Overview

Overview

Onegevity's metagenomic sequencing has examined the abundance, type, and balance of more than **39 trillion microbial cells** in your body, resulting in the generation of **6 GB of unique data** and insights on you and your microbiome.

Enjoy getting to know your gut!

- Artificial intelligence-powered pattern analysis
- Board-certified physician reviewed

Results:

Interpretation

All of the scores are based on peer-reviewed publications and our proprietary databases to show the potential risk generated from the gut microbiome to each key symptom related to gut health. The intent is to provide insight into how bacteria and other microorganisms contribute to each symptom. However, other lifestyle factors can influence the symptom without the presence of associated bacteria. For example, a low score for constipation does not mean you will not experience constipation, but that your gut microbiome is unlikely to contribute to that particular GI symptom. A high score provides a focus point for you and your health care provider to consider as a root cause for potential symptoms.

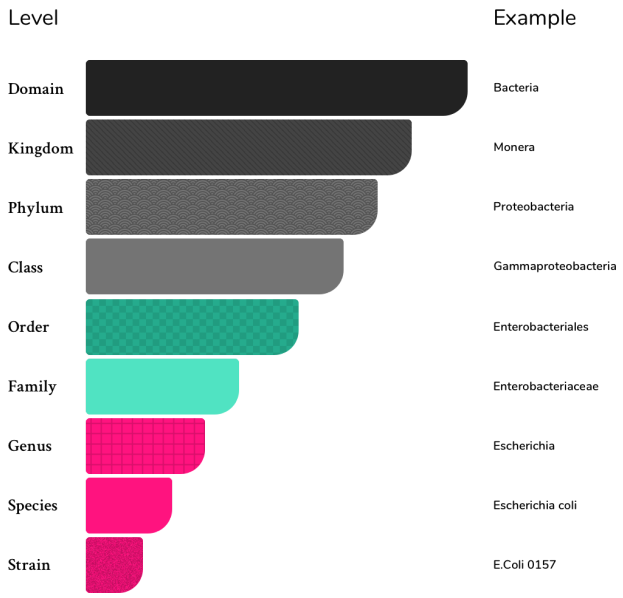
Results:

Taxonomy Example

When reviewing your results, refer to this taxonomy classification chart to discover the hierarchical breakdown of microorganisms that make up your microbiome.

Discovering Keen Patterns

Continue Onegevity For Great Success



Results: Inflammation

Good news!

Onegevity examined the levels of more than 100 inflammation-associated bacterial species. Your test result shows a low Inflammation Potential in your gut. This means the balance of inflammation-associated bacteria to bacteria that are less inflammatory is optimized in your gut microbiome.

Your gut Inflammation Potential score is calculated by examining hundreds of bacterial species in your gut that are known to correlate with Inflammatory Bowel Disease (IBD). IBD is a condition in which your gut is constantly inflamed, producing symptoms that include abdominal pain, gas, diarrhea, and constipation. Your results have been associated with a lower risk of developing inflammatory bowel disease (IBD).

It's important to note that your Inflammatory Potential score only includes bacterial species as contributors to inflammation in your gut. There are other elements, such as human immune system factors and viruses, that can influence gut inflammation as well.

How Inflammation Affects Your Gut

Many factors contribute to gut inflammation, including both the overgrowth of and the absence of certain bacterial species. Inflammation is the body's natural response to injury or infection, which can manifest as swelling, redness, and heat, as immune cells respond to the site of the trauma.

- Your microbiome and your immune system are inextricably linked. While some bacteria species stimulate the production of pro-inflammatory immune cells perhaps worsening issues, others will stimulate the production of anti-inflammatory cells, which may alleviate symptoms.

Numerous studies have linked chronic inflammation to adverse gut conditions, such as Inflammatory Bowel Disease (IBD). IBD is believed to be an autoimmune disease in which the immune system attacks the tissues of the intestines. In IBD, the gastrointestinal tract is constantly inflamed. The intestinal tissues become red and swollen and can ulcerate and bleed. There are two main types of IBD: Crohn's disease and ulcerative colitis. IBD is diagnosed through a colonoscopy.

Microbiome-based Inflammation Score: MINIMAL

Optimal range: 0 - 33

These bad bacteria are high and contributing to a higher risk score:

Species	[Ruminococcus] gnavus	88.9%
Phylum	Firmicutes	53%
Family	Lachnospiraceae	47.8%
Genus	Dialister	89.9%
Phylum	Proteobacteria	57.1%

These good bacteria are low and contributing to a higher risk score:

Family	Bacteroidaceae	8.8%
Genus	Bacteroides	8.8%
Species	[Eubacterium] rectale	40.1%
Phylum	Bacteroidetes	10.2%
Order	Bacteroidales	10.3%

Optimal levels of the following bacteria were found in your gut

Combined 137 bacteria were found in the optimal range

Improve your score

Review the 10 interventions recommended to improve your inflammation score.

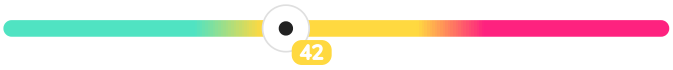
Results: Constipation

Keep an eye on this!

Onegevity has calculated your Constipation score by examining the pattern of hundreds of bacterial species that are known to positively correlate with constipation. Your test results reveal a bacterial composition consistent with an individual who has moderate irritation in the gut and is at a moderate risk for constipation.

In the survey, you reported that you are not currently experiencing constipation despite a moderate Constipation score. The microbial composition of your gut impacts the consistency and frequency of elimination; however, many other factors can and do influence constipation. For example, perhaps you eat a diet rich in fiber, exercise regularly, and maintain hydration - which are factors known to support healthy and regular elimination. Thus, despite an imbalance of bacterial species that often contributes to constipation, you are constipated.

Microbiome-based Constipation Score: MODERATE



Optimal range: 0 - 33

These bad bacteria are high and contributing to a higher risk score:

Genus	Veillonella	96.9%
Family	Streptococcaceae	92%
Genus	Actinomyces	61.5%
Family	Fusobacteriaceae	96.7%
Species	Enterococcus faecium	89%

These good bacteria are low and contributing to a higher risk score:

Species	Bifidobacterium adolescentis	33.4%
Species	Prevotella bivia	21%
Species	Akkermansia muciniphila	20.9%
Species	Bifidobacterium dentium	16.4%
Species	Bacteroides stercoris	34.5%

Optimal levels of the following bacteria were found in your gut

Combined 47 bacteria were found in the optimal range

Improve your score

Review the 10 interventions recommended to improve your constipation score.

