



GENE &
GUTBIOME
TEST

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MIND • BODY • GENE

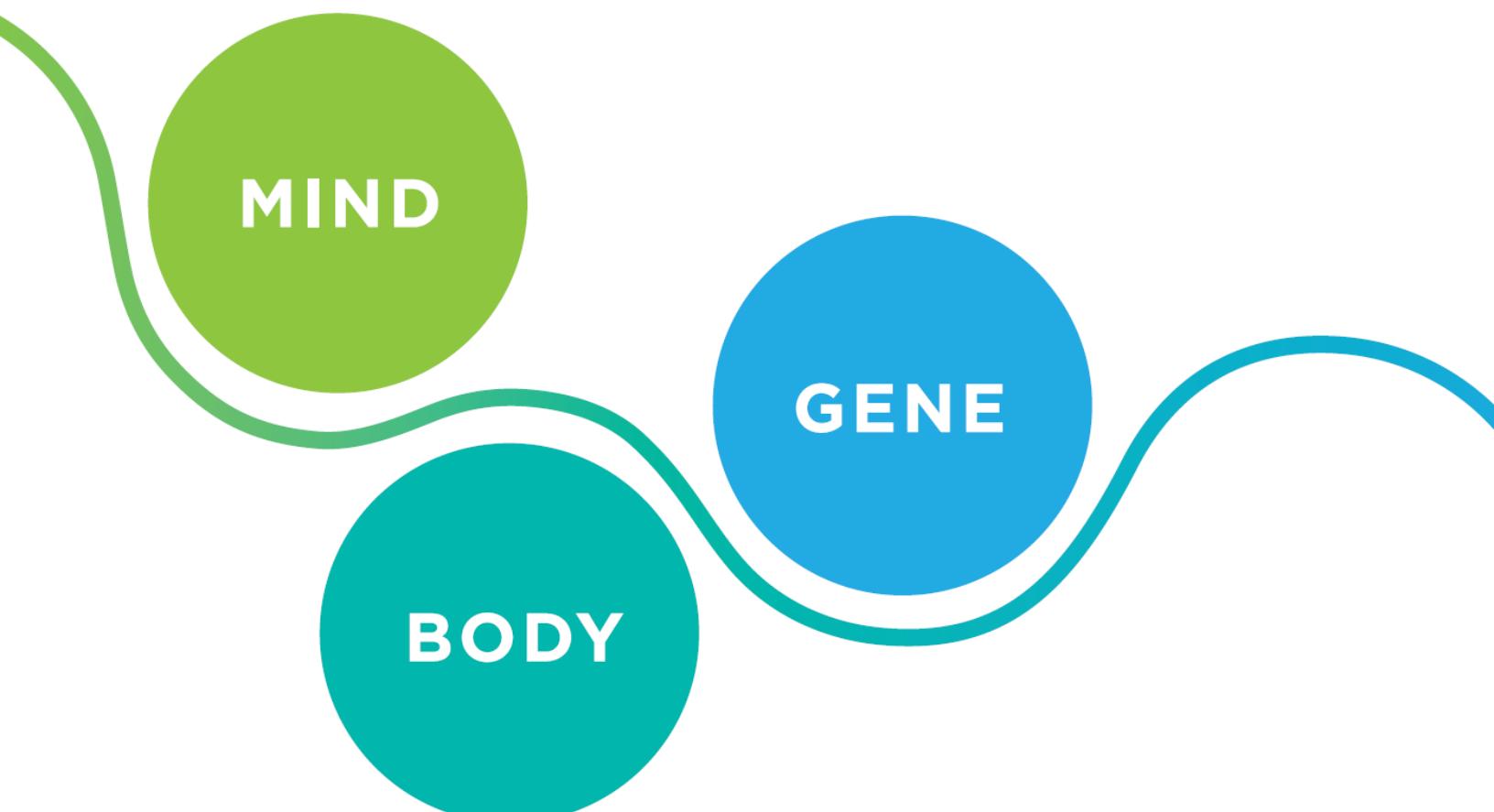
this is your personalized
**RESULT
REPORT**



Name: Charles Warden

Kit ID: A374-R052-T972, B374-R052-T972

Test Date: 03/12/2021



MIND

BODY

GENE

YOUR
SELF-DISCOVERY
JOURNEY STARTS
HERE



Gene

Every cell in your body contains DNA, the genetic information that tells you the story of you — your tendencies, nutritional deficiencies, and physical and personality traits, just to name a few. Your results provide insights into why you are gifted at sports, music, or the arts. Or perhaps how you are great at fixing cars or troubleshooting computer issues. Whatever the results, you will start to see yourself in a new and exciting way!



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Gene Explanation Guide

To become more familiar with your gene sample results, we provide you this simple guide on how to interpret the different scores and graphs within your report. You can access the full gene report on our website at mypsomagen.com. There, you can find detailed information about your genetics related to 27+ different foods and 79+ traits unique to you!

GRAPHS

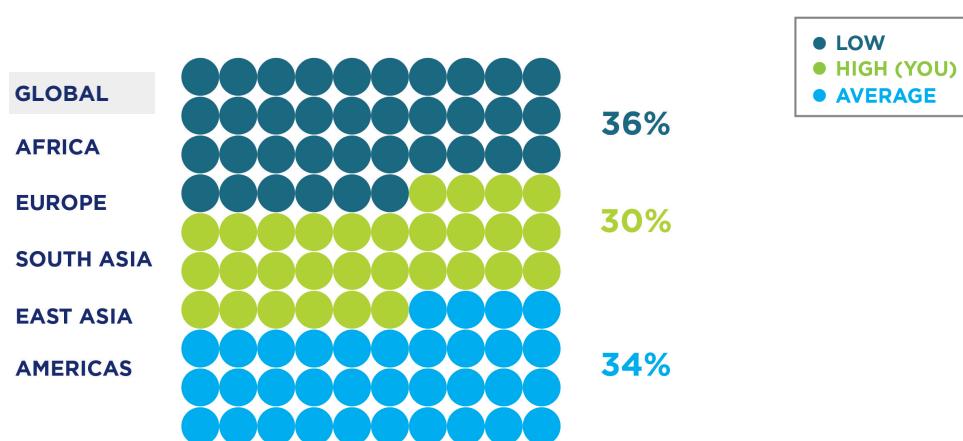
YOUR RESULT

YOUR POSITION: You are likely to have a high level of vitamin A.



This is a sample of your main result. It indicates your probability of having or not having a particular trait or your levels of certain foods. This is based on your genetic background. In some cases, one particular predisposition may not match your trait or food levels. This may be due to other factors such as age, gender, environment, or other unknown genes that may affect your result.

GLOBAL COMPARISON



This graph displays your results for the corresponding trait or food category compared to average populations from different geographical locations. For example, the sample graph shows the user with a high level of Vitamin A at 30%, with compared percentages of people having a low (36%), or average (34%) level of Vitamin A. At mypsomagen.com, you can select the different geographic regions and explore how a particular trait or food level is distributed.



GENOTYPE



Your Genotypes

GG
GG
AA*Chromosome 16*

Here, we show you an example of your chromosome, its marker relative position, and your genotype. Your Genotype is your personal DNA sequence that is located at a particular place in the genome. The letters on the side are examples of your alleles. Alleles can be identical, or differ by minor changes in their DNA sequence. We call the pair of alleles of each individual a genotype. If your variant is detected, it will be highlighted in green in your DNA sequence. If no variant was found, it will appear gray.

GENES & THEIR VARIANTS

Related Genes

GENE	POSSIBLE RESULTS	YOUR GENOTYPE
rs9275572	A/G - A/A - G/G	A/G
rs9479482	T/T - T/C - C/C	T/C
rs1024161	A/A - A/T - T/T	T/T

This table shows you the different genes we test, the possible results or variants for the particular gene sequence, and the results or allele found on your genes. Your genotype results are shown as letters — A, G, C, and T. Each letter represents a different nucleotide. Nucleotides are the building blocks of our DNA. Your result contains the different nucleotides and the sequence found in your gene.



Gene Score Summary

Here you will find a summary of all your gene results. You can see your food results that may answer your questions regarding lactose intolerance or vitamin level. In addition, you can see your genetic results that may tell you about your physical, personal, sensory, or other miscellaneous traits unique to you! For more details, you can go to our website at mypsomagen.com, to explore more of your results.

FOOD

One of the major lifestyle factors that affect our bodies is diet and our response to diet (how we metabolize, absorb and use food nutrients). This is highly dependent on our genetic background.

Here you can learn about your genetic background and your potential response to several foods and nutrients in your diet.

FOOD

YOUR RESULTS

Vitamin A	likely to have an average level
Vitamin B6	likely to have an average level
Vitamin B12	likely to have a low level
Vitamin C	likely to have a high level
Vitamin D	likely to have a high level
Vitamin E	likely to have a high level
Calcium	likely to have an average level
Magnesium	likely to have a low level
Iron	likely to have an average level
Lutein	likely to have an average level
Homocysteine	likely to have an average level
Folate	likely to have a high level
Selenium	likely to have an average level
Coenzyme Q10	likely to have an average level
Fat Intake	likely to consume a moderate amount
Unsaturated Fat Level	likely to have an average level
Saturated Fat & BMI	likely to have a high BMI
High-Fat Diet	less likely to be effective for you
Omega-3 Fatty Acid	likely to have an average level
Trans Fatty Acid Levels	likely to have an average level



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FOOD continued

YOUR RESULTS

Coffee Consumption	likely to have more coffee consumption
Alcohol Consumption	likely to have moderate consumption
Food Consumption	likely to consume a high amount
Caffeine Metabolism	likely to have an average metabolism
Protein Intake	likely to consume more protein
Carbohydrate Intake	likely to consume moderate carbohydrate
Lactose Intolerance	likely to be lactose tolerant
Leptin Regulation	likely to have an average level
Fasting Blood Sugar Level	likely to have a low level

PHYSICAL TRAITS

Physical traits are your defining characteristics — eye color, curly hair, earlobe type. Your Gene's physical results inform you about your uniqueness. Although those features are defined by your genes, they can also be affected by external factors like the environment or your lifestyle choices.

Here you can learn about your genetic background and how your "looks" are shaped in part by your genes.

PHYSICAL TRAITS

YOUR RESULTS

Alopecia Areata	more likely to have
Beard Density	likely to have a high level
Chin Protrusion	likely to be large
Ear protrusion	is likely to be protruded
Earlobe Type	likely to be detached
Early-onset Hair Loss	more likely to lose
Eye Color	likely to have brown or hazel
Eyebrow Thickness	likely to have a thin eyebrow
Facial Pigment Spots	likely to have a low amount
Finger 2D:4D Ratio	likely to have longer index finger
Freckles	likely to have a low level
Hair graying	likely to experience less level
Hair Thickness	likely to be thin
Hair Type: Straight or Curly	likely to be straight
Hip Size	likely to be average



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Iris Nevus

likely to have a **moderate** iris nevus**PHYSICAL TRAITS continued**

Male Pattern Baldness

less likely to be bald

Pigmented ring

likely to have **no**

Red Hair

less likely to have red hair

Shovel-Shaped Incisors

likely to have **no shovel-shaped**

Skin Aging

likely to have an **average** level

Tanning

likely to have a **low** level

Transepidermal Water Loss

likely to have a **high** level

Unibrow

less likely to have a unibrow**PERSONAL TRAITS**

Your personal preferences and personality are defined by your experiences in life, but your genes can also impact them in different ways. How's your response to exercise? Are you a morning person? Do you have a weakness for candy? Explore your personal traits here.

