

Proline

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

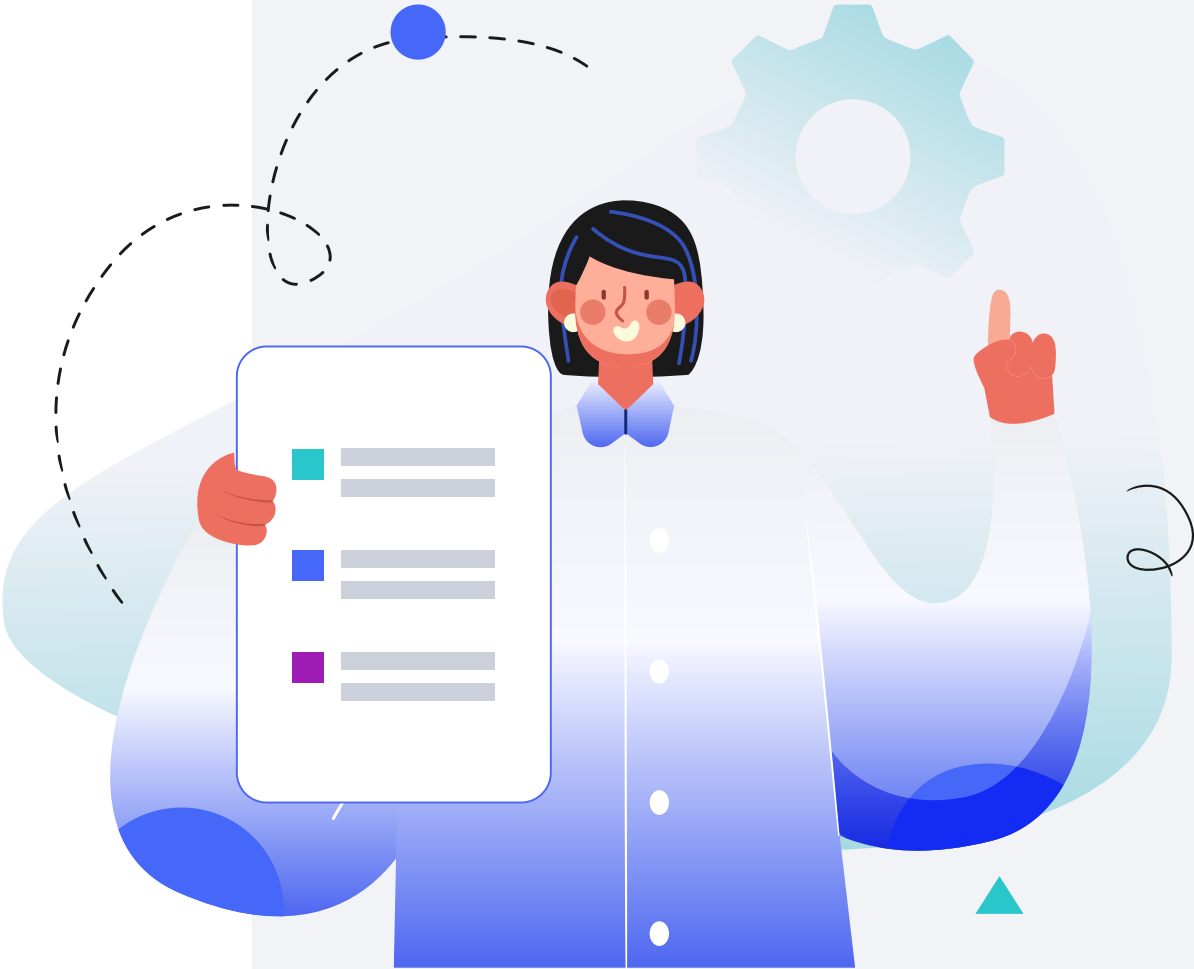
Male

HEIGHT

5ft 5" 165cm

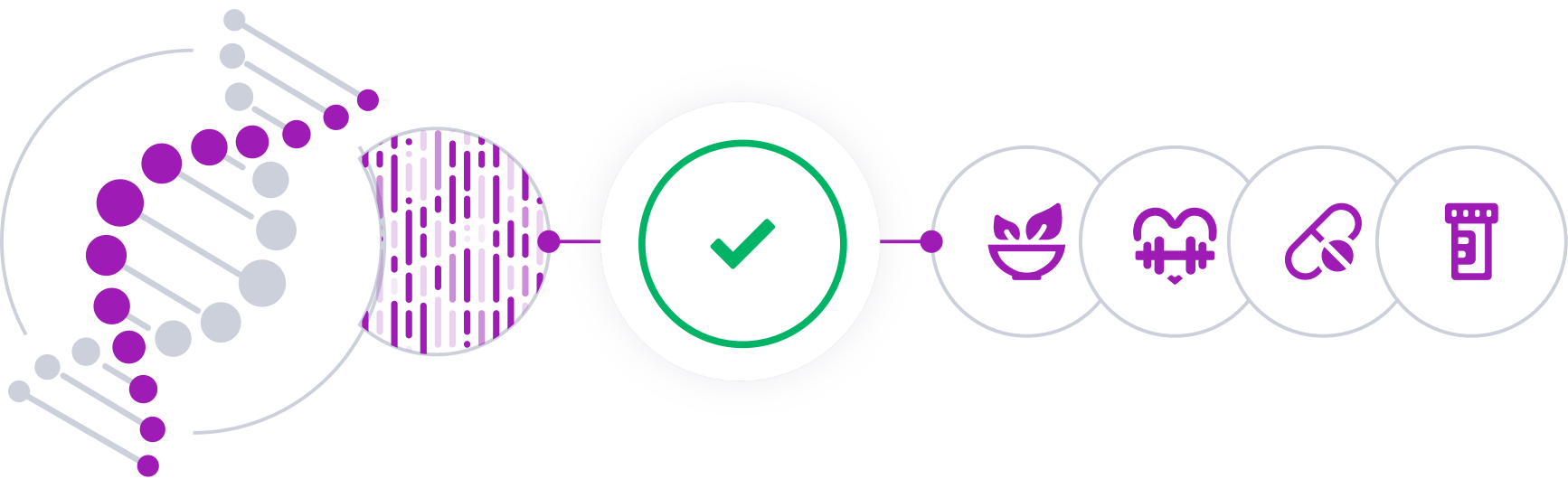