Results: Diarrhea

Good news!

Onegevity has calculated your Diarrhea Score by examining the pattern of hundreds of bacterial species that are known to positively correlate with diarrhea. Based on the specific microbial composition of your stool, your test results reveal a low risk for diarrhea.

Increased levels of certain bacterial species are known to be protective against the development of diarrhea. Increased levels of other bacterial species are known to contribute to diarrhea. In the absence of other influences, such as infection, food intolerance, and medication use, the balance of these bacterial species can be a major driver of diarrhea-risk originating from your gut.

Microbiome-based Diarrhea Score: MINIMAL

Optimal range: 0 - 33

These bad bacteria are high and contributing to a higher risk score:

Genus	Veillonella	96.9%
Genus	Roseburia	52%

These good bacteria are low and contributing to a higher risk score:

Family	Propionibacteriaceae	33.3%

Optimal levels of the following bacteria were found in your gut

	Combined	31 bacteria were found in the optimal range

Improve your score

Review the 10 interventions recommended to improve your diarrhea score.

Results: Diversity

Congratulations!

You are in the 96 percentile for microbial diversity, which indicates your gut microbiome is very highly diverse — a good thing!

Studies show that individuals with low gut microbial diversity are at greater risk for certain adverse conditions - ranging from allergies to obesity. Maintain a highly diverse microbiome with a richly varied diet including foods with probiotics and avoiding environmental and lifestyle factors that will reduce diversity — see specifics in your personalized recommendations.

To optimize your physical and mental health, metabolism, weight management, and resistance to pathogens, your goal should be to increase and maintain the diversity of your gut microbiome.

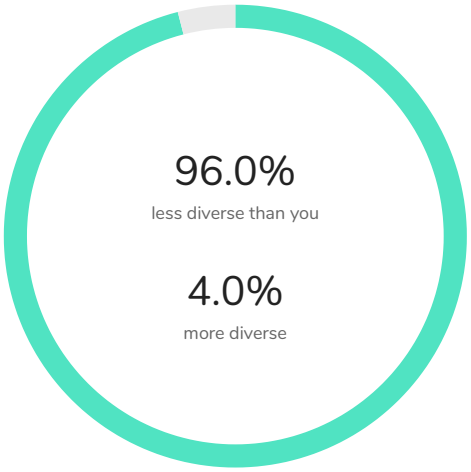
- Multiple studies indicate that healthy people tend to have higher gut microbial diversity, while less healthy people tend to exhibit a less diverse gut microbiome profile.
- A more diverse gut microbiome can efficiently process dietary components — like proteins, fats, gluten, lactose, or micronutrients — and act together with your physiology to maintain health and weight.
- It's harder for infectious species, such as *Clostridium difficile,* to thrive or multiply in a diverse gut environment, which means that they have a harder time infecting you.

What does this all mean? The diversity of your gut microbiome relates to your lifestyle and diet.

- When you choose what to eat for dinner, you're choosing which bacteria in your gut get fed. If you eat a diet high in fiber, then your fiber-loving beneficial bacteria will thrive, while other non-beneficial species are likely to starve and die.
- A diverse gut microbiome helps you to adapt to changes in your diet more easily and facilitate your digestion of different nutrients from foods. Similarly, a diet consisting of a variety of nutrient rich foods can help increase microbial diversity. Food variety and gut diversity have a symbiotic relationship.
- An increasing body of research also shows exercise will positively increase microbial diversity. Changing the type and environment where you exercise, or increasing the frequency or intensity of your exercise routine can help your gut diversity levels.
- Environments and exposures can have a large impact on your gut microbiome. For example, antibiotic used to treat an infection can adversely impact the diversity in your gut. How? Antibiotics are nonspecific killers of bacterial populations (i.e. they can't distinguish between good and bad bacteria in most cases). Therefore, Onegevity recommends taking an antibiotic only when necessary.

Everything you come into contact with challenges and alters your microbiome diversity- sometimes in unknown and complex ways. Rest assured, Onegevity is constantly tracking the newly published research to keep this platform current and applicable!

Diversity Score: GREAT



Results: Micronutrients

Keep in mind!

Your test results indicate that your gut microbial population is not contributing significantly to your daily need of one or more of the B vitamins.

Certain gut bacteria can produce B vitamins and contribute to your recommended daily intake of folate (B9), B6, B12, and niacin (B3). It is important that you consume adequate amounts of these B vitamins, with particular attention to the B vitamins in which your gut microbiome may be making less than optimal.

Micronutrients: B vitamins

Micronutrients are elements or substances needed in trace amounts to support healthy growth, development, and metabolism. Although the original "vitamin B" was thought to be a single vitamin, the B-vitamin group is now considered to be eight separate micronutrients. B vitamins are essential water-soluble vitamins, meaning you must obtain them from your diet.

The B vitamins play several different yet important roles in your body's functioning and are necessary for healthy neurological function and energy production.

How much can I make?

With the right gut bacteria, some B vitamins can be produced in your body. For example, 86 percent of the recommended daily intake of vitamin B6 can come from gut bacteria in humans, 37 percent for folate, 31 percent for vitamin B12, and 27 percent for niacin.

In times when your bacterial diversity is less than optimal, and you're producing fewer B vitamins, it's essential that more come from your diet.

More on the specific B vitamins:

Niacin

Vitamin B3 (niacin) like all B vitamins, plays an important role in metabolizing food. It aids nervous system function, participates in hormone production, and improves circulation and cholesterol levels.

Symptoms of mild niacin deficiency include depression, fatigue, indigestion, vomiting, and canker sores. In developed countries, the most common causes of deficiency are alcohol consumption and malabsorption disorders in the gut.

Vitamin B6

Vitamin B6 is a versatile micronutrient that performs many different functions in your body including digesting protein and helping to produce blood and immune system cells.

A mild vitamin B6 deficiency might not exhibit symptoms for months or even years.

