

Carnitine

Biohacker 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

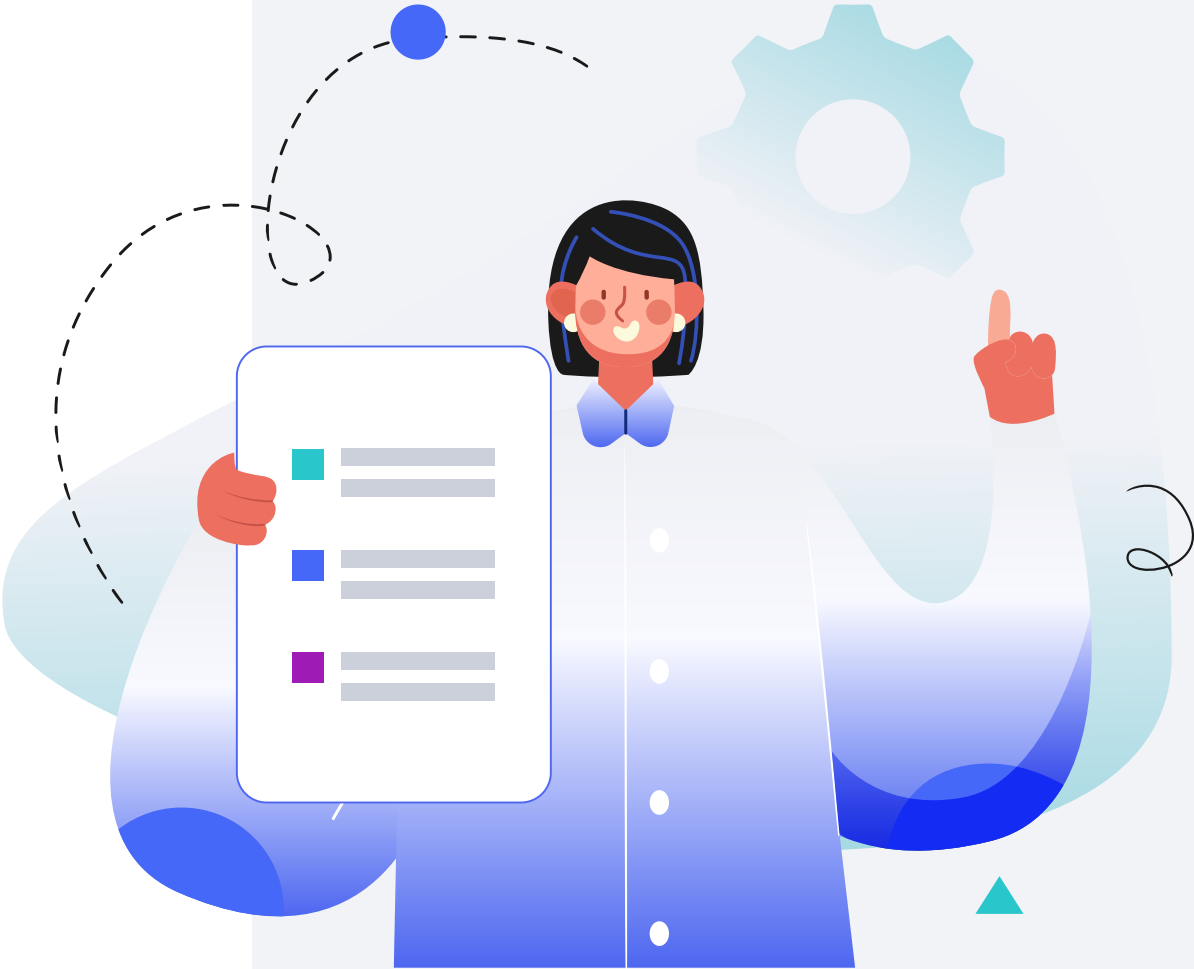
Male

HEIGHT

5ft 5" 165cm

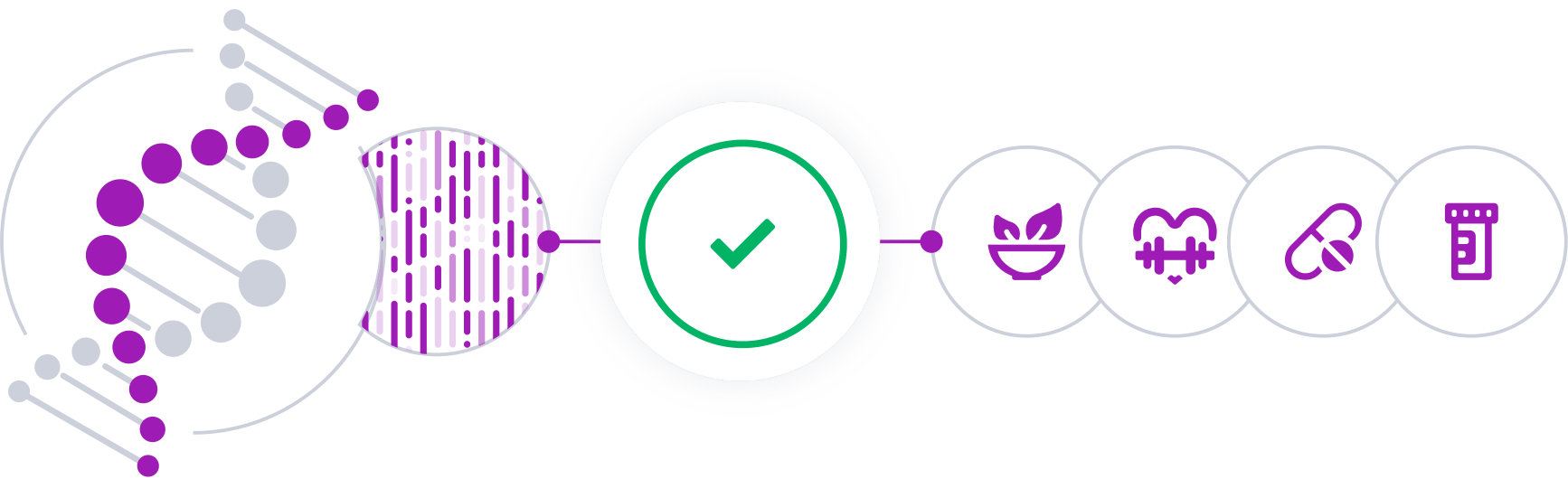
