

Glutamine

DNA Health Report

REPORT CATEGORY —



Sample Client

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DISCLAIMER

This report does not diagnose this or any other health conditions. Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

Personal information

NAME

Sample Client

SEX AT BIRTH

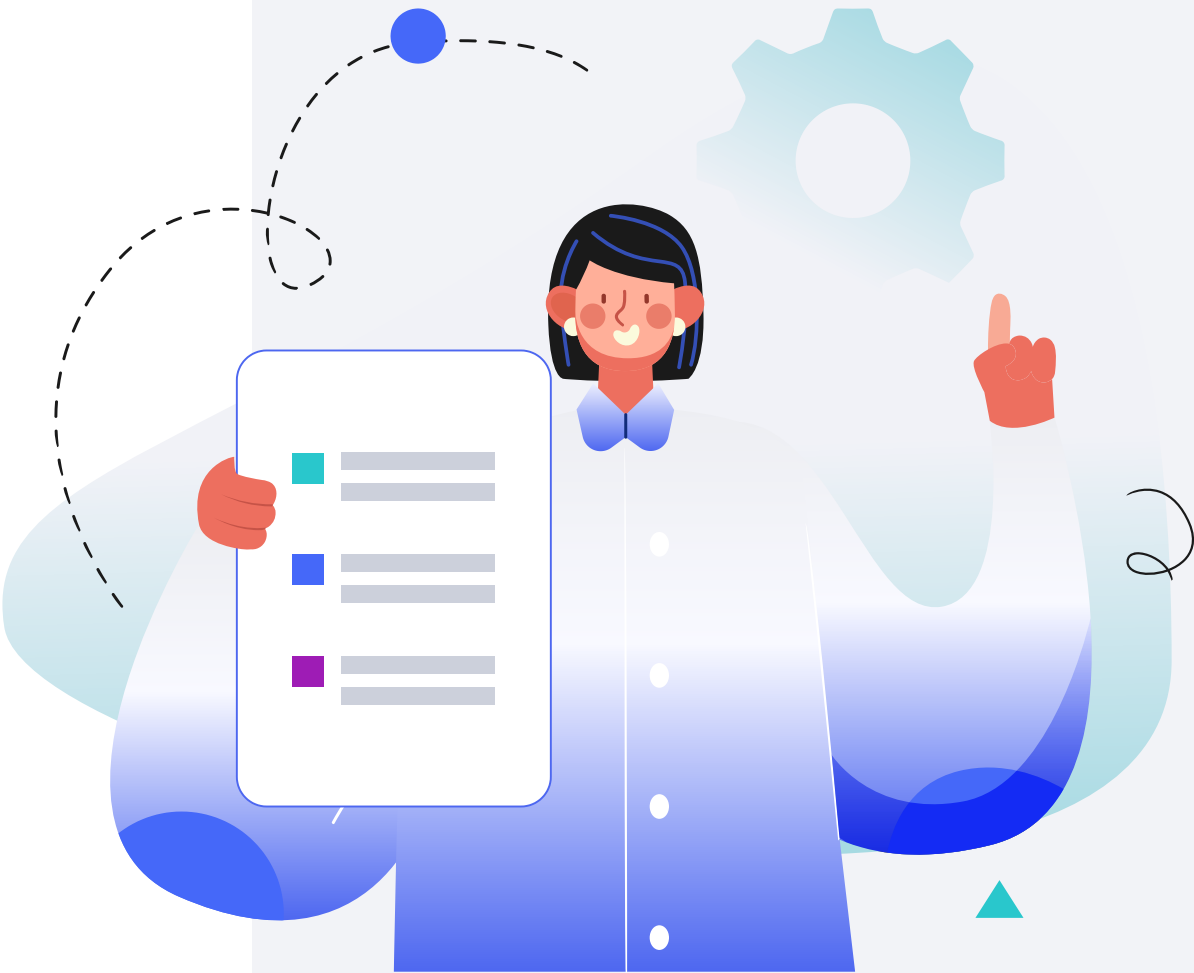
Male

HEIGHT

5ft 5" 165cm

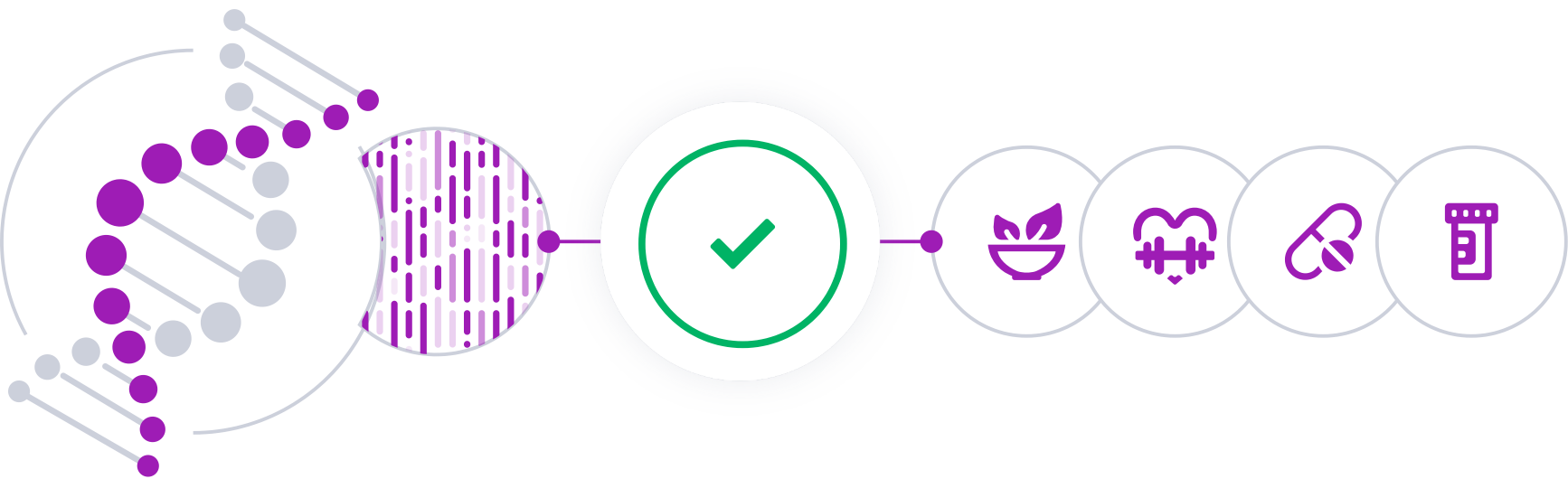
WEIGHT

137lb 62kg



How this works

Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.

