# Cholesterol

DNA Wellness Report

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How this works

## Your genetic risk summary

**Cholesterol**
Average risk of high cholesterol

## Your recommendations summary

See more details

1 **Exercise**
Exercise regularly.
IMPACT EVIDENCE

2 **Maintain a Healthy Weight**
Try to maintain a healthy weight.
IMPACT EVIDENCE

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3 **Choose Healthy Fats**
Replace saturated fats with polyunsaturated fats in your diet.
IMPACT EVIDENCE

4 **Fiber**
Get more fiber from diet or supplements.
IMPACT EVIDENCE

5 **Berberine**
Consider supplementing with berberine.
IMPACT EVIDENCE

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7 **Spirulina**
Consider supplementing with spirulina.
IMPACT EVIDENCE

8 **Garlic**
Eat more garlic.
IMPACT EVIDENCE

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# Welcome Jane Doe

Your Cholesterol DNA Wellness Report

## Introduction

Around 20% of your cholesterol is absorbed in your gut from the food you eat. That's why if you have high cholesterol, one of the first actions your doctor will recommend is to eat less saturated and trans fat [R].

### Topics Covered

Cholesterol

Unfortunately, simply eating less of these foods isn't enough to sufficiently lower cholesterol for some people. Thankfully, there are other cholesterol-lowering strategies available, like eating plant sterols and stanols!

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These compounds are found in plants like nuts, rice bran, and avocado. You can think of them as the plant versions of cholesterol (plant-sterol, if you will). Plant-sterol is very similar in structure to cholesterol, but doesn't come with the negative health effects [R, R, R].

Just like cholesterol, plant-sterol is absorbed in your gut. Because they're so similar in structure, they compete for absorption at the same location. As a result, the more plant-sterol you eat, the more it will compete with cholesterol, causing less cholesterol to be absorbed [R, R, R].

Strangely, researchers investigating the effects of plant-sterol on your "bad" cholesterol (LDL) found that, despite their potential benefits, a small group of people actually experienced no benefit. Even worse, some people experience an increase in "bad" cholesterol after consuming plant-sterols. But why does this happen [R, R, R]?

Well, the answer may lie in your DNA!

Take your *CYP7A1* gene. A variant of the *CYP7A1* gene may alter your cholesterol levels by increasing the rate at which cholesterol is absorbed in your gut. This variant may also increase the effectiveness of plant sterols and stanols at lowering your cholesterol [R].

If your absorption levels are higher, even if you eat less cholesterol than another person, you may end up having higher cholesterol levels. Pretty unfair, right? Which is why it's particularly important to understand how your body works. Then you can take targeted action to lower your cholesterol absorption rate, like eating more plant-sterol [R]!

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**We're all unique. Your genetics can influence how well your body handles cholesterol. The information hidden in your DNA may help predict the best cholesterol-lowering strategies for you, helping you to live a healthier and happier life.**

**This report focuses on the genetics of cholesterol. Read more to find out:**

- **The role of genetics on your cholesterol levels**
- **Your genetic risk score based on over one million genetic variants**
- **Personalized recommendations based on your genetics**

# Genetics Overview

Your Cholesterol DNA Wellness Report

## Cholesterol

Your Genetics Overview

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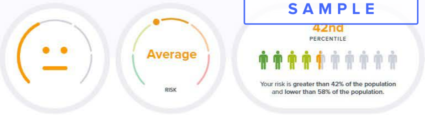

Your risk is greater than 42% of the population and lower than 58% of the population.

Average risk of high cholesterol

Based on your genetics

**People think of cholesterol as being bad, but it's actually essential.** Cholesterol gives shape to all of your cells. Your body also uses it to make vitamin D and some types of hormones [R].

**There are two major types of cholesterol: LDL and HDL**. We call HDL "good cholesterol" because it helps your liver get rid of excess cholesterol. On the other hand, LDL cholesterol is "bad" because it can stick to your blood vessels. This can cause heart problems [R, R].

