GUT MICROBIOME REPORT

Name: Sample Report

POWERED BY:
HEALTH EXCHANGE

BugSpeaks®
Powered by Leucine Rich Bio

Welcome

This is your BugSpeaks® report.

Future reference to this report can be made using the Report ID#I19PHDGMP474.

With this report, our endeavor is to provide you with an evidence-based interpretation of your gut microbiome data, with the hope that it will guide you to better understand your health and make necessary changes to your lifestyle to lead a healthier life.

We have categorized the report into following 4 sections

Please note:
1. This is not a diagnostic report and should be interpreted or used exclusively by or under the guidance of a practitioner, including but not limited to, certified physicians, clinicians, dietitians, nutritionists, sports therapists and such other persons in similar profession having appropriate validation to undertake such practice. (Please See Disclaimers).
2. Establishment of gut microbiome is quantitatively and functionally influenced by your diet and nutrition, and it is highly dynamic. Hence, we recommend you to undergo retesting of your gut every 3 months and renew your recommendations.

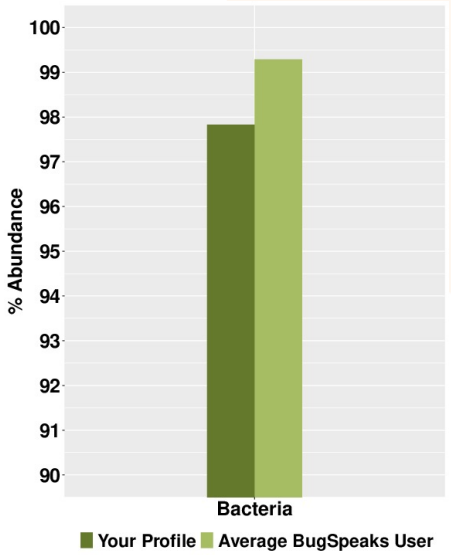
We thank you for choosing BugSpeaks®

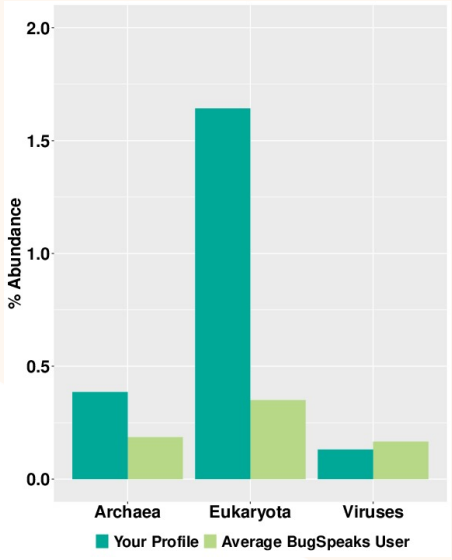
Your Gut Microbiome Index (GMI)

The GMI is a cumulative measure of

- Composition - Different species identified
- Abundance - Quantity of the species identified
- Diversity - How diverse are the identified species

Composition of gut microbiome is defined by 4 major groups of microorganisms - Bacteria, Archaea, Virus and Eukaryota (Fungi, Protozoa and Metazoa). Below is a representation highlighting these 4 groups, its corresponding abundance and what it means to you, in context of gut microbiome.

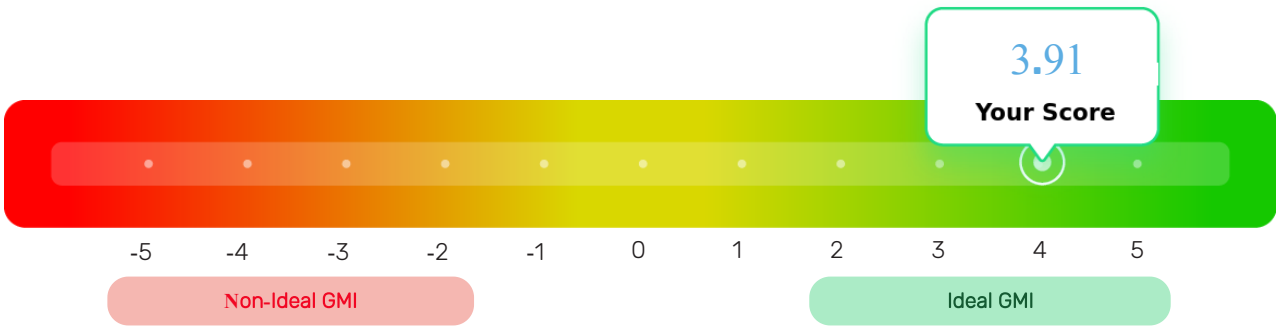




Taxa	Abd/Ratio	Tag
Bacteroidetes	44.87%	Ideal
Firmicutes	44.08%	
Bacteroidetes-to-Firmicutes Ratio	1.01	
Total Probioitic Abundance	2.90%	Ideal

Taxa	Abd/Ratio	Tag
Actinobacteria	1.82%	Non-Ideal
Proteobacteria	5.26%	
Actinobacteria-to-Proteobacteria Ratio	0.34	
Tota Pathogen Abundance	1.20%	Ideal

If the composition & abundance of these groups change, it can result in low or loss of microbial diversity. This in turn is the most common reason of intestinal dysbiosis (disruption in the balance of microorganisms) and hence associated with many human diseases. To represent this cumulative shift, as an indication of your overall gut health, we have generated the following GMI spectrum of the gut microbiome, and where you stand.