These results can teach you about your genetic background and how parts of yourself respond in relation to that background.

PERSONAL TRAITS**YOUR RESULTS**

Aerobic Performance

likely to have **average** level

Agreeableness

less likely to be agreeable

Anaerobic Performance

likely to have an **average** level

Candy Preference

moderately likely to have level

Cold Acclimation

likely to have a **low** level

Conscientiousness

less likely to be conscientious

Extraversion

less likely to be extraverted

Fear of dental pain

likely to have **less** fear

Lark vs. Night Owls

likely to be a **night owls** type

Life Satisfaction

likely to have **lower** level

Linguistic Performance

likely to have a **high** level

Memory Performance

likely to have **average** level

Musical Ability

likely to have an **average** ability

Neuroticism

likely to have a **moderate** level

Novelty-Seeking

likely to have a **high** level

Openness

less likely to be open



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Persistence
PERSONAL TRAITS continued**less likely to be
YOUR RESULTS**

Risk Taker	more likely to be a risk taker
Smoking Preference	likely to smoke moderately
Sweet Taste Preference	more likely to prefer sweet foods
Warrior vs Worrier	likely to be a warrior
White Wine Preference	less likely to prefer white wine

SENSORY TRAITS

Your taste, your sleep, your reflex to light. Have you wondered what they have in common? The environment does play a role, but genes are a big part of how you respond to different stimuli.

Here you can learn about your genetic background and how you respond to different stimuli such as foods, light and odors.

SENSORY TRAITS**YOUR RESULTS**

Alcohol-Induced Flushing	likely to not flush
Asparagus Odor Detection	likely to smell
Bitter Taste Sensitivity	likely to have a moderate sensitivity
Fat Taste Sensitivity	likely to have a low level
General Cognitive Ability	likely to have a high ability
Hearing Difficulty	likely to have an average level
Insomnia	moderately likely to have
Knee Pain	average level
Mosquito Itch Intensity	likely to have low itch intensity
Motion Sickness	likely to have a low level
Perception of Rhythm	likely to have an average perception
Photic Sneeze Reflex	more likely to have
Salty Taste Sensitivity	likely to be more sensitive
Savory Taste Sensitivity	likely to be less sensitive
Sensitivity to Caffeine Bitterness	likely to be moderately sensitive
Sleep Duration	likely to be short
Sour Taste Sensitivity	likely to be more sensitive to sour taste
Sleep Episode	moderately likely to have sleep episodes



OTHER TRAITS

There is a lot more to you than your appearance. Your genes can also tell you information about how your body operates, such as your lung capacity or blood pressure.

Here you can learn about your genetic background and how certain characteristics of your body relate to each other.

OTHER TRAITS

YOUR RESULTS

Alcohol Dependence	likely to have a high level
Attractiveness to Mosquitoes	more likely to attract
Average Blood Pressure	likely to have an average level
Birth Weight	likely to have an average birth weight
BMI	likely to have an average level
Body Odor	likely to have a normal body odor
Earwax Type	likely to be wet
Handgrip Strength	likely to be strong
Information Processing Speed	likely to have an average level
Lean Body Mass	likely to have a high level
Lower Body Strength	likely to be strong
Lung Capacity	likely to have a lower level
Predicted Childhood Weight	likely to have an average level
Primary Tooth - Number of teeth at 12 months of age	likely to have a high number
Primary Tooth - Time to first tooth eruption	likely to be average
Telomere Length	likely to have an average
Weight Loss Response to Exercise	more likely to lose weight
Weight Regain	moderately likely to regain weight

GutBiome



Your gut microbiome can significantly influence your day-to-day life. You may find that certain microbes in your gut may cause inflammation, affect your weight, or even your bowel movements. Many of these concerns can be linked to your gut health and are influenced by your diet or lifestyle. Your GutBiome results will help evaluate what healthy choices you want to make to improve your overall health.

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GutBiome Explanation Guide

To become more familiar with your GutBiome sample results, we provide you this simple guide on how to interpret the different scores and graphs within your report. You can find the 19 different panels that we test and may access your full GutBiome report on our website at mypsomagen.com.

SCORES

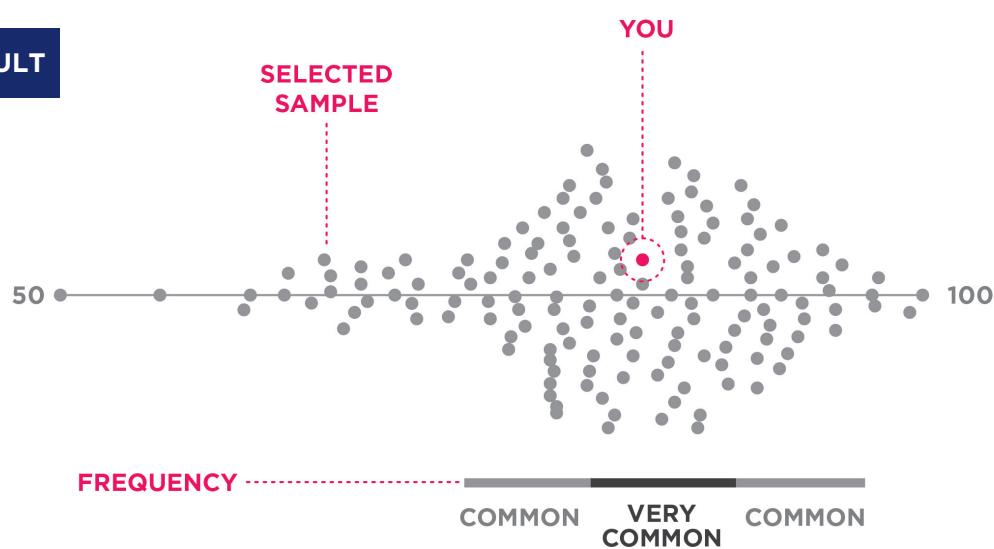
DIVERSITY SCORE



This is your diversity score, a summary of your results. Higher scores mean you have a more balanced microbiome and increased numbers of bacteria that can support your gut or a particular function.

GRAPHS

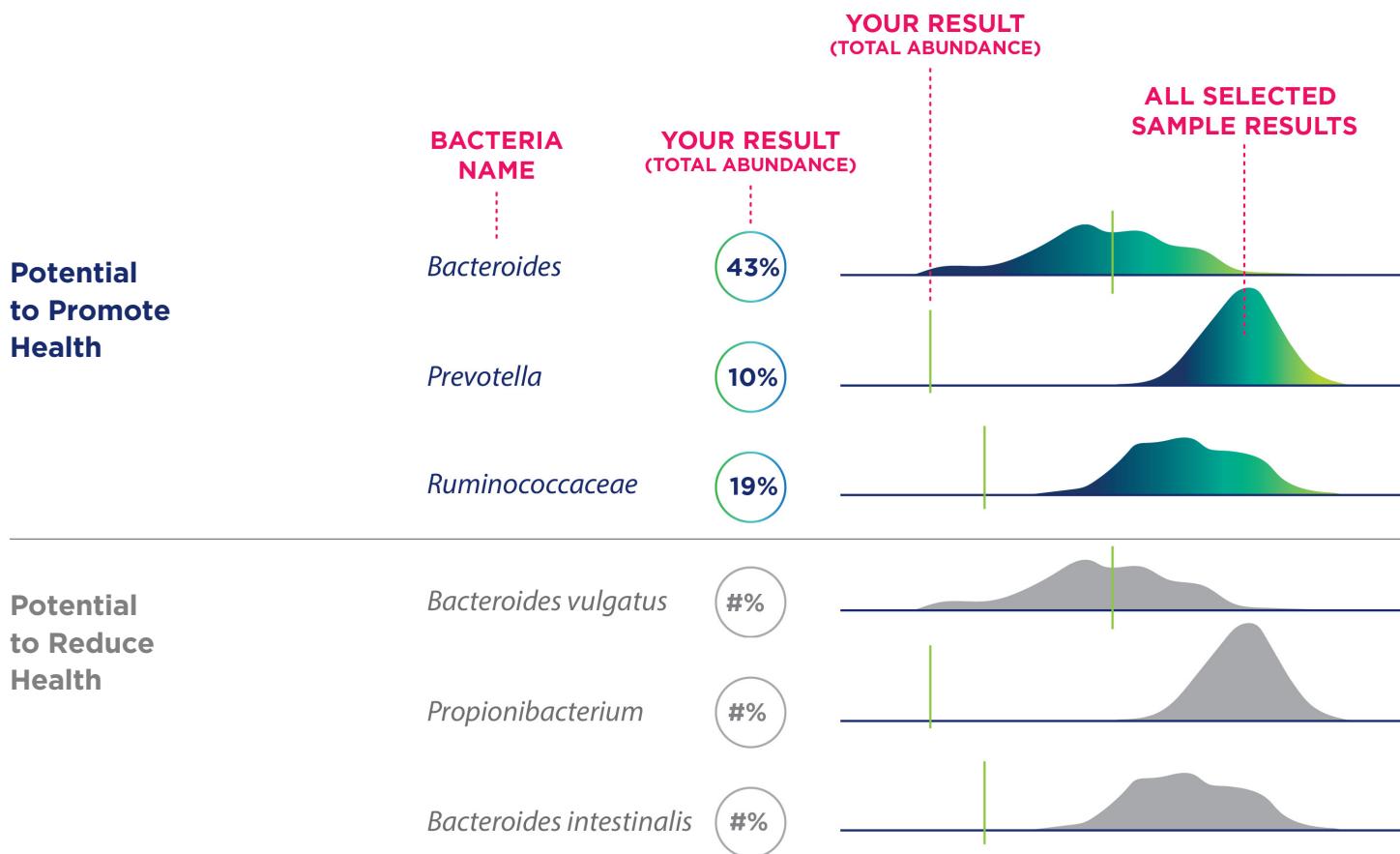
DIVERSITY RESULT



The red point is your result. Results from our other users are represented by the surrounding gray points (the selected sample). This graph shows you where your specific result falls in comparison to our other users. Results on the right side have more diversity, while results on the left side have less diversity.



BACTERIAL ABUNDANCES



These are your individual bacteria results. These particular graphs are distribution graphs. The top of the graph or top of the "mountain" means that many users have a similar abundance, while the "valleys" mean that fewer users have the same abundance. Each graph shows you the bacteria name, its abundance, and results from our users database. The colored results show you the bacteria that promote or support a particular function. The gray-colored results show you the contrary.



