

AMILI

Your Gut Microbiome Profile



Report Number:
B2D0-TEST-TEST

Prepared For:

Jane Doe

Sample Received
Date: 30-11-2022

Dear Jane,

Thank you for choosing the AMILI Gut Health Test!

Did you know that there are trillions of microbes that live in and on us? One of the highest concentrations of these microbes can be found in the gut (known as the gut microbiome). The gut microbiome, weighing up to 2 kilograms, was thought of to be mainly involved only in supplementing digestion. This is incorrect and in recent years, research has found that the gut microbiome is integral to many seemingly unconnected health aspects such as mental well-being, cardiovascular health, and many chronic diseases. The role in digestion has now been correctly identified to be much more than minor and depending on one's gut microbiome profile, the differences in sugar, insulin and fat responses can be 8-10x different for the same foods!

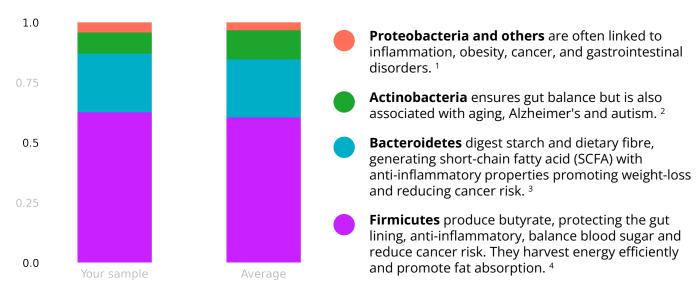
We hope that you find this report useful, and we encourage you to come back for a re-test with AMILI every 3-6 months to track changes in your microbiome.

Yours, **Dr Jeremy Lim**Chief Executive Officer

Jereny Lim



Microbiome Overview



Firmicutes/Bacteroidetes Ratio

The Firmicutes/Bacteroidetes Ratio refers to the abundance of Firmicutes with respect to the abundance of Bacteroidetes.

A high ratio i.e. high Firmicutes and low Bacteroidetes is linked to the development of obesity, whereas a low ratio i.e low Firmicutes and high Bacteroidetes is linked to the development of Inflammatory Bowel Disease.⁵



Your F/B ratio is at an optimum level, hence your score is **great**.

Diversity Index

Diversity of strains refers to the different bacteria that make up your microbiome, and may diminish with age or due to lifestyle. A high diversity is associated with a healthy and resilient gut while a low diversity is prone to imbalances and disease.⁶



Your microbiome diversity is at a suitable level but there is still room to make it more diverse. Hence, your score is good.



Think Well looks at processes in your gut that can have a profound effect on sleep, focus, mood and mental performance.



Live Well looks at the bacteria and the chemicals they produce which contribute to heart health, liver health, digestive health and other organ functions.



Feel Well tracks how food is broken down into its vital components and tracks its uptake and use in your body through the microbiome.



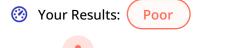
Think Well Gut-Brain Axis

Your gut and brain are very closely connected, both physically and biochemically. They 'communicate' through a complex network known as the `gut-brain axis'. Your score is poor, which means that your gut microbiome is not living up to its fullest potential in influencing your feelings and mood.



GABA

Stress Management



A neurotransmitter. 7

Helps with feelings of anxiety and stress.

- Concentration of bacterial groups associated with GABA production is **poor**.
- Gut microbiome may be producing less GABA, resulting in **stress and anxiety**.

Serotonin

Mood Regulation



A neurotransmitter. 8

Regulates your emotional behaviour (happiness), bowel movements, sleep and much more.

- Concentration of bacterial groups associated with serotonin production is poor.
- Gut microbiome may not be producing sufficient serotonin naturally, affecting your feelings and mood.

Tryptophan

Cell Communication



An essential amino acid. 9

Building block of major biomolecules in the body.
Helps in proper nervous system functioning.

- Concentration of bacterial groups associated with tryptophan metabolism is good.
- Gut microbiome is **producing sufficient tryptophan** naturally to make essential biomolecules, maintaining your **mental and emotional wellness**.



Live Well Organ Health and Immunity

Your gut microbiome is closely tied to many aspects of your overall wellbeing. Apart from regulating digestion, the bacteria in your gut produce chemicals that can contribute to other health conditions. Your score is poor, which means that your gut microbiome is unfavourably influencing your heart, gut, and liver health.