Symptoms of a severe deficiency can include anemia, scaling on the mouth, swollen tongue, depression, confusion, and a weakened immune system. Deficiencies can be caused by kidney diseases and gut malabsorption disorders, such as celiac disease or Crohn's disease.

Folate

Vitamin B9 (folate) is necessary for energy metabolism and proper cell division. It is very important for pregnant women to have an adequate folate level for their fetus to develop properly.

A folate deficiency can be caused by poor diet, alcohol abuse, medication, and gut malabsorption disorders such as celiac disease and inflammatory bowel disease (IBD). Symptoms of a deficiency can include anemia, weakness, fatigue, difficulty concentrating, irritability, headache, heart palpitations, shortness of breath, mouth ulcers, and changes in hair or skin pigmentation.

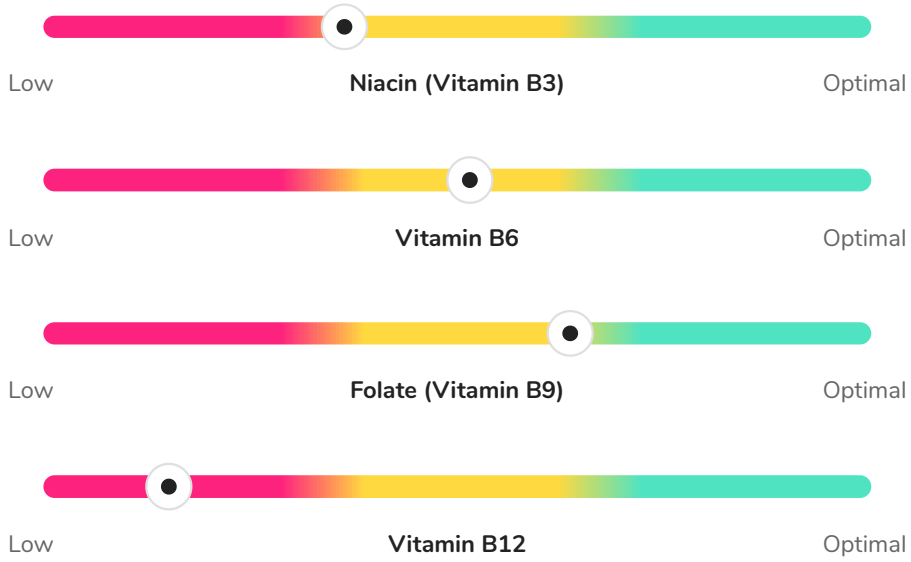
Vitamin B12

Vitamin B12 keeps your body's nervous system healthy, as well as playing a role in digesting protein and making DNA and red blood cells.

Malabsorption disorders, such as hypochlorhydria (low stomach acid), celiac disease, and Inflammatory Bowel Disease (IBD) can cause a B12 deficiency. Individuals who don't eat animal-derived foods are also at risk of a B12 deficiency. Certain medications can contribute to vitamin B12 depletion.

B12 deficiency can manifest as neurological symptoms such as numbness or tingling in the hands, legs, or feet, difficulty walking, and confusion or difficulty thinking. Other symptoms can include anemia, weakness and fatigue, constipation, and a swollen tongue. B12 deficiency can lead to permanent nerve and brain damage and increases the risk of dementia.

Micronutrients



Clinical reference range

Results: Short-Chain Fatty Acids

Short-chain fatty acids are fatty acids that are six or fewer carbons long. In the gut, they are produced by many microbes, including *Clostridial Clusters* and species belonging to the *Clostridium, Eubacterium, Ruminococcus, Coprococcus, Dorea, Lachnospira, Roseburia,* and *Butyrivibrio* genera. These species are of the *Firmicutes* phyla.

SCFAs are produced through the fermentation of carbohydrates, including resistant starches, by bacteria in the gut. Once they are produced, SCFAs have three fates. They can either be absorbed into the human body from the intestines and colon, stay in the colon and get utilized by bacteria, or get excreted from the body in the stool.

In the human body, SCFAs can:

- Act as an energy source and help our metabolism by improving blood lipid levels, increasing satiety, and improving sensitivity to insulin
- Act as a signaling molecule in the nervous system, among other systems
- Help prevent the absorption of toxic compounds
- Increase nutrient circulation

In the gut, SCFAs from fibers can:

- Inhibit the growth of pathogens
- Stimulate the growth of beneficial bacteria
- Maintain a healthy pH
- Improve gut-immune capacity

In the gut, SCFAs from protein fermentation are not necessarily health-promoting, and some opportunistic pathogens feed on SCFAs from fibers, like acetate.

Putting SCFA Levels in Context

Low SCFA levels may be caused by:

- Lack of microbial diversity due to diet
- Inflammation in the gut
- History of chronic antibiotic use
- Decreased consumption of fiber

Paradoxically, diarrhea or constipation may result in lower levels of SCFAs.

SCFA Ranges and Measurement

It should be noted, at this time, exact reference ranges for fecal SCFAs have not been established. However, higher levels are more beneficial and can be optimized through diet and supplementation. Resistant starches, other carbohydrates, and certain dairy products (such as butter and heavy cream-based products) may contribute to increasing the levels of SCFAs in the colon.

Importantly, we do not directly measure SCFAs. Rather, we are characterizing the genes that describe the content of SCFA-producing bacteria and specific genes that regulate the production of SCFAs. Using these measures, we show how you compare to others in SCFA-producing capability. Though this is not a direct measure of actual SCFAs, we believe that it dictates recommendations for dietary modifications to benefit wellbeing. *See Metabolic Efficiency for more detail on this prediction method.*

Butyrate

Butyrate (or butyric acid) is a 4-carbon SCFA found most commonly in dairy products. It gets its name from a molecule called tributyrin, a butyrate precursor often in butter. Butyrate acts as an energy source and a signaling molecule in the colon.

- For example, butyrate is the primary energy substrate used by colonic enteric cells, accounting for roughly 70% of their energy demands.

- Butyrate acts as a histone deacetylase (HDAC) inhibitor in the central nervous system and has similarly been shown to upregulate the production of brain-derived neurotrophic factor (BDNF) in the brain.
- Butyrate is a reliable source of fuel for the brain where it can replace sugar and can account for some of the effects of the gut microbiota on mood, cognition, and behavior.