GENE & GUTBIOME TEST

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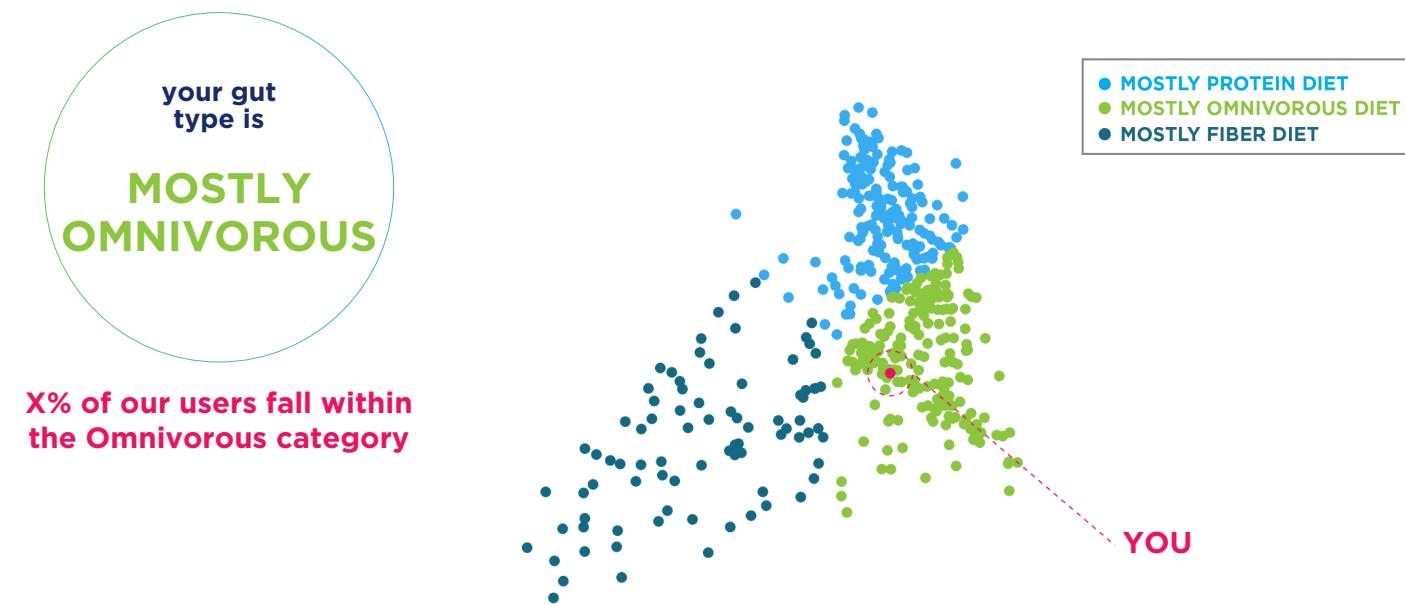
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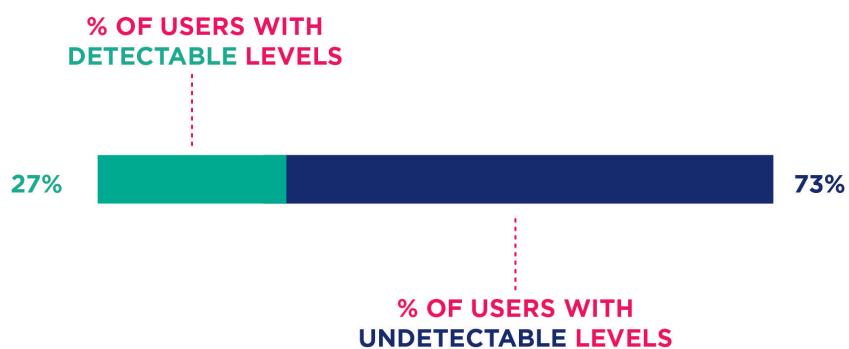
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GUT TYPE



This graph represents your position within our users' gut type database. The different colors represent the three different gut types. The closer the points are to each other, the more similar their results are.

PROBIOTICS RESULTS



These bar graphs show if probiotics are detected or undetected in your sample. This shows you how many users in our database have detectable levels (green) and undetectable levels (blue) of a particular probiotic. Keep in mind that probiotics are not usually detected in your gut unless they are actively being consumed.



GutBiome Score Summary

Here you will find all your GutBiome results. You can check your various bacteria levels and how they may affect your microbial diversity, gut type, and much more. Your report also gives you a deeper dive into your results by evaluating individual categories. You can also access your results on our website at mypsomagen.com.

RESULTS

Overview	Your Gut Score	49
	Microbial Diversity	77
Probiotics Profile	Probiotics Profile	2 out of 17
Your Gut Type	Your Gut Type	Protein
Lifestyle Status	Your Mood & Bacteria	46
	Your Weight & Bacteria	51
	Bloating	60
	Constipation	42
Nutrition Utility	Fiber Breakdown	57
	Protein Breakdown	42
	Starch Breakdown	45
	Lactose Consumption	32
Metabolism	Butyrate Production	37
	Vitamin B Production	28
	Vitamin K Production	51
	Propionate Production	46
	Anti-Inflammatory Bacteria	50
	BCAAs Production	39



Microbial Diversity

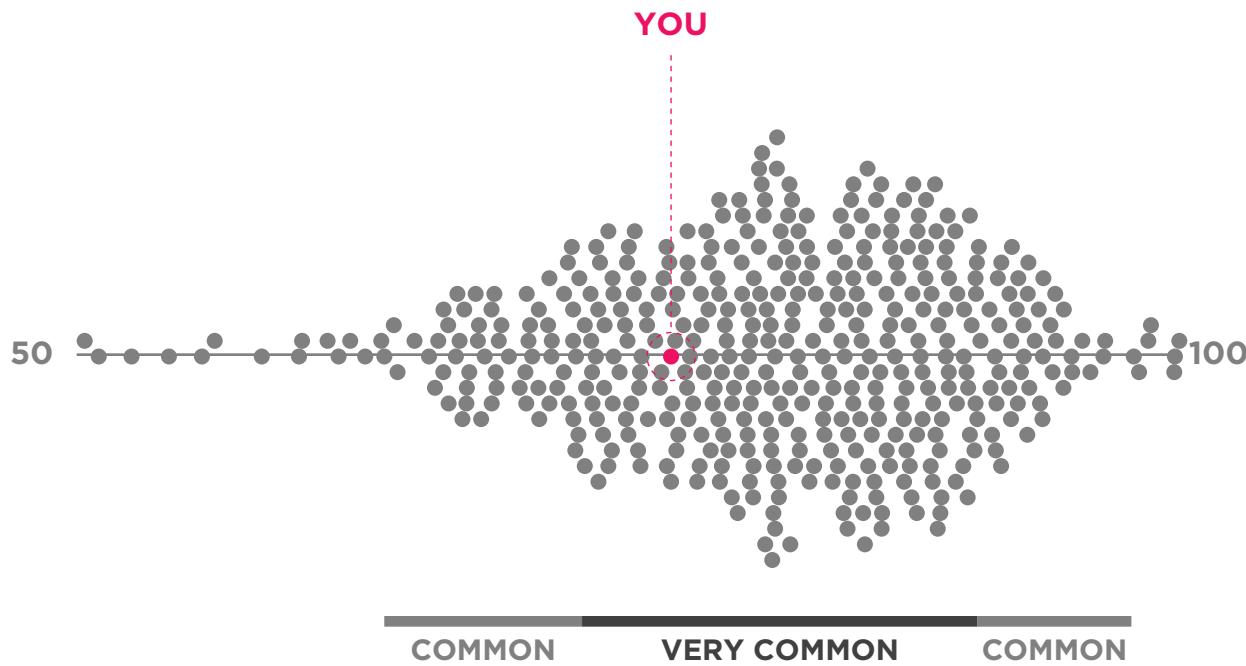


You have more diversity
than 28% of our users

What does the score mean?

Your score measures how many different kinds of microorganisms are present in your sample and how evenly they are distributed within your gut. A high score means your gut microbiome has a high number of different species and the distribution between each species is fairly even. Therefore, to have a healthy gut microbiome, you will want to achieve greater microbial diversity within your gut.

DIVERSITY RESULT





Microbial Diversity continued

How does this relate to you and your microbiome?

Gut microbes play an important role in our health, and because their diversity has been linked to several beneficial health outcomes, its measure has become a key indicator of one's overall health status. For example, lower microbial diversity has been associated with diabetes, obesity, and chronic gut inflammatory diseases.

Now, it's known that many factors can alter the diversity of your gut microbiome. What you eat, your lifestyle, medications you take, your age, and physiology are just some of the factors that can impact your microbiome composition and in turn, its diversity. While some factors are not manageable, others can be managed granting you the possibility of improvement.

How can I take action?

Many factors can have an impact on your gut microbiome and can be modified. However, factors like your age, cannot. If you want to increase or maintain your microbial diversity try the following:



Increase your **fiber** intake by eating a variety of fruits and vegetables.



Try **prebiotics or probiotics**. Prebiotics such as oligosaccharide or inulin, or probiotics like species of *Bifidobacterium* and *Lactobacillus*. You can find both as commercial supplements or additives in your foods.



Avoid unnecessary use of **antibiotics**.

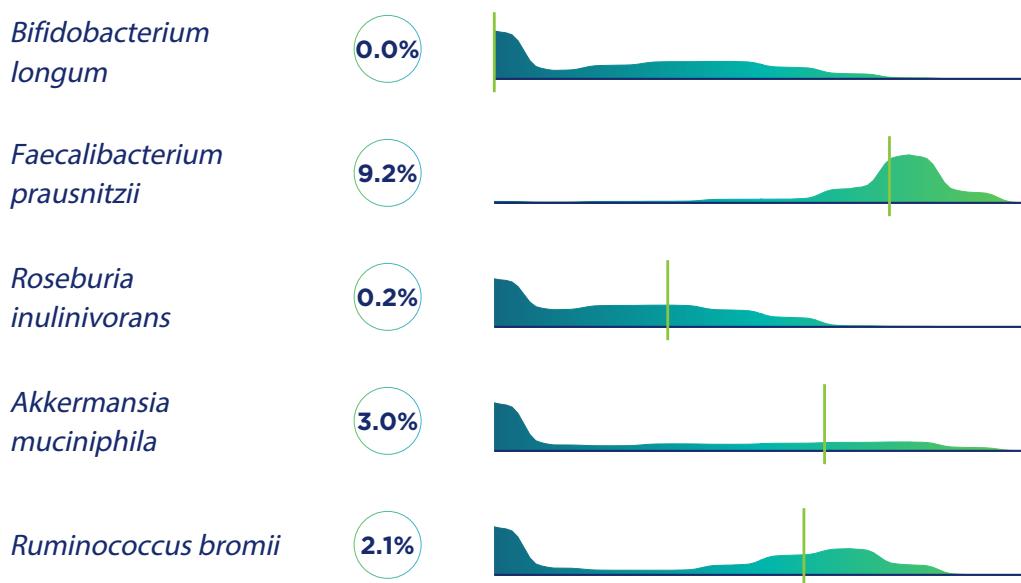


Exercise regularly. Physical activity on a regular basis can help to increase the microbiome diversity.



Beneficial Bacteria

BACTERIAL ABUNDANCES



Your Results

The above graph displays the detected bacteria that are considered beneficial to your gut health. For each listed bacteria, the green line shows your result percentage. This percentage is the total abundance of that specific bacteria detected in your gut. The “mountains” represent users and their results from our database. The “valleys” means fewer users have the same abundance.