TMAO

Heart Health



A biomolecule produced during digestion. 10

Strongly associated with an increased potential of heart disease, stroke, and other cardiovascular diseases.

- Concentration of bacterial groups associated with your TMAO production processes is **moderate**.
- Gut microbiome not producing a significant amount of TMAO or TMA.

Cysteine & Derivatives

Inflammation Management



Your Results: (



An amino acid.11

Building block of major biomolecules used to protect the intestinal lining and reduce gut inflammation.

- Concentration of bacterial groups in your gut responsible for cysteine production is high.
- Gut microbiome **produces plenty of cysteine** to keep your gut lining healthy.

Indole & Derivatives

Inflammation Management



Your Results: (



A **compound** formed by bacterial action.¹²

Helps protect the gut lining from damage and inflammation, allowing nutrients to be transported through from food to blood.

- Concentration of bacterial groups responsible for indole production is **good**.
- Gut microbiome producing **enough indole** to maintain your gut lining.



Imidazole Propionate

Glucose Regulation



Commonly found in proteins.14

Elevated levels are known to disrupt glucose metabolism.

- Concentration of bacterial groups associated with your Imidazole Propionate production is **moderate**.
- **Production** by the gut microbiome **is in check**, keeping your metabolic health in the right range.

Bile Acid Pool

Fat Metabolism



Helps the body digest fat. 13

Maintains the gut microbiome, ensuring that there is no bacterial overgrowth leading to digestive or bowel issues.

- Concentration of bacterial groups in your gut responsible for contributing to the bile acid pool is **poor**.
- Bile acid pool size might be reduced, potentially resulting in overgrowth of gut bacteria.

Branched Chain Amino Acids

Protein Stimulation



Group of **three** essential amino acids.

Stimulates the building of protein in muscle and in certain quantities regulate glucose levels in blood.¹⁵

- Concentration of bacterial groups associated with BCAA availability is **poor**.
- Gut microbiome not producing enough BCAAs, which results in inefficient muscle building, repair

Oxidative Stress

Body Tissue Damage Potential



Imbalance between the availability of reactive oxygen species (ROS) and the body's ability to detoxify these ROS. ¹⁶

Can cause tissue damage, neurodegenerative disorders, amongst others.

- Bacterial groups involved in producing ROS are high.
- Gut microbiome **producing a significant amount of ROS**, and high oxidative stress links it to diseases such as neurodegenerative disorders and inflammation.



♥ | Feel Well | Metabolism

Your gut microbiome is largely responsible for digesting the food you consume. In doing so, it generates energy that fuels your cells and, by extension, you! Your score is **poor**, which means that your gut microbiome may be inefficiently metabolising food and harvesting energy.



Carbohydrates

Energy Harvest



Sugar molecules.17

The body uses them to derive energy and when undigested by the gut, they can lead to fermentation, causing gas and bloating.

- Concentration of bacterial groups associated with carbohydrate breakdown levels is **poor**.
- Gut microbiome is **less able to harvest energy** from carbohydrates.

Proteins

Body Repair



Body's **building blocks**. 18

Required for regulation of body's tissues and organs. When left undigested, it can be difficult to maintain muscle mass.

- Concentration of bacterial groups associated with protein digestion and muscle repair is poor.
- Body is **less efficient at building and maintaining muscle** and engaging in muscle recovery.

Fats

Cell Function Support



Sources of essential fatty acids.¹⁹

Help to maintain healthy skin and hair, insulate body organs against shock and maintain body temperature.

- Concentration of bacterial groups associated with fat breakdown levels is poor.
- Body is **less efficient at burning fats** and harvesting energy.



Butyrate

Post-Meal Satiety



Short-chain fatty acid.20

Sourced from dietary fibre, it is the main energy source for the gut lining cells, and regulates feeling of fullness after meals.

- Concentration of bacterial groups associated with butyrate production is **good**.
- You are **producing enough butyrate** to maintain your normal satiety levels and gut lining.

Lactate

Exercise Recovery



By-product constantly formed in the gut by bacterial action.²¹

Ability to convert lactate into energy is an indicator of body's ability to tolerate exercise and perform better.

- Concentration of bacterial groups associated with lactate metabolism is **good**.
- You might be relatively tolerant to exercise.

Vitamin B1 Thiamine

Carbohydrate Metabolism



Plays an essential role in **metabolism**.²²

Needed for effective utilisation of carbohydrates, by helping convert nutrients into energy.