WEIGHT

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.

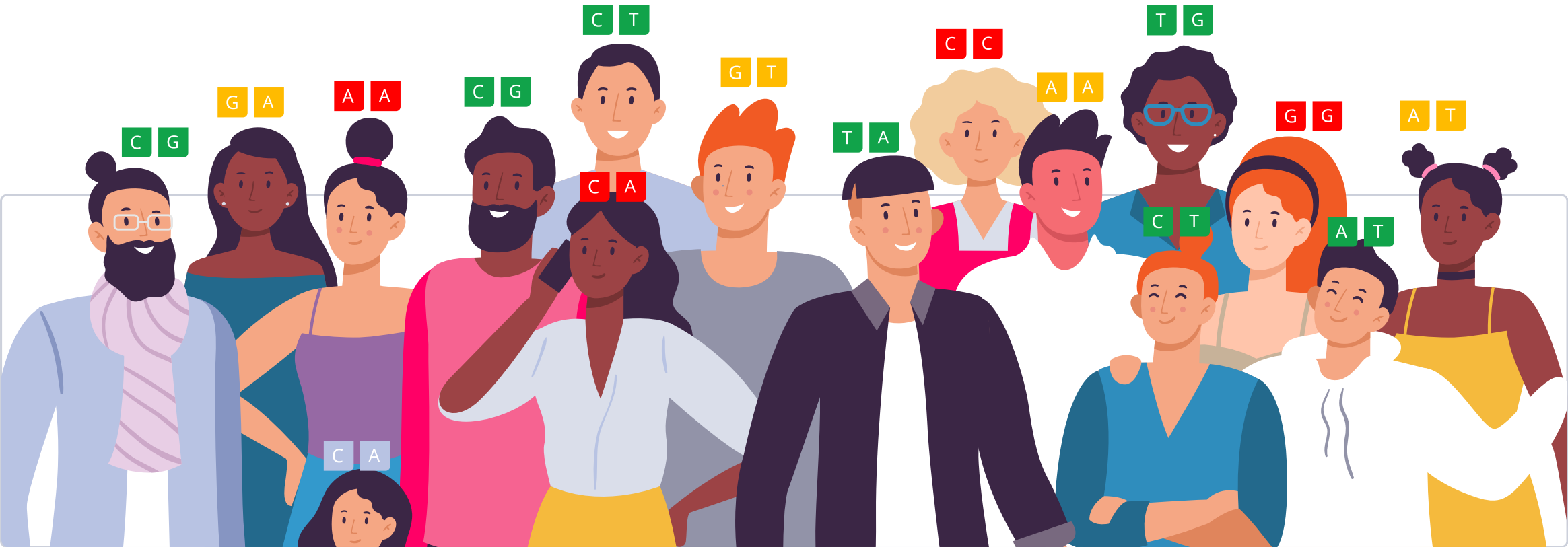


Similarly, our Trait Reports look at how your DNA influences your traits.