If your doctor has ever told you that you have high cholesterol, they were either referring to [R]:

- LDL cholesterol
- Total cholesterol (LDL + HDL)

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Some risk factors for high LDL cholesterol include [R, R]:

- A diet high in saturated fat
- Obesity
- Lack of exercise
- Older age
- Smoking
- Diabetes
- Family history (genetics)

If your cholesterol levels rise, your doctor will recommend strategies for lowering them. These may include [R]:

**We analyzed 1,171,067 genetic variants.**

**Have you ever been told you have high cholesterol?**

YES ✓ NO ✕

- A diet low in saturated fat
- The Mediterranean diet
- Exercise
- Losing weight

How well you respond to these strategies may depend on your genes.

**Up to 65% of differences in cholesterol levels may be attributed to genetics.** Genes that may contribute to high cholesterol influence [R, R, R, R, R, R]:

- Cholesterol production (*LPL*, *LIPC*, *HMGCR*)
- Cholesterol transport (*APOB*)
- HDL and LDL cholesterol balance (*CETP*)

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# Prioritized Recommendations

Your Cholesterol DNA Wellness Report

## 1 Exercise

Your Recommendation

Exercise regularly.

+ ADD TO MY REGIMEN

LIFESTYLE

Impact

Evidence

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### Description

**Exercise can do wonders for your health.** It can help you lose weight, improve your heart health, boost your mood, and more [R].

There are many ways you can be active. You can walk, run, swim, dance, or play team sports. **Everything counts, and it's never too late to start!**

Try getting a mix of cardio (at least 150 min/week) and strength training (2 times/week) [R].

### How Exercise Helps Reduce Cholesterol

**Exercise is one of the best things you can do to lower cholesterol** [R, R, R].

Exercise can help you burn fat and boost HDL or "good" cholesterol [R, R].

**People who exercise for at least 150 minutes per week** tend to have lower cholesterol. All types of exercise are helpful. In fact, strength and endurance training have about the same effect on cholesterol [R, R, R, R].

Low-intensity exercise, such as tai chi and yoga, may reduce cholesterol as well [R, R, R, R].

Exercise works especially well if you also eat a healthy diet [R, R, R, R].

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- **Exercise is a great way to reduce your cholesterol by targeting many of your gene variants at once [R, R].**

### Helps with these:

Cholesterol

### Was this recommendation helpful for you?

👍 👎

## 2 Maintain a Healthy Weight

Your Recommendation

Try to maintain a healthy weight.

LIFESTYLE

Impact ⓘ

Evidence

+ ADD TO MY REGIMEN

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## Description

**People have a healthy weight when they don't have too much or too little body fat** [R].

*Body mass index* (BMI) can help determine body fat levels. Your BMI is your mass (in kg) divided by the square of your height (in meters) [R].

In general [R]:

- People with a BMI **between 18.5 and 25** tend to have a **healthy weight**
- People with a BMI **between 25 and 30** tend to be **overweight**
- People with a BMI **over 30** tend to be **obese**

People who are overweight or obese are more likely to have [R, R]:

- High blood pressure
- Type 2 diabetes
- Heart disease
- Joint problems
- Sleep problems

**The best ways to lose weight are to consume fewer calories and exercise regularly** [R].

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### How a Healthy Weight Prevents High Cholesterol

**People who are overweight are more likely to have high cholesterol.** Most experts say to aim for a **BMI below 25** for heart health [R, R, R].

Getting to a healthy weight can decrease your total and “bad” (LDL) cholesterol [R, R].

Some people may need to lose at least **5%** of their starting weight to see a drop in cholesterol. This is especially true for obese people or those with diabetes [R, R, R].

- **Maintaining a healthy weight can help prevent high cholesterol by targeting many of your gene variants at once [R, R].**
- **People with your *FAAH* gene variant may see a bigger drop in cholesterol after losing weight [R].**

### Helps with these:

Cholesterol

### Was this recommendation helpful for you?

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# Choose Healthy Fats

Your Recommendation

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Replace saturated fats with polyunsaturated fats in your diet.