- Concentration of bacterial groups associated with Vitamin B1 production was found to be poor.
- Potentially impairs your glucose metabolism, and disadvantage nerve, muscle and heart function.

Vitamin B6 Pyridoxine

Neurotransmitter Synthesis



Keeps the **nervous and immune system healthy**.²²

Involved in amino acid metabolism, red blood cell production, and the creation of neurotransmitters.

- Concentration of bacterial groups associated with Vitamin B6 production is good.
- Helps maintain your carbohydrate, protein and fat metabolism, and your nervous and immune function.



Vitamin B7 Biotin

Liver Metabolism



Plays an important role in **liver metabolism and** in the functioning of the nervous system.²²

Essential for carbohydrate and fat metabolism, and to prevent thinning of hair.

- Concentration of bacterial groups associated with Vitamin B7 production is **good**.
- Helps maintain your carbohydrate and fat metabolism, and your skin, nail and hair health.

Vitamin B9 Folate

Blood Cell Production



An essential vitamin that **naturally occurs as folate**.²²

Needed for formation of red and white blood cells and cellular processes, and is responsible for production of DNA and RNA.

- Concentration of bacterial groups associated with Vitamin B9 production is **poor**.
- Potentially impairs your blood cell count and cellular processes.

Vitamin B12 Cobalamin

Brain Development



Important for neurological function and red blood cell formation.²²

Helps in development of brain and nerve cells, and binds to proteins in food we consume.

- Concentration of bacterial groups associated with Vitamin B12 production is good.
- Helps maintain your neurological function and red blood cell count, preventing fatigue and the chance of gastrointestinal issues.



AMILI Supplement Recommendations

Enriched with prebiotics and postbiotics





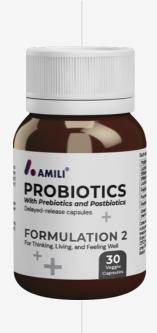








We Recommend



Formulation 2 for Well-being

Your report indicates poor scores across all your wellness categories. However, this is no time to worry. Formulation 2 is designed to improve your overall physical and mental well-being. It contains *Lactobacillus plantarum* and *Bifidobacterium longum* which protect heart health by reducing TMAO, increase beneficial bile acid metabolism, and increase the production of neurotransmitters which positively affect mood, sleep, and stress management.

Probiotic Strains:

Lactobacillus plantarum, Bifidobacterium breve, Bifidobacterium longum, Lactobacillus rhamnosus

Postbiotic Strains:

S. salivarius ssp. thermophilus2 billion cells per capsule

Prebiotics:

Fructooligosaccharides (FOS) 30mg per capsule



AMILI Food Recommendations















Salmon 23

Seafood

Foods like Salmon and Pineapple contain high amounts of tryptophan that naturally boost serotonin levels.

0.5 cup



Olives 24

Probiotic

Start including foods with antioxidant properties such as Carrots that contain carotenoids, Prunes that contain polyphenol extracts, Olives and Cinnamon in your diet. Along with their antioxidant properties, these foods reduce inflammation and oxidative stress in the body.

20



Carrot 25

Root Vegetable

Start including foods with antioxidant properties such as Carrots that contain carotenoids, Prunes that contain polyphenol extracts, Olives and Cinnamon in your diet. Along with their antioxidant properties, these foods reduce inflammation and oxidative stress in the body.

0.5 cup



Pineapple ²⁶

Fruit

Fruits such as Pineapple and Kiwi are an excellent source of digestive enzymes, such as actinidain, that can break down proteins.

1 cup



Barley 27

Grain

Barley and Eggs are rich in Vitamin B1, enabling the body to use carbohydrates as energy.

0.5 cup



Disease Risk

How do I interpret these results?

The graphs in these sections display your likelihood of falling in a particular range based on your gut microbiome composition and results.

If you tend more to the left, it means that your microbiome coupled with your genetic makeup resembles that of a healthy one; and if you tend more to the right, your microbiome coupled with your genetic makeup resembles that of an unhealthy patient.

It is not uncommon to see anomalies, as this suggests that having healthy samples in the risk range is the reason why the graphs are not deterministic of the result.

With these graphs, you can see how there is an evident correlation between the microbes in your gut and potential diseases.

Obesity



- Obesity is a medical condition that occurs when a person carries excess weight or body fat that might affect their health.
- The dysbiosis of gut microbiota is closely related with obesity, and a less diverse gut makes an individual more prone to obesity. Bacterial diversity and richness contributes to processes such as metabolism, which helps to maintain weight.

