

Omega-6:Omega-3 Ratio

Biohacker Report

REPORT CATEGORY —



NUTRITION

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

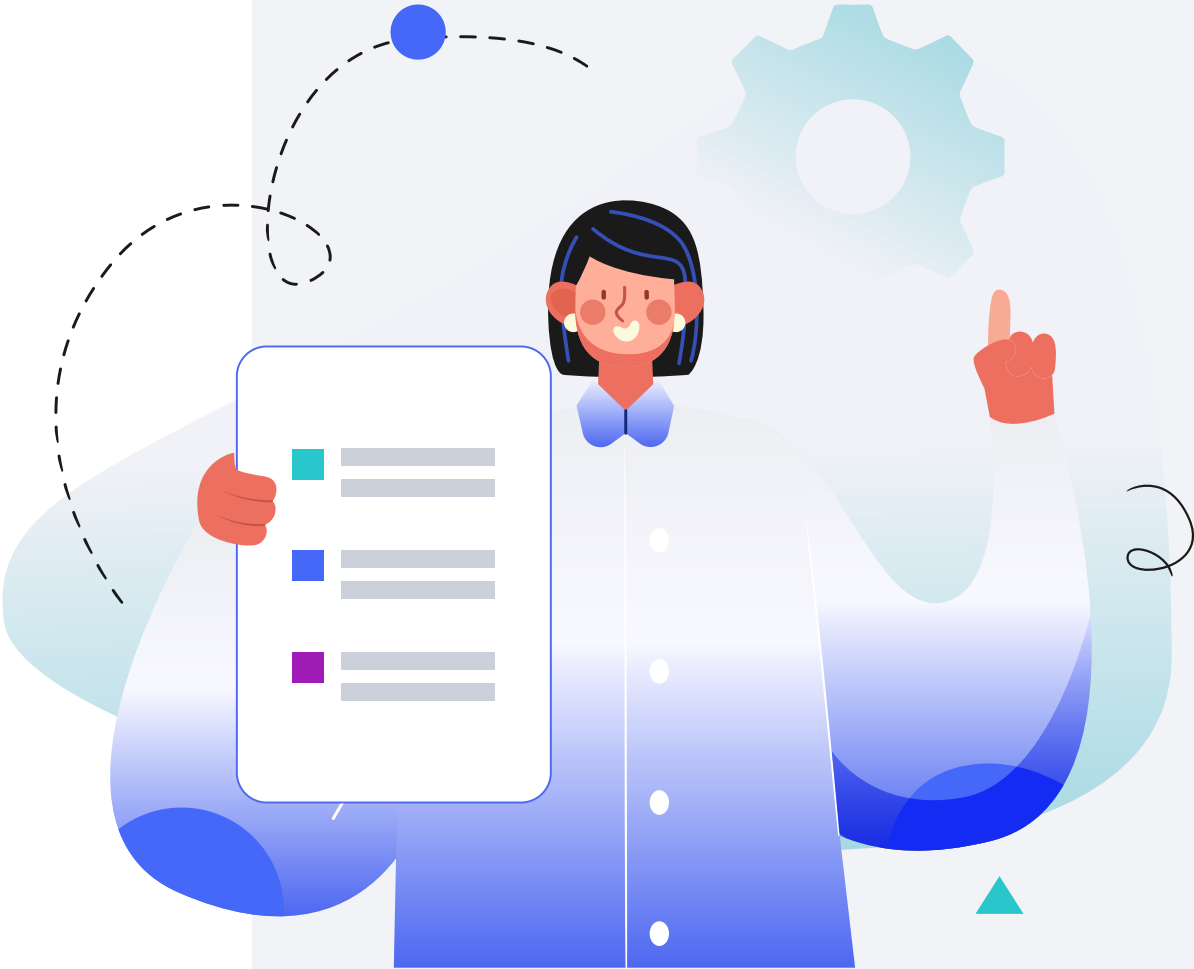
Male

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

Omega-6 and omega-3 fatty acids are **polyunsaturated fatty acids (PUFAs)**. Most experts consider PUFAs to be healthy fats [\[R\]](#).