+ ADD TO MY REGIMEN

DIETARY

Impact ⓘ

Evidence ⓘ

## Description

The fats in our diet can be broadly divided into *saturated* and *unsaturated* fat. Too much saturated fat can increase “bad” (LDL) cholesterol [R, R, R].

People who eat a lot of saturated fat may be at a higher risk of [R, R]:

- Weight gain
- Heart disease
- Stroke

**Animal products, such as meat and dairy are highest in saturated fats** [R].

**On the other hand, unsaturated fat can be good for your cholesterol.** Experts say you should look to add **polyunsaturated fats** (PUFAs) from sources like [R]:

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- Walnuts
- Seeds
- Fish

### Helps with these:

Cholesterol

### Was this recommendation helpful for you?

👍 👎

### How Choosing Healthy Fats Helps Reduce Cholesterol

**Many experts recommend eating less saturated fat to help lower cholesterol.** This may lower your risk of heart disease [R, R, R, R].

However, keep in mind that simply reducing saturated fats may not reduce your cholesterol. **This is especially true if you replace saturated fats with processed and sugary foods** [R].

To make a meaningful change, replace saturated fats with healthier alternatives, such as unsaturated fats. Good sources of these healthy fats include [R, R, R, R, R]:

- Fish
- Nuts
- Seeds
- Avocado
- Safflower, olive, and canola oil

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**Fish, walnuts, and seeds** are rich in polyunsaturated fats (PUFAs). These fats may be the best replacement for saturated fat [R].

**Making these healthy replacements may lower cholesterol by up to 17%** [R, R, R, R].

Diets rich in healthy fats include [R, R, R]:

- The Mediterranean diet
- The DASH diet
- Vegetarian diets

  - **People with your *PPARA* gene variant may respond better to diets low in saturated fat [R]. Try to focus on healthy unsaturated fat sources.**

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# Fiber

Your Recommendation

> Get more fiber from diet or supplements.

+ ADD TO MY REGIMEN

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## Description

**Fiber is a type of carb that your body can't digest. It supports gut health, heart health, blood sugar control, and more** [R, R].

**Women should get 21-25 g of fiber per day, while men should get 30-38 g.** Most people in the US don't get enough fiber [R, R].

Fiber supplements are available for people who don't get enough from their diets [R].

### How Fiber Helps Reduce Cholesterol

**Health officials recommend eating more fiber (3-10 g) to improve your cholesterol levels.** Fiber stops your gut from absorbing too much cholesterol. By doing so, it lowers cholesterol levels in the blood [R, R, R].

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High-fiber foods that may lower cholesterol include:

- Buckwheat [R, R, R]
- Oats [R]
- Barley [R, R]
- Beans [R]
- Apples [R]

Diets high in the above foods may be a good choice for reducing cholesterol. They include:

- The Mediterranean diet [R, R]
- Vegetarian diets [R, R]
- The DASH diet [R]

The following fiber supplements may also help improve cholesterol levels:

- Psyllium [R, R, R, R]
- Beta-glucans [R, R, R, R]
- Glucomannan [R, R]
- Inulin [R, R, R, R]
- Pectin [R, R]
- Resistant starch [R]

### Helps with these:

Cholesterol

### Was this recommendation helpful for you?

- **People with your *LEP* variant may see a bigger drop in cholesterol from fiber (psyllium) supplementation [R].**

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## Berberine

Your Recommendation

Consider supplementing with berberine.

+ ADD TO MY REGIMEN

SUPPLEMENT

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Evidence

### Description

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Berberine is an active compound of some plants used in traditional medicine, such as [R]:

- Barberry
- Oregon grape
- Goldenseal
- Chinese goldthread

You can also get berberine as a supplement. People use it to help with [R, R, R]:

- High blood sugar
- High cholesterol
- High blood pressure
- Polycystic ovary syndrome (PCOS)

### How Berberine Helps Reduce Cholesterol:

**Berberine (0.9-1.5 g/day for 2-6 months) may lower total and "bad" (LDL) cholesterol while raising "good" (HDL) cholesterol [R, R, R, R].**

It may also improve cholesterol when it's combined with other ingredients, such as:

- Milk thistle [R, R]
- Red yeast rice [R, R]
- Policosanol [R, R]
- Coenzyme Q10 [R]

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Berberine may help remove cholesterol from the blood and reduce its production [R, R].