Non-Alcholic Fatty Liver Disease (NAFLD)



- NAFLD is a term describing the range of diseases that are caused due to a build-up of fat in the liver.
- In some people, fat causes inflammation and damages liver cells.
- One type of NAFLD, non-alcoholic steatohepatitis (NASH), can cause scarring of the liver, leading to cirrhosis.



Inflammatory Bowel Disease (IBD)



- IBD is an umbrella term used to describe disorders that involve chronic inflammation of the digestive
- Types of IBD include:
 - Ulcerative colitis: This condition causes long-lasting inflammation and sores (ulcers) in the innermost lining of the large intestine (colon) and rectum.
 - Crohn's Disease: This type of IBD is characterized by inflammation of the lining of the digestive tract, which often spreads deep into affected tissue.

Colorectal Cancer (CRC)



- CRC covers cancers of the bowel, colon and rectum.
- In close to 75-95% of CRC cases, there is little or no underlying genetic risks.
- The risk factors for CRC are age, diet, obesity, smoking and red meat.

Type 2 Diabetes Mellitus (T2DM)



- T2DM is characterised by high blood glucose content, insulin resistance and the relative lack of insulin.
- It makes up close to 90% of diabetes cases worldwide.
- A combination of lifestyle and genetic causes attribute to T2DM.



More Health Insights

Antibiotic Resistance



Impacted by antibiotic treatment or environmental antibiotic exposure, pathogens can acquire resistance that prevent further antibiotic treatments to be effective.

We measure the abundance of resistance carrying genes in your microbiome. The less we detect, the better for your health.

You have a high abundance of resistance in your microbiome, hence your score is **poor**.



Gut Barrier Health



Gut barrier health is determined by biofilm, a component of mucus, which is important for two reasons: it is an internal shield lining the digestive tract, and it forms the home for the microbiome.

When too little is produced, it may give rise to harder stools and lower microbiome diversity. When too much is produced, it can lead to overgrowth of bacteria, and therefore inflammation.

Your gut barrier health is at a reasonable level, hence your score is **good**.



Pathogen Level



Pathogens and their toxins can cause inflammation and damage in the gut.

The lower your pathogen level, the less likely your gut bacteria will damage the gut, release toxins and impair your health and wellbeing.

Your pathogen level is on the higher side, hence your score is **poor**.





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Food Recommendations

Supplements Recommendations

Think Well

GABA | Stress Management

Fermented foods like Kimchi (1 cup) and Sauerkraut (1/8th cup) contain lactic bacteria that can synthesise GABA.

Veggies like Sweet Potato (1/2 cup) and Raw Spinach (1 cup) contain significant amounts of magnesium, which aids in the production of GABA.

Seafood like Shrimp (1 cup) promotes GABA production.

Supplements like Magnesium and Zinc help raise GABA levels in the brain, thus reducing anxiety.

Green Tea, like many other teas, is rich in GABA and can therefore increase GABA levels in the body.

Serotonin | Mood Regulation

Foods like Tofu (0.5 cup) and Skinless Turkey (One palm size) are rich in serotonin.

Foods like Salmon (0.5 cup) and Pineapple (1 cup) contain high amounts of tryptophan that naturally boost serotonin levels.

Spinach (1 cup) contains key vitamins and minerals that are absolutely essential for the production of serotonin in the brain.

Vitamin B6, also known as pyridoxine, has special importance as a precursor of serotonin and tryptophan and can also play a role in behavior and mood.

Vitamin B12 acts as a cofactor in synthesis of neurotransmitters such as serotonin and dopamine, thus B12 deficiency affects mood, emotions and sleeping and can lead to psychiatric disorders.

5-HTP Supplement promotes the production of serotonin in the brain.

Tryptophan | Cell Communication

Foods such as Tofu (0.5 cup), Eggs (1) and Oatmeal (1 cup) are rich in tryptophan.

Unsweetened Greek Yoghurt (0.75 cup) is naturally rich in the protein alpha-lactalbumin, which was shown to increase blood tryptophan levels.

Edamame (0.5 cup) is a food known to increase tryptophan production in the body.

Take supplement L-tryptophan seldom, if your diet cannot make up for the lack of tryptophan in your body. It is an amino acid used in the biosynthesis of protein.