Pathogen Characterization

BugSpeaks® identifies and characterizes many pathogens commonly known to cause gut infections and issues. These pathogens are reported with "% abundances", along with "indicative tags", which can be interpreted as described below

●	Absent	Do not Worry
●	Low	Follow Recommendations
●	Moderately High	Follow Recommendations. If any symptoms persist, consult a doctor
●	High	Consult a doctor

Species	Abd	Tag
Bacteroides fragilis	0.27%	●
Haemophilus parainfluenzae	0.16%	●
Clostridioides difficile	0.13%	●
Klebsiella pneumoniae	0.12%	●
Clostridium botulinum	0.10%	●
Bacillus cereus	0.09%	●
Bilophila wadsworthia	0.09%	●
Escherichia coli	0.07%	●
Mycobacterium tuberculosis	0.07%	●
Helicobacter pylori	0.05%	●
Streptococcus agalactiae	0.04%	●
Fusobacterium nucleatum	0.04%	●
Porphyromonas gingivalis	0.04%	●
Enterococcus faecium	0.04%	●
Enterococcus faecalis	0.03%	●
Clostridium perfringens	0.03%	●
Clostridium butyricum	0.03%	●
Streptococcus pneumoniae	0.02%	●
Staphylococcus epidermidis	0.02%	●
Campylobacter jejuni	0.02%	●
Leptospira interrogans	0.02%	●

Species	Abd	Tag
Staphylococcus aureus	0.02%	●
Clostridium tetani	0.01%	●
Francisella tularensis	0.01%	●
Leptospira noguchii	0.01%	●
Listeria monocytogenes	0.01%	●
Vibrio cholerae	0.01%	●
Leptospira weilii	0.01%	●
Ehrlichia canis	0%	●
Haemophilus influenzae	0%	●
Yersinia enterocolitica	0%	●
Bacillus anthracis	0%	●
Chlamydia pneumoniae	0%	●
Corynebacterium diphtheriae	0%	●
Legionella pneumophila	0%	●
Leptospira santarosai	0%	●
Neisseria meningitidis	0%	●
Proteus mirabilis	0%	●
Ureaplasma urealyticum	0%	●
Yersinia pestis	0%	●
Bordetella pertussis	0%	●
Citrobacter rodentium	0%	●

Disclaimers:

- This is not a diagnostic report. This is not a microbiology (culture based) report.
- We quantify these pathogens using sequencing-based method, and hence represent quantity only as "% abundances" of these pathogens. Also, the "indicative tags" does not represent standard scientific notation such as colony forming units per gram of stool (CFU/g).
- Moderately High or High tags for any pathogen does not mean you have the disease or have symptoms. Many factors, including the overall health status of the individual, the transient nature of some pathogens, and the presence and expression of its virulence (disease causing) factors all contribute to an individual's disease.

Disease Risk

Based on your current microbiome profile, you are susceptible to some diseases summarized in the table below.

Low Risk	Moderate Risk	High Risk
Non-Alcoholic Fatty Liver Disease	Irritable Bowel Syndrome	
Clostridium Difficile Infection	Depression	
	Inflammatory Bowel Disease	
	Colorectal Neoplasm	
	Constipation	
	Atherosclerosis	
	Crohns Disease	
	Chronic Kidney Disease	
	Diabetes Mellitus Type 2	
	Anxiety	
	Ulcerative Colitis	
	Obesity	
	Hypertension	
	Rheumatoid Arthritis	

Please note:

- These "Disease Risks" are an algorithm based output. This does not predict or diagnose any disease. Please consult a doctor or a physician.
- Each of these identified health conditions have been given a brief description below, to provide you with a basic understanding of associations between the gut microbiome and these diseases.

Disease Description

Non-Alcoholic Fatty Liver Disease

Low Risk

Microbiota promote the absorption of monosaccharides from the gut, thereby triggering lipogenesis in the liver. Dysbiosis is associated with reduced synthesis and secretion of fasting-induced adipocyte factor a powerful metabolism and adiposity regulator belonging to the angiopoietin-like protein family in enterocytes, which results in increased activity of lipoprotein lipase (LPL), responsible for the secretion of triglycerides (TG) from very low-density lipoprotein, eventually resulting in the augmented uptake of fatty acids and accumulation of TG in the adipocytes and leading to NAFLD.

Clostridium Difficile Infection

Low Risk

A dysbiotic microbiota can result in the loss of colonization resistance due to changes in the structural and/or metabolic environment. The loss of specific community members potentially affects the levels of microbial and host-generated metabolites, resulting in a different functional state that promotes spore germination and vegetative outgrowth. A dysbiotic microbiota may also result in an imbalanced immune response through the loss of immune regulation and a proinflammatory state, both of which may affect disease development. Toxin production by vegetative C. difficile can stimulate the production of inflammatory cytokines, neutrophils, and antitoxin antibodies.

Irritable Bowel Syndrome

Moderate Risk

The gut microbiota is important in the development and regulation of intestinal immunity. The intestinal immune system interacts with the gut microbiota and helps in maintaining normal gastrointestinal functions, and any alteration in gut microbiota may be associated with activation of mucosal immunity and cause inflammation. Intestinal infection with pathogenic bacteria results in a transient disruption of the resident gut microbiota which is a risk factor for IBS. Release of these inflammatory mediators are known to cause irritable bowel syndrome.