Omega-6 fatty acids play important roles in skin health, energy production, and immunity. Food sources of omega-6s include [\[R\]](#):

- Vegetable oils (e.g., corn, soybean, sunflower, safflower, and cottonseed oils)
- Nuts, especially walnuts
- Seeds (e.g., safflower, sunflower, and pumpkin seeds)

Increased levels of omega-6s may promote inflammation and increase the risk of heart disease. However, not all studies found this, and scientists stress the need for more research [\[R, R, R, R, R, R, R\]](#).

[Omega-3 fatty acids](#) are **some of the healthiest fats we can eat**. They help lower inflammation and protect the heart, brain, and eyes [\[R, R\]](#).

There are three major types of omega-3s: ALA, EPA, and DHA. **EPA and DHA are vital for cognition and mental health** [\[R, R\]](#).

Fatty fish are rich in EPA and DHA. They include [\[R\]](#):

- Salmon
- Tuna
- Herring
- Sardines

Humans evolved on diets with an omega-6/omega-3 ratio close to 1:1. A low omega-6/omega-3 ratio is associated with a healthy weight, a lower risk of heart disease, healthier blood vessels, and improved longevity [\[R, R\]](#).

However, in a modern Western diet, the omega-6/omega-3 ratio can be as high as 20:1. High omega-6/omega-3 ratios may be linked to obesity, heart disease, and cancer [\[R, R\]](#).

Increasing the intake of DHA and EPA helps lower the omega-6/omega-3 ratio. Try to get at least **two servings of fatty fish per week**. Fish oil supplements are available for those who don't eat fish regularly. It's also a good idea to **limit your intake of vegetable oils high in omega-6s**. You can partly replace them with flaxseed oil, which is high in omega-3s [\[R, R, R\]](#).

Genetics of the Omega-6:Omega-3 Ratio

Key Takeaways:

- Genes impacting your omega-6:omega-3 ratio may involve omega-6 and omega-3 fatty acid production, as well as fat breakdown.
- Other risk factors include excessive omega-6 fatty acid intake.
- Ideally, the omega-6:omega-3 ratio should be between 1:1. However, the Western diet can be upwards of **20:1**.
- If your genetic risk is high, take action to balance your intake of omega-6 and omega-3's.
- Click the **next steps** tab for relevant labs.

Genetics may influence your omega-6:omega-3 ratio [R].

Two crucial genes are [FADS1](#) and [FADS2](#). They help make the enzymes that produce omega-3 and omega-6 fatty acids. One *FADS* variant, [rs174547-C](#), may lead to lower omega-3 production, which may increase the **omega-6:omega-3 ratio** [R, R, R].

Find out more about the *FADS* genes in [this post](#) and [this post](#).

Genes involved in fat breakdown may also influence the omega-6:omega-3 ratio [R, R].

Keep in mind that your diet and environment also influence your omega-6:omega-3 ratio.



Predisposed to a typical omega-6:omega-3 ratio based on 6 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NRG3	rs2207778	GG
ASPH	rs7812327	CC
/	rs7611558	CC
GPR18	rs2390277	AG
INSM1	rs11908058	AG
FADS2	rs174547	TT

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	Omega-3 (Fish Oil)	500 mg	2	Limit Omega-6 Fatty Acids	
3	Mediterranean Diet		4	Flaxseed	2 tbsp
5	Perilla Oil	600 mg	6	Chia Seeds	
7	Krill Oil	1 g	8	Canola Oil	
9	Hemp Seed Oil				

1



Omega-3 (Fish Oil)

IMPACT

5 / 5

EVIDENCE

4 / 5

How to implement

Take 1-2 g of omega-3 (fish oil) supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

500 mg

Description

Omega-3 fatty acids are essential fats found in fatty fish like salmon, flaxseeds, and walnuts. They are known for their potential cardiovascular and brain health benefits, including reducing the risk of heart disease and supporting cognitive function.

[Omega-3 fatty acids](#) are some of the healthiest fats we can eat. They help lower inflammation and protect the heart, brain, and eyes. Our bodies produce less omega-3s than we need for optimal health, so it's important to get enough through food or supplements [\[R\]](#), [\[R\]](#), [\[R\]](#).

There are three major types of omega-3s: ALA, EPA, and DHA [\[R\]](#), [\[R\]](#).

Fatty fish are rich in EPA and DHA. They include [\[R\]](#):

- Salmon
- Tuna
- Herring
- Sardines

For optimal protection, try to get at least **two servings of fatty fish per week**. Fish oil supplements are available for those who don't eat fish regularly [\[R\]](#).