Live Well

TMAO | Heart Health

Incorporate a healthy amount of Olive oil (1 tbsp) and Garlic (1 clove) into your diet, as they stall and inhibit bacteria in the digestive system from turning compounds into TMA, the precursor to TMAO.

Vitamin D supplements regulate the bacteria that produce TMAO, thus reducing TMAO that is induced by choline.

Probiotics that contain *Lactobacillus rhamnosus* promotes the reduction of the TMAO levels in plasma.

Cysteine & Derivatives | Inflammation Management

Start slowly and incorporate Quinoa (1.5 cup) in your diet to replace more carb-heavy foods, and Garlic (1 clove). Consuming Quinoa and Garlic reduce oxidative stress and increase levels of glutathione (made of glycine, cysteine and glutamate), an antioxidant, to a great extent.

Cruciferous vegetables like Broccoli (10 florets) and Brussel sprouts (1 cup) contain a high amount of the antioxidant glutathione.

Baked Salmon (0.5 cup) contains healthy amounts of selenium, which is the cofactor for glutathione production. Fish is a selenium-rich food that increases selenium levels naturally.

NAC supplement is rich in cysteine and its derivatives and consuming adequate amounts of it is beneficial for a variety of health reasons - including replenishing glutathione, the most powerful antioxidant in the body. These amino acids also help with chronic respiratory conditions, fertility, and brain health.

Indole & Derivatives | Inflammation Management

Veggies such as Broccoli (10 florets), Cabbage (1 cup) and Cauliflower (1 cup) contain a compound called indole-3-carbinol, which is an indole derivative that has anticancer properties.

Include sulfur-containing compounds such as Kale (1 cup) in your diet, which can be broken down into isothiocyanate and indole-3-carbinol after chewing, cooking or chopping.

Indole-3-carbinol is formed when vegetables are cut, chewed or cooked. You can find indole-3-carbinol supplements to replace the lack of indole derivatives in your diet.

Imidazole Propionate | Glucose Regulation

Histidine is a precursor to imidazole propionate, so switch our high-histidine foods with foods that have lower levels of histidine such as Cucumber (1 cup), Pear (1 medium) and Watermelon (1.5 cup) to curb the production of imidazole propionate.



Bile Acid Pool | Fat Metabolism

Beetroots (0.5 cup) help to stimulate bile production, as well as thin out bile, allowing it to easily move around the body.

Vegetables like Artichoke (1) contain cynarin, a naturally occurring compound that stimulates bile production in the body.

Similarly, Bittergourd (1 cup), Celery (1 cup) and Pickles (0.5 cup) stimulate the liver to secrete bile acids that are essential for fat metabolism.

П	Bile salts such as Choline, Glycine and
	Taurine consumed in a supplement form
	help to increase bile production in the
	body.

BCAAs | Protein Stimulation

Include high protein foods in your diet such as Salmon (0.5 cup) and Tofu (0.5 cup) - these foods are rich in BCAAs and very versatile in cooking.

Red lentils (1 cup) and milk (1 cup) are a good source of BCAAs as well as glutamine, and are known for muscle repair and growth.

BCAA supplements are well-known and widely available, and have been shown to build muscle, decrease muscle fatigue and alleviate muscle soreness.

Oxidative Stress | Body Tissue Damage Potential

Start including foods with antioxidant properties such as Carrots (0.5 cup) that contain carotenoids, Prunes (5) that contain polyphenol extracts, Olives (20) and Cinnamon (1 tsp) in your diet. Along with their antioxidant properties, these foods reduce inflammation and oxidative stress in the body.

Fruits such as Citrus fruits (1) contain vitamin C, which also helps to prevent oxidative stress.

Feel Well

Carbohydrates | Energy Harvest

Incorporate foods such as Green Banana (1) and Soybean (0.5 cup) in your diet. These foods promote the growth of bacteria that are responsible for carbohydrate metabolism.

Consider introducing less well-known foods such as Alfalfa (1 cup) and Beetroot (0.5 cup) in your diet too. If you have some Corn (0.5 cup) on hand, consume it on occasion as it encourages the growth of beneficial bacteria for carbohydrate breakdown.

The Vitamin Bs, B2 and B3, also known as riboflavin and niacin, are known for their metabolism enhancing properties, especially playing a key role in carbohydrate metabolism.

Magnesium supplements can aid carbohydrate digestion as an adequate amount of magnesium has proven to be a cofactor for many enzymes during carbohydrate metabolism.