Depression

Moderate Risk

Depression is a syndrome (a group of symptoms) characterized by sad or irritable mood exceeding normal sadness or grief, both in its intensity and duration. On one end, specific gut microbes (like Blautia, Clostridium, Klebsiella etc.) are known to be higher in individuals with depression, which increase inflammation causing biochemicals that cause depression. On the other end, certain beneficial microbes (like Lactobacillus rhamnosus, Bifidobacterium breve etc.) are known to increase serotonin activity, and decrease norepinephrine and dopamine activities, overall reducing symptoms of depression.

Disease Description

Inflammatory Bowel Disease

Moderate Risk

The abundant bacteria in the gut needs complex polysaccharides to survive, which if absent in your gut, starts eating the mucus layer shielding the colon lining which leads to many opportunistic infections aided by Roseburia and Actinobacteria, which will further activate several enteric pathogens and triggers inflammatory pathways and causes inflammation in walls of gastrointestinal tract.

Colorectal Neoplasm

Moderate Risk

Gut bacteria like Escherichia coli, Bacteroides fragilis Enterococcus etc., produces toxins that are reported to be involved in the development of cancers. Specifically, these toxins are called enterotoxigenic (in simpler terms - toxic to genes), which means these toxins can directly damage the DNA resulting in activation of uncontrollable cell proliferation, which eventually leads to cancer.

Constipation

Moderate Risk

There are two important luminal (gut) factors, modulated by the gut microbiota, which maintains smooth muscle contraction and balanced bowel movements. The factors include short chain fatty acids (SCFAs) and bile acids. The absence of SCFAs due to low-fiber diet inhibit mucin secretion by intestinal goblet cells, reduce stool volume by stimulating water and electrolyte absorption, and inhibit smooth muscle contraction in the colon, causing imbalanced bowel movements/constipation.

Atherosclerosis

Moderate Risk

Trimethylamine-N-oxide (TMAO) is a product of microbial-human co-metabolic pathway, which is derived from dietary (food based) choline and carnitine and converted to trimethylamine (TMA) by anaerobic bacteria residing within the lumen of the gut. TMA is then oxidized by a liver enzyme to TMAO. This TMAO is known to be a pro-atherogenic compound, which is directly implicated in the development of plaques inside the arteries. A dysbiosis in the intestinal microbiota, resulting in increased anaerobic bacteria, is thought to contribute to the chronic inflammatory state, production of TMAO and eventually atherosclerosis.

Disease Description

Crohns Disease

Moderate Risk

Increased abundance of Enterobacteriaceae activates other enteric pathogens that trigger a set of inflammatory pathways, causing irritation of your gut. For instance, Sulfate reducing bacteria inflame the lining of the gut, while Clostridium and certain fungi trigger the factors that decrease anti-inflammatory bacteria (Lactobacillus, Faecalibacterium), cumulatively triggering or inducing to Crohn's disease.

Chronic Kidney Disease

Moderate Risk

Delivery of undigested protein to the colon results in the proliferation of proteolytic bacteria. These bacteria ferment proteins and amino acids to generate potential uremic toxins, including p-cresol, indoxyl sulfate and trimethylamine N-oxide. Impaired gut barrier function allows translocation of uremic toxin into systemic circulation. This contributes to chronic kidney disease (CKD) progression.

Diabetes Mellitus Type 2

Moderate Risk

Diabetes mellitus is associated with chronic (slow developing) low-grade inflammation, and gut microbes have been shown to contribute to this. Lipopolysaccharides (LPS), which are components of the cell walls of Gramnegative bacteria, play a key role in the development of such chronic inflammation, resulting insulin resistance in fat, liver and muscle cells, eventually leading to Diabetes Mellitus Type 2.

Anxiety

Moderate Risk

It is defined as intense, excessive and persistent worry and fear about everyday situations. Anxiety is mostly induced by stress that triggers immune cells to produce biochemicals (like Interleukin-6) that cause symptoms of anxiety. Several gut microorganisms, like species of Bifidobacterium and other belonging to group of Bacteroides, release tryptophan, a precursor of neurotransmitter serotonin and Bacillus, Enterococcus species produce norepinephrine, and dopamine. All these three biochemicals together reduce the symptoms of anxiety by increasing the action of a brain chemical called gamma-aminobutyric acid (GABA). Hence, gut microbiome has emerged as a key factor to manage anxiety.

Disease Description

Ulcerative Colitis

Moderate Risk

Bifidobacterium and Lactobacillus maintains the gut mucosal integrity through the expression of many tight junction encoding genes (connections that bridge and hold the cells). Reduction of Bifidobacterium results in marked reduction in the tight junction expression, in turn reducing the gut integrity. Parallelly, increased abundance of E. coli activates bacterial TLR2 ligands and other downstream signaling, contributing to colitis pathology.