Propionate

Propionate (or propionic acid) is a 3-carbon SCFA found in the gut. Propionate forms via multiple pathways from carbs, organic acids, and amino acids. Like butyrate, propionate acts as an energy source and exhibits anti-inflammatory effects.

- In the gut, propionate acts as a minor energy source for colonic enteric cells, with butyrate being the major substrate.
- In the liver, it acts as a precursor for gluconeogenesis.
- In the gut, propionate also has anti-inflammatory effects.

Valerate

Valerate (or valeric acids) is a 5-carbon SCFA. Less is known about valerate and its impact on the gut. Research has shown by restoring valerate homeostasis, *C. difficile* is less likely to be produced. Research has also found valerate to be elevated in obese people. More evidence is needed before the conclusion of these studies can be substantiated.

Lactate

Lactate is not a SCFA, but an organic acid with two isoforms in the gut. Lactate can be a critical substrate within the microbiome, and like the SCFAs, is a substrate to or byproduct of bacterial energy metabolism, but it's important to consider the balance between lactate production and lactate consumption.

In a hyper-acidic, low-diversity gut, lactate producing microbes thrive and can result in lactate accumulation, resulting in negative situations for those with short bowel syndrome, ulcerative colitis, and colic. The genus *Lactobacillus* is mostly associated with negative outcomes in these conditions.

The genus *Veillonella* thrives in a lactate-rich environment and is exclusively a lactate consumer. It also produces hydrogen, which alone or in combination as hydrogen-sulfide, have been shown to cause GI problems.

In the blood, d-lactate is associated with dangerous acidosis effects. It's unclear as to whether both lactate isoforms (d- and l-) are problematic in the gut, but you should aim to reduce lactate producers and increase lactate utilizers - achieving a balance of lactate - for a healthier GI tract.

Short-Chain Fatty Acids

Clinical reference range

Results: Probiotics

Good news!

Onegevity analyzed specific beneficial bacteria that are linked with commonly consumed probiotics. Your microbiome has optimal levels of key beneficial microbes.

The number of microbes that comprise the human microbiome is fairly fixed - there can only be so many troops on the battlefield - so the more good microbes you can introduce, the stronger the front line gets!

The good news is you can increase the numbers of these beneficial microbes by consuming probiotics.

The biggest contributors:

Bifidobacterium family

In the colon, members of the Bifidobacterium family are among the most predominant "friendly" bacteria. These bacteria are among the first microbes to colonize the intestinal tract of an infant. Low levels of Bifidobacterium have been found in individuals with irritable bowel syndrome (IBS), particularly those with diarrhea. Various Bifidobacterium species can crowd out pathogenic ("bad") bacteria by competing for binding sites on the walls of the intestines.

Lactobacillus family

The Lactobacillus family contains lactic acid producing bacteria that have beneficial effects in the human GI tract. They make up a large portion of the beneficial bacteria that normally inhabit our intestines. They protect the body from invasion of pathogenic microbes while we provide nutrients for their growth and development — it's a mutually beneficial relationship.

Lactobacillus plantarum

- Naturally occurring strains of *L. plantarum* can inhibit or block pathogenic bacteria like *Helicobacter pylori,* which is involved in gastritis and ulcers.

Lactobacillus acidophilus

- *L. acidophilus* inhibits the growth of pathogenic bacteria, such as *Salmonella, Listeria, and Campylobacter*.

Lactobacillus paracasei

- *L. paracasei* is naturally present in the GI tract and provides antimicrobial effects against common pathogens that affect oral health, including gingivitis.

Lactobacillus gasseri

- Naturally occurring strains of *L. gasseri* can inhibit pathogenic bacteria like *Salmonella, Listeria, Campylobacter, or Helicobacter pylori* and block the attachment of *E. coli* to the wall of the GI tract.
- High levels of *L. gasseri* also aid energy metabolism, so might provide benefit for maintaining a healthy weight.

Probiotics

▬	Species	Bacillus coagulans
▬	Strain	Bifidobacterium animalis subsp. animalis
▬	Strain	Bifidobacterium animalis subsp. lactis
▬	Species	Bifidobacterium bifidum
▬	Species	Bifidobacterium breve
▬	Species	Bifidobacterium longum
▬	Strain	Bifidobacterium longum subsp. infantis
▬	Strain	Bifidobacterium longum subsp. longum
▬	Species	Lactobacillus acidophilus
▬	Species	Lactobacillus brevis
▬	Species	Lactobacillus casei
▬	Strain	Lactobacillus delbrueckii subsp. bulgaricus
▬	Strain	Lactobacillus delbrueckii subsp. delbrueckii
▬	Species	Lactobacillus fermentum
▬	Species	Lactobacillus gasseri
▬	Species	Lactobacillus helveticus
▬	Species	Lactobacillus paracasei
▬	Species	Lactobacillus plantarum
▬	Species	Lactobacillus reuteri
▬	Species	Lactobacillus rhamnosus
▬	Species	Lactobacillus salivarius
▬	Species	Lactococcus lactis
▬	Species	Propionibacterium freudenreichii
▬	Species	Saccharomyces boulardii
▬	Species	Streptococcus salivarius

▬ Indicates number of bacteria found is in the optimal range.

▼ Indicates moderately low levels of this bacteria were found.

▼ Indicates low levels of this bacteria were found.

Results: Pathogens

Pathogen Screening: Normal

Good news - no known pathogens were found in your sample!

Pathogens are bacteria, viruses, and parasites that can cause disease. Most of the bacteria in your gut are not pathogenic—in fact, less than 100 species of identified bacteria are linked to infectious diseases. There are tens of thousands of other bacterial species in the gut that are mostly harmless, or even beneficial!

Pathogens can wreak havoc in the gut--contributing to inflammation that can result in symptoms like pain or diarrhea. In addition, pathogens can damage your intestinal lining, making it more prone to leaking, which could result in food allergies and other adverse conditions.

How do pathogens enter the body?

There are four primary routes of entry into one's body.