How it helps

Experts recommend consuming **0.5-4 g omega-3s per day** to reduce the omega-6:omega-3 ratio. Try to get at least **two servings of fatty fish per week** [\[R\]](#), [\[R\]](#).

Functional food products enriched with omega-3 fatty acids may also help [\[R\]](#), [\[R\]](#), [\[R\]](#).

Fish oil supplements may also improve the omega-6:omega-3 ratio and are available for those who don't eat fish regularly [\[R\]](#), [\[R\]](#).

2



Limit Omega-6 Fatty Acids

IMPACT

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EVIDENCE

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How to implement

Reduce your intake of foods high in omega-6 fatty acids, such as processed snacks, fast foods, cakes, fatty meats, and certain vegetable oils like corn, soybean, and sunflower oil. Aim to consume these foods less frequently, perhaps limiting them to once a week or less, and focus on increasing your intake of foods rich in omega-3 fatty acids like fish, walnuts, and flaxseeds to help balance your omega-6 to omega-3 ratio.

Description

Balancing omega-6 and omega-3 fatty acids in the diet by limiting excessive omega-6 intake can help reduce inflammation and lower the risk of chronic diseases. Achieving a healthier ratio of these fatty acids promotes overall cardiovascular and metabolic health.

Omega-6 fatty acids are polyunsaturated fatty acids (PUFAs). Food sources of omega-6s include [\[R\]](#), [\[R\]](#):

- Vegetable oils (e.g., corn, soybean, sunflower, safflower, and cottonseed oils)
- Nuts, especially walnuts
- Seeds (e.g., safflower, sunflower, and pumpkin seeds)

The most highly consumed omega-6 fatty acid is linoleic acid. Linoleic acid is essential, meaning we have to get it from our diets. Our bodies use it to produce other omega-6s such as gamma-linolenic acid (GLA) and arachidonic acid (AA) [\[R\]](#).

How it helps

Experts agree that modern Western diets contain excessive amounts of omega-6 fatty acids [\[R\]](#), [\[R\]](#), [\[R\]](#).

Due to the use of corn, soybean, sunflower, safflower, and cottonseed oils, processed and takeaway foods are major sources of omega-6 fatty acids in Western diets. Cutting down on these types of foods and partly replacing vegetable oils rich in omega-6 fatty acids with flaxseed oil, which is high in omega-3s, may help lower the omega-6:omega-3 ratio [\[R\]](#), [\[R\]](#), [\[R\]](#).

3



Mediterranean Diet

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Incorporate a variety of primarily plant-based foods, such as fruits, vegetables, whole grains, nuts, and legumes, into every meal. Choose healthy fats, like olive oil, over saturated fats and consume fish and poultry at least twice a week. Limit red meat to a few times a month and include a moderate amount of dairy products. Opt for water and red wine in moderation as your beverages.

Description

The [Mediterranean diet](#) is based on the traditional cuisine from the Mediterranean regions. It moderates the intake of red meat and dairy, while being rich in fruits and vegetables, whole grains, and healthy fats ([olive oil](#)).

The [Mediterranean diet](#) focuses on traditional cuisine from the Mediterranean regions. It’s rich in [\[R\]](#):

- [Olive oil](#)
- Fruits and vegetables
- Whole grains
- Nuts and seeds
- Fish

This type of diet may **reduce inflammation and protect the brain and heart** [\[R, R, R, R\]](#).

Limited intake of animal products, saturated fat, and refined sugar likely contribute to the health benefits of the Mediterranean diet [\[R\]](#).

How it helps

Adopting a Mediterranean diet may help lower omega-6 levels and the omega-6:omega-3 ratio [\[R, R\]](#).

The Mediterranean diet may be a good choice because it is [\[R\]](#):

- Rich in fish
- Focused on olive oil instead of vegetable oils richer in omega-6s
- Low in processed foods

4



Flaxseed

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Consume 2 tablespoons of ground flaxseed daily. You can add it to your breakfast cereal, smoothies, or salads.

TYPICAL STARTING DOSE

2 tbsp

Description

Flaxseed is a nutrient-dense food that's high in fiber and omega-3 fatty acids. It may contribute to heart health, promote digestive regularity, and help manage cholesterol levels when included in a balanced diet.