Obesity

Moderate Risk

Fermentation of polysaccharides by gut microbes results in the production of short chain fatty acids (butyrate, propionate, acetate), carbon dioxide (CO2), and hydrogen (H2). Butyrate is an important energy substrate for the colonic epithelium. Acetate and propionate can be taken up by the liver and used as substrates for lipogenesis and gluconeogenesis. This result in increased availability of calories and adiposity to the host leading to obesity

Hypertension

Moderate Risk

The fermentation of dietary fiber by gut microbiota generates short-chain fatty acids (SCFAs) like acetate, propionate, and butyrate. Butyrate is used by colonocytes (cells of the colon) to maintain the intestinal barrier and decrease local inflammation, while small amounts are transported with acetate and propionate to the liver through the portal vein. Most of the propionate is metabolized by the hepatocytes (liver cells), whereas acetate and remaining proportions of propionate and butyrate are released into the systemic circulation, they can reach organs involved in the regulation of blood pressure and help to maintain or reduce the blood pressure.

Rheumatoid Arthritis

Moderate Risk

The human gut microbiota and their metabolites can regulate immune cells and cytokines via epigenetic modifications. For example, short-chain fatty acids (SCFAs) produced by gut microbiota promote the differentiation of natural T cell into Treg cells by suppressing histone deacetylases (HDACs). Thus, resulting bacterial metabolites cause aberrant immune responses via epigenetic modifications, leading to Rheumatoid arthritis.

Dietary Recommendations

Our approach to restore the gut balance is based on a three stage strategy:

Phase 1

Restoring your gut microbiome - 2 Weeks

Involves restoration or resetting of your gut microbiome, where we minimize the composition and abundance of pathogenic or opportunistic microorganisms, to create a gut environment ideal for beneficial microorganisms to grow in Phase 2. This phase requires strict changes in your diet for a short period of time and supplementation with anti-inflammatory foods, natural antibiotics, and through restriction of selected inflammatory foods.

Phase 2

Rebuilding your microbiome - 8 Weeks

Involves rebuilding of your healthy gut microbiome, through re-inoculation and replacement with mostly beneficial microorganisms. We achieve this through incorporation of prebiotics and probiotics, via natural dietary sources and commercially available supplements. This lasts for up to 10th week of your diet plan (a total of 8 weeks), which ensure the complete restoration of your gut microbiota.

Phase 3

Maintaining the healthy gut - 2 Weeks

Largely involves a streamlined method for sustaining the healthy gut microbiome built during phase 2. These dietary, prebiotic and probiotic recommendations can be adopted for long term sustenance, spanning up to 2 weeks of your diet plan.

All 3 phases have a total of 6 food categories, each containing a list of foods and a frequency tag. We have used a total of 4 frequency tags that indicates how frequently you can include a specific food in your meal plan.

Frequent	can be consumed everyday [in 1 meal/day]
Moderate	can be consumed every alternate day [in 1 meal/2 days]
Low	can be consumed once in 3 days [in 1 meal/3 days]
Avoid	Avoid the consumption as much as possible

Please note:

These recommendations are largely beneficial, with no or minimal negative impact on your health. Even though these dietary charts are evidence based recommendations, we would strongly suggest you to consult a physician/nutritionist, before implementing these in your lifestyle. This is specifically true about the extent of inclusion and exclusion of a specific food and for individuals who are either diabetic, hypertensive and/or having special dietary needs.

Establishment of gut microbiome is quantitatively and functionally influenced by your diet and nutrition, and it is highly dynamic. Hence, we strongly recommend your to undergo retesting of your gut every 3 months and renew your recommendations.

• Phase 1

Greens & Vegetables

Broad Beans	Frequent	Pak Choi Leaves	Moderate
Leeks	Frequent	Parsnips	Moderate
Onion	Frequent	Peanuts	Moderate
Water chestnuts	Frequent	Peas	Moderate
Beans	Moderate	Pigeon Peas	Moderate
Beet Greens	Moderate	Potato	Moderate
Beet Root	Moderate	Pumpkin	Moderate
Bellpeppers	Moderate	Radish	Moderate
Broccoli	Moderate	Ricebean	Moderate
Carrot	Moderate	Soya Bean	Moderate
Celery	Moderate	Swede	Moderate
Chickpeas	Moderate	Tomato	Moderate
Cluster Beans	Moderate	Turnips	Moderate
Coccinia Grandis	Moderate	Zucchini	Moderate
Cowpea	Moderate	Brussels Sprouts	Low
Cucumber	Moderate	Cabbage	Low
Dandelion Greens	Moderate	Cauliflower	Low
Fennel	Moderate	Eggplant	Low
French Beans	Moderate	Jalapeno	Low
Garden Cress	Moderate	Mushrooms	Low
Lemon Grass	Moderate	Sweet corn	Low
Lettuce	Moderate	Sweet potato	Low
Okra	Moderate	Yam	Avoid

• Phase 1

Cereals, Herbs & Condiments

Almond	Frequent	Nutmeg	Moderate
Artichokes	Frequent	Oats	Moderate
Asparagus	Frequent	Parsley	Moderate
Cloves	Frequent	Pepper	Moderate
Fish Oil	Frequent	Peppermint	Moderate
Garlic	Frequent	Pippali	Moderate
Ginger	Frequent	Poppy Seeds	Moderate
Olive oil	Frequent	Quinoa	Moderate
Barley	Moderate	Red chilli flakes	Moderate
Basil	Moderate	Rice Bran Oil	Moderate
Buckwheat	Moderate	Rosemary	Moderate
Bulgur	Moderate	Soyabean Oil	Moderate
Capers	Moderate	Thyme	Moderate
Carom seeds	Moderate	Triticale	Moderate
Cashew Nut	Moderate	Vanilla Extract	Moderate
Coconut Oil	Moderate	Vegetable Oil	Moderate
Cumin Seeds	Moderate	Walnut	Moderate
Dates	Moderate	Semolina	Low
Honey	Moderate	Spelt	Low
Horseradish	Moderate	Sunflower Oil	Low
Mace	Moderate	Teff	Low
Maize	Moderate	Vinegar	Low
Mango Ginger	Moderate	Wild Rice	Low

