



Muscle Loss

DNA Health Report

REPORT CATEGORY —



LONGEVITY

Sample Client

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Table of Contents

03 How this works

- 04 Impact
- 05 Evidence
- 06 Some things to keep in mind

07 Introduction

08 Your genetics

09 Your recommendations

18 Next Steps

- 18 Your Lab Results

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

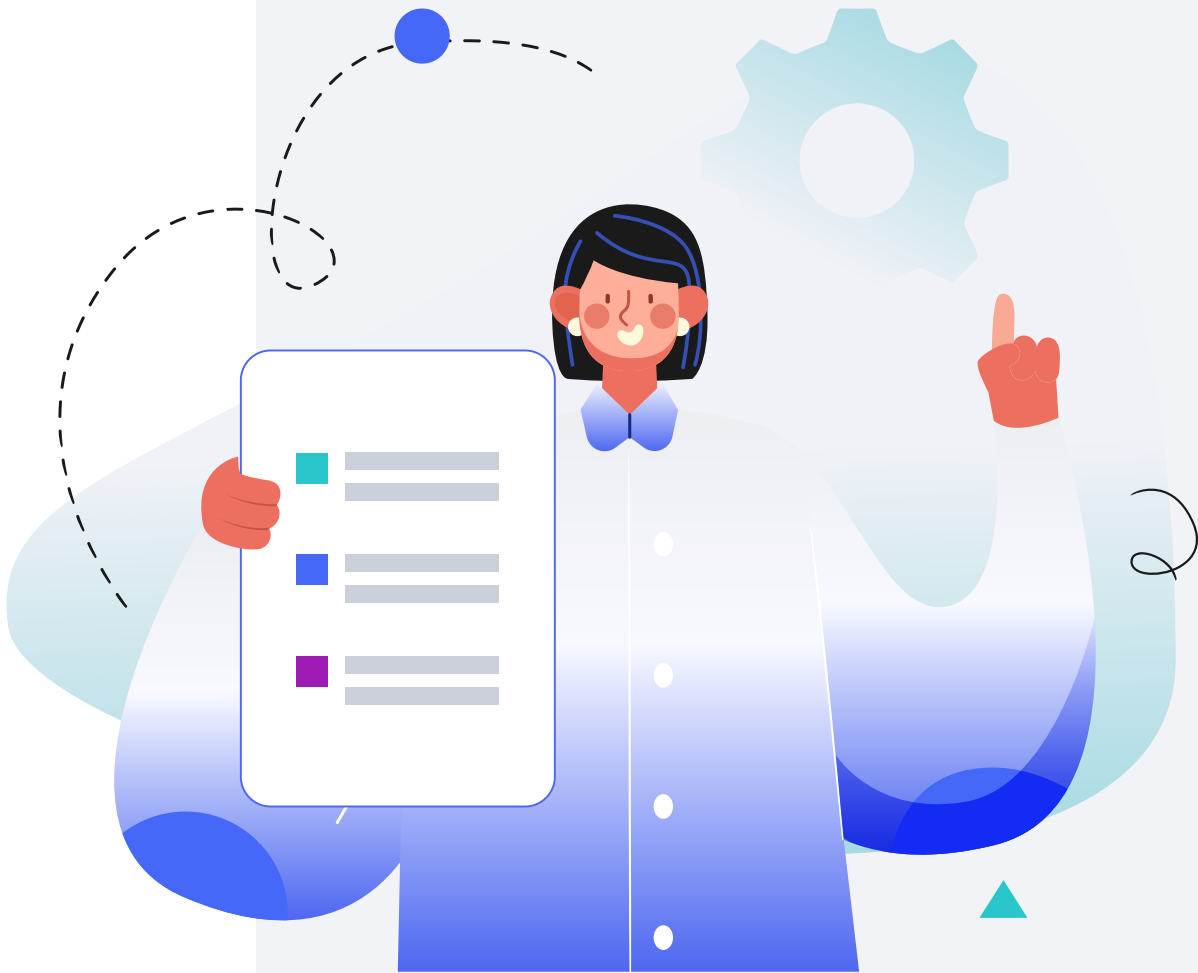
Male

HEIGHT

5ft 5" 165cm

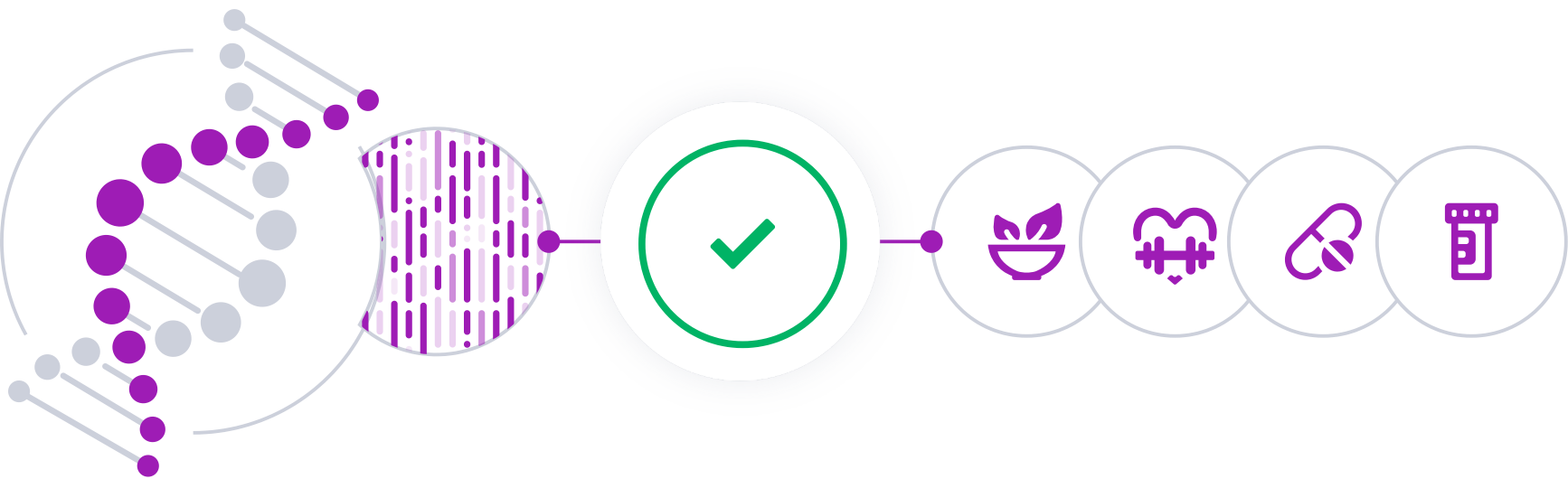
WEIGHT

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.