1. **Contact:** Pathogens can be spread by direct or indirect contact. If an infected person touches a surface, for example, a doorknob, the pathogens that are left behind can be transferred to another person.
2. **Airborne Transmission:** Airborne pathogens can enter the body through the mouth or nose when a person is breathing.
3. **Food/Water:** Contaminated food and water are common vehicles for spreading pathogens. Once ingested, the pathogens enter the digestive tract.
4. **Vectors:** Organisms such as fleas, mites, and mosquitos can transmit pathogens directly into the bloodstream.

Pathogen Screening: NORMAL

Expand each of the below pathogen categories below to learn more.

●	Negative	Bacteria	**Escherichia coli**
●	Negative	Parasite	**Cryptosporidium**
●	Negative	Bacteria	**Vibrio cholerae**
●	Negative	Parasite	**Giardia lamblia**
●	Negative	Parasite	**Entamoeba histolytica**
●	Negative	Bacteria	**Clostridium difficile**
●	Negative	Bacteria	**Salmonella enterica**
●	Negative	Bacteria	**Campylobacter**
●	Negative	Bacteria	**Helicobacter pylori**

Results: Phyla Breakdown

The *Firmicutes* to *Bacteroides* ratio was at one time assumed to be related to health outcomes. Over the years, as research has continued to deepen our understanding of the microbiome, this ratio has been proven to be less relevant. There is roughly an even split between positive and negative associations with the ratio to any given condition at this time. Additionally, each phylum has several beneficial species, and each also has some potential problematic species. Therefore, it is necessary to dig deeper into each of the taxa to the species level, which we do with our whole-genome shotgun sequencing technology. *You can find your full species breakdown in the downloadable Community Profile.*

We report the Phyla Breakdown because there are interesting phyla to note.

Proteobacteria

Arguably the quickest way to detect dysbiosis (microbial imbalance of the gut) is to look at your levels of *Proteobacteria*. *Proteobacteria* is a phylum with numerous opportunistic pathogens, including *E. coli*, *Salmonella*, and *Shigella* as well as many others. Not all species within *Proteobacteria* are bad; however, the data are abundantly clear that if your *Proteobacteria* are high compared to others, then you most likely have dysbiosis.

Fusobacteria

Fusobacteria is another phylum that can provide insight. It contains some opportunistic pathogens, and although not as many as *Proteobacteria*, this phylum should represent a smaller percent of your pie chart. If your *Fusobacteria* levels are high compared to others, it may indicate dysbiosis.

Verrucomicrobia

Verrucomicrobia is a very small phylum and contains the very beneficial species *Akkermansia muciniphila* within it. High levels of *A. muciniphila* have been associated with fewer metabolic conditions. Since this phylum contains other species, specifically consider the levels of *A. muciniphila* from the Keystone Taxa section of your report.

Phyla Breakdown

- Firmicutes 16.83%
- Bacteroidetes 7.993%
- Actinobacteria 0.8354%
- Proteobacteria 0.6645%
- Other 0.55352%
- Tenericutes 0.02148%
- Cyanobacteria 0.01586%
- Fusobacteria 0.009771%
- Verrucomicrobia 0.006473%

- Unknown 73.07%
  This is considered normal

Results: Keystone Taxa

Methanobacteria

Methanobacteria are not a bacteria - but actually a methanogen from the Archaea domain. As the name implies, some of these archaea, such as *M. smithii*, produce methane.

M. smithii is present in most people - about 95 percent of adults - and is the dominant archaeon of the five methanogens found in the human gut. The archaea have found their niche in the gastrointestinal tract by surviving on the end products of bacterial metabolism. In doing so, they reduce gut hydrogen levels, which also benefits your microbiome.

Onegevity considers *Methanobacteria* a keystone species for certain individuals, as reductions in *M. smithii* can increase one's risk for Crohn's Disease, Ulcerative Colitis, and diarrhea. An increased prevalence of *M. smithii* is linked to slower gut motility, which can increase one's risk for constipation, diverticulosis, and obesity.

Your goal should be to optimize your level of *Methanobacteria*. Although *M. Smithii* would make a useful probiotic, or more precisely an archaebiotic, for individuals with diarrhea or failure to thrive, it is not commercially available. The only appreciable dietary source of *M. smithii* found to date is in certain dairy products - milk and yogurt - which is a reason why individuals suffering from constipation should avoid these products. In general, individuals having diarrhea should not consume dairy products because multiple variables associated with dairy might contribute to diarrhea.

Prevotella

Although some data shows that several species of the *Prevotella* genus can be inflammatory under certain circumstances, Onegevity believes that if your *Prevotella* level is low, then you will want to raise it - especially if you are experiencing constipation or have Metabolic Syndrome.

Data shows *Prevotella* is one of the genera of bacteria we are inoculated with at birth during vaginal delivery. Its level is low in individuals who have constipation or severe IBS, and higher in healthy individuals, and is associated with microbial stability and richness.

Numerous references cite high *Prevotella* levels in healthy, native peoples who have high fiber diets, and in at least one study, profound reductions in *Prevotella* occurred with migration and adoption of a Western diet, often combined with weight gain and obesity. Beyond weight gain, there also might be improvements in glucose metabolism and other metabolic benefits by increasing *Prevotella* through use of prebiotics.

Faecalibacterium prausnitzii

F. prausnitzii is a well-researched keystone species. If it were available as a supplement, then it would be a top-seller. Until then, you should focus on maximizing its presence in the gut through using prebiotics.

It's a very common bacterium, comprising about five percent of the microbiome in a healthy adult. Onegevity believes it's a keystone species because it's a productive butyrate producer. Butyrate is a short-chain fatty acid made from the fermentation of fiber within the gut.

Butyrate, produced by several important butyrate-producing bacteria, is invaluable to our health. It also has direct and indirect effects on the health of colon cells, contributing to increased cellular energy, improved mucus production, neuroendocrine balance, immune tolerance, reduced inflammation, and gut permeability. Research shows *F. prausnitzii* is low in the frail and in individuals who have asthma, Metabolic Syndrome, ulcerative colitis, IBS, and especially in those who have Crohn's disease.