WEIGHT

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.

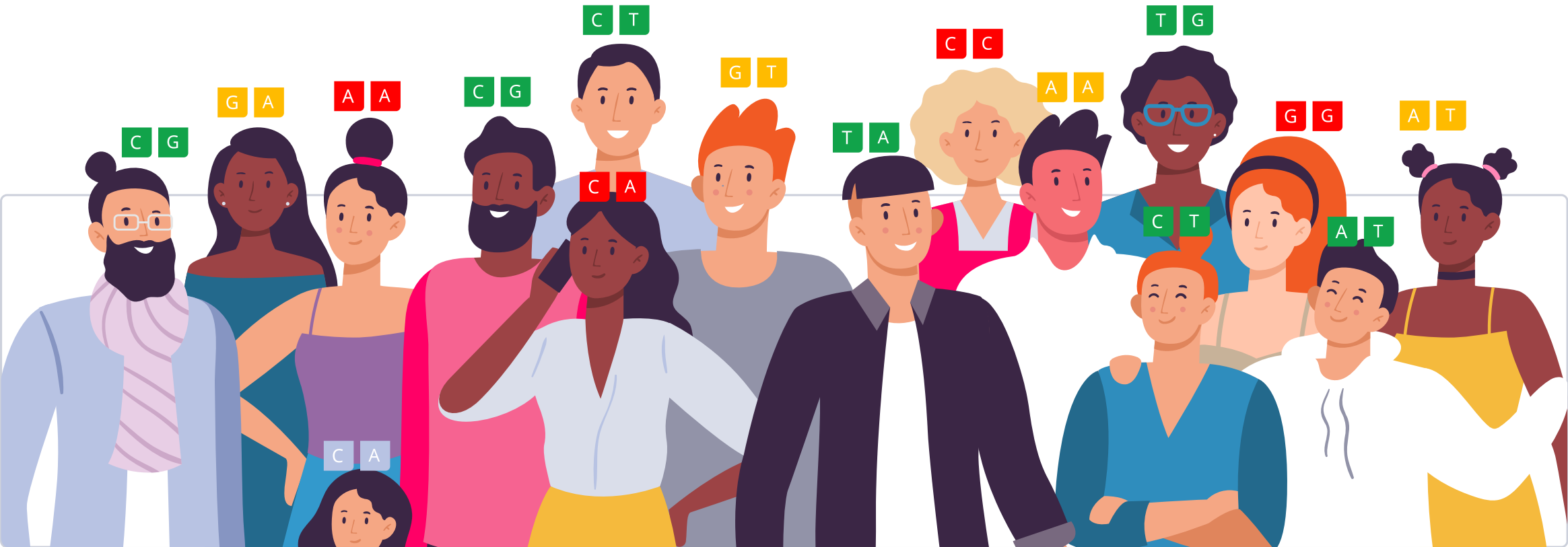


Similarly, our Trait Reports look at how your DNA influences your traits.