These bacteria play important roles in our gut, for example, by supplying essential nutrients that can benefit our overall health. Some bacteria species can synthesize vitamin K, while others can help maintain the gut lining, defend against colonization of pathogens, and help us digest certain complex carbohydrates.

What's the difference between probiotics and beneficial bacteria?

Probiotics are living microorganisms that provide a health benefit to a person when administered in adequate amounts. Beneficial bacteria microorganisms have shown favorable effects to the gut in lab conditions and have been linked to good health outcomes, but that has yet to prove its advantages under large trials.



Beneficial Bacteria continued

How does this relate to you and your microbiome?

Beneficial bacteria have good effects on human health, specifically in the gut. Studies have shown bacteria's ability to synthesize vitamins and break down certain types of non-digestible carbohydrates, like fiber. For example, bacteria process fiber to obtain energy, resulting in Short-Chain Fatty Acids (SCFAs) production. SCFAs are known as the main energy source of gut cells and have been also associated with a reduction of intestinal inflammation, enhanced intestinal barrier function, and increased satiety —your body's state of feeling full after eating.

Some of these bacteria are common members of the human gut microbiome, while others may not. Different factors can contribute to their presence or be detrimental to your gut's beneficial bacteria levels. For instance, intrinsic factors like human physiology (gut oxygen levels or gastric acidity), genetics, ethnicity, age, health status, or external factors like diet, medication, and lifestyle choices can help you maintain or raise these bacteria levels.

How can I take action?

You can add foods high in fiber, inulin, and polyphenols to your diet. The following foods are natural sources of these compounds.



Fiber-rich foods: Apples, Beans, Bananas, Cereals, Dark-color Vegetables, Legumes

Inulin foods: Asparagus, Banana, Chicory roots, Dahlia tubers, Garlic, Jerusalem Artichoke, Leek, Wheat

Polyphenol foods: Chestnut, Blueberry, Hazelnut, Plum, Sweet Cherry, Globe Artichoke Heads, Blackberry, Strawberry, Whole Grain Hard Wheat Flour, Prunes, Almonds

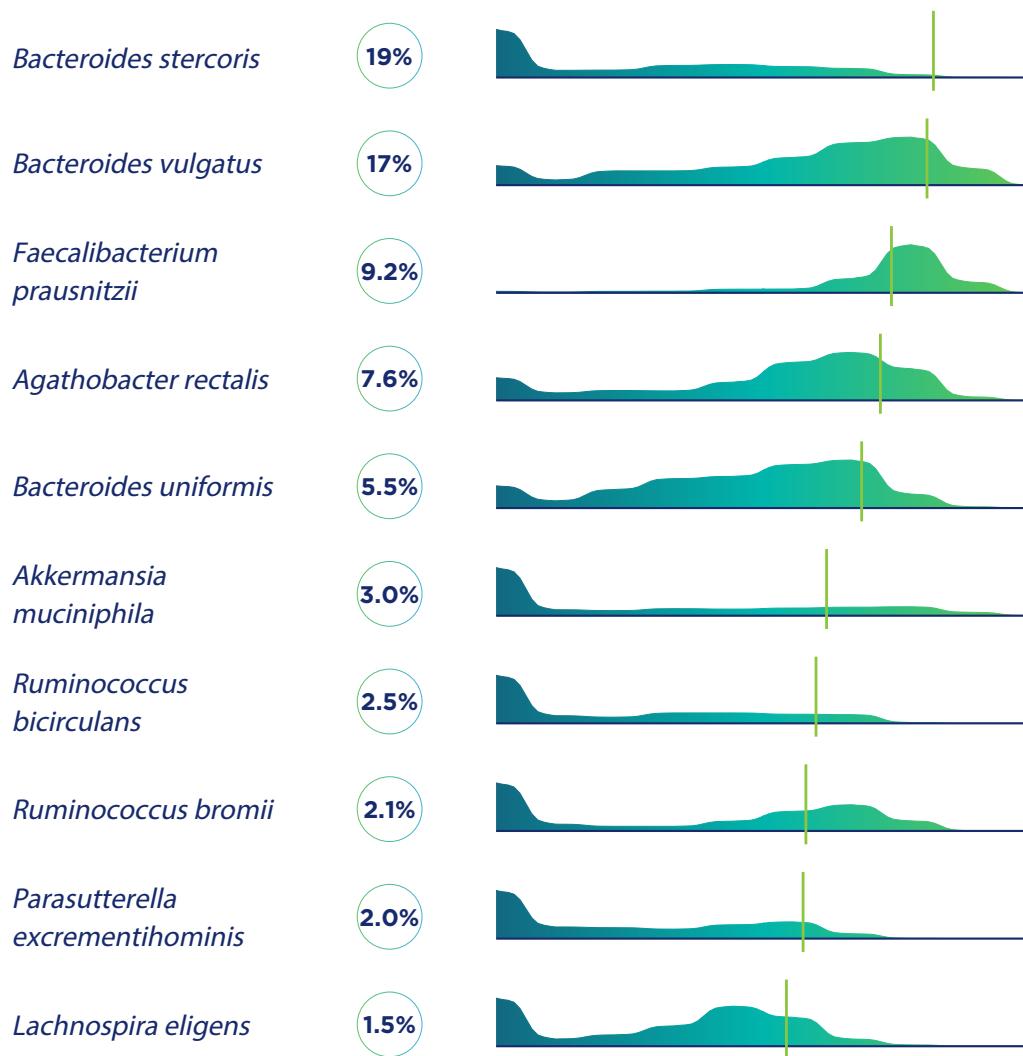
These compounds are considered to be **prebiotics**. Prebiotics are substances that favor and increase the activity of beneficial gut microorganisms.

In addition to the above suggestions, the consumption of **probiotics** can improve and boost the levels of beneficial bacteria. **Exercise** has also been described as a potential intervention to boost levels of beneficial bacteria.



Your Top Bacteria

BACTERIAL ABUNDANCES



How many bacteria live in our gut?

Estimates put the number at around 380 trillion, roughly similar to all of the human cells in our bodies, and equivalent to around half a pound. With small variations, each individual carries about 1000 different species in their gut. Most of these species—90%—belong to the Firmicutes and Bacteroidetes group, while Actinobacteria, Proteobacteria, Fusobacteria, and Verrucomicrobia make up for the rest. In this section, you can see the 10 most numerous bacterial species within your gut.



Probiotics Profile



1 in 5 users have
2 or less probiotics

- users with detectable levels
- users with undetectable levels

BACTERIA	YOUR RESULTS	OTHER USERS
Lactobacillus 0 out of 11 detected	<i>Lactobacillus acidophilus</i> undetected	5% 95%
	<i>Lactobacillus bulgaricus</i> undetected	3% 97%
	<i>Lactobacillus casei</i> undetected	0% 100%
	<i>Lactobacillus fermentum</i> undetected	6% 94%
	<i>Lactobacillus gasseri</i> undetected	9% 91%
	<i>Lactobacillus helveticus</i> undetected	0% 100%
	<i>Lactobacillus paracasei</i> undetected	22% 78%
	<i>Lactobacillus plantarum</i> undetected	0% 100%
	<i>Lactobacillus reuteri</i> undetected	5% 95%
	<i>Lactobacillus rhamnosus</i> undetected	14% 86%
Lactococcus 0 out of 1 detected	<i>Lactococcus lactis</i> undetected	62% 38%
	<i>Streptococcus thermophilus</i> detected	66% 34%
Bifidobacterium 1 out of 4 detected	<i>Bifidobacterium longum</i> undetected	70% 30%
	<i>Bifidobacterium animalis</i> detected	13% 87%
	<i>Bifidobacterium bifidum</i> undetected	19% 81%
	<i>Bifidobacterium breve</i> undetected	5% 95%



Probiotics Profile continued

What do these graphs mean?

Your result displays how many microorganisms with probiotics properties we were able to identify. Additionally, we provide information on how many users from our database have or don't have detectable levels for each different probiotic bacteria. Probiotics support your gut in different ways and it is broadly accepted by the scientific community that they wield beneficial effects on your health.

Why don't I have any detectable levels of probiotics in my sample?

Keep in mind that having undetectable levels of probiotics is not unusual. Adults usually have very low or undetectable levels of probiotics naturally present in their gut, despite being actively consuming them. Most of them will be detectable only during periods of consumption and will be washed out after stopping its intake.

How does this relate to you and your microbiome?

Several studies show the use of probiotics can help you achieve a healthier digestive tract, maintain a healthy immune system, and reduce the risk of certain diseases. Probiotics exert their action through different mechanisms; through modifying gut microbiome activities, inhibiting harmful bacteria growth, or by improving intestinal transit.

The presence of probiotics within the gut is dependent on several factors. For instance, an individual would respond differently after the use of probiotics based on their personal microbiome, the probiotic bacteria they have consumed, the dosage of probiotic bacteria, and the duration of consumption. All these factors may play a role in the detection of probiotics on your gut.

How can I take action?

You can obtain probiotics mainly from two main sources; Certain foods containing probiotics (e.g. yogurt) and dietary supplements.



Fermented foods are potentially a good source of probiotics; however, not all probiotics from these foods will survive the pass through the gut. Commercial yogurts, and unfermented foods (like milks or infant formulas) can have added probiotics strains.



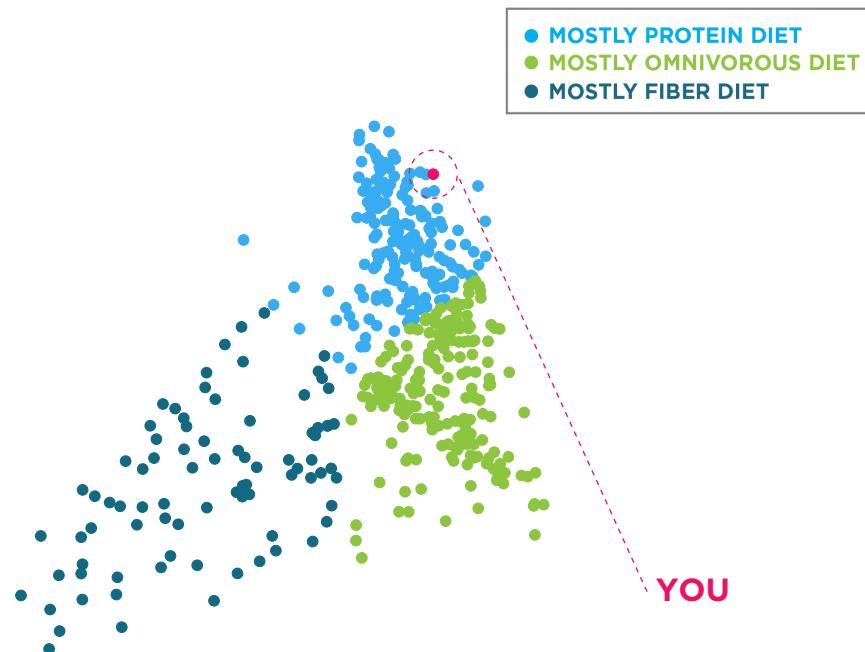
Dietary supplements, in different formats (e.g. capsules, drinks) are also a source of probiotics. They can be found more often in mixtures and in varying doses. Dosage is often expressed on colony forming units (CFU), a number that expresses the amount of viable cells in the product. However, a higher CFU does not necessarily mean you receive a greater benefit.



