving nutritional value of food and supporting a healthy immune system.¹¹⁵

REPOPULATING Your Microbiome

If you can combine supplements and diet to provide probiotics that are mainly plant based, contain antioxidants, fermented substances (bringing additional probiotic benefits, including microbes and enzymes), and the proper strains of bacteria... you're going to change your microbiome. Continue to do so, and you'll provide your body an opportunity to repopulate its microbiota, and watch as your health, mood, and wellness improve across the board.



PROBIOTIXX⁺™

Create a Strong, Healthy Gut Barrier, and Reduce Gas, Cramps, and Bloat!

You've learned that the #1 way to boost your digestive health and support your immune system is probiotics.

However, while many probiotics are available, as you've learned above, only a few can be called "decent," while most are downright mediocre or worse.

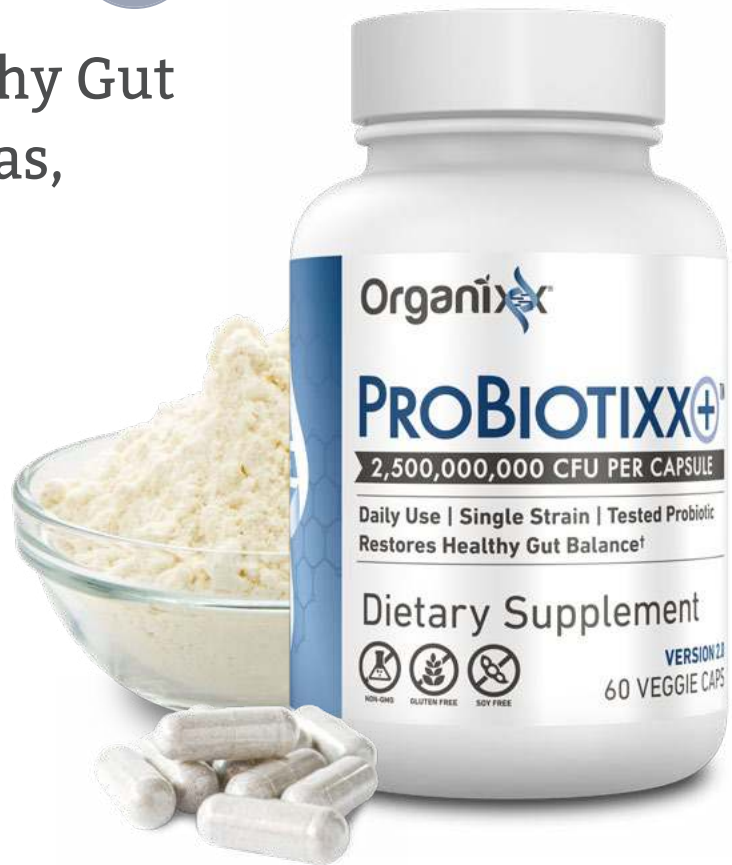
In addition to the other issues cited, many probiotics on the market have purity issues, such as yeast contamination, genetically modified ingredients, and more.

That's why **Organixx**® created the purest, most powerful probiotic formula available on the market today. **ProBiotixx+**™ is a single "super-strain" of *L. plantarum*. It uses a patented process to dramatically enhance this highly beneficial probiotic's abilities.

You'd have to eat pounds of fermented foods such as kimchi... sauerkraut... and cultured vegetables to get the same benefits as you would from a few capsules per day of **ProBiotixx+**.

ProBiotixx+ eliminates bad bacteria fast... eats up excess sugar... and protects your gut from inflammation and viruses.

Try it today and feel the improvement in your overall health in just 3-4 days. Plus, every bottle comes with our No-Risk 100% One-Year Money-Back Guarantee of Satisfaction.



Discover more about the health benefits of **ProBiotixx+** here:

[Organixx.com/probiotixx](https://www.organixx.com/probiotixx)

Empowering YOU Organically!

Our Commitment to You:

- 1 Only deliver supplements that can really make a powerful difference in your health and life.
- 2 Provide you supplements made from only the purest natural ingredients on earth, including USDA Certified Organic ingredients whenever possible.
- 3 Use proprietary fermentation processes to make our supplements extremely bioavailable. (This ensures the maximum amount of nutrients from our supplements are actually utilized by your body – versus being wasted.)
- 4 Deliver the highest quality, most effective supplement blends available. We started this company because of the huge demand for quality supplements at affordable prices. We keep our markups extremely low, because we're a mission-based company with hopes of healing the world.

Now here's the great news... we're constantly improving and making our supplements even better.

We've received a LOT of overjoyed feedback from others just like you, and the one thing we keep hearing over and over is how pleased they are to finally find a supplement company 100% committed to using the purest, non-GMO and USDA Certified Organic ingredients wherever and whenever possible!



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