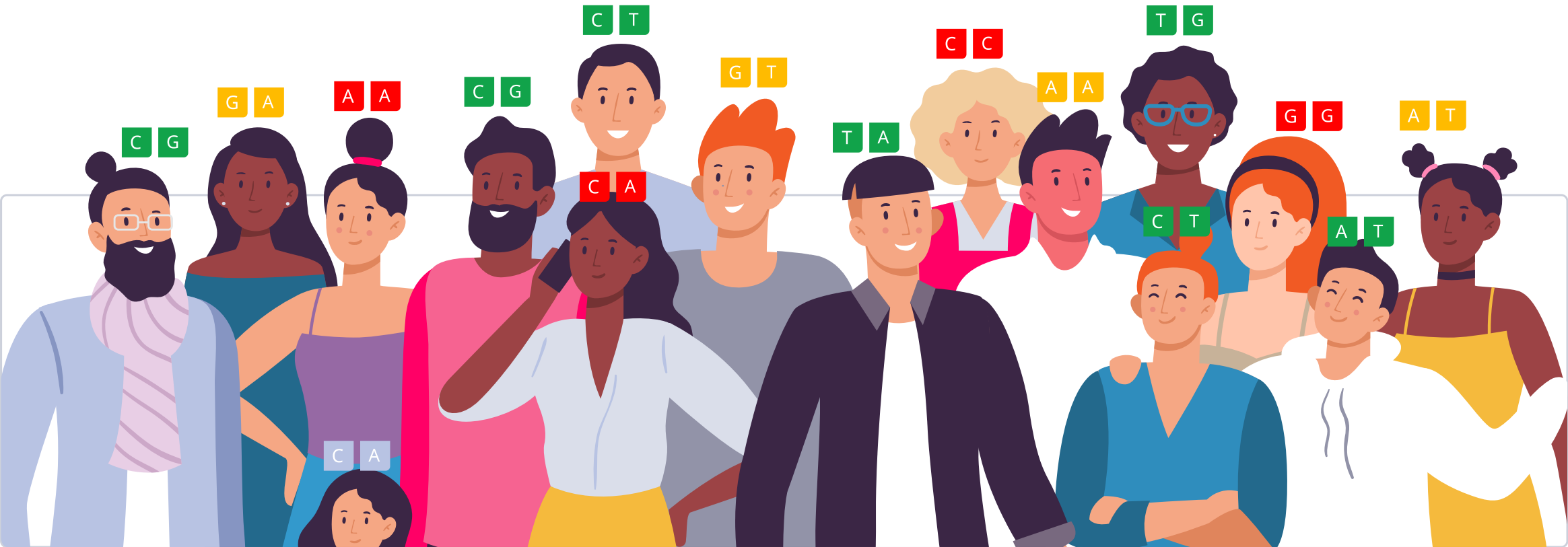


Similarly, our Trait Reports look at how your DNA influences your traits.



Your DNA is like an instruction manual — it contains a lot of information.
You can think of it as a blueprint for your body.

Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



We use artificial intelligence and machine learning to analyze all this information.
We then summarize your results as a risk score or display it on a gauge.

In total, we analyze up to 83 million genetic variants.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:



Genotype color info:

AA

You don't have any risk alleles

AA

You have 1 risk allele

AA

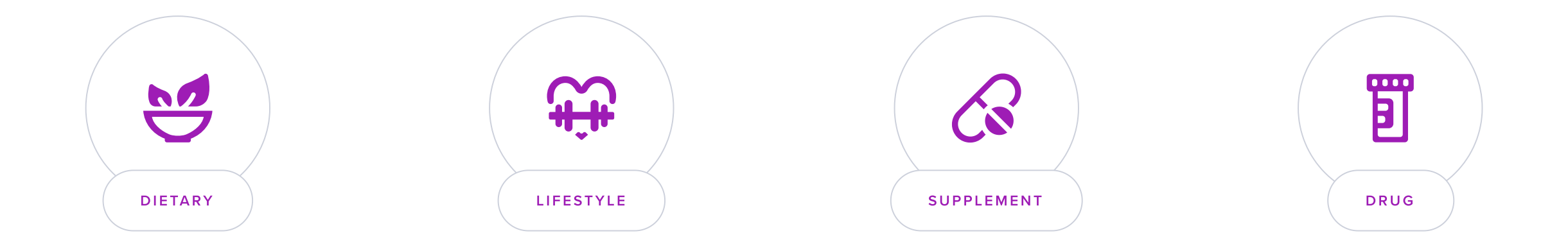
You have 2 risk alleles

Your risk is also displayed as a percentile. This will tell you how your risks compare to our sample population. The lower your percentile number, the lower your risk. The "50th percentile" would be an average risk.

Similarly, the gauge tells you your relative risk score compared to our sample population, or it indicates a specific trait or haplotype you are more likely to have based on your genetic variants.

When applicable, we also list top evidence-based recommendations that may help lower your risk. The focus is on recommendations that may be of benefit to you, based on your genetics.

Our recommendations come in four categories: lifestyle, diet, supplements and drugs.
The following icons tell you which category a recommendation falls into:



Our team of scientists also ranks each recommendation.
We rank based on impact and the strength of evidence in the medical literature.

Impact shows how strongly a recommendation will affect your health in a certain area.
Evidence is how much scientific support there is for the recommendation. Rankings are from 1 to 5 (low to high):



Impact

Impact scores range from 1-5. These scores reflect how much of an effect each recommendation can have. An impact score of 5 predicts the biggest effect.