Your Gut Type

your gut type is
MOSTLY PROTEIN

40% of our users fall within
the Protein category



BACTERIAL ABUNDANCES

Bacteroides



Prevotella



Ruminococcus





Your Gut Type continued

What does your result mean?

This result tells you which type of "enterotype" your gut microbiome is similar to. Gut microbiome enterotypes, or "gut types", were proposed by researchers as a way to reduce gut microbiome complexity and allow them to better understand the relationship between the gut microbiome and us. Having a type similar to PROTEIN/FIBER/OMNIVOROUS means that your microbiome is characterized by the presence of members of the *Bacteroides/Prevotella/Ruminococcus* genus.

Are enterotypes and your dietary habits proven science?

The science behind enterotypes and your diet is constantly changing. Research has shown a correlation between your dietary habits and the composition of your gut microbiome. However, the correlation between your gut type and dieting is not as strong as it seemed at first. This is due to the fact that gut types are affected by more factors than just what you eat.

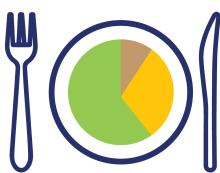
To establish clear distinctions between gut types, think of gut types as groups or sets with some shared 'points' like inside intersecting sets. Some areas will share 'points,' while others will not. This means that while some users will have a defined gut type, others will not, and will present results that do not necessarily reflect their diet. Additionally, it is possible for every one of the 'points' to move in time within the set or to move to another set altogether due to changes in diet, or other factors.

How does this relate to you and your microbiome?

Think of gut types as a snapshot of your gut microbiome, and a way to represent and characterize it in a useful way to relate it to other interesting insights such as diet, lifestyle, health, and disease. If you introduce changes to your diet, you will probably see a change in your gut type in the short or long term, depending on how profound those changes are. Your gut type tends to primarily reflect your diet, but factors like lifestyle and even age can also shape it. Because of this, it is normal to see or expect changes in your gut type throughout various stages in your life.

How can I take action?

As mentioned, gut types are a continuum, and represent a snapshot of your gut microbiome. Changes in your gut type are not considered indicators of a state of imbalance. Rather, gut types have been associated with different factors, diet being the most indicative. To see a shift from one gut type to another may just be a reflection of your current lifestyle.



Any changes you make in your **dietary patterns** or lifestyle, whether slight or long-term, may surely lead to changes in your gut microbiome composition. So don't panic! It's common to find shifts in the results of your gut type. That's why testing your microbiome is great in understanding your overall health!



Your Mood & Bacteria



17% of users have a score lower than yours

What does the score mean?

This score represents the levels of bacteria within your gut that have the potential to produce and modulate certain neurotransmitters. High levels of these microorganisms represent a boost in your ability to produce serotonin and gamma-aminobutyric acid (GABA), neurotransmitters involved in the regulation of mood and anxiety. Both molecules are associated with the reduction of stress, lowering anxiety, and an overall calm mood.

BACTERIAL ABUNDANCES

Potential to Promote Score

Bifidobacterium

0.0%



Faecalibacterium prausnitzii

9.2%



Roseburia

0.2%



Lactobacillus

0.0%



Potential to Reduce Score

Holdemania

0.1%



Coprococcus

0.0%



Paraprevotella

0.0%



Phascolarctobacterium

0.0%





Your Mood & Bacteria continued

How does this relate to you and your microbiome?

The gut microbiome has been involved directly and indirectly in producing several neurotransmitters, molecules that act as messengers in the central nervous system. Bacteria can stimulate or produce these molecules, which then are interpreted by our nervous system through different mechanisms. Although these mechanisms are not very well understood, these connections show that bacteria can play a role in our mood as well as in our behavior. Scientists call this communication route the Microbiome-Gut-Brain axis.

An important number of bacteria in our gut has been described to be able to produce molecules like dopamine, norepinephrine, serotonin, or gamma-aminobutyric acid (GABA), while others have been reported to heavily influence its production. These molecules play essential roles in the modulation of human behavior.

How can I take action?

Some early studies done on human subjects, have shown a link between the consumption of certain strains of probiotics and positive changes in mood and anxiety.



Consumption of *Lactobacillus helveticus*, *Lactobacillus rhamnosus* and *Bifidobacterium longum* have shown **positive effects** on mood and anxiety.



Avoid major disruptions of your gut microbiome, like **unnecessary use of antibiotics**.

Research regarding the mechanisms by which the human gut microbiome and the nervous system communicate to each other is still in its early steps. Much of the current knowledge comes from animal models studies and requires further validation of humans.



Your Weight & Bacteria



53% of users have a score lower than yours

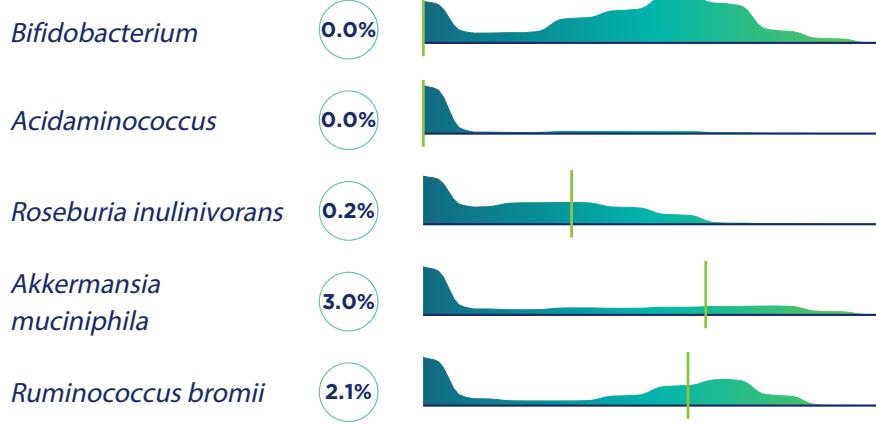
What does the score mean?

This score represents the levels of bacteria associated with lean and overweight body types. A higher score means greater levels of bacteria associated with lean body types, while lower scores indicate low levels of those bacteria and high levels of bacteria linked to overweight body types.

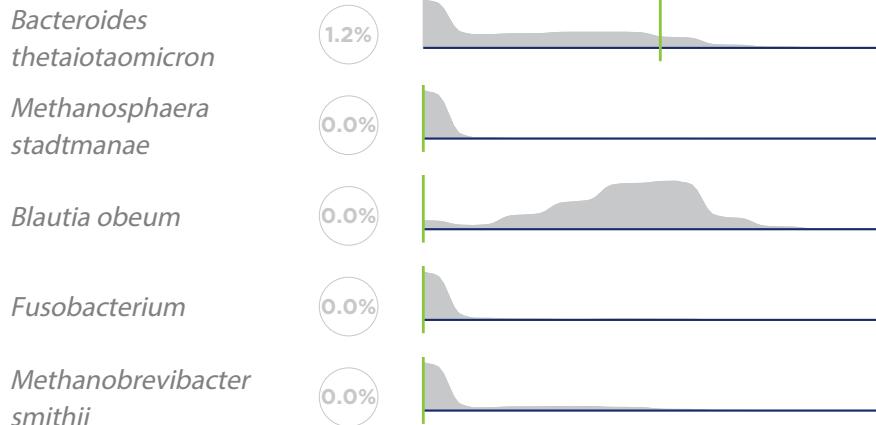
Body weight is a consequence of a highly complex network of factors, both internal and external to your body. Diet, lifestyle, genetics, age, and hormone regulation are just a few of them. Increasingly, the gut microbiome has been shown to be both, an indicator of a healthy weight and a player in its maintenance.

BACTERIAL ABUNDANCES

Potential to Promote Score



Potential to Reduce Score





Your Weight & Bacteria continued

How does this relate to you and your microbiome?

Whether the changes in microbial composition observed in lean or overweight body types are a cause or consequence has yet to be fully clear in scientific studies. Still, a combination of several factors are certainly at play.

Several specific bacteria have been linked to body types. Many interactions that affect energy balance (satiety and weight gain) mediate through the release of bacterial molecules in the gut. Moreover, some of these molecules, like SCFAs, have been shown to be directly involved in the stimulation of satiety, helping reduce food intake and even capable of controlling your blood sugar levels.

How can I take action?

You probably can find dozens, if not hundreds, of strategies to maintain a healthy weight. Diets, treatments, exercise routines, and even devices have been offered to manage weight gain. The nature of the issue has challenged practitioners and researchers, including the general population. Truthfully, eating a well-balanced diet and having a healthy lifestyle is the best way to support your body.

If you choose to maintain a healthy diet, remember that bacteria can partially contribute to achieve your goal of maintaining or reaching a healthy weight. Researchers have found that:



Certain **probiotics**, like *Bifidobacterium breve*, *Bifidobacterium lactis*, *Bifidobacterium bifidum*, *Lactobacillus rhamnosus* and *Lactobacillus acidophilus* have shown beneficial effects on preventing weight gain.



Intake of **dietary fiber** has been recommended to improve the sensation of satiety. You can find fiber in bran ready-to-eat cereal, beans (navy, white, yellow, chickpeas), lentils, artichoke, fruits (apple, bananas, pear), cooked vegetables (potatoes with skin), seeds and nuts (chia, peanuts, hazelnuts, pistachios, almonds, dates).



Supplements containing **prebiotics**, like galactomannan, can contribute to weight management.



Bloating



86% of users have a score lower than yours

What does the score mean?

This score represents the balance between bacteria linked to bloating and bacteria that can help to reduce it. Bloating is the sensation of a full and tense abdomen or a feeling of having gas. On occasions, the abdomen becomes swollen or painful. Abdominal bloating is very common. It can range from mild to severe. Although cases of bloating are very frequent, the cause is still not fully understood, and the annoying symptom may affect your quality of life. If you are experiencing symptoms related to abdominal bloating and are concerned about your health, we suggest you consult with your doctor for diagnosis and further treatment.

BACTERIAL ABUNDANCES

Potential to Promote Score



Potential to Reduce Score





Bloating continued

How does this relate to you and your microbiome?

Although the possible causes of bloating are diverse, some evidence shows that an altered gut microbiome is a potential factor in its generation. It alters the balance of gas metabolism, between gas-producing and gas-consuming bacteria, and the types of gases generated.

Two lines of evidence link the gut microbiome and abdominal bloating. First, researchers found differences in the composition and abundances of certain microorganisms between people with and without bloating symptoms. Secondly, the use of probiotics improved abdominal bloating levels in some subjects, supporting the presumption of the involvement of the gut microbiome in bloating.

How can I take action?

Bloating is a common symptom, also a general and ambiguous term that can have several causes. Based on scientific research, there are some steps you can take to help alleviate the discomfort of bloating if the cause is dysbiosis or an imbalance of the gut microbiome. You can try the following:



Certain **probiotics** such as *Bifidobacterium* strains: *B.infantis*, *B. lactis*, *Lactobacillus* strains: *L. acidophilus* and combinations have shown to improve symptoms of bloating.