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

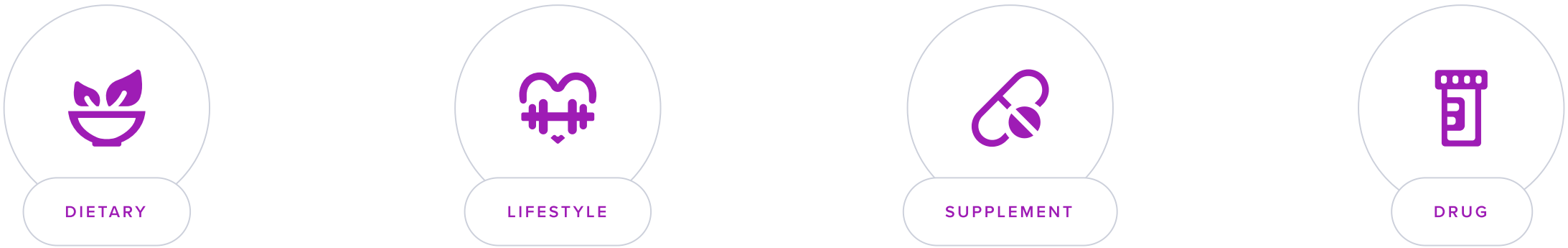
You have 2 risk alleles

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

Proline is a non-essential amino acid, which means that our bodies can make it from other amino acids such as [arginine](#), [glutamate](#), and [glutamine](#) [R].

We can also get proline from foods, such as [R]:

- Dairy, especially cheese
- Soybean
- Eggs
- Red meat and poultry
- Gelatin

Proline is a building block of all proteins in our bodies, especially collagen. It also helps produce other amino acids and plays important roles in [R, R, R, R, R, R]:

- Wound healing
- Fighting oxidative stress
- Immunity
- Brain health

On the other hand, high proline levels may be linked to a higher risk of diabetes [R].

Factors Influencing Proline Levels

Up to 70% of differences in people’s proline levels may be due to genetics [R, R].

Involved genes may influence proline breakdown. For example, the [PRODH](#) gene helps make an enzyme that converts proline into glutamate. Several *PRODH* variants are associated with higher proline levels [R, R, R].

High proline levels may also result from [R, R, R, R]:

- Muscle loss from aging
- Rare genetic disorders

Factors contributing to **low proline levels** include [R, R, R, R]:

- Malnutrition
- Burns and injuries
- Rare genetic disorders

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



TYPICAL NEED

Likely typical need for proline based on 3 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PRODH	rs2238732	CC
DGCR6	rs2080346	AG
SLC38A4	rs17666239	TA
ENTPD1	rs10882649	AG
AMER2	rs9581297	GG

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	Beef
3	Cream Cheese	4	Cabbage
5	Gelatin Powder	6	Soy Protein20 g
7	Pork	8	Collagen Peptides10 g
9	Alpha-Ketoglutarate (AKG)1 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 the amino acid proline, which supports the production of collagen, vital for skin, joint, and bone health. Including it in your diet can help to maintain these structures and potentially prevent proline deficiency-related problems.

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 rich in amino acids, one of which is proline that helps in the production of collagen, crucial for healthy skin, joints, and muscles. By incorporating beef into your diet, you can prevent proline deficiency, thereby ensuring the proper functioning of these body parts.

3



Cream Cheese

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Incorporate cream cheese into your daily diet by using it as a spread on bagels or toast, mixing it into sauces for a creamy texture, or adding it to desserts. Keep portions to about 1-2 tablespoons per serving to maintain a balanced diet.

Description

Cream cheese is a good source of arachidonic acid, protein, vitamin A and riboflavin, along with calcium and phosphorus.