[Flaxseed](#) is a common ingredient in bakery products. Some people also use it as a health food to support digestion [\[R\]](#).

Flaxseed is rich in many compounds, including [\[R\]](#):

- Vitamins and minerals
- Protein
- Fiber
- Omega-3 fatty acids ([ALA](#))

How it helps

Flaxseed oil is rich in alpha-linolenic acid (ALA), a plant-based omega-3 fatty acid. It can help in altering the omega-6 to omega-3 ratio by increasing the intake of omega-3 fatty acids.

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Perilla Oil

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 600-900 mg of perilla oil daily, ideally with meals to enhance absorption. This should be divided into two or three doses throughout the day. Continue this regimen for at least 8 to 12 weeks to evaluate its effectiveness.

TYPICAL STARTING DOSE
600 mg

Description

Perilla oil is an edible oil extracted from the seeds of the *Perilla frutescens* plant, which is native to Asia. It is rich in omega-3 fatty acids, particularly alpha-linolenic acid (ALA), and is known for its potential health benefits, including supporting heart health, reducing inflammation, and providing essential nutrients like vitamin E and omega-3s.

How it helps

Perilla oil is derived from the seeds of the perilla plant and is high in ALA. It can enhance omega-3 fatty acid intake and modify the omega-6:omega-3 ratio favorably.

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Chia Seeds

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate 1 to 2 tablespoons of chia seeds into your daily diet. You can add them to yogurt, smoothies, oatmeal, or salads. Do this regularly as part of your daily meals.

Description

Chia seeds are high in fiber, omega-3 fatty acids, and various vitamins and minerals. Adding chia seeds to your diet can support digestive health, provide essential nutrients, and contribute to overall nutritional wellness.

Chia seeds are a healthy source of omega-3s, calcium, as well as fiber, iron, magnesium phosphorus, and vitamins B1 and B3. A 1-ounce serving provides 5.06 g of ALA.

How it helps

Chia seeds are high in omega-3 fatty acids, particularly ALA, which can help balance the omega-6 to omega-3 ratio.

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Krill Oil

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 1 to 3 grams of krill oil daily as a dietary supplement, preferably with a meal to enhance absorption. It's often available in soft gel form, making it easy to swallow. Continue this regimen consistently for best results, typically reviewing its effectiveness and any need for adjustments with a healthcare provider after a few months.

TYPICAL STARTING DOSE

1 g

Description

Krill oil is a source of omega-3 fatty acids, primarily in the form of phospholipids. It can promote cardiovascular health, joint comfort, and may have anti-inflammatory properties.

How it helps

Krill oil contains omega-3 fatty acids, specifically EPA and DHA, which can improve the omega-6 to omega-3 ratio by boosting omega-3 levels.

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Canola Oil

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate canola oil into your diet as a cooking oil or a salad dressing base. Use it in place of other fats such as butter or margarine when baking, frying, or preparing meals to help lower bad cholesterol levels. Aim for using canola oil in 1-2 meals per day, everyday, for consistent dietary benefits.

Description

Canola oil is a heart-healthy cooking oil rich in unsaturated fats and low in saturated fats. Incorporating canola oil into your diet can help lower cholesterol levels and reduce the risk of cardiovascular disease.

How it helps

Canola oil is lower in omega-6 and higher in omega-3 fatty acids compared to many other vegetable oils, which can help improve the dietary balance of these fats.

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Hemp Seed Oil

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate hemp seed oil into your diet by adding 1-2 tablespoons to salads, smoothies, or yogurt daily. Ensure the oil is cold-pressed and unrefined for maximum health benefits. This can be a regular part of your diet indefinitely.

Description

Hemp seed oil is derived from hemp seeds and is known for its nutritional value, including a balanced ratio of omega-3 and omega-6 fatty acids. It may support skin health, reduce inflammation, and provide a source of essential nutrients.

Hemp seed oil contains vitamin E, magnesium, calcium, sulfur, phosphorus, iron, and zinc. Hemp oil contains about 30 mg of GLA per gram.

How it helps

Hemp seed oil provides a favorable omega-6 to omega-3 ratio and can be used to optimize the overall balance of these fatty acids in the diet.

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.