Increasing physical activity. You can start with 20 minutes of moderate exercise 3 to 5 days a week and gradually increase. Recommended activities include walking, aerobics and cycling.



Low FODMAP diet. FODMAP is the acronym for Fermentable Oligosaccharides, Disaccharides, and Monosaccharides and Polyols. FODMAPS are a group of short-chain carbohydrates contained in some foods that are fermented in the large intestine and produce gas. There is evidence that a diet low in FODMAP, guided by a specialist, helps relieve bloating.



Name:

Charles Warden

Kit ID:

B374-R052-T972

Test Date:

03/12/2021

Constipation



21% of users have a score lower than yours

What does the score mean?

This score represents the levels of bacteria associated with constipation. If you have a high score you have less of a chance to have constipation. A low score means that you have bacteria that will promote continence.

Constipation can have a broad set of symptoms, where the difficulty of infrequent or incomplete evacuation predominates. Other symptoms considered can include hard stools, abdominal discomfort, or bloating. Nonetheless, physicians consider those experiencing constipation having fewer than three bowel movements per week. Some studies based on self-report and clinical data place constipation prevalence at around one out of six adults, with factors like age and gender impacting the most. If you are experiencing symptoms related to constipation and are concerned about your health, we suggest you consult with your doctor for diagnosis and further treatment.

BACTERIAL ABUNDANCES

Potential to Promote Score

Bifidobacterium

0.0%



Faecalibacterium prausnitzii

9.2%



Roseburia

0.2%



Lactobacillus

0.0%



Potential to Reduce Score

Holdemania

0.1%



Coprococcus

0.0%



Paraprevotella

0.0%



Phascolarctobacterium

0.0%





Constipation continued

How does this relate to you and your microbiome?

The gut microbiome has been linked to constipation by researchers based on two sources of data. First is the evidence that some probiotics improve intestinal transit. Secondly is the differences in the abundance of specific gut microbiome members between constipated and normal subjects.

The way your gut microbiome plays a role in constipation is not 100% understood. Still, some hypothesize that the release of bacterial compounds (SCFAs or serotonin) could influence and regulate gut motility —the stretching and contracting of your gut while digesting food.

How can I take action?

There are multiple factors that may be associated with why an individual may be experiencing constipation. Some factors include; old age, no physical activity, and a lack of fiber, vegetables, or fruit in your diet. In addition, women may often experience constipation, as well as individuals diagnosed with depression or anxiety. Therefore to improve bowel movement we recommend the following:



Certain **probiotics** such as, *Bifidobacterium animalis* and *B. lactis*, and VSL#3 (probiotic medical food) to ease and improve constipation symptoms.



Intake of **dietary fiber** has been recommended empirically to improve constipation.



Increasing physical activity. Moderate exercise for at least 20 minutes or more per day has shown to improve constipation symptoms. Researchers believe that exercise helps by accelerating gut motility, increasing transit and abdominal muscle stimulation.



Fiber Breakdown



81% of users have a score lower than yours

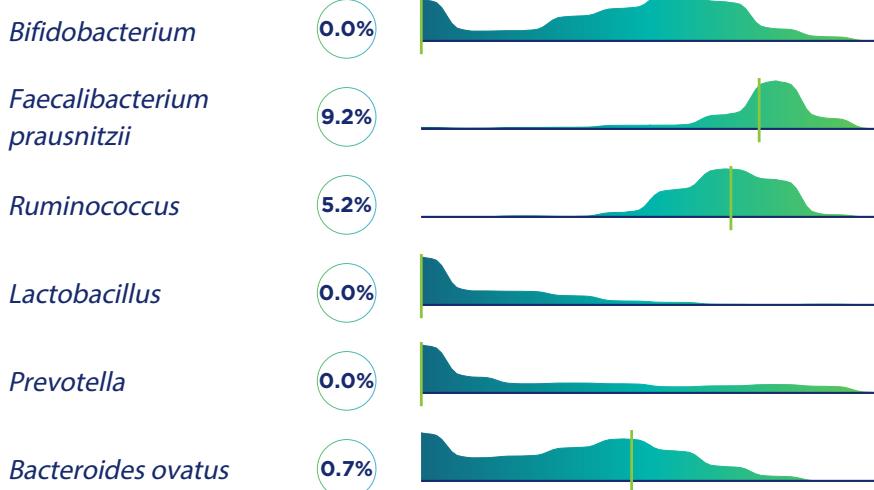
What does the score mean?

This score represents the levels of bacteria known to break down fiber. A high score means that you have an increased number of bacteria capable of breaking down fiber in your gut.

Dietary fibers are carbohydrates with a complex structure that we cannot digest. The fiber passes through our digestive system without being absorbed and without being broken down until it reaches the large intestine where it is used by bacteria as food — essentially for energy. In this process, different metabolites are generated with multiple effects in our bodies.

BACTERIAL ABUNDANCES

Potential to Promote Score



Potential to Reduce Score





Fiber Breakdown continued

How does this relate to you and your microbiome?

Fermentable dietary fiber serves as food for our gut microbiome and stimulates the growth of specific organisms. This leads to the production of metabolites including short-chain fatty acids (SCFAs) such as butyrate, propionate, and acetate. Some of these dietary fibers are considered prebiotics, given their ability to stimulate beneficial microorganisms' growth. Prebiotics can improve our cardiovascular metabolism, reduce insulin resistance, reduce blood lipid levels, and immune stimulation in the gastrointestinal tract.

How can I take action?

Make sure to add fiber to your diet by eating a variety of vegetables, fruits, legumes, and grain products. Consuming dietary fiber allows us to shape our gut microbiome and enhance our overall health. In addition to these benefits, it is known that regular consumption of fiber-rich foods normalizes bowel movements, but their consumption is also associated with decreasing the risk of cardiovascular diseases, type 2 diabetes, and some types of cancer.

The fibers most studied for their prebiotic effect are fructooligosaccharides (FOS) and galactooligosaccharides (GOS). These fibers influence the growth or activity of *Lactobacillus* and *Bifidobacterium* species. Some fruits and vegetables containing FOS are nectarines, scallions, onions, Jerusalem artichokes, chicory root, garlic, and asparagus. GOS are found in legumes such as lentils, chickpeas and beans.



According to the Dietary Guidelines for Americans, the recommended daily amount of fiber is:
28g for adult women
34g for adult men



Protein Breakdown



22% of users have a score lower than yours

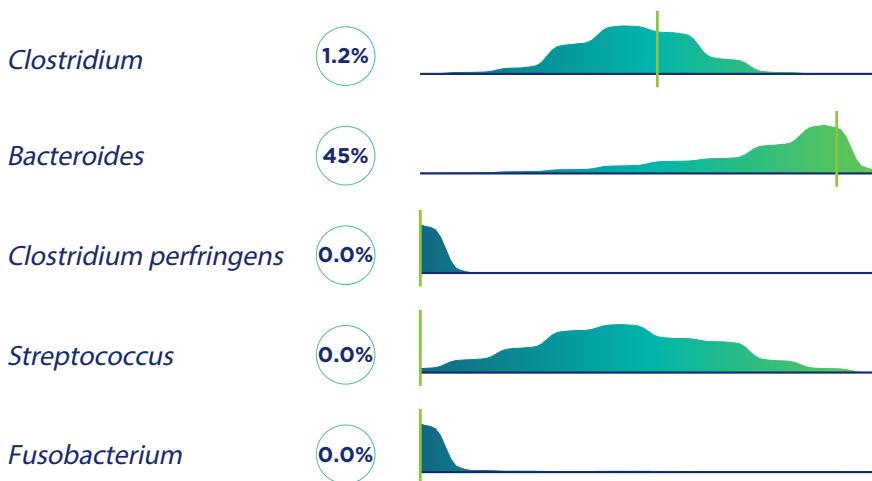
What does the score mean?

This score represents the levels of bacteria known to break down protein into its smallest components, amino acids. A high score means you have an increased number of bacteria that can break down protein. In contrast, a lower score is associated with a decreased number of bacteria involved in protein metabolism.

Dietary protein is a macronutrient that plays a fundamental role in different processes of our body. Proteins have a structural function in parts of our muscles, hair, and collagen. Proteins also act as messengers of important body signals (like hormones) and carry out chemical reactions inside cells. After a meal, food is typically digested by our gut, broken down, and absorbed in the gastrointestinal tract. However, some small portions of proteins can pass the intestine undigested. Instead, they enter the large intestine where gut bacterial enzymes metabolize and use proteins as energy sources to produce metabolites like SCFAs, ammonia, and others.

BACTERIAL ABUNDANCES

Potential to Promote Score





Protein Breakdown continued

How does this relate to you and your microbiome?

As proteins break down, resulting amino acids are used by gut bacteria to synthesize microbial proteins and as an energy source throughout the fermentation process. The fermentation of proteins by gut bacteria is troublesome because metabolite production is harmful to our health. However, these metabolites in average concentrations are essential for the body.

Some examples of metabolites are mono and polyamines, created in amino acid fermentation. They play an essential role in intestinal health within the intestinal barrier function, support the immune response and gut motility. Additionally, protein derived metabolites like short-chain fatty acids (SCFAs) provide many health benefits by allowing us to obtain energy from undigested proteins and providing an anti-inflammatory effect.

How can I take action?

Eating a balanced diet, including a high fiber intake is a way to positively influence your gut microbiome health. The Dietary Guidelines for Americans recommend **34g** of total fiber per day for men and **28g** per day for women. Studies show that foods we eat may influence the type of metabolites being produced in our gut. A diet high in protein and low in fiber may lead to the production of harmful metabolites.



By eating good quality protein in the recommended amount (**46g** for women, **56g** for men daily) and incorporating fiber into your diet, you can reduce the production of these detrimental substances in your gut.



Starch Breakdown



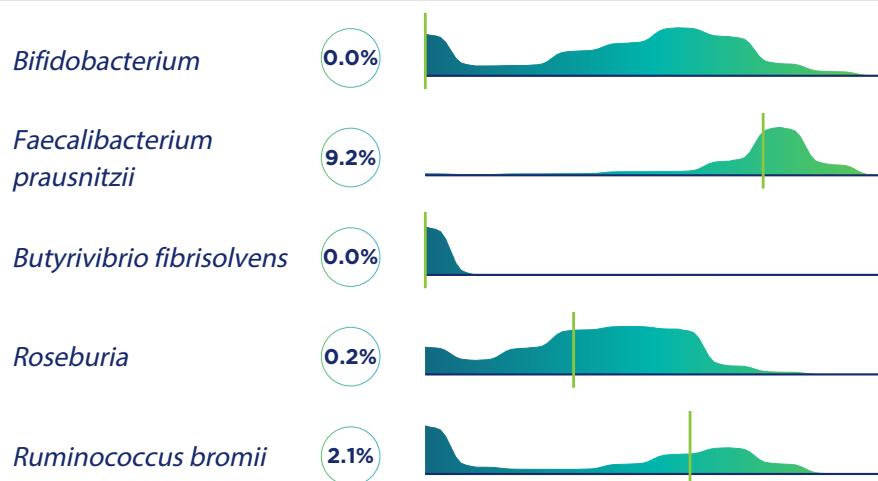
29% of users have a score lower than yours

What does the score mean?