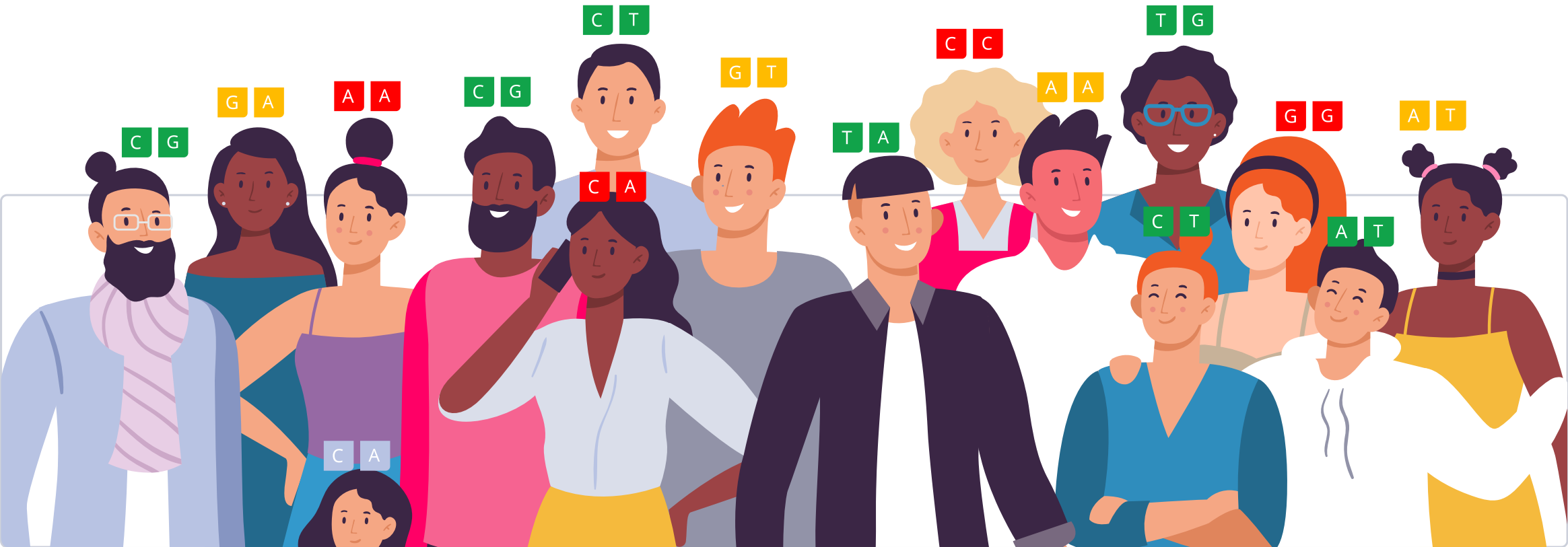


Similarly, our Trait Reports look at how your DNA influences your traits.



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

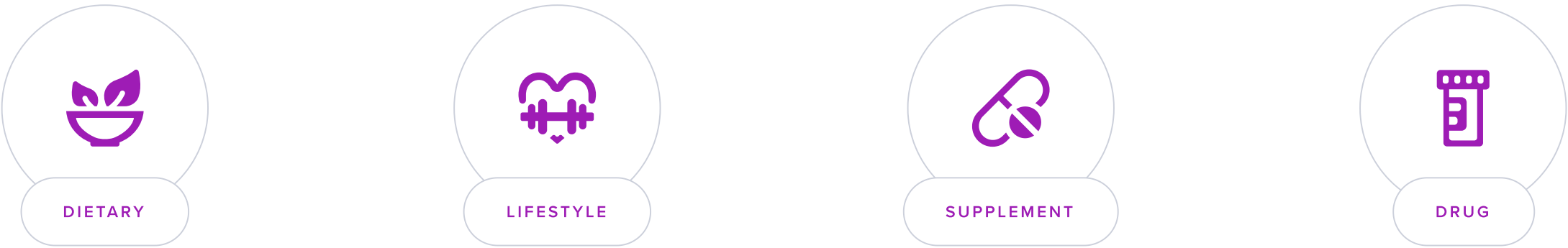
You have 2 risk alleles

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

Sarcopenia is the loss of muscle mass, strength, and function related to aging. While muscle loss is a natural part of the aging process, sarcopenia refers to an accelerated decrease in muscle mass. It typically starts around the age of 30 and progressively intensifies after the age of 60. This condition can lead to:

- Reduced mobility
- Increased risk of falls and fractures
- Decline in overall health and quality of life.

Common manifestations of sarcopenia include:

- Decreased muscle strength.
- Reduced endurance in physical activities.
- Loss of muscle tone and bulk.
- Slower gait and walking speed.
- Difficulty in tasks requiring strength, such as lifting objects or climbing stairs.

Risk Factors and Genetics

About **60%** of the differences in sarcopenia may be due to **genetics** [R].

Some genes associated with muscle growth, repair, and inflammation have been linked to sarcopenia susceptibility [R].

For example, genetically higher IGF-1 levels may be causally associated with higher muscle mass and a lower risk of muscle loss [R, R].

Factors that might increase the risk or intensity of sarcopenia include:

- Age: Older adults are at higher risk.
- Sedentary lifestyle
- Insufficient protein intake.
- Chronic illnesses (e.g., heart failure, chronic obstructive pulmonary disease (COPD), or cancer)
- Hormonal changes (e.g., reduced levels of growth hormone, testosterone, and insulin-like growth factor).
- Chronic inflammation.



LESS LIKELY

Less likely to have sarcopenia based on 10 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NAV2	rs117775496	GG
KCNMA1	rs17415098	GG
DOCK5	rs11135857	CC
KHDC1L	rs6453647	CG
TTC9	rs148532338	CC
FDFT1	rs191172273	TT
PPARGC1A	rs145583424	GG
LRP1B	rs74659977	TT
ZNF622	rs31574	AA
FADS2	rs97384	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	Strength Training	1 hour	
2	Leucine	2 g	
3	Alpha-Ketoglutarate (AKG)	1 g	
4	Collagen Peptides	10 g	
5	L-Carnitine	1 g	
6	MCT Oil		
7	Essential Amino Acids (EAA)	10 g	
8	Avoid Phthalate Exposure		
9	Agmatine	1 g	

1



Strength Training

IMPACT4 / 5

EVIDENCE2 / 5

How to implement

Engage in strength training exercises, such as weight lifting or bodyweight exercises, for 60 minutes per session, 2 to 3 times per week. Ensure you work all major muscle groups and rest each muscle group for at least 48 hours before exercising it again.