Cream cheese is a good source of arachidonic acid, protein, vitamin A and riboflavin, along with calcium and phosphorus. Cream cheese contains .50 mg of arachidonic acid per gram.

How it helps

There's a misunderstanding here; Proline is an amino acid, not a medical condition, so it can't be prevented or treated with cream cheese or any other food. However, eating a variety of proteins, which include cream cheese, ensures intake of necessary amino acids.

4



Cabbage

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Incorporate fresh cabbage into your diet by adding it to salads, soups, stews, or as a side dish steamed or lightly sautéed. Aim for at least 2-3 servings of cabbage per week, where one serving is approximately one cup chopped or two leaves.

Description

Cabbage is a cruciferous vegetable rich in vitamins, fiber, and antioxidants. It's known for its potential to support digestive health, provide essential nutrients, and contribute to a balanced diet.

Cabbage is a great source of vitamins C and K, with decent amounts of other vitamins and minerals like folate and manganese. A ½ cup serving provides 16 mg of vitamin C or 18%DV.

How it helps

Cabbage is rich in vitamin C and amino acids like proline which promote skin health and wound healing. Regular consumption can increase your body's proline levels, helping prevent conditions linked to proline deficiency like skin aging and poor joint health.

5



Gelatin Powder

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Dissolve one to two tablespoons of gelatin powder in a cup of hot water, tea, or juice and drink it daily. Ensure to consume it consistently for at least one month to observe benefits.

Description

Gelatin powder is a source of collagen and protein that can support joint health, skin elasticity, and nail strength. It's often used as a dietary supplement to promote overall connective tissue well-being.

Gelatin powder is an excellent source of proline, with some protein (mainly collagen) and a bit of selenium.

How it helps

Gelatin powder is rich in proline, a type of amino acid essential for skin health and joint function. By consuming gelatin, you increase your body's proline levels, supporting a healthy skin and joints, thus potentially preventing conditions related to proline deficiency.

6



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 contains amino acids, including proline, that are vital for various bodily functions such as cellular regeneration and immune responses. Regular intake of soy protein can provide enough proline, helping to prevent deficiencies that might lead to conditions like joint disorders and skin issues.

7



Pork

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate lean cuts of pork, such as tenderloin or loin chop, into your diet 2-3 times per week, aiming for a portion size of about 3-4 ounces (85-113 grams) per meal. Cook it using healthy methods like grilling, baking, or broiling to minimize added fats.

Description

Pork is a meat obtained from pigs, and is a great source of zinc, protein, and iron, as well as leucine, selenium, phosphorus, and B-vitamins.

Pork is a good source of protein, chromium, selenium, phosphorus, zinc, and potassium. A 3-ounce serving provides 3.6 mcg of chromium or 10%DV.

How it helps

The term "Proline" refers to an amino acid used by the body to build proteins and doesn't represent a medical condition. Pork is rich in proline, beneficial for skin health and joint function, but doesn't directly prevent any specific disease.

8



Collagen Peptides

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 10-20 grams of collagen peptides daily, mixing the powder into a glass of water, juice, or a smoothie. It is recommended to consume this supplement on an empty stomach to improve absorption, ideally first thing in the morning or right before bedtime for a period of at least 8-12 weeks to observe beneficial effects.

TYPICAL STARTING DOSE

10 g

Description

Collagen peptides are a form of collagen that is broken down into smaller, more easily absorbed molecules. They are commonly used in supplements and skincare products for their potential to promote skin elasticity, hair strength, and nail health.

[Collagen](#) is a protein that helps build skin, bones, and joints [\[R, R\]](#).

People use collagen supplements for [\[R, R, R, R\]](#):

- Joint pain
- Skin health
- Hair growth

How it helps

Collagen supplements can increase proline blood levels. Collagen is rich in proline, an amino acid, and supplementing with collagen can increase circulating proline as it is broken down during digestion and absorbed into the bloodstream [\[R, R\]](#).

This increase supports tissue repair and other physiological processes where proline is essential.

9



Alpha-Ketoglutarate (AKG)

IMPACT1 / 5

EVIDENCE1 / 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

In hemodialysis patients, a study showed that combining alpha-ketoglutarate with calcium carbonate over one year improved amino acid metabolism. **Plasma urea decreased, while histidine, arginine, proline, and certain keto acids increased.** This combination treatment effectively reduced hyperphosphatemia [\[R\]](#).

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.