Because clinical data is often contradictory, seldom do you find such a clear association between the lack of a bacterium like *F. prausnitzii* and a disease such as Crohn's. Your objective, as it relates to *F. prausnitzii*, should be to increase its abundance through the use of prebiotics, in two ways:

1. "feed" it the substrates it's built to consume directly, or
2. "feed its friends" - substrates it's known to consume and their by-products (a term known as cross-feeding)

Akkermansia muciniphila

Akkermansia muciniphila (AM) is one of the most interesting and beneficial bacteria in our microbiome. It typically makes up 1-5 percent of the microbiome, and your goal should be to maximize its abundance, which can be done with prebiotics.

It resides primarily in the mucus and is known to degrade it, which might sound like a bad thing; however, rather than being pathogenic, *AM* is amazingly beneficial. As a mucin degrader, it frees up numerous nutrients for other mucin residents, notably the very beneficial butyrate producers in the Clostridium IV and XIVa clusters.

One specific *AM* protein, Amuc1100, interacts with a certain receptor in our gut to generate numerous health benefits. Although the direct health benefits of *AM* are considered metabolic, they largely translate to the entire body and brain.

A higher *AM* status is associated with:

- reduced gut permeability
- improved mucus production
- decreased plasma leptin
- improved insulin sensitivity
- decreased triglycerides
- increased intestinal antimicrobials
- decreased portal and vascular LPS (think metabolic toxemia among others)
- decreased weight gain/increased leanness
- decreased risk for allergic diseases (asthma, eczema, etc)
- decreased risk for type II diabetes
- decreased risk for hypertension
- reduced risk for liver diseases
- increased longevity

Bifidobacteria

As with *F. prausnitzii*, you will rarely find a taxa with such consistently positive research findings as the genus *Bifidobacteria*. Whether it's breastfeeding, IBS, anxiety, depression, or most other health metrics, Bifidobacteria consistently have positive associations with healthy individuals compared to diseased individuals.

If your report shows low amounts of one or more of its species, regardless of their count, you can increase them substantially with prebiotics.

Bifidobacteria often comprise at least part of most commercially available probiotics, and although much literature supports the use of *Bifidobacteria* as a probiotic, their presence should be increased far beyond what commercial probiotic products can offer.

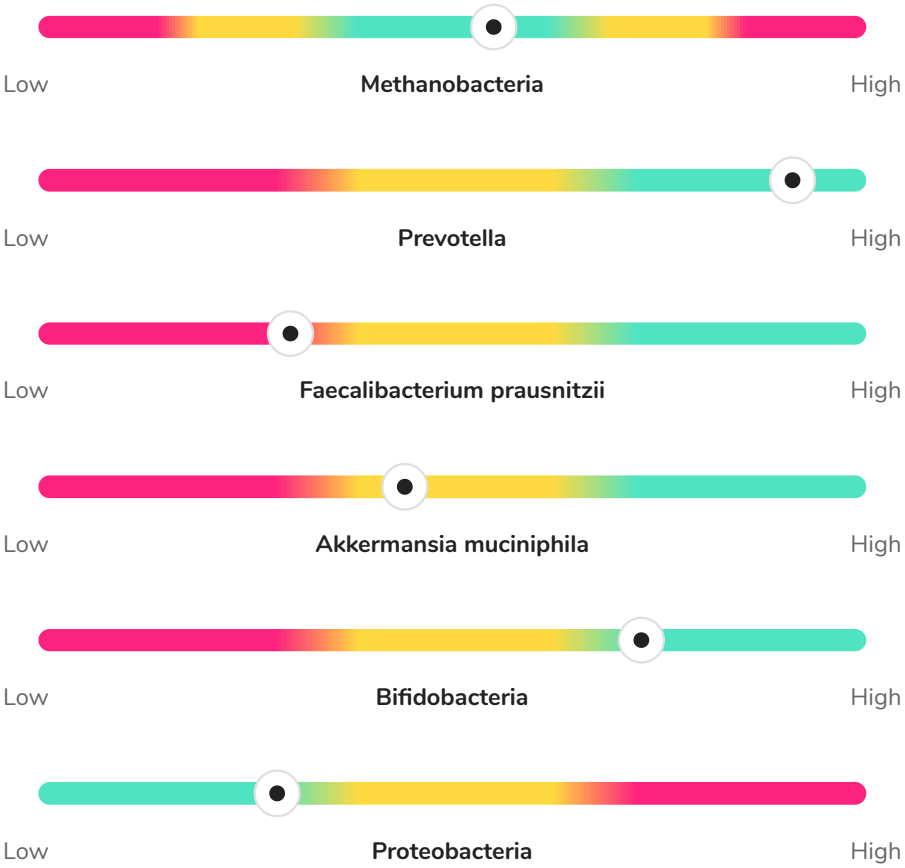
Proteobacteria

Proteobacteria is a phylum, which is a broader classification of bacteria than our other listings. It's consistently linked to negative health outcomes in the research. Although not all members of this phylum are "bad," it does harbor a great many that are characterized as opportunistic pathogens.

These potential bad bugs are present in practically everyone's GI tract, although, in healthy individuals, they are kept in balance by "good" bacteria through several mechanisms. When they aren't kept in check, however, bacteria within *Proteobacteria* thrive and multiply, which increases GI acidity, which contributes to conditions like IBS, IBD, mood disorders, Metabolic Syndrome, autoimmune disease, and cognitive dysfunction.

Subclassifications of *Proteobacteria*, such as *Gammaproteobacteria* and *Enterobacteriaceae*, should be noted as well. If your levels of these are elevated, then your objective should be to reduce the overall abundance of this phylum.

Keystone Taxa



Clinical reference range

Results: Community Breakdown

Most of the cells and DNA found in a stool sample come from microorganisms such as bacteria, archaea, viruses, and other organisms that come from animals, plants, and fungi. These DNA fragments are compared and matched to the known DNA sequences to identify which species are in your gut.

Keep in mind, studies have found that almost half of the DNA in the gut microbiome come from previously uncharacterized species. Since these species are unclassified, scientists don't yet know the impact of such bacteria.

Archaeal species found in the human gut microbiome are primarily from the *Methanobacteriaceae* genus. These archaeal species, known as methanogens, are believed to help in the process of breaking down carbohydrates and turning excess hydrogen molecules into methane. No archaeal species are associated with human disease to date.