• Phase 1

Fruits

Apple	Frequent	Cranberry	Moderate
Bananas	Frequent	Loganberries	Moderate
Grapes	Frequent	Mango	Moderate
Kiwifruit	Frequent	Melons	Moderate
Lemon	Frequent	Mulberries	Moderate
Papaya	Frequent	Muskmelon	Moderate
Pineapple	Frequent	Orange	Moderate
WaterMelon	Frequent	Peach	Moderate
Apricot	Moderate	Pear	Moderate
Avocado	Moderate	Plum	Moderate
Black Berry	Moderate	Pomegranate	Moderate
Cherries	Moderate	Strawberry	Moderate

Egg & Meat

Bacon	Avoid	Lobster	Avoid
Beef	Avoid	Mollusks	Avoid
Cat Fish	Avoid	Pork	Avoid
Catla	Avoid	Prawns	Avoid
Chicken	Avoid	Rohu	Avoid
Crab	Avoid	Salmon	Avoid
Egg	Avoid	Sardine	Avoid
Goat	Avoid	Tuna	Avoid
Lamb	Avoid	Turkey	Avoid

• Phase 1

Milk & Fermented Products

Brined Olives	Avoid	Kombucha	Avoid
Butter milk	Avoid	Sauerkraut	Avoid
Cheese	Avoid	Skim milk	Avoid
Kefir	Avoid	Tofu	Avoid
Kimchi	Avoid	Yogurt	Avoid

Processed Foods

Burger	Avoid	Noodle	Avoid
Cake	Avoid	Pancakes	Avoid
Chocolate	Avoid	Pasta	Avoid
Cinnamon Buns	Avoid	Pastry	Avoid
Cookies	Avoid	Pizza	Avoid
Crackers	Avoid	Rolls	Avoid
French Toast	Avoid	Sandwich	Avoid
Garlic Bread	Avoid	Subway	Avoid
Ice Cream	Avoid	Taco	Avoid

Drinks & Beverages

Red wine	Low	Distilled Alcoholic Beverages	Avoid
Soy milk	Low	Lemonade	Avoid
Beer	Avoid	Malt Beverage	Avoid
Carbonated Beverages	Avoid	Milk Shakes	Avoid

Phase 2

Greens & Vegetables

Broad Beans	Frequent	Pak Choi Leaves	Moderate
Leeks	Frequent	Parsnips	Moderate
Onion	Frequent	Peanuts	Moderate
Water chestnuts	Frequent	Peas	Moderate
Beans	Moderate	Pigeon Peas	Moderate
Beet Greens	Moderate	Potato	Moderate
Beet Root	Moderate	Pumpkin	Moderate
Bellpeppers	Moderate	Radish	Moderate
Broccoli	Moderate	Ricebean	Moderate
Carrot	Moderate	Soya Bean	Moderate
Celery	Moderate	Swede	Moderate
Chickpeas	Moderate	Tomato	Moderate
Cluster Beans	Moderate	Turnips	Moderate
Coccinia Grandis	Moderate	Zucchini	Moderate
Cowpea	Moderate	Brussels Sprouts	Low
Cucumber	Moderate	Cabbage	Low
Dandelion Greens	Moderate	Cauliflower	Low
Fennel	Moderate	Eggplant	Low
French Beans	Moderate	Jalapeno	Low
Garden Cress	Moderate	Mushrooms	Low
Lemon Grass	Moderate	Sweet corn	Low
Lettuce	Moderate	Sweet potato	Low
Okra	Moderate	Yam	Avoid

Phase 2

Cereals, Herbs & Condiments

Almond	Frequent	Nutmeg	Moderate
Artichokes	Frequent	Oats	Moderate
Asparagus	Frequent	Parsley	Moderate
Cloves	Frequent	Pepper	Moderate
Fish Oil	Frequent	Peppermint	Moderate
Garlic	Frequent	Pippali	Moderate
Ginger	Frequent	Poppy Seeds	Moderate
Olive oil	Frequent	Quinoa	Moderate
Barley	Moderate	Red chilli flakes	Moderate
Basil	Moderate	Rice Bran Oil	Moderate
Buckwheat	Moderate	Rosemary	Moderate
Bulgur	Moderate	Soyabean Oil	Moderate
Capers	Moderate	Thyme	Moderate
Carom seeds	Moderate	Triticale	Moderate
Cashew Nut	Moderate	Vanilla Extract	Moderate
Coconut Oil	Moderate	Vegetable Oil	Moderate
Cumin Seeds	Moderate	Walnut	Moderate
Dates	Moderate	Semolina	Low
Honey	Moderate	Spelt	Low
Horseradish	Moderate	Sunflower Oil	Low
Mace	Moderate	Teff	Low
Maize	Moderate	Vinegar	Low
Mango Ginger	Moderate	Wild Rice	Low