This score represents the levels of bacteria known to break down resistance starch. A high score means that you have an increased number of bacteria capable of breaking down starches within your gut. Starch is the major source of carbohydrate in the human diet; the starch that is not digested in the small intestine is called resistant starch (RS). Resistant starch is considered a prebiotic dietary fiber that gut bacteria uses as an energy source. This process generates different metabolites that have a beneficial impact on intestinal and overall health.

BACTERIAL ABUNDANCES

Potential to Promote Score





Starch Breakdown continued

How does this relate to you and your microbiome?

Resistant starch is a prebiotic that stimulates the growth of “good” bacteria like *Bifidobacterium*. Upon reaching the large intestine, resistant starch is fermented by intestinal bacteria. The main products of this process are Short Chain Fatty Acids (SCFAs) —Acetate, Propionate, and Butyrate— which have beneficial effects on your gut health. For example, butyrate is essential for intestinal function and is a major energy source for gut lining cells with anti-inflammatory properties.

How can I take action?

If you want to increase your level of starch breakdown bacteria, try to add some food sources of resistant starch to feed them, like the following:



Legumes (Brown beans, White beans, Kidney beans)



Rice



Unripe banana, once the banana ripens, the resistant starch changes to regular starch



Pistachio, Chestnut, Cashew nuts



Cooked and cooled potatoes



Taro root



Whole or partly milled grains and seeds



You can also try probiotics alongside food sources of resistant starch



Lactose Consumption



7% of users have a score
lower than yours

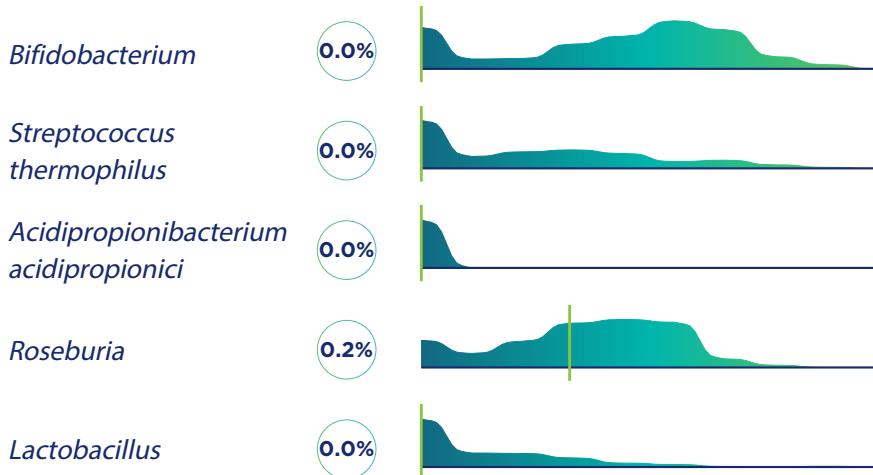
What does the score mean?

This score represents the levels of bacteria known to digest lactose. A high score means you have an increased number of lactose digesting microbes, giving you a chance to improve lactose intolerant annoyances.

Milk and dairy products are important sources of energy for humans, providing high-quality protein, fats, vitamins, and calcium. Milk is crucial in the early stages of human development and consuming it in proper amounts brings benefits to healthy adults. However, some individuals experience issues after consuming milk or dairy. Most of the time, lactose, the main carbohydrate from milk, is the key instigator behind these issues. Bacteria can help to consume it before it causes problems.

BACTERIAL ABUNDANCES

Potential to Promote Score





Lactose Consumption continued

How does this relate to you and your microbiome?

When lactose from milk or dairy products is not completely digested in the gut, some people can experience gastrointestinal symptoms like abdominal pain, flatulence, and even diarrhea. This is considered lactose intolerance.

How can some people drink milk without issue?

We know that after weaning off milk at infancy, at least 75% of the population gradually lose the ability to digest lactose. You may wonder, "Then why do some people still drink milk without experiencing any issues?" Here are some reasons why the gut microbiome may be the answer:

- Undigested lactose is taken and fermented by the gut microbiome to use it as an energy source.
- Certain probiotic strains have shown the potential to alleviate symptoms of lactose intolerance and improve lactose digestion.
- People with similar lactose-digesting capacity can have very different symptoms or none at all.
- Ingestion of lactose during long periods helps both the gut microbiome and the colon to respond and adapt better to its intake.

How can I take action?

Instead of avoiding or cutting out dairy or milk from your diet, current studies encourage restriction. Most individuals experiencing lactose intolerance can consume between 12g to 15g per day, with a 5 grams per dose limit. The idea is to minimize your dairy consumption while still reaping their nutritional benefits in small doses, rather than cutting out foods high in lactose. Additionally, there are some alternatives that you can try;



Consumption of **lactose reduced milk products** that are nutritionally identical to regular dairy products.



Use of **lactase capsules**, drops or tablets. They contain the enzyme lactase which breaks lactose into smaller sugars.



Consumption of **aged cheeses** or **fermented products**, like low-lactose yogurt or yogurt with added probiotics that contain low levels of lactose.



To replace calcium from milk, include other food sources, like **dark green leafy vegetables, dried beans and legumes**.



The use of certain **probiotics**, specifically, *Bifidobacterium animalis*.



Butyrate Production



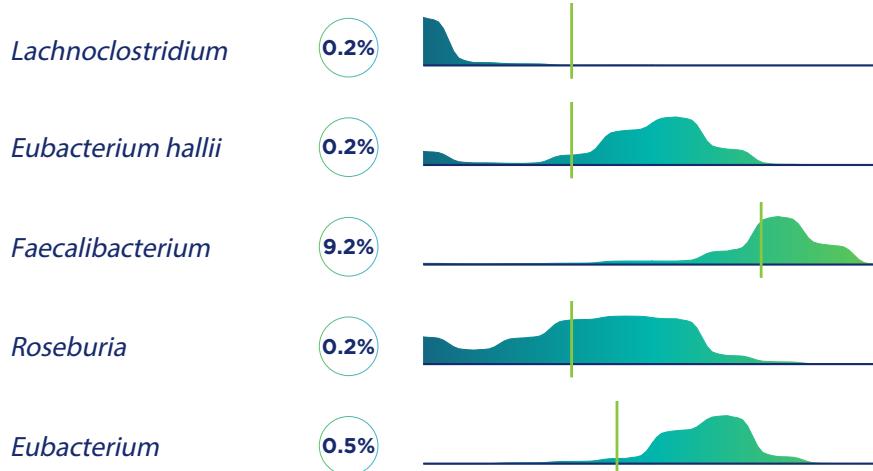
15% of users have a score lower than yours

What does the score mean?

This score represents the levels of bacteria known to produce butyrate, a type of Short-Chain Fatty Acid (SCFA). SCFAs are sub-products of bacterial fermentation of complex, non-digestible carbohydrates present in your diet. Bacteria obtain energy from fermentation, and SCFAs are derived from that process. These molecules are linked to several beneficial health outcomes, from preventing metabolic diseases (like obesity and insulin resistance) to increasing gut integrity, appetite reduction and reducing inflammation. A high score means you have greater levels of butyrate producing bacteria.

BACTERIAL ABUNDANCES

Potential to Promote Score





Butyrate Production continued

How does this relate to you and your microbiome?

Butyrate is one of the three main SCFAs produced by bacterial fermentation, along with Acetate and Propionate. They are produced from dietary fiber that is not digestible or absorbed in the small intestine. Not all gut bacteria can produce SCFAs, and some of them favor the production of certain SCFAs over others.

SCFAs, and in particular butyrate, provide many different beneficial effects on the gut and human health. For example, the cells in your gut lining receive their main source of energy from butyrate. These cells are crucial to the maintenance of your gut barrier integrity. Butyrate also reduces inflammatory responses in the gut and has protective potential against obesity and diabetes. All these effects come indirectly from the production of SCFAs from bacteria in your gut.

How can I take action?

Butyrate and SCFAs are derived from dietary fibers, therefore, by increasing your intake of foods rich in dietary fibers, you can increase your levels of Butyrate and other SCFAs.

In particular, your gut microbiome will produce more butyrate when you consume dietary fibers, especially foods high in resistant starch. Resistant starches are carbohydrates that cannot be digested by the human intestine, but bacteria are able to use it to obtain energy.



Good sources of resistant starches:

- Cooked and cooled potatoes
- Unripe bananas
- Legumes
- Oats



Added resistant starch can be found on:

- Breakfast cereals
- Tortillas
- Breads



Vitamin B Production



4% of users have a score lower than yours

What does the score mean?

This score represents your gut microbiome's potential to produce and synthesize B vitamins. Having a high score means your microbiome has a high number of microorganisms able to produce Vitamin B.

B vitamins are a group of eight different water-soluble compounds that are not synthetized by our bodies. One of the most well known roles of Vitamin B, specifically B12 (cobalamin), is its involvement in red blood cells production. However, they also have significant roles in both the generation of energy within cells and as intermediaries in the production of the building blocks of proteins, fat, and DNA. The B vitamins are:

B-1 (thiamine)	B-6 (pyridoxine)
B-2 (riboflavin)	B-7 (biotin)
B-3 (niacin)	B-9 (folic acid)
B-5 (pantothenic acid)	B-12 (cobalamin)

BACTERIAL ABUNDANCES

Potential to Promote Score

Bifidobacterium longum

0.0%



Faecalibacterium prausnitzii

9.2%



Lactobacillus coryniformis

0.0%



Bifidobacterium animalis

0.0%





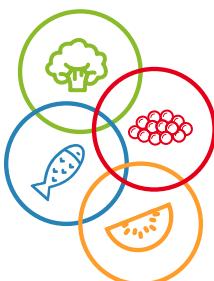
Vitamin B Production continued

How does this relate to you and your microbiome?

Vitamins are micronutrients, essential for our bodies to function normally. These micronutrients are synthesized primarily by plants, but bacteria and yeasts can also synthesize them. The major source of vitamins come from our diet. Dietary Vitamin B is mainly absorbed in the small intestine, while microbiome-derived Vitamin B is produced and absorbed in smaller quantities in the colon. The exception is Vitamin B12 (cobalamin), which is only synthesized by bacteria. Researchers believe that bacteria in the colon can act as both providers and consumers of Vitamin B.

How can I take action?

Intake of Vitamin B is associated with increased energy levels, maintaining eye and skin health, and supporting brain functions. Most of the Vitamin B availability comes from plant synthesis, with the sole exception of Vitamin B12 as mentioned previously. Good sources of Vitamin B compounds are:



B1 - Thiamine	Cereals (esp. whole grain), brown rice, green vegetables, potatoes, pasta, liver, pork, and eggs.
B2 - Riboflavin	Dairy products, leafy vegetables, legumes, liver, kidneys, yeast, and mushrooms
B3 - Niacin	Meat, fish, whole grain cereal, legumes, mushrooms, and nuts
B5 - Pantothenic acid	Liver, cereals, Shiitake mushrooms, chicken, tuna, avocados and milk
B6 - Pyridoxine	Meat, fish, legumes, nuts, bananas, and potatoes
B7 - Biotin	Eggs, liver, pork, and leafy vegetables
B9 - Folic acid/folate	Leafy vegetables, legumes, and citrus fruits
B12 - Cobalamins	Meat, fish and other animal products

Dietary reference values for the intake of vitamins B varies according to each compound. If you have an interest in those values, you can check them out in the recommended dietary allowances and adequate intakes for vitamins from the Food and Nutrition Board, Institute of Medicine, National Academies.