Although you may be surprised to find out that there are viruses in your microbiome, most are believed to be components of a healthy microbiome because they provide evolutionary advantages to other microbes.

Unique Species - Your DNA

Interestingly, some of the DNA in your stool comes from your own body. Your DNA enters your stool sample from the cells that line your intestinal tract. Those cells die and are replenished naturally, so a small amount of human DNA is always expected in a stool sample. Normal levels range between 0.01- 0.1 percent.

There may be higher levels of human DNA in the stool when the cells of the intestinal tract turn over at a faster-than-normal rate. Higher levels of human DNA in the stool have been associated with various gut health concerns, such as an increased risk of *Clostridium difficile* infection (CDI), ulcers, intestinal permeability, and increased inflammatory response.

Unique Species - Unknown

One of the most exciting aspects of the microbiome is the previously uncharacterized species in your stool. Although we don't yet know the role of these species, what we identify in your microbiome today might one day play an important role in human health, as research is advancing our understandings every day.

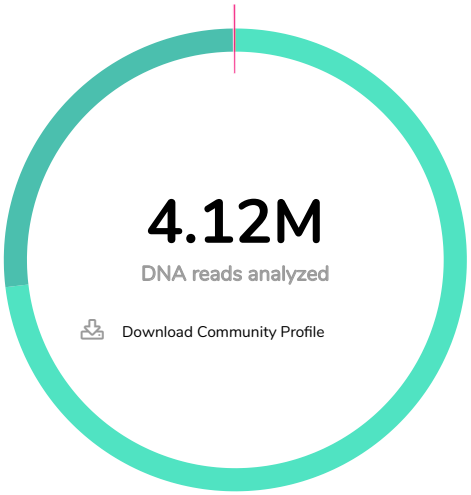
Results: Community Profile

See how your gut ecosystem compares to other adults.

Download a full breakdown of your gut microbiome exploring all kingdoms of life including bacteria, archaea, viruses, fungi, and parasites.

Download Community Profile

Community Breakdown



- Unknown 73.07%
- Bacteria 26.7%
- Eukaryotes 0.09128%
  - Animals 0.07094%
  - Human * 0.0698%
  - Fungi 0.01428%
  - Plants 0.005576%
- Viruses 0.05647%
- Archaea 0.0184%

*Human DNA Content: Optimal

Personalized Recommendations

Diet

Mediterranean Diet

Mediterranean Diet cuisine incorporates native produce, grains, and fish, and cooking styles popular in the countries that border the Mediterranean Sea. This traditional diet places minimal emphasis on red meat, while focusing on whole foods, whole grains, unsaturated fats, and moderate consumption of red wine.

An immense amount of research backs the Mediterranean Diet's effectiveness in reducing the risk of heart disease through managing LDL cholesterol levels. It is also associated with a lower incidence of cancers, Parkinson's disease, and Alzheimer's disease, and with the prevention of other chronic diseases. And because diet has such a profound impact on the microbiome, research has seen favorable bacteria shifts within the most common bacteria species found in our biomes, including a higher ratio of Firmicutes-Bacteroidetes phyla from consuming a Mediterranean diet and a greater presence of Bacteroidetes with lower animal protein intake. Similarly, the Mediterranean Diet shows increases in short-chain fatty acid production from friendly gut bacteria in the colon, which play an important role in maintaining health and preventing disease.

How to start the Mediterranean Diet: You will want to buy, prepare, and consume large amounts of vegetables and moderate amounts of fruit, in addition to whole grains, beans, nuts, and seeds. Fish, and to a lesser extent low-fat meat and poultry, can be eaten in moderation. Fresh fruit is the typical daily dessert, and olive oil is the primary source of fat. Simple carbs are kept to a minimum. Foods are prepared with simple cooking techniques such as roasting, grilling, sauteing, or steaming, and many ingredients can be consumed fresh. Although portion sizes should be moderate, this dietary pattern does not stress tracking total calories and percentages of macronutrients.

Recommended Foods

Consume regularly: Vegetables, fruits, nuts, seeds, legumes, potatoes, whole grains, breads, herbs, spices, fish, seafood and extra virgin olive oil

- Vegetables: Tomatoes, broccoli, kale, spinach, onions, cauliflower, carrots, Brussels sprouts, cucumbers
- Fruits: Apples, bananas, oranges, pears, strawberries, grapes, dates, figs, melons, peaches
- Nuts and seeds: Almonds, walnuts, macadamia nuts, hazelnuts, cashews, sunflower seeds, pumpkin seeds
- Legumes: Beans, peas, lentils, pulses, peanuts, chickpeas
- Tubers: Potatoes, sweet potatoes, turnips, yams
- Whole grains: Whole oats, brown rice, rye, barley, corn, buckwheat, whole wheat, whole-grain bread, pasta
- Fish and seafood: Salmon, sardines, trout, tuna, mackerel, shrimp, oysters, clams, crab, mussels
- Herbs and spices: Garlic, basil, mint, rosemary, sage, nutmeg, cinnamon, pepper
- Healthy Fats: Extra virgin olive oil, olives, avocados, avocado oil

Consume in moderation: Poultry, eggs, cheese, yogurt

- Poultry: Chicken, duck, turkey
- Eggs: Chicken, quail, duck
- Dairy: Cheese, yogurt, Greek yogurt

Consume rarely: Red meat

Avoid: Sugar-sweetened beverages, added sugars, processed meat, refined grains, refined oils, other highly processed foods

Personalized Recommendations

Supplement

FiberMend

Fiber intake is essential for promoting regular bowel movements.* **FiberMend®** is a prebiotic fiber formula that stimulates the growth of beneficial bacteria in the GI tract.* It combines Sunfiber® - a partially hydrolyzed (predigested by enzymes) guar gum fiber - with rice bran, larch arabinogalactans, apple pectin, and green tea phytosome in a water-soluble blend that helps maintain healthy glycemic control (i.e., healthy blood sugar levels) and promotes regularity and optimal digestive function.*

Although the use of fiber to help improve bowel regularity is well-known and well-researched, some fibers may be more effective than others.