Phase 2

Fruits

Apple	Frequent	Cherries	Moderate
Bananas	Frequent	Cranberry	Moderate
Grapes	Frequent	Loganberries	Moderate
Kiwifruit	Frequent	Mango	Moderate
Lemon	Frequent	Melons	Moderate
papaya	Frequent	Mulberries	Moderate
Pineapple	Frequent	Muskmelon	Moderate
Pomegranate	Frequent	Orange	Moderate
WaterMelon	Frequent	Peach	Moderate
Apricot	Moderate	Pear	Moderate
Avocado	Moderate	Plum	Moderate
Black Berry	Moderate	Strawberry	Moderate

Egg & Meat

Cat Fish	Low	Bacon	Avoid
Catla	Low	Beef	Avoid
Crab	Low	Chicken	Avoid
Egg	Low	Goat	Avoid
Prawns	Low	Lamb	Avoid
Rohu	Low	Lobster	Avoid
Salmon	Low	Mollusks	Avoid
Sardine	Low	Pork	Avoid
Tuna	Low	Turkey	Avoid

Phase 2

Milk & Fermented Products

Yogurt	Frequent	Kimchi	Moderate
Brined Olives	Moderate	Kombucha	Moderate
Butter milk	Moderate	Sauerkraut	Moderate
Cheese	Moderate	Skim milk	Moderate
Kefir	Moderate	Tofu	Moderate

Processed Foods

Burger	Avoid	Noodle	Avoid
Cake	Avoid	Pancakes	Avoid
Chocolate	Avoid	Pasta	Avoid
Cinnamon Buns	Avoid	Pastry	Avoid
Cookies	Avoid	Pizza	Avoid
Crackers	Avoid	Rolls	Avoid
French Toast	Avoid	Sandwich	Avoid
Garlic Bread	Avoid	Subway	Avoid
Ice Cream	Avoid	Taco	Avoid

Drinks & Beverages

Beer	Low	Carbonated Beverages	Avoid
Lemonade	Low	Distilled Alcoholic Beverages	Avoid
Red wine	Low	Malt Beverage	Avoid
Soy milk	Low	Milk Shakes	Avoid

Phase 2

Supplements

Probiotics

Probiotics are a set of beneficial microorganisms that help you metabolize the food you eat and have significantly positive impact on your overall gut health. Consuming foods or supplements rich in these probiotics will aid in restoring and maintaining a healthy gut in the long run. Below we have listed of probiotics species along with one example of its natural source.

Bifidobacterium infantis	Yogurt	Bifidobacterium animalis	Fermented dairy products
Lactobacillus acidophilus	Fermented milk	Lactobacillus reuteri	Kefir
Lactobacillus fermentum	Fruits	Lactobacillus helveticus	Italian Cheeses
Lactobacillus paracasei	Butter milk	Lactobacillus rhamnosus	Butter milk
Bifidobacterium bifidum	Cheese	Enterococcus durans	Kefir
Bifidobacterium breve	Fermented Vegetables	Lactobacillus casei	Fermented milk
Lactobacillus gasseri	Kimchi	Lactobacillus delbrueckii	Greek yogurt
Bacillus coagulans	Yogurt	Lactobacillus pentosus	Fermented dairy
Lactobacillus johnsonii	Fermented Vegetables	Leuconostoc mesenteroides	Sauerkraut

Also, these supplements are available for purchase through online retailers. Example of a probiotic supplement include Ultra-30.

Prebiotics

PREBIOTICS are a special form of dietary fibers that act as fertilizers for the probiotics in your gut (listed above). Below we have listed a set of probiotics species along with one example of its natural source.

Isomalto-oligosaccharides	Honey	Hemicellulosic oligosaccahride	Garlic
Arabinoxylan oligosaccharides	Cluster beans	Inulin	Onions
Dextran	Artichokes	Lactulose	Oats
Fructo-oligosaccharides	Sugar cane	Mannose and Galactose	Yogurt
Galacto-oligosaccharides	Bamboo shoots	Resistant starch	Rice bran

Also, these supplements are available for purchase through online retailers. Example of a Prebiotic supplement include Prebiotin - a natural fiber to promote colon and gut health.

Phase 3

Greens & Vegetables

Broad Beans	Frequent	Jalapeno	Moderate
Leeks	Frequent	Lemon Grass	Moderate
Onion	Frequent	Lettuce	Moderate
Beans	Moderate	Mushrooms	Moderate
Beet Greens	Moderate	Okra	Moderate
Beet Root	Moderate	Pak Choi Leaves	Moderate
Bellpeppers	Moderate	Parsnips	Moderate
Broccoli	Moderate	Peanuts	Moderate
Brussels Sprouts	Moderate	Peas	Moderate
Cabbage	Moderate	Pigeon Peas	Moderate
Carrot	Moderate	Potato	Moderate
Cauliflower	Moderate	Pumpkin	Moderate
Celery	Moderate	Radish	Moderate
Chickpeas	Moderate	Ricebean	Moderate
Cluster Beans	Moderate	Soya Bean	Moderate
Coccinia Grandis	Moderate	Swede	Moderate
Cowpea	Moderate	Tomato	Moderate
Cucumber	Moderate	Turnips	Moderate
Dandelion Greens	Moderate	Water chestnuts	Moderate
Eggplant	Moderate	Yam	Moderate
Fennel	Moderate	Zucchini	Moderate
French Beans	Moderate	Sweet corn	Low
Garden Cress	Moderate	Sweet potato	Low