- **A supplement with berberine may reduce cholesterol more in people with your *LDLR* gene variant [R].**

Helps with these:

Cholesterol

Was this recommendation helpful for you?

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## Black Seed

Your Recommendation

Consider supplementing with black seed.

+ ADD TO MY REGIMEN

SUPPLEMENT

Impact

Evidence

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### Description

Black seed (black cumin) and its oil are used in cooking and traditional medicine [R].

People use black seed for [R, R, R, R, R]:

- Asthma
- Allergies
- High blood sugar
- High blood pressure
- Joint pain

Helps with these:

Cholesterol

Was this recommendation helpful for you?

### How Black Seed Helps Reduce Cholesterol

**Black seed supplements may lower total and "bad" (LDL) cholesterol. The antioxidants and healthy fats in black seed may explain these effects [R, R, R].**

Studied doses include [R, R, R]:

- **Powder**: 0.5-2 g/day for 1-2 months
- **Oil**: up to 5 g/day for 1-3 months
- **Extract**: 0.7-1 g/day for 2 months

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It is sometimes combined with turmeric, garlic, or fenugreek in supplements for high cholesterol [R, R, R].

**Black seed may also increase "good" (HDL) cholesterol.** However, the evidence for this effect is mixed [R, R, R].

- **Your *HMGCR* gene variant is linked to higher cholesterol levels. It may increase the activity of an enzyme that makes cholesterol. Black seed may help by blocking this enzyme [R, R, R, R, R].**

## 7 Spirulina

Your Recommendation

Consider supplementing with spirulina.

+ ADD TO MY REGIMEN

SUPPLEMENT

Impact

Evidence

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## Description

Spirulina is a supplement made from blue-green algae that grows in fresh and marine water [R, R].

**Dried spirulina is up to 70% protein. It's also rich in vitamins, antioxidants, and healthy fats.** This makes it a great source of nutrition for both people and livestock [R, R, R].

People use spirulina supplements to reduce [R, R]:

- Cholesterol
- Blood pressure
- Blood sugar

### How Spirulina Helps Reduce Cholesterol

**Spirulina supplements (1-10 g/day for 2-12 months) may reduce "bad" (LDL) cholesterol and raise "good" (HDL) cholesterol [R].**

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**Spirulina may stop your gut from absorbing too much cholesterol from [illegible]** prevent some of the toxic effects of LDL cholesterol [R, R, R].

Spirulina may be especially helpful for people with [R, R, R, R]:

- Obesity
- High blood pressure
- High blood sugar

- **Your *NPC1L1* gene variant is linked to higher levels of "bad" (LDL) cholesterol. It may increase the amount of cholesterol your body absorbs. Spirulina may help by reducing cholesterol absorption [R, R, R, R].**

**Helps with these:**

Cholesterol

**Was this recommendation helpful for you?**

## 8 Garlic

Your Recommendation

Eat more garlic.

DIETARY

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+ ADD TO MY REGIMEN

## Description

Garlic is a vegetable often used to flavor food. It's been a part of traditional medicine for thousands of years [R].

Today, people take garlic to help control their blood pressure and cholesterol [R].

### How Garlic Helps Reduce Cholesterol

**Garlic (600-900 mg/day for 3-6 months) may help lower total and "bad" (LDL) cholesterol** [R, R, R, R, R].

Garlic may help lower cholesterol by blocking its production [R, R, R].

***Please note**: Garlic can interact with blood thinners (like aspirin, Plavix, Coumadin). If you are on blood thinners, consult your doctor before supplementing with garlic [R].*

- **Your *HMGCR* gene variant is linked to higher cholesterol levels. It may increase the activity of an enzyme that makes cholesterol. Garlic may help by blocking this enzyme** [R, R, R, R].

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### Helps with these:

Cholesterol

### Was this recommendation helpful for you?

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