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

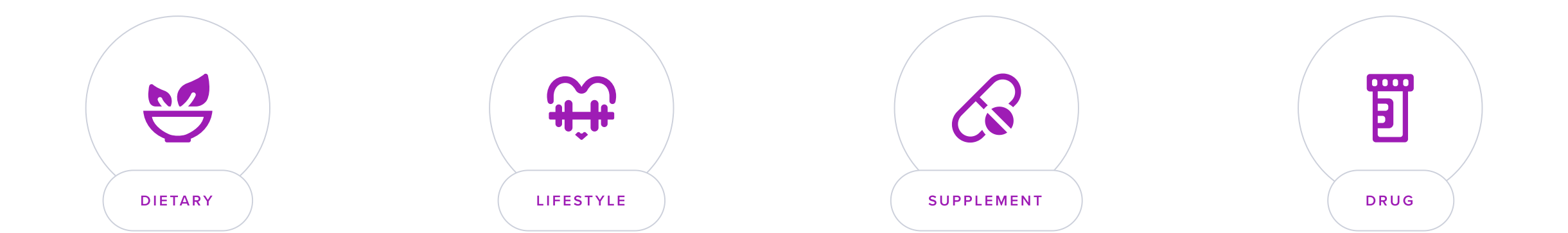
You have 2 risk alleles

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

Carnitine is a non-essential nutrient derived from amino acids. This means that our bodies can produce it or get it from foods, such as [\[R\]](#):

- Red meat and poultry
- Fish
- Dairy

Carnitine can also be taken as a supplement. However, its absorption by the gut is much better from food sources than from supplements [\[R\]](#).

Carnitine is made by the liver, kidneys, and brain, and it is stored where fatty acids are used as energy sources, including [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Muscles
- Heart
- Brain

Carnitine helps cells process fats for energy. It's crucial during fasting or ketogenic diets, when sugar as an energy source is not readily available [\[R\]](#), [\[R\]](#), [\[R\]](#).

Factors Influencing Carnitine Levels

Genetics is the main factor influencing carnitine levels. Up to **80%** of differences in people’s carnitine levels may be due to genetics [R, R, R].

Diet may also influence carnitine levels. In non-vegetarians, 75% of carnitine is derived from the diet and about 25% is made within the body. In strict [vegetarians](#) and vegans, over 90% of carnitine is made within the body. Their kidneys also make sure that less carnitine is lost through urine. **For this reason, genetics may have a stronger influence on carnitine levels in vegans and vegetarians** [R, R].

High carnitine levels may be due to excessive carnitine supplementation [R].

Several factors may lead to **low carnitine levels**, such as pregnancy, malnutrition, fasting, ketosis, and some prescription drugs [R, R, R, R, R].

People with the following health conditions may also have low carnitine levels:

- Type 2 diabetes [R]
- Gut disorders, such as celiac disease [R]
- Kidney, liver, or heart disease [R, R]
- Viral infections, such as HIV [R]
- Rare genetic disorders [R, R]

Keep in mind that this report is not about the rare genetic disorders mentioned above.



Likely typical need for carnitine based on 8 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SLC16A9	rs1171617	TG
SFMBT1	rs12715455	AA
CRIP3	rs2396004	GG
SLC47A1	rs111653425	CC
WASHC2C	rs10466245	GA
CD83	rs853358	TA
SLC22A5	rs274551	CC
SLC36A2	rs77010315	CC
C12ORF43	rs1169299	CC

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	L-Carnitine	500 mg	2	Beef	
3	Beef liver		4	Acetyl-L-Carnitine	500 mg
5	Propionyl-L-Carnitine	500 mg			

1



L-Carnitine

IMPACT

4 / 5

EVIDENCE

3 / 5

How to implement

Take 500 mg of L-carnitine supplement daily with a glass of water, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

500 mg

Description

L-carnitine is an amino acid-like compound that plays a role in energy metabolism and helps prevent toxic substances from building up in cells. It is often used in dietary supplements for its potential to support muscle recovery, reduce fatigue, and enhance athletic performance.