When a recommendation affects something we can measure, we use those measurements to assign the impact score. For example, a recommendation that decreases cholesterol by 20% will have a higher impact score than one that decreases it by 5%.

Some recommendations affect things that we cannot directly measure, like stress or mood. For these, the impact score is based on how well they work relative to other recommendations and standard treatments. The best ones get the highest scores.

If there is a lot of research that shows a recommendation works especially well for your genotype, the impact score gets increased.

Recommendation Evidence

5 / 5

Recommendations that are considered effective and generally recommended by experts and medical bodies.

4 / 5

Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.

3 / 5

Recommendations that are considered possibly effective and have many studies supporting them

2 / 5

Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.

1 / 5

Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.

0 / 5

No evidence in humans.

Genotype-specific Evidence

High-quality

Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, a few large clinical trials, or a meta-analysis).

Medium-quality

Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).

Low-quality

Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).

Indirect

A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).

In theory

A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).

Some things to keep in mind:

- Genetics doesn’t play a considerable role in a condition or a trait.
- There is not enough research available to estimate a genetic predisposition.
- There are technical limitations to estimating or presenting a genetic predisposition.
- The topic is sensitive, and a genetic predisposition should only be estimated and presented by a healthcare professional.

Introduction

Glutamine is the most abundant amino acid in blood. It accounts for about 20% of free amino acids in blood and 40-60% of all amino acids in the liver and muscles [R].

Glutamine is not an essential amino acid, which means that our bodies can produce it from another amino acid, [glutamic acid](#). We can also get glutamine from foods, such as [R, R]:

- Grains, especially rice and corn
- Dairy
- Fish, shellfish, and poultry
- Red meat
- Vegetables and legumes
- Eggs
- Soy

It can also be taken as a supplement.

Glutamine is crucial as a building block for proteins. It also plays important roles in [R, R, R, R, R, R]:

- Production of the amino acid [arginine](#)
- Immunity
- Healthy metabolism
- Gut health
- Muscle function
- Energy production
- Removal of toxic ammonia

Glutamine also helps produce chemical messengers, such as [glutamate](#) and [GABA](#) [R].

Factors Influencing Glutamine Levels

Up to 50% of differences in people’s glutamine levels may be due to genetics. Involved genes may influence glutamine breakdown [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Low glutamine levels may also result from [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Malnutrition
- Major surgery
- Crohn's disease
- Short gut syndrome
- Hemolytic conditions (e.g., sickle cell disease, malaria, and thalassemia)
- Critical conditions (e.g., burns, trauma, and sepsis)

Factors linked to **high glutamine levels** include [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Excessive glutamine supplementation
- Liver disease
- Rare genetic diseases

Genetically higher glutamine levels may be causally associated with:

- Alzheimer’s Disease (protective) [\[R\]](#)
- Cognition (higher IQ) [\[R\]](#)

Genetically lower glutamine levels may be causally associated with:

- Low Mood (depression) [\[R\]](#)

Keep in mind that this report is not about the rare genetic disorders mentioned above. They are very rare and usually diagnosed in infancy.



Predisposed to typical glutamine levels based on 2,068 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SFXN1	rs34907038	CC
NDRG2	rs1998848	GG
PROX1	rs79687284	GG
SLC7A2	rs56335308	GG
HOGA1	rs7078003	CC
SLC16A7	rs17122673	TT
PGM2L1	rs78431863	CC
GLS	rs62182473	TT
SLC38A4	rs113674212	CA
PIP4K2A	rs1750768	CC
GCKR	rs1260326	TC
SLC38A4	rs117433039	TC
ARHGEF40	rs12881221	CC
RSPO3	rs9482770	CC
TRIB1	rs28601761	CC
CDKAL1	rs35261542	CC
NDRG1	rs11993225	AA
GLUD1	rs17096421	AT
WARS1	rs35007880	GT
GLIS3	rs4237150	CG
CCND2	rs10849008	TC
LDHA	rs7925445	AG
DLST	rs7147721	AG
CPS1	rs4673538	CT
SLC38A4	rs77503738	AA
SLC7A2	rs140440674	CC
HOGA1	rs185803104	GG
LMO1	rs2168101	CC
CDKN2B	rs10811663	GG
SAMM50	rs738408	TT
MAD1L1	rs58673065	GG
WSB1	rs904538	AA

GENE	SNP	GENOTYPE
PBRM1	rs36059845	INS(TTGT)INS(TTGT)

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Your Recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your genetics, along with the amount of scientific evidence supporting the recommendation.