TYPICAL STARTING DOSE

1 hour

Description

Strength training, also called resistance or *anaerobic* training, contracts the muscles against an external resistance for short periods of time. This helps gain muscle strength, tone, and mass. This can include activities like weight lifting, pushups, and crunches.

Strength training, also known as resistance training, is a type of physical exercise that uses resistance to build strength, anaerobic endurance, and size [R]. Some of the most common strength training methods include [R]:

- Weight lifting
- Bodyweight exercises like push-ups, pull-ups, squats, and lunges.
- Resistance bands
- Plyometrics or explosive force exercises

The benefits of strength training are numerous, and include [R]:

- Increased muscle strength
- Improved bone health
- Reduced risk of injury
- Improved balance and coordination
- Enhanced mood
- Boost metabolism

Consult with a doctor before starting any new exercise program, especially if you have any health conditions.

How it helps

Resistance training is effective for age-related sarcopenia, but specific recommendations are lacking. A meta-analysis of 13 trials found kettlebell and elastic band training improved muscle strength, with elastic bands suggested as the most efficient method [R].

2



Leucine

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Take 2 to 3 grams of leucine supplement per day, with meals to enhance its absorption, particularly after resistance exercise to stimulate muscle protein synthesis. Consistency is important, so continue daily for at least several months to gauge effectiveness.

TYPICAL STARTING DOSE

2 g

Description

Leucine is an essential, branched-chain amino acid found in protein-rich foods that plays a key role in muscle protein synthesis and overall muscle health. It is commonly used by athletes and fitness enthusiasts to support muscle recovery and growth.

[Leucine](#) is a branched-chain amino acid (BCAA). It's essential, which means we can't produce it and must get it from food. Leucine is found in all protein-rich foods, such as [\[R\]](#):

- Red meat and poultry
- Fish
- Dairy products
- Eggs
- Legumes (e.g., beans and peas)
- Nuts (e.g., pistachios, almonds, and cashews)
- Cereals (e.g., corn, millet, semolina, and spelt)

How it helps

Six randomized controlled trials involving 699 participants found that leucine-rich protein supplements significantly improved overall muscle strength, mass, and performance compared to control groups (SMD = 0.939; 95% CI, 0.440-1.438; P < 0.001). Specifically, muscle strength significantly improved in the leucine group (SMD = 0.794; 95% CI, 0.104-1.485; P = 0.024). This suggests that leucine-rich protein supplements could be beneficial in the nutritional treatment of sarcopenia in older adults [\[R\]](#).

Leucine supplementation, based on 16 studies with 999 subjects, significantly increased body weight, lean body mass, and body mass index compared to controls. Particularly effective for those with sarcopenia, it didn't impact muscle strength. Further homogenous studies are needed for conclusive evidence [\[R\]](#).

3



Alpha-Ketoglutarate (AKG)

IMPACT

2 / 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 plays a crucial role in the Krebs cycle, aiding in efficient energy production, which is vital for muscle growth and maintenance. AKG also stimulates protein synthesis as a source of [glutamine](#) and [glutamate](#), promoting anabolic processes. It serves as a nitrogen transporter, helping in the synthesis of amino acids, the building blocks of protein.

Additionally, AKG can enhance cellular energy and reduce oxidative stress in muscle tissue, supporting muscle endurance and recovery. These combined effects contribute to muscle hypertrophy and help in mitigating muscle atrophy, especially in aging or muscle-wasting conditions.

In 21 people who underwent surgical trauma, supplementing alpha-ketoglutarate in a controlled trial prevented muscle breakdown and increased protein synthesis [\[R\]](#).

Abdominal surgery reduces muscle protein synthesis and increases fatigue. In 22 adults who had stomach surgery, supplementing alpha-ketoglutarate improved glutamine supply in the muscles and prevented muscle loss [\[R\]](#).

4



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

In a study with male subjects having sarcopenia, a 12-week resistance training program combined with collagen peptide supplementation (15g/day) resulted in greater improvements in fat-free mass (FFM), muscle strength (IQS), and fat loss compared to a placebo group [\[R\]](#).

5



L-Carnitine

IMPACT

1 / 5

EVIDENCE

1 / 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

1 g

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

In a trial involving 44 pemphigus patients receiving glucocorticoid therapy, the effect of L-carnitine (LC) supplementation was investigated. LC intake led to a significant increase in serum IGF-1 and a reduction in creatine kinase (CK) and myostatin levels compared to baseline. LC also prevented the decreasing trend in myogenin levels observed in the placebo group, suggesting that LC supplementation can improve muscle metabolism and regeneration in pemphigus patients undergoing glucocorticoid therapy [\[R\]](#).