A review of studies that looked at fiber for either chronic constipation or irritable bowel syndrome with constipation (IBS-C) found that fiber was beneficial in five of seven studies on its effect on chronic constipation and three of three studies in IBS-C.[1]

Research supports the use of partially hydrolyzed guar gum (PHGG) in the form of Sunfiber (a primary component of **FiberMend**) for nutritional support in IBS-C. In one study of 68 men and women with constipation associated with IBS, PHGG for four weeks resulted in significant improvement in bowel transit time, number of evacuations, stool consistency, number of incomplete evacuations, and symptoms of gas and bloating.[2]

In a small study of 15 women with an average of 2.8 bowel movements per week, PHGG significantly increased the number of bowel movements and moisture content after two weeks.[3]

Thorne

FiberMend

☆☆☆☆☆ 0

$38.00

Add to cart

Personalized Recommendations

Supplement

Bio-Gest (60's)

Digestive enzymes can provide nutritional support for individuals who have small bowel bacterial overgrowth (SIBO).* Stomach acid is one of the first lines of defense against invading pathogens (the "bad" bacteria) that can colonize the intestines, and studies have shown individuals with low levels of stomach acid have increased incidence of SIBO.

Clinical studies have also shown a connection between low levels of pancreatic enzymes and SIBO. The proposed theory for this connection is that secretion of enzymes from the pancreas into the small intestine has the effect of keeping this bacterial overgrowth in check.

Bio-Gest® offers broad spectrum digestive support from both hydrochloric acid and pancreatic enzymes - in addition to pepsin and ox bile.*

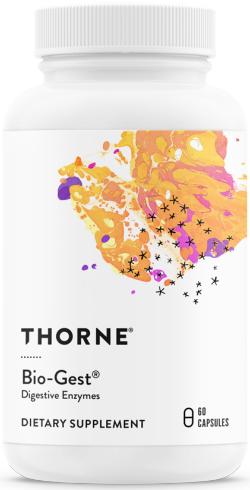
Studies of individuals with low levels of stomach acid, either from atrophic gastritis (degeneration of the cells of the stomach that produce stomach acid) or from acid-blocking medications (proton pump inhibitors; PPIs), have significantly greater incidence of SIBO than individuals with normal stomach acid levels.[1] In one study, SIBO was present in 50 percent of participants using PPIs and 24.5 percent of individuals with IBS, but in only six percent of healthy participants.[2]

The connection between SIBO and pancreatic enzyme deficiency was demonstrated in a group of individuals with inflammation of the pancreas (that results in low levels of pancreatic enzymes). The prevalence of bacterial overgrowth was 39 percent in these patients compared to 2.5 percent in those without inflammation, indicating a need for nutritional support for this condition.[3]

Thorne

Bio-Gest (60's)

☆☆☆☆☆ 0



$19.00

Add to cart

Personalized Recommendations

Supplement

B-Complex #12

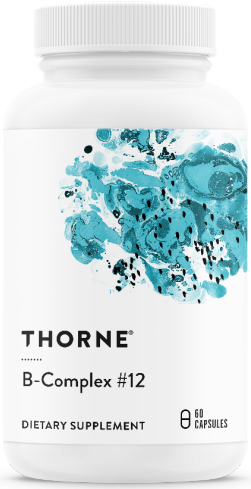
Because your test results indicate you are low in one or more of the following B vitamins - vitamin B3 (niacin/niacinamide), vitamin B6, folate, or vitamin B12 - we recommend a B complex supplement, **B-Complex #12**. These vitamins are all provided in their most active, tissue-ready forms in this product. A nutritional supplement that contains these active cofactors is optimally used by the body, ensuring the body gets the nutrients it needs.*

B-Complex #12 includes eight water-soluble B vitamins: thiamin (vitamin B1); riboflavin/riboflavin 5'-phosphate (vitamin B2); niacinamide (vitamin B3);[1] pantothenic acid (vitamin B5); pyridoxine/pyridoxal 5'-phosphate (vitamin B6);[2] methyl- and adenosylcobalamin (vitamin B12);[3] folinic acid and 5-MTHF (folate);[4] and biotin; plus choline. Although each B vitamin is chemically distinct, the vitamins often work synergistically in various biochemical functions throughout the body - from cellular energy production, to healthy red blood cell formation, to healthy neurological function.*

Thorne

B-Complex #12

☆☆☆☆☆ 0



$18.00

Add to cart

Personalized Recommendations

Exercise

Exercise is an effective way to manage body weight, stress levels, mood, sleep patterns, and more. Exercising from an early age promotes optimal development of brain function by promoting health-enhancing microbial species. Studies investigating the connection between exercise and the microbiome have found numerous positive outcomes. Including, but not limited to:

- Enhancement of beneficial microbial species
- Enrichment of microflora diversity
- Improvement of the development of mutually beneficial bacteria

Interestingly, these outcomes are independent of the diet an individual consumes.

In general, exercise can reduce the inflammatory accumulation of foreign species while protecting gut function and maintaining the integrity of the intestinal lining. Studies have found exercise is associated with phyla increases in the gut of Firmicutes and decreases in Bacteroidetes, benefitting metabolism efficiency and modulating body weight and BMI. Similarly, bacteria *B. coccoides* and *E. rectal* can increase with exercise and help synthesize butyrate, a short-chain fatty acid that plays promotes energy production and protects the gut lining. All these effects are beneficial and are associated with improved metabolic function, immune function, and improved health status.

While more research is needed for specific types of exercise, duration, intensities, and time, we already know that low-intensity exercises improve transient stool time, meaning there is less contact time between pathogens in the stool and the gastrointestinal mucus layer.

- Low-intensity exercise is associated with less risk of colon cancer, diverticulitis, and inflammatory bowel disease.
- Research suggests higher cardiorespiratory fitness levels are associated with better gut diversity levels too. Therefore, high-intensity interval training and other exercises that can increase the ability of your heart, lungs, and muscles working together can also benefit your gut health.
- Too much endurance exercise may negative effects that can last for a few days or longer. Prolonged endurance exercise may cause an increase of intestinal permeability or leaking, compromising gut-barrier function and resulting in bacterial translocation from the colon to the bloodstream. Maintaining healthy gut cells through exercise training is crucial in helping avoid any negative consequences of exercise.

Our recommendation is to start and continue an exercise plan that works for you.