You'll likely find common healthy recommendations at the top of the list because they are often the most impactful and most researched.

DOSAGE		DOSAGE			
1	Cottage Cheese	2	Seaweed		
3	Tomato	4	Tofu		
5	Bok choy	6	Shrimp		
7	Alpha-Ketoglutarate (AKG)	1 g	8	Alanylglutamine	1 g
9	Turkey	10	Crab		
11	Pyroglutamate	600 mg	12	Chicken broth	
13	Soy Protein	20 g			

1



Cottage Cheese

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Incorporate 1/2 cup of cottage cheese into your daily diet. This can be included as part of your breakfast, as a snack, or mixed into dishes like salads or pasta. Continue this habit daily for long-term health benefits.

Description

Cottage cheese (1%) is a healthy dairy product, high in protein, and a good source of selenium, calcium, vitamin B12, and riboflavin.

Cottage cheese (1%) is a healthy dairy product, high in protein, and a good source of selenium, calcium, vitamin B12, and riboflavin. A 1-cup serving provides 20 mcg of selenium or 36%DV.

How it helps

Cottage cheese is rich in glutamine, an amino acid important for muscle health and boosting immune function. Regular intake can help maintain good levels of glutamine in the body, thus reducing the risk of glutamine deficiency.

2



Seaweed

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Incorporate seaweed into your diet 2-3 times per week by adding it to salads, soups, or as a wrap for sushi and other ingredients. Seaweed can be consumed both in dried form as a snack or rehydrated in meals.

Description

Seaweed is a marine algae that is a source of vitamins A and C, iron, calcium, iodine, omega-3s, and dietary fiber. It is often consumed as a food and is valued for its potential to provide essential nutrients, including iodine, and support thyroid health.

Seaweed is a good source of iodine and also has vitamins A, C, E and K, along with folate, zinc, sodium, calcium and magnesium. A 2-tablespoon serving provides 116 mcg of iodine or 77%DV.

How it helps

Seaweed is rich in amino acids, including glutamine, which boosts the immune system and supports gut health. Regular intake of seaweed can help maintain adequate levels of glutamine in your body, aiding in prevention of glutamine deficiency.

3



Tomato

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Incorporate fresh or cooked tomatoes into your daily diet. This can be achieved by adding them to salads, sandwiches, pastas, and sauces or simply eating them on their own. Aim for at least one serving (approximately 1 medium-sized tomato or 1/2 cup of chopped or cooked tomatoes) per day.

Description

Tomatoes are a fruit grown widely in numerous varieties, and are rich in vitamins C and K, as well as the antioxidant lycopene, which may contribute to heart health and protect against certain chronic diseases when incorporated into a balanced diet.

Tomato (*Solanum lycopersicum*) is a fruit originally from the Andes in South America. It is usually consumed as a vegetable in juices, sauces, or fresh. Tomato is an important source of [R]:

- [Vitamin C](#)
- Potassium
- Antioxidants (e.g., [lycopene](#))
- Vitamin B9 ([folate](#))

Tomato is traditionally used for [R, R]:

- High cholesterol
- High blood pressure

How it helps

Tomatoes are rich in antioxidants, like lycopene, which can protect the cells from damage and prevent the onset of diseases associated with glutamine deficiency. Still, this alone may not prevent glutamine deficiency and it's best to include a balanced diet that includes other nutrients.

4



Tofu

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate tofu into your meals 2-3 times per week, replacing meat in dishes such as stir-fries, salads, and sandwiches. Aim for servings of about 3.5 to 4 ounces (100 to 113 grams) each time.