Phase 3

Cereals, Herbs & Condiments

Almond	Frequent	Nutmeg	Moderate
Artichokes	Frequent	Oats	Moderate
Asparagus	Frequent	Parsley	Moderate
Cloves	Frequent	Pepper	Moderate
Fish Oil	Frequent	Peppermint	Moderate
Garlic	Frequent	Pippali	Moderate
Ginger	Frequent	Poppy Seeds	Moderate
Olive oil	Frequent	Quinoa	Moderate
Barley	Moderate	Red chilli flakes	Moderate
Basil	Moderate	Rice Bran Oil	Moderate
Buckwheat	Moderate	Rosemary	Moderate
Bulgur	Moderate	Soyabean Oil	Moderate
Capers	Moderate	Thyme	Moderate
Carom seeds	Moderate	Triticale	Moderate
Cashew Nut	Moderate	Vanilla Extract	Moderate
Coconut Oil	Moderate	Vegetable Oil	Moderate
Cumin Seeds	Moderate	Walnut	Moderate
Dates	Moderate	Semolina	Low
Honey	Moderate	Spelt	Low
Horseradish	Moderate	Sunflower Oil	Low
Mace	Moderate	Teff	Low
Maize	Moderate	Vinegar	Low
Mango Ginger	Moderate	Wild Rice	Low

Phase 3

Fruits

Apple	Frequent	Cherries	Moderate
Bananas	Frequent	Cranberry	Moderate
Grapes	Frequent	Loganberries	Moderate
Kiwifruit	Frequent	Mango	Moderate
Lemon	Frequent	Melons	Moderate
papaya	Frequent	Mulberries	Moderate
Pineapple	Frequent	Muskmelon	Moderate
Pomegranate	Frequent	Orange	Moderate
WaterMelon	Frequent	Peach	Moderate
Apricot	Moderate	Pear	Moderate
Avocado	Moderate	Plum	Moderate
Black Berry	Moderate	Strawberry	Moderate

Egg & Meat

Cat Fish	Low	Bacon	Avoid
Catla	Low	Beef	Avoid
Crab	Low	Chicken	Avoid
Egg	Low	Goat	Avoid
Prawns	Low	Lamb	Avoid
Rohu	Low	Lobster	Avoid
Salmon	Low	Mollusks	Avoid
Sardine	Low	Pork	Avoid
Tuna	Low	Turkey	Avoid

Phase 3

Milk & Fermented Products

Yogurt	Frequent	Kimchi	Moderate
Brined Olives	Moderate	Kombucha	Moderate
Butter milk	Moderate	Sauerkraut	Moderate
Cheese	Moderate	Skim milk	Moderate
Kefir	Moderate	Tofu	Moderate

Processed Foods

Burger	Avoid	Noodle	Avoid
Cake	Avoid	Pancakes	Avoid
Chocolate	Avoid	Pasta	Avoid
Cinnamon Buns	Avoid	Pastry	Avoid
Cookies	Avoid	Pizza	Avoid
Crackers	Avoid	Rolls	Avoid
French Toast	Avoid	Sandwich	Avoid
Garlic Bread	Avoid	Subway	Avoid
Ice Cream	Avoid	Taco	Avoid

Drinks & Beverages

Beer	Low	Carbonated Beverages	Avoid
Lemonade	Low	Distilled Alcoholic Beverages	Avoid
Red wine	Low	Malt Beverage	Avoid
Soy milk	Low	Milk Shakes	Avoid

Lifestyle and Gut Microbiome

Health and wellbeing is greatly influenced by lifestyle and behavioral aspects, including but not limited to sleeping habits, your body type, your response to exercise, your body's detoxification potential and many others. While your genetic makeup has a large influence on these aspects, scientific communities have recently acknowledged that the gut microbiota can significantly contribute to these critical aspects of your lifestyle.

Gut microbiome is said to have a two-way association with these lifestyle and behavioral aspects, either favorably or unfavorably impacting your overall lifestyle. For example, in the table below, if 'Physical Endurance' is in the favorable zone (green), it means that any endurance based exercises that you might be performing has positively influenced your gut microbiome, and this improved gut microbiome is positively increasing your endurance, creating a cyclical positive loop.

So, along with diseases (described above) we have also looked at some of these aspects of your lifestyle and what your current gut microbiome profile is indicating, in hope that this would aid you in building a healthier lifestyle, along with the dietary recommendations we have listed above.

Please note:

- These Lifestyle and gut microbiome associations are an algorithm-based output. This does not ensure any optimal performance or improved lifestyle.
- Each of these screened lifestyle aspects have been described at the end of this report to provide you with a basic understanding of associations between the gut microbiome and these lifestyle aspects.

Description

Physical Endurance

Favourable

The ability to perform strenuous, large-muscle exercise or activities for a prolonged period is termed as physical endurance. High endurance sports / training is accompanied with production of oxidative stress, due to over production of reactive oxygen species (ROS) and reactive nitrogen species (RNS). Studies have observed that high abundance of Lactobacillus paracasei, Bifidobacterium sp., Lactobacillus rhamnosus and Faecalibacterium prausnitzii, in the gut aids in management of oxidative stress and hence positively correlated with endurance.