Proteins | Body Repair

Fruits such as Pineapple (1 cup) and Kiwi (1) are an excellent source of digestive enzymes, such as actinidain, that can break down proteins.

Ginger (2 inch) contains protease gingipain, which helps the body digest protein as well as increase the production of digestive enzymes. Similarly, Papaya (3 thin slices) contains the enzyme papain, which is a group of proteases designed to break down proteins.

Supplements such as papain supplements, bromelain supplements and probiotics containing B. coagulans 30 all aid in the digestion of proteins if unable to get adequate amounts of proteases from the diet.

Fats | Cell Function Support

Foods such as Miso (1 tbsp), Avocado (0.5 cup) and Kefir (3 cups) contain a variety of digestive enzymes, especially lipases, which help digest fats. Kimchi (1 cup) contains bacteria of the *Bacillus* species which also produce lipase to digest fats.

Berries such as Blackberries (1 cup) are rich in antioxidants such as catechins, which activate fat-burning genes in fat cells surrounding the belly. They also contain polyphenols which prevent fat from forming in the first place.

Probiotics containing Lactobacillus gasseri support fat matabolism. It is known to be one of the most effective probiotics for weight loss.

Butyrate | Post-Meal Satiety

Foods such as Sorghum (0.5 cup) and Brown rice (1 cup) stimulate the growth of butyrate-producing bacteria in the gut.

In addition, Oat Bran (0.5 cup) and Barley (0.5 cup) are rich in dietary fibre, which enable gut bacteria to break them down into SCFAs like butyrate and promote the growth of butyric acid.

Potato, when cooked and cooled down (1 cup), is a source of resistant starch, which feed beneficial bacteria in the gut and promotes butyrate production.

Potato starch supplements contain resistant starches, that produce butyrate when broken down. Resistant starches can also nourish bacteria like Ruminococcus bromii that produce fuel for butyrate-producing bacteria like Faecalibacterium prausnitzii.

Lactate | Exercise Recovery

Good bacteria-rich foods like Yoghurt (0.75 cup) and Sauerkraut (0.5 cup) contain probiotic organisms such as lactic acid bacteria which are beneficial for the repopulation of a depleted gut.

CoQ10 supplements is a potent antioxidant and facilitates energy metabolism. It increases the efficiency of the cells, allowing the body to generate more power and reduce lactic acid.



	Vitamin B1	Carbohydrate	Metabolism
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44	Eggs (1) and Barley (0.5 cup) are rich in Vitamin B1, enabling the body to use
	carbohydrates as energy.

B-Complex is a vitamin that contains all 8
B vitamins packed in one pill. Another
Ayurvedic herb that is rich in vitamin B is
Ashwagandha, which has the active form
of vitamin B12 called methyl cobalamin.

Vitamin B6 | Neurotransmitter Synthesis

Sorghum (0.5 cup) is rich in Vitamin B6, which is important for the normal development of the brain, as well as keeping the immune and nervous system healthy.

Barley (0.5 cup) is rich in Vitamin B6 too, as well as contains healthy amounts of potassium, folate and iron so that cardiovascular functions are supported.

B-Complex is a vitamin that contains all 8 B vitamins packed in one pill. Another Ayurvedic herb that is rich in vitamin B is Ashwagandha, which has the active form of vitamin B12 called methyl cobalamin.

Vitamin B7 | Liver Metabolism

Green banana (1) contains Vitamin B7 which promotes function of the nervous system as well as boosts liver metabolism. Vitamin B7 also stimulates keratin production in hair and increases the rate of follicle growth, and Avocados (0.5 cup) are rich in B7.

B-Complex is a vitamin that contains all 8 B vitamins packed in one pill. Another Ayurvedic herb that is rich in vitamin B is Ashwagandha, which has the active form of vitamin B12 called methyl cobalamin.

Vitamin B9 | Blood Cell Production

Citrus foods like Orange (1) are rich in Vitamin B9.

B-Complex is a vitamin that contains all 8 B vitamins packed in one pill. Another Ayurvedic herb that is rich in vitamin B is Ashwagandha, which has the active form of vitamin B12 called methyl cobalamin.

Vitamin B12 | Brain Development

Green banana (1) and Egg (1) promote the formation of the red blood cells, and the function and development of brain and nerve cells.

B-Complex is a vitamin that contains all 8 B vitamins packed in one pill. Another Ayurvedic herb that is rich in vitamin B is Ashwagandha, which has the active form of vitamin B12 called methyl cobalamin.



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