6



MCT Oil

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate 1 to 2 tablespoons of MCT oil into your daily diet by adding it to coffee, smoothies, or salad dressings. Start with a lower dose to assess tolerance before gradually increasing to the full dosage. Use daily for ongoing benefits.

Description

MCT oil is a type of dietary fat known for its rapid absorption and potential to provide quick energy. It is often used in ketogenic diets and may support weight management and cognitive function.

How it helps

A 3-month study with elderly nursing home residents compared the effects of different supplements. The MCT group, receiving 6g/d of MCTs, showed a 48.1% increase in leg strength, 27.8% improvement in swallowing, and a 7.5% increase in activities of daily living (ADL) compared to the control group. This suggests that MCTs can enhance muscle strength, function, and ADL in frail elderly individuals [\[R\]](#).

7



Essential Amino Acids (EAA)

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take a supplement containing all nine essential amino acids, aiming for a total of 10-20 grams per day. This can be divided into 2-3 doses throughout the day, ideally around exercise sessions or with meals. Continue as long as you are seeking to enhance muscle recovery, growth, or overall protein intake.

TYPICAL STARTING DOSE

10 g

Description

Essential amino acids are crucial for building and repairing tissues, supporting immune function, and maintaining overall health. Obtaining these amino acids through a balanced diet or supplementation can promote muscle growth, better immune response, and overall well-being.

How it helps

Studies explored the role of essential amino acids (EAA) in muscle metabolism under different conditions [\[R, R, R\]](#):

The first study investigates the comprehensive effects of EAA supplementation in patients with severe COPD and sarcopenia, demonstrating significant improvements in muscle function and inflammation markers.

The second study examines the impact of resistance training combined with timed EAA intake during prolonged bed rest and energy deficit, showing its effectiveness in preventing muscle mass and strength loss.

8



Avoid Phthalate Exposure

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

To avoid phthalate exposure, check product labels and choose phthalate-free options for personal care items, plastics (look for recycling codes 3 and 7 or the letters 'V' or 'PVC'), and household products. Additionally, reduce the use of plastic containers for food storage, especially those not marked as 'phthalate-free', and avoid microwaving food in plastic containers. Aim to make these changes consistently in your daily life for long-term health benefits.

Description

Avoiding phthalate exposure involves choosing phthalate-free products, such as personal care items and plastics, to minimize potential endocrine-disrupting effects and protect reproductive and hormonal health.

How it helps

A study from NHANES 1999-2006 with 3,562 adults found that higher urinary levels of certain phthalate metabolites, specifically mono-n-butyl phthalate and monobenzyl phthalate, were associated with increased sarcopenia risk, with variations in association by sex [\[R\]](#).

9



Agmatine

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take agmatine as a dietary supplement in a dose of 1.6 to 6.4 milligrams per kilogram of body weight, daily. It can be consumed with or without food. For best results, continue taking it on a daily basis for at least two weeks to assess its effect on your body.

TYPICAL STARTING DOSE

1 g

Description

Agmatine is a naturally occurring compound found in the human body and in certain foods. It is sometimes used as a dietary supplement and is believed to have potential benefits for pain relief, mood regulation, and cognitive function.

How it helps

ease note: *There is no evidence from controlled clinical trials to support this recommendation. It is included based on uncontrolled clinical trials, animal or cell udies, or non-scientific criteria. Please take this recommendation with a grain of salt until more research is available.*

Agmatine increased fat burning, decreased fat composition, and increased muscle mass in rats [R].

Agmatine stimulated the production of [luteinizing hormone \(LH\)](#) in rats. Increased levels of LH increase testosterone levels. By increasing testosterone levels, agmatine contributed to an optimal hormonal environment for muscle growth and enhanced athletic performance [R].

It increased [insulin sensitivity](#) and uptake of glucose into the muscles of mice. Increased insulin sensitivity results in more effective shuttling of glucose and amino acids into muscles for growth and repair [R, R].

Agmatine also increased appetite in rats. An increased appetite can lead to increased caloric consumption, which is necessary for increasing muscle mass [R, R].

It may also aid muscle growth by enhancing nitric oxide (NO) production, which improves blood flow and nutrient delivery to muscles.

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 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.