Prone to Fatigue

Favourable

Tiredness can be a normal response to physical and mental activity. In most normal individuals are quickly relieved from regular fatigue (usually in hours to about a day, depending on the intensity of the activity). However, extreme tiredness resulting from physical exertion defines the state of fatigue. Twitch muscle fibers maintains the contractile responses while performing different motor tasks, and is directly associated with fatigue. Higher abundance of Lactobacillus acidophilus, and supplementation with multi-strain probiotic of Lactobacillus and Bifidobacterium have shown better contractile responses and hence minimizing fatigue.

Muscle Strength

Favourable

Muscular strength is a component of fitness that is necessary for optimal well-being and quality of life. In general, physical endurance is directly correlated to muscle strength. Smooth muscle works most efficiently, and needs much less energy for its activity and they display considerable plasticity when healthy and young. However, these cells can switch to largely non-contractile mode in response to inflammatory stimuli, diet or other factors, which result in loss of plasticity and in turn contractibility. Supplementation with multi-strain probiotic of Lactobacillus and Bifidobacterium have shown better contractile responses and hence better muscle strength.

Aerobic Endurance

Unfavourable

Aerobic endurance is the ability to sustain an aerobic effort over time, such as distance running or cycling. Aerobic endurance maintains the ability of the cardiovascular system to deliver oxygen to working muscles and the ability of the muscles to utilize that oxygen. The most common quantification of endurance is the maximal rate of oxygen uptake (VO2max). High abundance of Faecalibacterium prausnitzii has been associated with higher aerobic endurance.

Disclaimers

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- This is not a diagnostic report (hereinafter referred to as this "Report") and therefore should be used for Research Use Only (RUO) or Investigational Use Only (IUO) and should be interpreted or used exclusively by or under the guidance of a practitioner, including but not limited to, certified physicians, clinicians, dietitians, nutritionists, sports therapists and such other persons in similar profession having appropriate validation to undertake such practice (from here on referred to as "Professional Practitioners"). It is imperative that any preventative or therapeutic measures taken, by placing reliance on this Report, for any of the diagnosis should be solely under the guidance of a "Professional Practitioner". In the event of You executing any preventative or therapeutic measures by virtue of practicing selfmedication and/or undergoing diagnosis from persons other than Professional Practitioners, then We cannot be held responsible in any manner for any loss, liability, counter-effect and so on suffered by You as a result of ignorance of this Disclaimer. Further, We shall not be held responsible for any misinterpretation by Your "Professional Practitioner" of this Report or for any other matter arising out of this Report.
- This Report's role is limited to providing insights of Your gut microbiome, with a general set of dietary recommendations and risk managements. General risk management strategies provided in Our Report are for information purpose only and in this regard, it is essential to understand that every person's resistance, immunity, sensitivity and response to medication is different and therefore not all general risk management strategies may be suitable to everyone. It is also essential to note that, while assessing Your Report and providing these recommendations, We assume that You are in a general state of good health, and do not consider Your past or existing health conditions and or any medication taken by You (either in the past or currently), even if You have provided Us with such information. Therefore, it is essential that, You consult a Professional Practitioners for detailed recommendations or risk managements that may be specific / customized for You. In other words, information contained in this Report is not intended to replace medical or professional advice offered by Professional Practitioners.
- We would like to bring it to Your notice that not all disease-associated microbial groups may have been identified, validated and recorded by the scientific community, and the clinical significance of many microbial groups are also not well understood. Hence, it should be noted that this analysis and this Report does not cover all clinically relevant microbes' that have been identified or reported till date. This Report is limited only to those variants within Your gut microbiome which has strong evidence of causing or contributing to a disease or a drug response or a metabolism related issue till date. We would also like to bring to Your attention that the microbiome sequencing data is being constantly updated both with new taxonomic groups and curation of old microbial databases. Hence, it is subject to revision-based updates, based on the latest scientific research. Therefore, it is important to note that it is possible that the interpretation of the results that have been reported herein may vary or be altered, subject to these revisions. Hence, We would recommend that You to undergo periodical reinterpretation of Your microbiome data that You possess, especially when a specific disease is confirmed through diagnosis or new symptoms arise, in the future.
- Microbiome information must always be considered in conjunction with other information about Your health, including, but not limited to, Your age, sex, ethnicity, lifestyle, bio-medical history, family health history and any other information that You may provide to the "Professional Practitioner". This is especially critical with respect to the pharmacogenomics data (therapies and drugs), where a person's response to various medications is determined by the above listed factors.
- We would like to bring to Your attention that very specific and rare microbial groups are not reliably detected by current sequencing methods or downstream analysis pipelines, hence they are not analyzed and interpreted within the current Report.
- Overall, Your reliance upon this Report is solely at Your own discretion. Adequate care should be exercised in using all health and medical related information and recommendations provided in this Report. We cannot be held responsible in any manner for non – adherence by You to the terms and conditions contained in this Disclaimer. Further, We shall not be responsible for any findings in this Report and disclaims any responsibility for any errors, including but not limited to human error in reporting, and/or omissions by the sampler or agent either during collection of DNA samples (stool etc.,) or delivery of the DNA sample to Us. With respect to this Report or process undertaken to arrive at the findings reflected or reported in the Report, We make no warranties of any kind including, without limitation, the implied warranties as to its merchantability, fitness for a specific purpose, accuracy and non-infringement.

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