Description

Tofu, also known as bean curd, is a popular plant-based protein source made from soybeans. It is rich in protein, iron, calcium, and various vitamins, making it a versatile and nutritious addition to vegetarian and vegan diets.

Tofu is a high-protein soybean product with plenty of iron, copper, calcium, vitamin A, and a host of other nutrients. A ½ cup serving provides 476 mcg of copper or 53%DV.

How it helps

Tofu is rich in protein, which contains the amino acid glutamine. This helps to maintain the barrier function of your intestines, supports the immune system and could prevent gut-related diseases.

5



Bok choy

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate bok choy into your diet 2-3 times a week by adding it to salads, stir-fries, or soups. Wash and chop the bok choy before cooking or consuming it raw.

Description

Bok choy is a great source of vitamins C, A, and K, with amounts of other nutrients like folate and manganese.

Bok choy is a great source of vitamins C, A, and K, with amounts of other nutrients like folate and manganese. Cabbage contains 62.32 mg of glutamine per gram.

How it helps

Bok choy is rich in glutamine, an amino acid essential for gut health and immune function. Consuming it can provide your body with glutamine it needs, promoting gut health and potentially preventing related issues.

6



Shrimp

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate shrimp into your diet 2-3 times per week, either grilled, boiled, or baked, aiming for servings of about 3-4 ounces (85-113 grams) per meal. Avoid frying or preparing with high-fat sauces to maintain nutritional benefits.

Description

Shrimp are a type of shellfish known for their low calorie content and high protein levels. They are a good source of essential nutrients like iodine, selenium, and vitamin B12, supporting thyroid function, immune health, and nerve function.

Shrimp are a great source for protein and minerals like selenium, zinc, iron, potassium, magnesium, and phosphorus. A 3-ounce serving provides 40 mcg of selenium or 73%DV.

How it helps

Shrimp is rich in protein, which contains high amounts of amino acids, including glutamine. Glutamine is essential for immune function and gut health, thus sufficient intake may help reduce the risk of related health conditions.

7



Alpha-Ketoglutarate (AKG)

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take alpha-ketoglutarate (AKG) as a dietary supplement in a dose of approximately 1-2g per day, preferably with meals to aid in its absorption. The exact dosage may vary based on the specific product and individual health needs, so it's important to follow the label instructions or consult a healthcare provider for personalized advice. This supplementation can be ongoing, with periodic evaluations to assess its effects on your health.

TYPICAL STARTING DOSE

1 g

Description

Alpha-ketoglutarate (AKG) is a key molecule in the Krebs cycle, crucial for energy production in cells. It plays a role in amino acid synthesis and nitrogen transport. In supplement form, it's claimed to improve athletic performance and support recovery, but the scientific evidence for these benefits is limited.

How it helps

AKG is a source of [glutamine](#) and [glutamate](#). In muscles, glutamine and glutamate inhibit protein breakdown and increase protein synthesis [\[R\]](#).

8



Alanylglutamine

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take alanylglutamine as a dietary supplement by mixing the prescribed dose, typically around 1 to 3 grams, into a beverage of your choice, such as water or juice. Consume this mixture once daily, preferably post-exercise or as directed by a healthcare professional.

TYPICAL STARTING DOSE

1 g

Description

Alanylglutamine is a dipeptide composed of the amino acids alanine and glutamine. It is used as a dietary supplement and is believed to support gut health and recovery from exercise.

How it helps

Alanylglutamine can enhance the stability and solubility of glutamine, leading to efficient absorption and delivery of glutamine in the body.

9



Turkey

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate turkey into your diet 2-3 times per week, choosing lean cuts like turkey breast. Aim for portions about the size of a deck of cards (3-4 ounces) for each serving.

Description

Turkey is a poultry meat known for its lean protein content and is a good source of nutrients like selenium and B vitamins. It is valued for its health benefits, including muscle growth, immune support, and stress reduction due to its content of tryptophan, which is a precursor to serotonin.

Turkey is a good source of zine, and rich in B-vitamins, minerals like selenium and phosphorus, and protein. A 3-ounce serving provides 1.5 mg of zinc or 14%DV.