Vitamin K Production



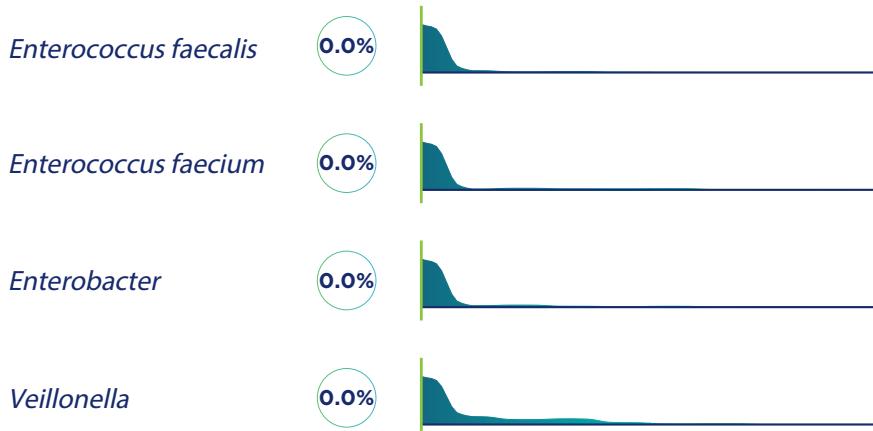
55% of users have a score lower than yours

What does the score mean?

This score represents your gut microbiome's potential to produce and synthesize Vitamin K2. Having a high score means your microbiome has a higher number of microorganisms able to produce Vitamin K2, a fat-soluble vitamin involved in protecting against cardiovascular diseases, bone development, improvements in chronic kidney disease, and treatments of certain cancers.

BACTERIAL ABUNDANCES

Potential to Promote Score





Vitamin K Production continued

How does this relate to you and your microbiome?

Vitamins are essential nutrients necessary for our health, given our inability to produce most of them. Vitamin K is a fat-soluble vitamin where bacteria naturally produce its K2 form in our gut. Most of our body requirements of Vitamin K, specifically K1, are satisfied from our diet. Nonetheless, researchers have established that gut microbes meet at least some of our bodies' requirements for Vitamin K.

How can I take action?

Ranges of Vitamin K daily intake have been established based on the consumption of healthy population groups and presented as estimated values. Recommendations range from 90 micrograms to 120 micrograms per day for females and males, respectively. Most of the Vitamin K2 availability comes from bacterial synthesis. By consequence, it's found in fermented dairy products and fermented vegetables. Good sources of vitamin K2 are:



Cheese (soft and hard)



Sauerkraut



Sour and buttermilk



Nattō (fermented soybeans)



Propionate Production



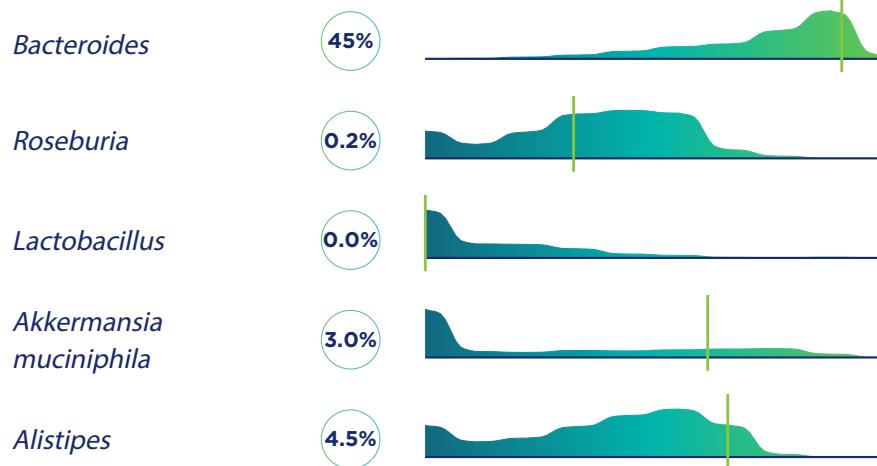
31% of users have a score lower than yours

What does the score mean?

This score represents the levels of bacteria known to produce propionate. A high score means you have greater levels of propionate producing bacteria. Propionate is one of the three most common Short-Chain Fatty Acids (SCFAs). SCFAs result from the bacterial fermentation of complex, non-digestible carbohydrates present in dietary fiber. As the name implies, they are a type of fatty acids and a source of energy to our cells. SCFAs provide several beneficial health outcomes. These range from preventing metabolic diseases (like obesity and insulin resistance), maintaining gut integrity, increase satiety (your body's state of feeling full after eating), and reducing inflammation in the gut.

BACTERIAL ABUNDANCES

Potential to Promote Score





Propionate Production continued

How does this relate to you and your microbiome?

Propionate, like Acetate and Butyrate —other two well known SCFAs, is produced by bacterial fermentation of dietary fiber that is not digestible or absorbed by the small intestine. Not all gut bacteria can produce SCFAs, and some of them prefer the production of certain SCFAs over others.

There are specific benefits to your gut from propionate. For example, propionate induces sugar production by intestinal cells, which protects against obesity and diabetes. One of the most researched beneficial effects of propionate in recent years is its ability to increase satiety.

How can I take action?

Propionate and SCFAs derive from dietary fiber. To increase propionate production by your gut microbes, you can increase the sources of fiber you eat. The production of propionate by the gut microbiome is satisfied by consuming dietary fiber and prebiotic compounds found in supplements, like Inulin or Arabinoxylan. Good sources of fiber:



Cooked, then cooled potatoes



Legumes



Raw Bananas



Oats



Anti-Inflammatory Bacteria



44% of users have a score lower than yours

What does the score mean?

This score represents your microbiome's ability to help reduce inflammation, and its consequences, on your gut and body. Gut microbes can help your body combat inflammation through different methods. A high score represents a boost in your microbiome's ability to produce specific molecules (like butyrate and propionate) with anti-inflammatory properties.

BACTERIAL ABUNDANCES

Potential to Promote Score

Clostridium sporogenes 0.0%



Ruminococcus gnavus 0.0%



Potential to Reduce Score

Listeria monocytogenes 0.0%



Escherichia coli 0.0%



Salmonella enterica 0.0%



Clostridioides difficile 0.0%



Staphylococcus aureus 0.0%





Anti-Inflammatory Bacteria continued

How does this relate to you and your microbiome?

The gut microbiome has a vital role in the production of anti-inflammatory molecules. Two well-known bacterial by-products of fermentation, butyrate and propionate, have anti-inflammatory properties. Butyrate and propionate have a critical role in maintaining a healthy gut barrier. Butyrate, specifically, is the main source of energy for your gut lining cells. In conjunction with propionate, it increases the gut barrier function by protecting us from unwanted microorganisms and potentially toxic molecules.

Your gut may host several microorganisms with the capacity to produce butyrate and propionate. Remember that these molecules derive from bacteria's ability to break down certain types of non-digestible carbohydrates, primarily fibers. A diet rich in fiber can help you boost these bacteria and the levels of anti-inflammatory molecules.

How can I take action?

If you want to increase or maintain your level of anti-inflammatory molecule-producing bacteria, try the following:



Increase fiber intake by eating a variety of fruits and vegetables.



Try **prebiotics** or **probiotics**



Exercise regularly. Moderate exercise activity for at least 20 minutes or more weekly has shown to improve anti-inflammatory levels of SCFAs.



BCAAs Production



3% of users have a score lower than yours

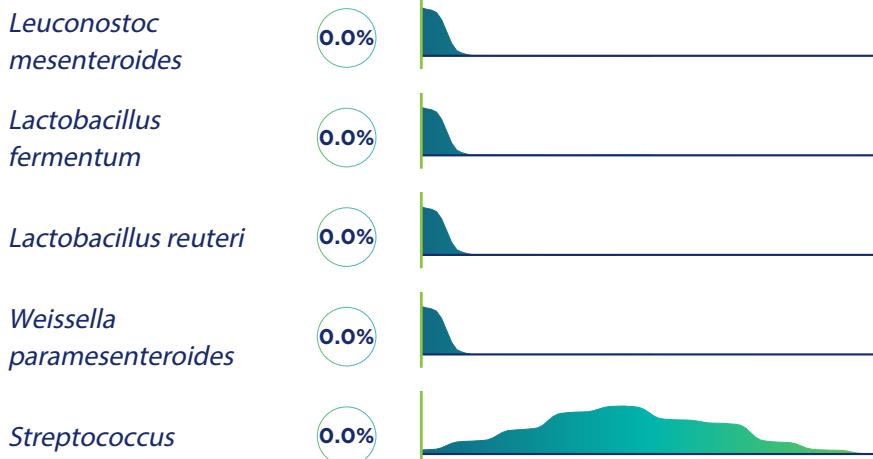
What does the score mean?

This score represents your gut microbiome's potential to produce certain amino acids called branched-chain amino acids (BCAAs). A high score means you have an increased number of bacteria able to produce these BCAAs.

Amino acids are the building blocks of protein. However, because our bodies are incapable of producing nine of the twenty different ones, these nine amino acids are considered "essential," and we need to obtain them from certain foods. Of these nine, three have a branched structure: leucine (Leu), isoleucine (Ile), and valine (Val).

BACTERIAL ABUNDANCES

Potential to Promote Score





BCAAs Production continued

How does this relate to you and your microbiome?

We can obtain BCAAs from food, but we can also receive them from our gut microbiome. Bacteria in our gut are capable of synthesizing BCAAs. These amino acids are important nutrients that contribute to protein synthesis, support our innate immunity functions, and are critical to the intestinal barrier function.

These branched amino acids are low in the blood of vegetarians, which may be linked to their lower dietary intake of BCAAs and changes in their gut microbiota that degrade these compounds.

Interestingly, elevated blood levels of BCAAs are associated with certain metabolic disorders like obesity and diabetes. Researchers suggest that this may be linked to an unbalanced gut microbiome, enriched in bacteria that produce BCAAs or lower BCAAs uptake capacity.

How can I take action?

A balanced gut microbiome is crucial to have good and healthy levels of BCAAs by keeping the BCAAs' metabolism regulated. There are many factors that can shape your gut microbiome. If you want to improve your gut microbiome health, you can try to:



Increase your fiber intake by eating a variety of fruits and vegetables.



Add prebiotics (like oligosaccharide or inulin) **or probiotics** (like *Bifidobacterium* and *Lactobacillus*) to your diet. You can find both commercial supplements or additives in your foods.



Avoid unnecessary use of **antibiotics**.



Exercise regularly.

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