[L-carnitine](#) is a compound that helps you burn fat. It also prevents toxic substances from building up in cells [\[R\]](#).

Your body can usually make enough carnitine to meet its needs. You can also get it from **meat and dairy products** [\[R\]](#).

People use L-carnitine for [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Heart problems
- Overactive thyroid
- Fertility problems
- Blood sugar control
- Weight control

How it helps

Supplementation with L-carnitine (428-4000 mg/day) may help correct carnitine deficiency in people with the following conditions:

- Rare genetic disorders [\[R\]](#), [\[R\]](#)
- Kidney failure [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Cancer [\[R\]](#), [\[R\]](#)

However, carnitine absorption by the gut is much better from food sources than from supplements [\[R\]](#).

Please note: *Supplementing with carnitine at doses of 3 g/day or more may cause nausea, vomiting, abdominal cramps, diarrhea, and a "fishy" body smell* [\[R\]](#).

2



Beef

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Incorporate lean beef into your diet 2-3 times per week, with a serving size of about 3-4 ounces (85-113 grams) per meal. Choose cuts like sirloin or round to minimize saturated fat intake.

Description

Beef is a rich source of high-quality protein, essential vitamins, and minerals like iron and zinc. Incorporating lean cuts of beef into a balanced diet can support muscle growth, overall nutrition, and iron intake.

Beef is an excellent source of many B-vitamins, protein, proline, and minerals like zinc and iron. Grass-fed uncharred beef is healthiest. Beef contains 34.82 mg of proline per gram.

How it helps

Beef is high in carnitine, a nutrient that helps your body convert fatty acids into energy and might improve symptoms related to carnitine deficiency. So, dietary augmentation with beef could provide ample amounts of carnitine to support this metabolism.

3



Beef liver

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Incorporate beef liver into your diet 1-2 times per week, aiming for a serving size of about 3-4 ounces (85-113 grams) each time. This can be pan-fried, baked, or incorporated into dishes like stews or pate to make it more palatable.

Description

Beef liver is a commonly recommended organ meat due to its rich content of protein, B-vitamins, and minerals.

Chickpeas are a good source of vitamin B6, iron, folate, fiber, and rich in minerals like copper, zinc, and phosphorus. A ½ cup serving provides 1.1 mg of vitamin B6 or 65%DV.

How it helps

Beef liver is a natural source of L-carnitine, which is essential for energy production in cells and may help support healthy carnitine levels in the body.

4



Acetyl-L-Carnitine

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Take 500-1,000 mg of Acetyl-L-Carnitine per day, split into 2 or 3 doses, with or without food. Joe prefers taking 500 mg in the morning. It can be taken indefinitely for chronic conditions or for a period of several months for acute concerns.

TYPICAL STARTING DOSE

500 mg

Description

[Carnitine](#) is a protein building block (amino acid). It comes in many forms, such as acetyl-L-carnitine. Acetyl-L-carnitine may help with nerve damage and mood problems.

[Carnitine](#) is a protein building block (amino acid). It comes in many forms, such as acetyl-L-carnitine [\[R\]](#), [\[R\]](#), [\[R\]](#).

[Acetyl-L-carnitine](#) may help with [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Nerve damage
- Mood problems
- Cognitive decline

Doctors are also studying its potential effect on drug addiction [\[R\]](#).

How it helps

Acetyl-L-Carnitine is a form of Carnitine which the body can more easily absorb. It can help by increasing your natural Carnitine levels, which allows your body to produce more energy and also may help with mental function.

5



Propionyl-L-Carnitine

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 500 mg to 2 g of propionyl-L-carnitine orally with meals to enhance absorption, divided into two or three doses throughout the day. Continue this regimen daily for a minimum of several weeks to observe benefits.

TYPICAL STARTING DOSE
500 mg

Description

Propionyl-L-carnitine is a naturally occurring compound that plays a role in energy production and cardiovascular health. It is often used as a dietary supplement to support circulation and reduce symptoms of conditions like peripheral artery disease.

Propionyl-L-carnitine is a supplement that people use to improve athletic performance, heart health, and more. It provides [L-carnitine](#), a compound that helps your body get energy from fat [\[R, R\]](#).

How it helps

Propionyl-L-Carnitine, a form of carnitine, can help improve carnitine deficiencies by increasing the body's supply of usable carnitine for energy production. This may improve muscle function and reduce fatigue, common symptoms in people with carnitine 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.