How it helps

Turkey is rich in protein which contains glutamine, a crucial nutrient for the immune system and intestinal health. By adding turkey to your diet, you increase the levels of glutamine in your body, helping to prevent glutamine deficiency, thus promoting better health.

10



Crab

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate crab meat into your diet 2-3 times per week, ensuring it is cooked thoroughly to avoid foodborne illness. Crab can be added to salads, pastas, or eaten as a main dish with a side of vegetables.

Description

Crab is a good source of zinc, iron, selenium, glutamine, folate, vitamin B12, niacin, and is lower in mercury than most white fish.

Crab is an excellent source of copper, zinc, iron, selenium, folate, vitamin B12 and niacin, as well as being lower in mercury than most white fish. A 3-ounce serving provides 624 mcg of copper or 69%DV.

How it helps

Crab is a great source of amino acid L-glutamine that supports gut health and immune response. Its regular consumption, along with a balanced diet, can help maintain healthy bodily glutamine levels, reducing the risk of glutamine deficiency.

11



Pyroglutamate

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take a pyroglutamate supplement orally, typically ranging from 600 to 2,000 mg per day, divided into one or two doses. It's advisable to start with the lower end of the dosage range and gradually increase if necessary, based on tolerance and effectiveness. Continue as long as it supports your cognitive or health goals, or as directed by a healthcare professional.

TYPICAL STARTING DOSE

600 mg

Description

Pyroglutamate is a naturally occurring amino acid found in certain foods like cheese and soybeans. It may have cognitive-enhancing properties and is sometimes used in supplements to support mental clarity and memory.

How it helps

Pyroglutamate supports brain health by helping improve the Glutamine (an amino acid) levels in your body, which can potentially enhance memory and cognition. Regular supplements could, therefore, help forestall issues, although it's important to know that conclusive scientific evidence for this is limited.

12



Chicken broth

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Consume 8-12 ounces of homemade or low-sodium canned chicken broth daily. For best results, incorporate it into your diet for at least 7-14 days, especially during cold and flu season or when feeling under the weather.

Description

Chicken broth is known for its potential to provide relief from cold and flu symptoms. It can help soothe a sore throat and provide hydration when you're feeling unwell, and is also a great source of glutamine.

Chicken broth is a great source for glutamine and has a small amount of other trace minerals. Chicken broth contains 142.50 mg of glutamine per gram.

How it helps

Chicken broth is packed with glutamine, an amino acid that helps maintain the function of your intestinal wall, preventing leaky gut, a condition that can lead to stomach discomfort and other issues. Regularly consuming chicken broth may help keep your gut strong and healthy.

13



Soy Protein

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Include 20 grams of soy protein in your daily diet. This can be achieved by consuming soy-based products such as tofu, soy milk, or soy nuts throughout the day.

TYPICAL STARTING DOSE

20 g

Description

Soy protein is a high-quality plant-based protein derived from soybeans. It is commonly used in vegetarian and vegan diets and may support muscle growth, weight management, and overall nutritional needs.

Soy is a common food in many cuisines around the world, especially Asian cuisines [\[R\]](#).

It’s a great source of [\[R\]](#), [\[R\]](#):

- Plant-based protein
- Fiber
- Omega-3 fats
- Antioxidants (isoflavones)

Soy-based foods include [\[R\]](#):

- Tofu
- Tempeh
- Edamame
- Miso
- Natto

Soy protein and soy isoflavones are also available as supplements.

How it helps

Soy protein is rich in amino acids, including glutamine, which is needed to repair and maintain your intestines, muscles, brain, and immune system functioning. Therefore, consuming soy protein can prevent health issues related to glutamine deficiency.

Next Steps

Remember, your genes only tell one important part of your health story!

Now that you've seen your DNA-based results for this health topic, let's take a look at other contributing factors.

Your lab results

Your lab results are impacted by the combined effect of your genes, environment and lifestyle.

Lab tests will give you the best picture of your current health status, while your genes provide insight into your health predispositions and which recommendations are best for you.